The Effectiveness of Lockdowns, Face Masks and Vaccination Programmes Vis-à-Vis Mitigating COVID-19

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Contents

Abstract **17**

1 Introduction **19**
1.1 Origins of SARS-CoV-2 . . . 19
1.1.1 Introduction . . . 19
1.1.2 Novel Virus? . . . 19
1.1.3 *Nature Medicine* Article . . . 19
1.1.4 Lab Leak? . . . 20
1.1.5 Cover-Up . . . 21
1.1.6 United States Involvement . . . 21
1.1.7 Iatrogenic Origin . . . 22
1.2 Variants of SARS-CoV-2 . . . 22
1.3 COVID-19 . . . 22
1.4 Transmission . . . 23
1.5 Epidemiological Statistics . . . 23
1.6 Comorbidities . . . 24
1.7 Reinfections . . . 24
1.8 Long COVID . . . 24
1.9 COVID-19 and Children . . . 24
1.10 COVID-19 and Influenza . . . 25
1.11 Herd Immunity . . . 25
1.12 Science . . . 26
1.13 Data . . . 26
1.14 Modelling . . . 26
1.15 Terminology . . . 27
1.16 Scope of Literature Review . . . 27
1.17 Rest of the Paper . . . 28

2 Lockdowns **29**
2.1 Background . . . 29
2.1.1 Pre-Pandemic . . . 29
2.1.2 China . . . 29
2.1.3 Italy . . . 29
2.1.4 United States . . . 30
2.1.4.1 New York . . . 30
2.1.5 United Kingdom . . . 30
2.1.6 Global . . . 31
2.2 Effectiveness of Lockdowns . . . 31
2.2.1 Literature Review . . . 31
2.2.1.1 Australasia . . . 31
2.2.1.2 Europe . . . 31
2.2.1.3 North America . . . 35
2.2.1.4 Global . . . 37
2.2.1.5 Conclusion . . . 41
2.2.2 Analysis . . . 42
2.2.2.1 SIR Model . . . 44
2.2.2.2 Experiment 1: Gompertz Function Analysis . . . 46
2.2.2.3 Experiment 2: SIR Model Analysis . . . 47
2.2.2.4 Conclusion . . . 49

2.2.3 Conclusion . . . 49
2.3 Collateral Damage Caused by Lockdowns . . . 49
2.3.1 Health . . . 49
2.3.1.1 General . . . 49
2.3.1.2 Delayed Healthcare . . . 50
2.3.1.3 Immunity Debt . . . 52
2.3.1.4 Accidents . . . 52
2.3.1.5 Deaths . . . 52
2.3.1.6 Cardiovascular Disease . . . 53
2.3.1.7 Cancer . . . 53
2.3.1.8 Mental Health . . . 54
2.3.1.9 Physical Exercise . . . 56
2.3.1.10 Obesity . . . 57
2.3.1.11 Sperm . . . 57
2.3.1.12 Fertility Treatment . . . 57
2.3.1.13 Alcohol . . . 57
2.3.1.14 Drugs . . . 58
2.3.1.15 Smoking . . . 58
2.3.2 Economic . . . 59
2.3.2.1 Africa . . . 59
2.3.2.2 Asia . . . 59
2.3.2.3 Australasia . . . 59
2.3.2.4 Europe . . . 59
2.3.2.5 North America . . . 61
2.3.2.6 Global . . . 62
2.3.3 Social . . . 62
2.3.3.1 Well-Being . . . 62
2.3.3.2 Withdrawal . . . 63
2.3.3.3 Communication . . . 63
2.3.3.4 Infantilisation . . . 63
2.3.3.5 Entitlement . . . 63
2.3.3.6 Ethics . . . 63
2.3.3.7 Prejudice . . . 64
2.3.3.8 Religion . . . 64
2.3.3.9 Crime . . . 64
2.3.4 Political . . . 65
2.3.4.1 Democracy . . . 65
2.3.4.2 Trust . . . 66
2.3.4.3 Inequalities . . . 66
2.3.4.4 Immigration . . . 66
2.3.4.5 Political Parties Voted Out . . . 67
2.3.4.6 UK Election Conspiracy of Silence . . . 67
2.3.5 Legal and Policing . . . 67
2.3.5.1 South Africa . . . 67
2.3.5.2 United Kingdom . . . 67
2.3.6 Transport . . . 68
2.3.7 Children . . . 68
2.3.7.1 Introduction . . . 68
2.3.7.2 Health . . . 69
2.3.7.3 Mental Health . . . 69
2.3.7.4 Intelligence . . . 70

2.3.7.5 Development . . . 71
2.3.7.6 Communication . . . 71
2.3.7.7 Learning and Education . . . 71
2.3.7.8 Exams . . . 74
2.3.7.9 School Closure . . . 74
2.3.7.10 Absence From School . . . 75
2.3.7.11 Behaviour . . . 76
2.3.7.12 Crime . . . 76
2.3.7.13 Social . . . 77
2.3.7.14 Inequalities . . . 77
2.3.7.15 Abuse . . . 77
2.3.7.16 Deaths . . . 77
2.3.7.17 Conclusion . . . 78
2.3.8 Third World . . . 78
2.3.8.1 Women . . . 78
2.3.8.2 Children . . . 79
2.3.9 Conclusion . . . 79
2.4 Benefits of Lockdowns . . . 79
2.4.1 Air Pollution . . . 80
2.4.1.1 China . . . 80
2.4.1.2 Europe . . . 80
2.4.1.3 United States . . . 80
2.4.1.4 Global . . . 80
2.4.2 Road Traffic Collisions . . . 80
2.4.2.1 Greece . . . 80
2.4.2.2 United States . . . 81
2.4.2.3 Global . . . 81
2.4.2.4 Conclusion . . . 81
2.4.3 Suicide . . . 81
2.4.3.1 United Kingdom . . . 81
2.4.3.2 Global . . . 81
2.5 Lockdown Cost–Benefit Analysis . . . 81
2.5.1 Literature Review . . . 82
2.5.1.1 Australia . . . 82
2.5.1.2 Canada . . . 82
2.5.1.3 Ireland . . . 82
2.5.1.4 Sweden . . . 82
2.5.1.5 United Kingdom . . . 82
2.5.1.6 United States . . . 83
2.5.1.7 Global . . . 84
2.5.2 Analysis . . . 84
2.6 Degree of Overreaction . . . 85
2.6.1 Asia . . . 85
2.6.1.1 China . . . 85
2.6.1.2 Israel . . . 85
2.6.2 Europe . . . 85
2.6.2.1 Austria . . . 85
2.6.2.2 Ireland . . . 85
2.6.2.3 Isle of Man . . . 86
2.6.2.4 Italy . . . 86
2.6.2.5 Slovakia . . . 86

2.6.2.6 United Kingdom . . . 86
2.6.3 North America . . . 87
2.6.3.1 United States . . . 87
2.6.4 Global . . . 88
2.6.4.1 Mortality . . . 88
2.6.4.2 Epidemiological Statistics . . . 88
2.6.4.3 No Pandemic . . . 88
2.6.4.4 Conclusion . . . 89
2.7 Why Don't Lockdowns Work? . . . 89
2.7.1 SARS-CoV-2 is Airborne . . . 89
2.7.2 Hope-Simpson's Model of Influenza Applies to COVID-19 . . . 89
2.7.3 The Majority Are Exposed, Susceptibility Is What Matters . . . 89
2.7.4 Long-Term Costs . . . 89
2.7.5 Lockdowns Merely Postpone the Inevitable . . . 90
2.7.6 Lockdowns Can Create Immunity Debt . . . 90
2.7.7 We Do Not Wish to Reduce Infections Across the Entire Community . . . 90
2.7.8 Lockdowns Lead to a Higher Herd Immunity Threshold . . . 91
2.7.9 Those With the Highest Relative Mobility Will Now Include the Old . . . 91
2.7.10 Reducing Mobility Can Increase the Spread of Disease . . . 91
2.7.11 Lockdowns Make Key Workers (Not the Young) The Most Mobile . . . 91
2.7.12 More Time Spent at Home . . . 91
2.7.13 Can Create Congestion . . . 92
2.7.14 SARS-CoV-2 Could Become More Infectious . . . 92
2.7.15 SARS-CoV-2 Could Become More Virulent . . . 92
2.7.16 Other Factors Dominate . . . 92
2.7.17 Long-Term Dynamics . . . 92
2.7.18 Conclusion . . . 93
2.8 If Lockdowns Don't Work, Why Were They Used? . . . 93
2.8.1 Why Were Lockdowns Used in the First Place? . . . 93
2.8.1.1 China . . . 93
2.8.1.2 Italy . . . 93
2.8.1.3 Ferguson's Paper . . . 93
2.8.1.4 Pueyo's Paper . . . 93
2.8.1.5 United Kingdom . . . 94
2.8.1.6 Collective Hysteria . . . 94
2.8.1.7 Politics . . . 94
2.8.1.8 Politician's Syllogism . . . 94
2.8.1.9 Technology . . . 94
2.8.1.10 Scientists . . . 94
2.8.1.11 Conclusion . . . 95
2.8.2 Why Were Lockdowns Sustained? . . . 95
2.8.2.1 Lockdowns Appeared to Work . . . 95
2.8.2.2 Politics . . . 95
2.8.2.3 Media . . . 95
2.8.2.4 Public Opinion . . . 96
2.8.2.5 Conclusion . . . 97
2.9 Conclusion . . . 97
2.9.1 Australia . . . 97
2.9.2 Sweden . . . 97
2.9.3 United Kingdom . . . 98
2.9.4 United States . . . 99

2.9.5 Global . . . 99

3 Face Masks **100**
3.1 Introduction . . . 100
3.2 Exhaled Particles . . . 100
3.2.1 Influenza . . . 100
3.2.2 COVID-19 . . . 101
3.2.2.1 Aerosols . . . 101
3.2.2.2 Particle Size . . . 101
3.2.2.3 Duration . . . 102
3.3 Effectiveness of Face Masks . . . 102
3.3.1 Effectiveness of Face Masks as a Filter . . . 102
3.3.1.1 Influenza . . . 103
3.3.1.2 COVID-19 . . . 103
3.3.2 Face Mask Fit . . . 104
3.3.3 Face Masks in General . . . 105
3.3.3.1 Pre-COVID-19 . . . 105
3.3.3.2 COVID-19 . . . 105
3.3.4 Face Masks in Healthcare . . . 106
3.3.4.1 Pre-COVID-19 . . . 106
3.3.4.2 COVID-19 . . . 108
3.3.5 Face Masks in the Community . . . 108
3.3.5.1 Influenza . . . 108
3.3.5.2 COVID-19 . . . 110
3.3.6 Face Masks in Schools . . . 114
3.3.6.1 Influenza . . . 114
3.3.6.2 COVID-19 . . . 114
3.3.7 Cochrane Review . . . 116
3.3.8 Face Masks in Aeroplanes . . . 117
3.3.9 Could Face Masks *Increase* the Spread of COVID-19? . . . 117
3.3.9.1 Europe . . . 117
3.3.9.2 North America . . . 118
3.3.9.3 Global . . . 118
3.3.10 Experiment 3: The Effectiveness of the Face Covering Policy in England . 118
3.3.11 Conclusion . . . 122
3.4 Harms Caused by Face Masks . . . 122
3.4.1 General . . . 123
3.4.1.1 False Sense of Security . . . 123
3.4.1.2 Breathing . . . 123
3.4.1.3 Cardiopulmonary Exercise Capacity . . . 124
3.4.1.4 Temperature . . . 124
3.4.1.5 Pathogens . . . 124
3.4.1.6 Skin . . . 125
3.4.1.7 Eyes . . . 125
3.4.1.8 Vision . . . 126
3.4.1.9 Nose . . . 126
3.4.1.10 Bad Breath . . . 126
3.4.1.11 Particulate Inhalation . . . 126
3.4.1.12 Communication . . . 127
3.4.1.13 Social . . . 127
3.4.1.14 Cognition . . . 128
3.4.1.15 Immunity Debt . . . 128

3.4.1.16 Crime . . . 128
3.4.1.17 Accidents and Deaths . . . 128
3.4.1.18 Pollution . . . 129
3.4.2 Healthcare . . . 129
3.4.2.1 Breathing . . . 130
3.4.2.2 Pathogens . . . 130
3.4.2.3 Headaches . . . 130
3.4.2.4 Skin . . . 130
3.4.2.5 Communication . . . 131
3.4.2.6 Cognition . . . 131
3.4.2.7 Mental Health . . . 131
3.4.3 Children . . . 131
3.4.3.1 Breathing . . . 131
3.4.3.2 Pathogens . . . 132
3.4.3.3 Communication . . . 132
3.4.3.4 Missing School . . . 132
3.4.3.5 Immunity Debt . . . 132
3.4.3.6 Conclusion . . . 132
3.4.4 Conclusion . . . 133
3.5 Financial Cost . . . 133
3.6 Cost–Benefit Analysis . . . 134
3.7 Making Masks Mandatory . . . 134
3.8 Why Don't Face Masks Mitigate COVID-19? . . . 135
3.8.1 A Viable COVID-19 Virus Is Small . . . 135
3.8.2 Masks Leak . . . 135
3.8.3 Masks Become Moist . . . 135
3.8.4 Masks Worn Incorrectly . . . 135
3.8.5 The Vulnerable Become More Susceptible . . . 135
3.8.6 Most Transmission Occurs in Unmasked Environments . . . 135
3.8.7 Limited Time Window of Effectiveness . . . 136
3.8.8 Long-Term Dynamics . . . 136
3.8.9 Merely Slows Onset of COVID-19 . . . 136
3.8.10 Cannot Thwart a High Viral Load in the Air . . . 136
3.8.11 Immune Response Rather Than Viral Load Matters . . . 137
3.8.12 The Virus Could Evolve to Become More Infectiousness . . . 137
3.9 If Face Masks Don't Mitigate COVID-19, Why Were They Used? . . . 137
3.9.1 Advantages of Face Masks . . . 137
3.9.2 Academia . . . 137
3.9.3 Precautionary Principle . . . 138
3.9.4 Government . . . 138
3.9.4.1 United Kingdom . . . 138
3.9.4.2 United States . . . 139
3.9.5 Healthcare . . . 139
3.9.6 Media . . . 139
3.9.7 Public . . . 139
3.10 Air Filters . . . 140
3.10.1 High-Efficiency Particulate Air (HEPA) Filters . . . 140
3.11 Cloth Masks . . . 141
3.12 Silent Eating . . . 141
3.13 Conclusion . . . 141

4 Vaccination Programmes **144**
4.1 Introduction . . . 144
4.1.1 Vaccinations . . . 144
4.1.2 COVID-19 Vaccination Trials . . . 144
4.1.3 COVID-19 Vaccinations . . . 145
4.2 Vaccine Effectiveness . . . 146
4.2.1 Biases . . . 146
4.2.1.1 Data . . . 146
4.2.1.2 Case Identification . . . 147
4.2.1.3 Unknown Denominator . . . 147
4.2.1.4 Case Counting Window . . . 147
4.2.1.5 Classification . . . 147
4.2.1.6 Healthy Vaccinee Bias . . . 148
4.2.1.7 Confounding by Indication . . . 148
4.2.1.8 Collider Bias . . . 149
4.2.1.9 Previous Infection . . . 149
4.2.2 General . . . 149
4.2.2.1 Asia . . . 149
4.2.2.2 Europe . . . 149
4.2.2.3 North America . . . 149
4.2.3 First Two Weeks . . . 150
4.2.3.1 Europe . . . 151
4.2.3.2 North America . . . 151
4.2.4 Transmission . . . 151
4.2.4.1 Europe . . . 152
4.2.5 Infections/Cases . . . 152
4.2.5.1 Asia . . . 152
4.2.5.2 Europe . . . 152
4.2.5.3 North America . . . 153
4.2.5.4 Global . . . 154
4.2.6 Severe COVID-19/Hospitalisations . . . 154
4.2.6.1 Europe . . . 154
4.2.6.2 North America . . . 155
4.2.6.3 Global . . . 155
4.2.7 Deaths . . . 155
4.2.7.1 Asia . . . 155
4.2.7.2 Australasia . . . 156
4.2.7.3 Europe . . . 156
4.2.7.4 North America . . . 158
4.2.7.5 Global . . . 158
4.2.8 All-Cause Mortality . . . 159
4.2.8.1 Europe . . . 159
4.2.8.2 North America . . . 159
4.2.8.3 Global . . . 159
4.2.9 Vaccination Effectiveness Wanes . . . 160
4.2.9.1 Asia . . . 160
4.2.9.2 Europe . . . 160
4.2.9.3 North America . . . 161
4.2.9.4 Global . . . 162
4.2.10 Negative Vaccination Effectiveness . . . 162
4.2.10.1 Asia . . . 162

4.2.10.2 Europe . . . 162
4.2.10.3 North America . . . 163
4.2.11 More Doses Increases Risk of Infection/Hospitalisation/Death . . . 164
4.2.11.1 Asia . . . 164
4.2.11.2 Australasia . . . 164
4.2.11.3 Europe . . . 164
4.2.11.4 North America . . . 165
4.2.12 Vaccinations Fail When We Need Them Most . . . 165
4.2.12.1 Italy . . . 166
4.2.12.2 Norway . . . 166
4.2.12.3 Spain . . . 166
4.2.12.4 Turkey . . . 166
4.2.12.5 United States . . . 166
4.2.13 Conclusion . . . 166
4.3 Issues with Vaccinations . . . 167
4.3.1 Natural Immunity . . . 168
4.3.1.1 Asia . . . 168
4.3.1.2 Europe . . . 169
4.3.1.3 North America . . . 169
4.3.2 Bolus Theory . . . 169
4.3.3 DNA Contamination . . . 170
4.3.4 Viral Immune Escape . . . 170
4.3.5 Original Antigenic Sin . . . 171
4.3.5.1 Letters to Journals . . . 171
4.3.5.2 Asia . . . 171
4.3.5.3 Europe . . . 172
4.3.5.4 North America . . . 172
4.3.5.5 Bloggers . . . 172
4.3.6 Marek's Disease . . . 174
4.3.7 Superspreader Hypothesis . . . 174
4.3.7.1 Singapore . . . 174
4.3.7.2 United Kingdom . . . 174
4.3.7.3 United States . . . 174
4.3.7.4 Vietnam . . . 175
4.3.8 Spike Protein . . . 175
4.3.8.1 mRNA Vaccines . . . 175
4.3.8.2 Spike Protein Damage . . . 175
4.3.8.3 Blood–Brain Barrier . . . 176
4.3.8.4 Spike Protein Persists . . . 176
4.3.8.5 Spike and Inflammation . . . 177
4.3.8.6 Spike and Ageing . . . 177
4.3.9 Junk Protein . . . 177
4.3.10 Nanoparticles . . . 178
4.3.11 Antibody-Dependent Enhancement (ADE) . . . 178
4.3.12 Vaccine-Associated Enhanced Disease (VAED) . . . 179
4.3.12.1 United Kingdom . . . 179
4.3.12.2 United States . . . 179
4.3.13 Immunosuppression . . . 179
4.3.14 Immune Tolerance . . . 181
4.3.14.1 IgG4 . . . 181
4.3.15 VAIDS . . . 183

4.3.16 Adverse Effects . . . 183
4.3.16.1 General . . . 183
4.3.16.2 Pharmacovigilance Databases . . . 186
4.3.16.3 Hospitalisations . . . 187
4.3.16.4 Deaths . . . 188
4.3.16.5 Audiological . . . 191
4.3.16.6 Cancer . . . 192
4.3.16.7 Cardiovascular . . . 194
4.3.16.8 Haematological . . . 199
4.3.16.9 Coagulation . . . 199
4.3.16.10 Immunological . . . 200
4.3.16.11 Neurological . . . 200
4.3.16.12 Respiratory . . . 201
4.3.16.13 Men . . . 202
4.3.16.14 Women and Babies . . . 202
4.3.16.15 Aircraft Pilots . . . 204
4.3.16.16 Shedding . . . 204
4.3.16.17 Other . . . 205
4.3.17 Long Vax . . . 206
4.3.18 Herd Immunity . . . 207
4.4 Boosters . . . 207
4.4.1 Asia . . . 207
4.4.1.1 Israel . . . 207
4.4.1.2 Japan . . . 208
4.4.1.3 Qatar . . . 208
4.4.2 Europe . . . 208
4.4.2.1 Gibralta . . . 208
4.4.2.2 United Kingdom . . . 208
4.4.3 North America . . . 208
4.4.3.1 United States . . . 209
4.5 Vaccinations Cost–Benefit Analysis . . . 209
4.5.1 Introduction . . . 209
4.5.2 Risk–Benefit Ratio . . . 209
4.5.3 Which Age Groups Benefit? . . . 209
4.5.4 Conclusion . . . 211
4.6 Experiment 4: Analysis of Vaccination Programmes . . . 212
4.7 Children . . . 223
4.7.1 Pre-COVID-19 . . . 223
4.7.2 Vaccination Effectiveness . . . 224
4.7.2.1 Italy . . . 224
4.7.2.2 United States . . . 224
4.7.3 Adverse Effects . . . 224
4.7.3.1 Vaccinations in General . . . 224
4.7.3.2 Influenza Vaccinations . . . 225
4.7.3.3 Asia . . . 225
4.7.3.4 Australasia . . . 225
4.7.3.5 Europe . . . 225
4.7.3.6 North America . . . 225
4.7.3.7 Asthma . . . 225
4.7.3.8 Myocarditis . . . 225
4.7.3.9 Deaths . . . 226

4.7.4 Cost–Benefit Analysis . . . 226
4.8 Mandatory Vaccinations . . . 227
4.9 Vaccination Passports . . . 227
4.10 Politics . . . 228
4.11 Public Opinion . . . 228
4.11.1 Canada . . . 228
4.11.2 France . . . 228
4.11.3 United Kingdom . . . 229
4.11.4 United States . . . 229
4.12 Vaccine Hesitancy . . . 229
4.13 Prejudice . . . 229
4.14 The Fall of Vaccinations . . . 230
4.14.1 Vaccinations Becoming Less Popular . . . 230
4.14.2 Calls to Withdraw Vaccinations . . . 230
4.14.3 Vaccinations Withdrawn . . . 231
4.15 Conclusion . . . 231

5 Excess Mortality **234**
5.1 Introduction . . . 234
5.2 Deaths . . . 234
5.2.1 Asia . . . 234
5.2.1.1 India . . . 234
5.2.2 Australasia . . . 234
5.2.2.1 Australia . . . 234
5.2.2.2 New Zealand . . . 235
5.2.3 Europe . . . 235
5.2.3.1 Denmark . . . 235
5.2.3.2 Finland . . . 235
5.2.3.3 Germany . . . 235
5.2.3.4 Ireland . . . 236
5.2.3.5 Norway . . . 236
5.2.3.6 Sweden . . . 236
5.2.3.7 United Kingdom . . . 237
5.2.4 North America . . . 241
5.2.4.1 Canada . . . 241
5.2.4.2 Mexico . . . 241
5.2.4.3 United States . . . 241
5.2.5 Global . . . 244
5.3 Injuries . . . 244
5.3.1 Europe . . . 245
5.3.1.1 Switzerland . . . 245
5.3.1.2 United Kingdom . . . 245
5.3.2 North America . . . 245
5.3.2.1 United States . . . 245
5.3.3 Global . . . 246
5.4 Excess Mortality and COVID-19 . . . 246
5.4.1 Asia . . . 246
5.4.1.1 Japan . . . 246
5.4.2 Australasia . . . 246
5.4.2.1 Australia . . . 246
5.4.2.2 New Zealand . . . 246
5.4.3 Europe . . . 246

5.4.3.1 Estonia . . . 246
5.4.3.2 Scandinavia . . . 247
5.4.3.3 United Kingdom . . . 247
5.4.4 North America . . . 248
5.4.4.1 Canada . . . 248
5.4.4.2 United States . . . 248
5.4.5 Global . . . 249
5.5 Excess Mortality and Lockdowns . . . 249
5.5.1 Australasia . . . 249
5.5.1.1 Australia . . . 249
5.5.2 Europe . . . 250
5.5.2.1 Sweden . . . 250
5.5.2.2 United Kingdom . . . 250
5.5.3 North America . . . 250
5.5.3.1 United States . . . 250
5.5.4 Global . . . 251
5.6 Excess Mortality and Vaccinations . . . 251
5.6.1 Asia . . . 253
5.6.1.1 Cyprus . . . 253
5.6.1.2 Israel . . . 253
5.6.1.3 Japan . . . 253
5.6.1.4 Singapore . . . 254
5.6.1.5 South Korea . . . 254
5.6.2 Australasia . . . 254
5.6.2.1 Australia . . . 254
5.6.2.2 New Zealand . . . 255
5.6.3 Europe . . . 255
5.6.3.1 Children . . . 255
5.6.3.2 Czech Republic . . . 256
5.6.3.3 Germany . . . 256
5.6.3.4 Norway . . . 256
5.6.3.5 Scandinavia . . . 256
5.6.3.6 Sweden . . . 257
5.6.3.7 The Netherlands . . . 257
5.6.3.8 United Kingdom . . . 257
5.6.4 North America . . . 260
5.6.4.1 Canada . . . 260
5.6.4.2 United States . . . 260
5.6.5 Global . . . 262
5.7 Excess Mortality and Iatrogenesis . . . 263
5.7.1 Asia . . . 264
5.7.1.1 India . . . 264
5.7.2 Europe . . . 264
5.7.2.1 United Kingdom . . . 264
5.7.3 North America . . . 264
5.7.3.1 United States . . . 264
5.7.4 Global . . . 265
5.8 Excess Mortality and Coinfections . . . 265
5.9 Excess Mortality, COVID-19 and Lockdowns . . . 265
5.9.1 North America . . . 265
5.9.1.1 United States . . . 265

5.10 Excess Mortality, COVID-19 and Vaccinations . . . 265
5.10.1 Europe . . . 266
5.10.2 North America . . . 266
5.10.2.1 United States . . . 266
5.11 Excess Mortality, Lockdowns and Vaccinations . . . 266
5.11.1 Europe . . . 266
5.11.1.1 United Kingdom . . . 266
5.11.2 Asia . . . 266
5.11.2.1 China . . . 266
5.11.3 Europe . . . 266
5.11.3.1 United Kingdom . . . 266
5.11.4 Global . . . 267
5.12 Excess Mortality, Lockdowns, Vaccinations and Iatrogenesis . . . 267
5.12.1 Global . . . 267
5.13 Conclusion . . . 267

6 Discussion **269**
6.1 Why Did the World Overreact? . . . 269
6.1.1 Representativeness . . . 269
6.1.2 Overreaction . . . 269
6.1.3 Availability . . . 269
6.1.4 Risk Aversion and Fear . . . 270
6.1.4.1 United Kingdom . . . 270
6.1.4.2 United States . . . 271
6.1.5 Prisoner's Dilemma . . . 271
6.1.6 Virtue Signalling . . . 271
6.1.7 Cheater Detection . . . 272
6.1.8 Purity Spiral . . . 272
6.1.9 Self-Deception . . . 272
6.1.10 Herding . . . 273
6.1.11 Illusion of Control . . . 273
6.1.12 Compliance . . . 273
6.1.13 Publication Bias . . . 274
6.1.13.1 Journals . . . 274
6.1.13.2 Newspapers . . . 277
6.1.13.3 Wikipedia . . . 277
6.1.13.4 Conclusion . . . 277
6.2 The Determinants of COVID-19 Case/Death Rates . . . 278
6.2.1 Dynamics of COVID-19 . . . 278
6.2.2 Pre-Existing Immunity . . . 280
6.2.2.1 Influenza . . . 280
6.2.2.2 COVID-19 . . . 281
6.2.3 Seasonality . . . 282
6.2.3.1 Influenza . . . 283
6.2.3.2 Latitude . . . 283
6.2.3.3 Temperature and Humidity . . . 283
6.2.3.4 Ultraviolet (UV) Light . . . 283
6.2.3.5 Conclusion . . . 284
6.2.4 Other Factors . . . 284
6.2.4.1 Genetics . . . 284
6.2.4.2 Lived Density/Collectivism . . . 285
6.2.4.3 Longevity . . . 285

6.2.4.4 Healthcare . . . 285
6.2.4.5 Mortality Displacement . . . 285
6.2.4.6 Obesity . . . 286
6.2.4.7 Vitamin D Deficiency . . . 286
6.2.4.8 Pollution . . . 286
6.2.4.9 Stress . . . 287
6.2.5 Conclusion . . . 287
6.3 Why Did Influenza All But Vanish? . . . 287
6.4 Fomite Transmission and Hand Sanitiser . . . 288
6.5 Early Treatment . . . 288
6.6 Long COVID . . . 289
6.6.1 Europe . . . 290
6.6.1.1 Germany . . . 290
6.6.1.2 Italy . . . 290
6.6.1.3 Norway . . . 290
6.6.1.4 United Kingdom . . . 290
6.6.2 North America . . . 290
6.6.2.1 United States . . . 291
6.6.3 Does Long COVID Exist? . . . 291
6.6.4 Children . . . 292
6.6.5 Conclusion . . . 292
6.7 Voices of Reason . . . 292
6.7.1 Individuals . . . 292
6.7.2 Organisations . . . 293
6.7.3 Science and Academia . . . 294
6.7.4 Media . . . 294
6.8 Bad Actors . . . 294
6.8.1 World Health Organization (WHO) . . . 294
6.8.1.1 Lockdowns . . . 294
6.8.1.2 Face Masks . . . 295
6.8.1.3 Vaccination Programmes . . . 295
6.8.1.4 Immunity . . . 295
6.8.1.5 Airborne Transmission . . . 296
6.8.1.6 Seasonal . . . 296
6.8.1.7 Conclusion . . . 296
6.8.2 European Union . . . 296
6.8.3 Academia . . . 296
6.8.4 Publications . . . 297
6.8.4.1 Magazines . . . 297
6.8.4.2 Newspapers . . . 297
6.8.4.3 Journals . . . 298
6.8.5 Independent SAGE . . . 300
6.8.6 Experts . . . 300
6.8.7 Midwits . . . 301
6.8.8 Politicians . . . 301
6.8.8.1 Australia . . . 302
6.8.8.2 New Zealand . . . 303
6.8.8.3 United Kingdom . . . 303
6.8.9 Teaching Unions . . . 304
6.8.10 Censors . . . 305
6.8.10.1 Government . . . 305

6.8.10.2 Academia . . . 305
6.8.10.3 Media . . . 305
6.8.10.4 Social Media . . . 305
6.8.11 Fact-Checkers . . . 307
6.8.11.1 Fact-Checking . . . 307
6.8.11.2 Fake News . . . 308
6.8.11.3 Disinformation . . . 308
6.8.11.4 Misinformation . . . 309
6.8.12 Sceptics and Sceptical Magazines . . . 310
6.8.12.1 *Skeptic* . . . 310
6.8.12.2 *Skeptical Inquirer* . . . 311
6.8.12.3 *The Skeptic* . . . 311
6.8.12.4 *Science-Based Medicine* (*SBM*) . . . 311
6.8.12.5 Office for Science and Society, McGill University . . . 312
6.8.12.6 Cambridge Skeptics . . . 312
6.8.12.7 Conclusion . . . 312
6.8.13 Zero COVID Zealots . . . 312
6.8.14 Mask Zealots . . . 312
6.8.15 Anti-Anti-Vaxxers . . . 313
6.9 Strengths and Weaknesses . . . 314
6.9.1 Strengths . . . 314
6.9.2 Weaknesses . . . 314

7 Conclusion **315**
7.1 General . . . 315
7.2 Medicine . . . 316
7.3 Effectiveness of Lockdowns, Face Masks and Vaccination Programmes . . . 316
7.3.1 Lockdowns . . . 318
7.3.2 Face Masks . . . 319
7.3.3 Vaccination Programmes . . . 319
7.4 Ethics . . . 319
7.5 COVID-19 Dynamics . . . 319
7.6 Media . . . 320
7.7 Conspiracy Theorists . . . 320
7.8 UK Covid-19 Inquiry . . . 321
7.9 Hindsight Prescription . . . 321
7.9.1 Focused Protection . . . 322
7.9.1.1 United Kingdom . . . 322
7.9.1.2 United States . . . 323
7.9.1.3 Global . . . 323
7.9.2 Politician's Syllogism . . . 323
7.10 Future . . . 323
7.10.1 Governance . . . 324
7.10.2 Censorship . . . 324
7.10.3 Lockdowns . . . 324
7.10.4 Face Masks . . . 324
7.10.5 Vaccination Programmes . . . 324
7.10.6 Excess Mortality . . . 324
7.10.7 Early Treatment . . . 324
7.10.8 Education . . . 325
7.10.9 New Normal . . . 325
7.10.10 Risk . . . 325

7.11 Unanswered Questions 325

A Countries **327**

B Income **446**

C Continents **449**

D European Union and World **453**

Bibliography **455**

Abstract

In the autumn of 2019 a novel coronavirus, SARS-CoV-2, began to circulate widely, embedding itself within a high proportion of the population but lying dormant. In March 2020, as the influenza season in the Northern Hemisphere subsided, due to viral interference, SARS-CoV-2 activated and became the dominant respiratory virus, and COVID-19 spread from China around the world, suppressing influenza, whilst leaving the other human-infecting coronaviruses undisturbed. The vast majority of countries reacted to COVID-19 by imposing non-pharmaceutical interventions, such as lockdowns and face mask policies and, later, vaccination programmes.

Lockdowns had no significant effect on COVID-19 transmission, cases or deaths. The collateral damage caused by lockdowns impacted health, economic, social, political, legal, policing and transport issues. Health issues included delayed and missed healthcare, immunity debt, accidents, deaths, mental health, reduced fertility, an increase in obesity, an increase in smoking, and alcohol and drug abuse. Economic issues caused by lockdowns include higher debt, higher taxes, higher inflation, more people on benefits, waste (test and trace, personal protective equipment and hotel quarantine) and fraud (furlough scheme payments). Children missed school which compromised their development, communication skills, education, behaviour and physical and mental health. Lockdowns also generated a workshy workforce and normalised truancy. Lockdowns exacerbated inequalities, too, with the poor being the worst affected. In the third world, matters were even worse. The United Nations reported that hunger led to the deaths of 10,000 more children per month over the first year of the pandemic. They also estimated that disruptions in South Asia in 2020 likely contributed to 228,000 deaths among children under five years old. The benefits of lockdowns included reduced air pollution, fewer road traffic collisions and a drop in suicide rates. Overall, lockdowns failed a cost–benefit analysis by orders of magnitude. Lockdowns were implemented by governments due to overly pessimistic modelling, risk aversion and the desire to be seen to take action. Lockdowns were then sustained because the media spread fear, whilst the public became fearful, abandoned the care of public affairs to the government-media-education uber-class, trusted them, and assumed that because governments implemented lockdowns they must work, were motivated to virtue signal and supported them. Meanwhile, politicians were motivated to retain or seek power, so keen to appease the median voter, and maintained lockdowns, despite the economic and health damage they caused. A vicious circle developed: fear sustained lockdowns and lockdowns sustained fear.

Face masks were not effective at mitigating COVID-19, but can cause dyspnoea, hypoxia, hypoxemia and hypercapnia, harbour pathogens, compromise communication, vision, exercise capacity, cognition and immunity, cause headaches, skin complaints, bad breath and particulate inhalation, facilitate crime and lead to pollution.

In December 2020 COVID-19 vaccination programmes were introduced. The vaccinations failed to provide sterilising immunity or stop transmission. The vaccination exhibits negative efficacy for the first two weeks due to immunosuppression, which increases cases, hospitalisations and deaths. The vaccine, in the pre-Omicron era, then provided effective protection against hospitalisation and death for several months, before it waned towards and below zero effectiveness. Because those with breakthrough infections exhibit lesser symptoms, but have a similar viral load to the unvaccinated, they may be more likely to inadvertently spread COVID-19 to others, and become superspreaders. In May 2021 the more virulent Delta variant evolved, possibly due to the vaccination programmes via a Marek's disease type effect. This led to more severe infections in the unvaccinated. From December 2021 the less severe Omicron variant activated. The variant displaced harmless cold-causing human coronaviruses, and influenza returned. Vaccination programmes led to the immune system, via original antigenic sin, being fixed for the wild-type strain. It then became less able to provide effective responses during subsequent infections. This enabled the natural selection of immune escape subvariants that are highly infectious. We ended up with antibody-dependent enhancement, vaccine-associated enhanced respiratory disease and the rapid spread of Omicron among the vaccinated leading to more cases, hospitalisations and deaths. The global mass vaccination campaign using non-sterilising vaccines homogenised our immune response at a population level. This makes it easy for the virus to evolve into a multitude of new variants, and increases the risk of zoonosis. Unlike the previous variants, Omicron is not seasonally activated. The constant reinfection from an evolving cloud

of variants leads to immunosuppression, secondary infections and superinfections. SARS-CoV-2 and mRNA vaccines can both induce cells in various parts of the body to produce the spike protein for months, leading to inflammation and adverse events. Whilst repeated mRNA vaccinations increase IgG4 antibodies, induce partial immune tolerance and weaken the immune system. Countries with a high vaccination rate lack natural immunity (which is broad and robust), so are unable to achieve herd immunity, and instead achieved herd-level original antigenic sin, and so COVID-19 waves continue to ripple. Because the unvaccinated did not impose a negative externality on others, there were no medical or ethical grounds for making vaccinations mandatory or vaccine passports.

The populations of East Asia, Southeast Asia and Australasia had greater pre-existing immunity (from other coronaviruses) against wild-type SARS-CoV-2 due to their closer proximity to the origin of COVID-19, but were adversely affected by Omicron. In 2021 excess deaths switched from the elderly to younger and middle-aged age groups because immunosuppression, caused by vaccinations, is more pronounced among those age groups. Global excess mortality, earlier largely involving COVID-19 and iatrogenesis, and later often related to cardiovascular issues, has continued to be significantly elevated since COVID-19 appeared, largely due to both COVID-19 and the vaccinations (directly, indirectly, in combination and over the short and longer term), and the collateral damage caused by lockdowns.

A seasonal influenza-like illness became a pandemic of governmental overreach and collective hysteria. Lockdowns turned out to be the greatest health economics mistake in modern history, face masks served no useful purpose in the community, in schools or in healthcare, whilst vaccinations were effective against severe COVID-19 in the elderly in 2021, but ultimately likely did more harm than good.

1 Introduction

In 2020 the world endured the COVID-19 pandemic, and by 2024 the World Health Organization (WHO) reported in excess of seven million COVID-19 deaths globally (WHO, 2024b). COVID-19 is a respiratory infectious disease caused by the SARS-CoV-2 coronavirus, which originated in Wuhan, China (Rothan & Byrareddy, 2020) in 2019.

1.1 Origins of SARS-CoV-2

1.1.1 Introduction

SARS-CoV-2 most likely either evolved naturally as a zoonotic event (J. C. Alwine, Casadevall, Enquist, Goodrum, & Imperiale, 2023; K. G. Andersen, Rambaut, Lipkin, Holmes, & Garry, 2020; Calisher et al., 2020; Holmes et al., 2021; Pekar et al., 2022), was created in a laboratory in Wuhan from which it escaped (Bruttel, Washburne, & VanDongen, 2022; A. Chan & Ridley, 2021; N. Hodgkinson, 2021; Lardieri, 2023; Mitteldorf, 2020; Ridley, 2021; Syed, 2022a; *The Telegraph*, 2022; Wade, 2021; Washburne, 2022), or was released in Wuhan deliberately (Mowrey, 2023i). Any of these hypotheses are possible (Bloom et al., 2021; Maxmen & Mallapaty, 2021; Segreto & Deigin, 2021).

1.1.2 Novel Virus?

To what extent were SARS-CoV-2 and COVID-19 novel? The prevailing view is that SARS-CoV-2 was a novel virus that caused a novel syndrome (Kory, 2024a). However, M. Neil and Engler (2024) argued that the virus which has become known as SARS-CoV-2 does not appear to be that novel when looked at from several angles. It appears to be just another coronavirus, of which at least eight other similar such viruses have been detected since the 1980s. M. Neil, Engler, and Hockett (2024) argued that there was *not* a novel deadly respiratory virus spreading from person to person in the spring of 2020. They state that the supposed unique symptoms of spikeopathy, such as CT-findings, 'happy hypoxia' and 'dry-lung', can be readily explained by other diseases/pathogens.

1.1.3 *Nature Medicine* Article

On 17 March 2020 an influential article entitled 'The proximal origin of SARS-CoV-2' published in *Nature Medicine* claimed that the virus emerged naturally (K. G. Andersen et al., 2020). However, some of the authors were not entirely honest and did not publish their true beliefs (Ebright, 2023; Taibbi, Woodhouse, Gutentag, & Shellenberger, 2023). Slack messages and emails subpoenaed and released by the House Oversight Select Subcommittee on the Coronavirus Pandemic suggest that some of the scientists who wrote the article worried privately that COVID-19 was caused by a laboratory escape, and perhaps even that SARS-CoV-2 was a genetically engineered virus (Ridley & Chan, 2023). On 1 February 2020 the lead author of the proximal origin paper, Kristian Andersen, wrote in a private Slack group: 'The main thing still in my mind is that the lab escape version of this is so friggin' likely to have happened because they were already doing this type of work and the molecular data is fully consistent with that scenario' (Birrell, 2023). A number of people, including prominent scientists, called for a full retraction of the origins paper (Miltimore, 2023). Richard H. Ebright, the Board of Governors Professor of Chemistry and Chemical Biology at Rutgers University, called the paper 'scientific fraud'. Thacker (2024i) reported that the paper was ghostwritten by funders. Whilst the International Committee of Journal Editors (ICMJE) refused to investigate calls to retract it.

1.1.4 Lab Leak?

Shellenberger and Gutentag (2024) reported that in early 2020 a Chinese national from Wuhan, working as a confidential human source (CHS) told the FBI that 'A person working at the Virology Institute lab in Wuhan, China was infected, left the building, and spread the virus outside the lab in Wuhan. It didn't have anything to do with the wet market or the bat soup story they were going with.' Deigin (2024) argued that SARS-CoV-2 is precisely the virus that EcoHealth and the Wuhan Institute of Virology were hunting for in 2019. They were seeking SARS-like viruses that were 10–25% different from SARS-CoV-1 in their spike but could still enter human cells. SARS2 fits those criteria like a glove: its spike is 24% different from that of SARS-CoV-1, and yet it binds to the human ACE2 receptor even better than SARS-CoV-1. In support of the lab-leak theory of COVID-19's origins, Matt Ridley pointed out that in exactly the right city, at exactly the right time, the Chinese government were playing with exactly the right kind of genetic insertion into exactly the right part of exactly the right gene of exactly the right kind of virus, in exactly the right way. In June 2024 in *The New York Times*, Alina Chan gave five reasons why the pandemic probably started in a lab (A. Chan, 2024; Lardieri, 2024). 1) The SARS-like virus that caused the pandemic emerged in Wuhan, the city where the world's foremost research lab for SARS-like viruses is located. 2) The year before the outbreak, the Wuhan Institute, working with U.S. partners, had proposed creating viruses with SARS-CoV-2's defining feature. 3) The Wuhan lab pursued this type of work under low biosafety conditions that could not have contained an airborne virus as infectious as SARS-CoV-2. 4) The hypothesis that COVID-19 came from an animal at the Huanan Seafood Market in Wuhan is not supported by strong evidence. 5) Key evidence that would be expected if the virus had emerged from the wildlife trade is still missing. For rebuttals of this article, see Gorski (2024) and P. Offit (2024). Robert Redfield, Director of the Centers for Disease Control (CDC) from March 2018 to January 2021 was interviewed in 2024 (I. Miller, 2024d). He said he believes that the Wuhan Institute of Virology was working on vaccine development in the lab, and that its research was directly responsible for the release of the coronavirus. J. Alwine et al. (2024) described publishing support of the lab-leak hypothesis for the origins of SARS-CoV-2 as harmful 'anti-science'. Whilst Lyons-Weiler (2024f) pointed out that the true harm is caused by dismissing the lab-leak hypothesis. Attempts to silence debate undermine the fundamental principles of scientific inquiry. Fidopiastis (2024) described the extent of the narrative perpetrated to shut down the lab leak hypothesis. In September 2024 Matt Ridley concluded that: 'those of us who argue that the pandemic began with a laboratory accident have comprehensively won the debate' (Ridley, 2024d). Later that month Crits-Christoph et al. (2024) published a paper in *Cell* that supported a zoonotic origin. The authors tested genetic samples of animals that were sold in the Huanan Seafood Wholesale Market in Wuhan in 2019 and found traces of SARS-CoV-2 in racoon dogs, civets and bamboo rats. The paper was interpreted by both the authors and the mainstream media as very strong evidence that the pandemic started in the Huanan Seafood Market (Chafer, 2024; Gallagher, 2024). However, in *The Telegraph*, Matt Ridley pointed out that what Crits-Christoph et al. (2024) does not say, because the article cannot, is that there was an infected mammal in the market; or a market vendor infected by a mammal (Ridley, 2024a). He reasseted that the evidence still points to a lab leak being the most likely cause of the pandemic:

> The lab was doing risky experiments that made bat viruses more infectious in the years leading up to the pandemic. It had a reputation for being unsafe. It was planning to switch its focus to viruses precisely like this one the year before the pandemic. It worked on a close relative of SARS-CoV-2 in 2018. It was party to a plan to insert a special feature into a virus's spike gene, a feature found uniquely in the virus that caused the pandemic.

Lyons-Weiler (2024d) argued that Crits-Christoph et al. (2024) suffers from numerous flaws.

The main flaws include the lack of direct animal infection testing, overextended phylodynamic inferences, reliance on correlational data and gaps in linking genetic diversity to a specific origin of the virus. Nickels (2024) reported that a group of scientists called for the retraction of Crits-Christoph et al. (2024), claiming that it has unsound premises, has unsound conclusions, and may be a product of scientific misconduct. By 2024, Boris Johnson said that believed that the COVID-19 pandemic started due to a leak from a Chinese laboratory (Owen, 2024).

1.1.5 Cover-Up

Matt Ridley argued that scientists tried to suppress the truth about COVID-19's origins (Ridley, 2024b). He believes that the closest thing to a smoking gun is the DEFUSE project proposal. We now know that in the right city, in the right time frame, scientists had a plan to put exactly the right sequence into exactly the right part of the gene of exactly the right virus to create a blueprint for SARS-CoV-2. Thacker (2023b) argued that some scientists were dishonest, and covered up the possibility of a Wuhan lab accident. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID) at the time, deliberately decided to downplay suspicions from scientists that COVID-19 came from a laboratory to protect his reputation and deflect from the risky coronavirus research his agency had funded, according to his boss, one of the most senior US health officials during the pandemic (Markson, 2023). In the US, the Committee on Oversight and Accountability concluded that the suppression of the lab leak hypothesis was not based on science (Committee on Oversight and Accountability, 2023). Reasons for the cover-up include appeasing China, protecting ties to high-risk research and responding to pressure from 'higher ups' (Birrell, 2023). Matt Ridley pointed out that if it emerged that the Wuhan Institute of Virology accidentally caused a pandemic that killed 28 million people, and its experiments had been funded by Anthony Fauci's institutes, you can see why he'd have an incentive not to talk about a lab leak (spiked, 2024).

1.1.6 United States Involvement

To what extent, if any, was the United States involved in the origins of SARS-CoV-2? On his blog, The Naked Emperor (2024a) argued that there is smoking gun evidence that EcoHealth Alliance (a US-based non-governmental organisation) and its associates caused the pandemic. Similarly, Will Jones, a doctor and editor of *The Daily Sceptic*, argued that SARS-CoV2 was more likely than not of American origin, an EcoHealth Alliance research product (W. Jones, 2024a). Whilst Washburne (2024b) argued that the evidence, including forensic analyses of the SARS-CoV-2 genome, suggests that it is beyond reasonable doubt that SARS-CoV-2 emerged from a lab, and the work was supported by the National Institute of Allergy and Infectious Diseases (NIAID) in the US. In his book *Wuhan Cover-Up*, Robert F. Kennedy Jr. argued that the virus was engineered in a US-funded lab in Wuhan by a group of Chinese and Western scientists. Lerman (2024b) stated that the book 'is the most important Covid chronicle to date'. In *The Hill*, Chellaney (2024) reported that the US government were happy to help China's cover-up of the origins of the virus because the coronavirus research at the Wuhan lab was part of a collaborative US–China scientific programme funded by the American government. In January 2023, Will Jones argued that the evidence is consistent with the US deliberately releasing the virus in China, with the lab leak being the intended cover story (W. Jones, 2023m). In May 2024 he pointed out that evidence in favour of it being the work of an American team is that the virus transmits readily in a range of American lab animals but not in Chinese laboratory bats (W. Jones, 2024n). Swiss Policy Research, an independent nonprofit research group, stated that the genetic evidence and additional evidence strongly indicate that SARS-CoV-2 is a lab-engineered virus, not a natural virus, and that it was engineered in the United States, not in China (Swiss Policy Research, 2023c). Whereas *The Lancet* COVID-19 Commission report (J. D. Sachs et al., 2022), published in September 2022, suggested that the virus may have

leaked from a laboratory in the United States and implies that US Government agencies may be covering it up (W. Jones, 2022m).

1.1.7 Iatrogenic Origin

M. Neil and Engler (2024) believe that the available virological and epidemiological evidence does not adequately support either the lab leak or the wet market theories for the origins of the virus. Instead, they believe that the 'COVID pandemic' was an iatrogenic phenomenon.

1.2 Variants of SARS-CoV-2

A number of variants of SARS-CoV-2 have evolved, namely Alpha (October 2020, United Kingdom), Beta (December 2020, South Africa), Gamma (January 2021, Brazil), Delta (October 2020, India) and Omicron (November 2021, Botswana) (Wikipedia, 2023b). SARS-CoV-2 evolves towards more infectious variants (R. Wang, Chen, Gao, & Wei, 2021), each being more transmissible than its predecessor. Whilst each was also more severe than its predecessor, except for Omicron, which was less severe. The viral loads of Delta infections were on average around 1000 times greater than those of lineage A/B infections (B. Li et al., 2022). On his blog eugyppius (2021h) argued that Omicron was leaked from a laboratory engaged in gain-of-function research. Whilst S. Andrews (2023f) argued that the Omicron variant was a product of gain of function, has a greater rate of mutation than previous variants (an 85-day cycle), and is not seasonally activated. Berenson (2023b) showed data from the Society of Actuaries in the US that shows that significant COVID-19 deaths across all age groups ended in the spring of 2022. He argued that the vaccinations didn't end severe COVID-19, Omicron did.

1.3 COVID-19

SARS-CoV-2 was circulating both in China and internationally by November 2019 at the latest, but competing with other, milder viruses, and did not become the dominant virus until March 2020 (W. Jones, 2022e). COVID-19 only took off in March 2020 as influenza subsided (eugyppius, 2023c). COVID-19 prior to Omicron was seasonal. Natural seasonal phenomena are ultimately caused by variation in solar radiation. During Autumn 2020 in Europe, the time of the resurgence of COVID-19 correlated with latitude (Walrand, 2021), and latitude correlates with solar irradiation. COVID-19 likely competes with influenza and the common cold, via virus competition for susceptible cells or as a consequence of virus-induced innate immune responses (Nickbakhsh et al., 2019). COVID-19 is mostly transmitted through droplets and airborne (aerosol) transmission, but also through contact transmission (E. L. Anderson, Turnham, Griffin, & Clarke, 2020; Azimi, Keshavarz, Laurent, Stephens, & Allen, 2021; The Lancet, 2020). The minimum infective dose of SARS-CoV-2 is estimated to be of the order of 100 particles (Basu, 2021; Karimzadeh, Bhopal, & Tien, 2021). Vis-à-vis COVID-19, the population is heterogeneous. It appears that 20% to 50% of people have a degree of pre-existing immunity (Doshi, 2020a). Between March and July 2021, 36 unvaccinated and previously uninfected participants were inoculated with wild-type SARS-CoV-2 (J. Zhou et al., 2023). 53% became infected, suggesting that around half had pre-existing immunity. According to Petersen and Phillips (2020), of those who get infected, about three quarters are asymptomatic. Whilst in a cohort study on the secondary attack rate of SARS-CoV-2 in schools in Massachusetts (S. B. Nelson et al., 2023), nearly 35% of index cases had no symptoms (I. Miller, 2023f). Common COVID-19 symptoms include fever, cough, fatigue and dyspnoea (Y. Hu et al., 2020; Nunan et al., 2020; J. Yang et al., 2020). The extent and duration of SARS-CoV-2-related clinical symptoms, which are likely correlated with virus replication, dictate the level of virus-specific humoral immunity (Cervia et al., 2021). Whilst SARS-CoV-2 viral loads, especially in the plasma, are predictive of mortality (Fajnzylber et al., 2020). Many COVID-19 patients died due to secondary bacterial infection

of the lung (pneumonia), rather than a 'cytokine storm' (C. A. Gao et al., 2023). M. Neil, Hockett, Engler, and Fenton (2023) argued that a proportion of COVID-19 deaths were caused by bacterial pneumonia, and bacterial pneumonia was the primary, not the secondary, infection.

1.4 Transmission

Letizia et al. (2020) investigated SARS-CoV-2 infections among US Marine Corps recruits who underwent a two-week quarantine at home followed by a second supervised two-week quarantine at a closed college campus that involved mask-wearing, social distancing and daily temperature and symptom monitoring. Approximately 2% who had previously had negative results for SARS-CoV-2 at the beginning of supervised quarantine, and less than 2% of recruits with unknown previous status, tested positive by day 14. Most recruits who tested positive were asymptomatic, and no infections were detected through daily symptom monitoring. Shared rooms and shared platoon membership were risk factors for transmission. Jefferson et al. (2022) deduced that SARS-CoV-2 transmission from presymptomatic and asymptomatic individuals is 'probable'. From an experiment that inoculated participants with wild-type SARS-CoV-2, 2% emitted the virus before the first positive lateral flow antigen test, suggesting that asymptomatic spread is rare (W. Jones, 2023f; J. Zhou et al., 2023). 7% emitted the virus before the first reported symptoms, suggesting that presymptomatic spread is uncommon. 86% of the total detected airborne virus was generated by just 11% of participants, which is evidence to support the super-spreader hypothesis. According to (M. Marks et al., 2021), the viral load of index cases is a leading driver of SARS-CoV-2 transmission. Madewell, Yang, Longini Jr, Halloran, and Dean (2020) estimated that the household secondary attack rate was 16.6%. Around 95% of COVID-19 transmission takes place indoors (Bulfone, Malekinejad, Rutherford, & Razani, 2021; McGreevy, 2021; Nishiura et al., 2020). COVID-19 reached Antarctica in December 2020; in practice it is unstoppable (Power & Dewar, 2021).

1.5 Epidemiological Statistics

The majority of individuals who die of COVID-19 are older than the life expectancy for their country (Malik, 2021). The average age of those who have died from COVID-19 in England and Wales is 82.4 years old (Burgess, 2020). In September 2023 Smalley (2023g) calculated that in England and Wales excess deaths were 69% of the deaths attributed to COVID-19, which suggests that 31% of those who died of COVID-19 would have died by September 2023 anyway. In March 2022 Smalley (2022z, 2023q) analysed QALY losses for England and Wales. He concluded that on a macro level, COVID-19 does and did not materially affect anyone under the age of 45. The basic reproduction number (R_0) (the expected number of cases directly generated by one case in a population where all individuals are susceptible to infection) of COVID-19 is estimated to be 2.87 (Billah, Miah, & Khan, 2020), the global infection fatality rate (IFR) 0.15% (Ioannidis, 2021) and the global case fatality rate (CFR) 2.16% (H. Ritchie, Ortiz-Ospina, et al., 2021). However, as populations are essentially networks of quasi-homogeneous mixing populations, the effective reproduction number (the average number of new infections caused by a single infected individual at time t in the partially susceptible population) at the aggregate level is fairly meaningless (Lemoine, 2021). The IFR, CFR (Levin et al., 2020) and mortality (J. R. Goldstein & Lee, 2020) all increase exponentially with age. Estimates for the IFR are 0.034% for those aged 0–59 years old, 0.095% for those aged 0–69 years old, 0.0003% for those aged 0–19 years old, 0.002% for those aged 20–29 years old, 0.011% for those aged 30–39 years old, 0.035% for those aged 40–49 years old, 0.123% for those aged 50–59 years old and 0.506% for those aged 60–69 years old (Pezzullo, Axfors, Contopoulos-Ioannidis, Apostolatos, & Ioannidis, 2023).

1.6 Comorbidities

In England and Wales, from 1 February 2020 to 31 December 2021, there were 6183 deaths where COVID-19 was the only cause mentioned on the death certificate (Office for National Statistics, 2022). Just 3 of them were under 20, 23 were under 30, 111 were under 40, 317 were under 50, 833 under 60, 1587 under 70, 2795 under 80, and 4692 under 90. Around 85% of those who died from COVID-19 suffered from at least one comorbidity, the most common being hypertension and diabetes (Franki, 2020; Gold et al., 2020; Palmieri et al., 2020). Basically, those most likely to die of COVID-19 are those most likely to die anyway (Crawford, 2022c). Whilst Emani et al. (2022) found that pre-existing conditions were present in 95.6% of all COVID-19 deaths. In a study of 5700 patients, Richardson et al. (2020) found that 93.9% of patients hospitalised with COVID-19 suffered from comorbidities. The most common comorbidities were hypertension (56.6%), obesity (41.7%) and diabetes (33.8%).

1.7 Reinfections

Radagast (2022l) explained that when you get constant waves of widespread SARS-CoV-2 infection in the population, you start getting positive feedback effects: the damage incurred from infection makes your body susceptible to further infection, both from SARS-CoV-2 and other pathogens (RSV, influenza, etc.). In the Omicron era, the average person is now infected twice a year, compared to 8% of the population who get influenza in a given year. Repeated COVID-19 reinfections increase the risk of hospitalisation (Cibis, 2023). For example, after three infections a person is almost eight times more likely to be hospitalised than someone who had no infections. This is disturbing.

1.8 Long COVID

5% of people with COVID-19 are likely to suffer symptoms for at least eight weeks (Steves & Spector, 2020). The most common symptoms associated with confirmed SARS-CoV-2 infection beyond 12 weeks in non-hospitalised adults include anosmia, hair loss, sneezing, ejaculation difficulty and reduced libido (A. Subramanian et al., 2022).

1.9 COVID-19 and Children

Children have lower susceptibility to SARS-CoV-2 (Viner, Mytton, et al., 2020), do not play a significant role in transmission (Boast, Munro, & Goldstein, 2020; Ludvigsson, 2020), have less severe acute COVID-19 than adults (Swann et al., 2020), a very low risk of COVID-19 mortality (Bhopal, Bagaria, Olabi, & Bhopal, 2021), generate more antibodies than adults (Di Chiara et al., 2022) and have a lower risk of reinfection than adults (Medić et al., 2023). Ludvigsson, Engerström, Nordenhäll, and Larsson (2021) analysed the effect of keeping schools open in Sweden during the pandemic. They found a low incidence of severe COVID-19 among schoolchildren and children of preschool age during the SARS-CoV-2 pandemic. Among the 1.95 million children who were 1 to 16 years of age, 15 children had COVID-19, MIS-C, or both conditions and were admitted to an ICU, which is equal to 1 child in 130,000. In a longitudinal cohort study of K-12 schools in 10 Massachusetts school districts, the secondary attack rate of SARS-CoV-2 in schools was 2.2% during the 2020–2021 school year and 2.8% in the autumn of 2021 (S. B. Nelson et al., 2023). In other words, children almost never spread COVID-19 infections in schools, and school closures were not justified. Adults living with children have no increased risk of infection or hospital admission with COVID-19 when schools are closed, but a small increase in absolute risk when schools are open (Forbes et al., 2021). In England, from March 2020 to December 2021, for children and young people aged under 20 years, SARS-CoV-2 was responsible for 1.2% of all deaths with an IFR of 0.0007% and a mortality rate of 0.00061% (Bertran et al., 2022).

1.10 COVID-19 and Influenza

How does, or did, COVID-19 compare to influenza? The original (wild-type strain) COVID-19, being novel and targeting the elderly and those with comorbidities (those most likely to die anyway), was more lethal than influenza. In the United States, COVID-19 deaths (from March to May 2020) made up 10.5% of the total life years lost (Wetzler, Wetzler, & Cobb, 2020). Whilst influenza and pneumonia (from January to March 2018) made up 3.0% of the total life years lost. J. Cates et al. (2020) analysed the risk for in-hospital complications associated with COVID-19 (1 March to 31 May 2020) and influenza (1 October 2018 to 1 February 2020) in the Veterans Health Administration. Compared with patients with influenza, those with COVID-19 had a more than five times higher risk of in-hospital death and approximately double the ICU admission risk and hospital length of stay, and were at higher risk for 17 acute respiratory, cardiovascular, haematologic, neurologic, renal and other complications. Xie, Choi, and Al-Aly (2023) found that, using data from US Department of Veterans Affairs (VA), in autumn–winter 2022–2023 the death rate at 30 days for patients hospitalised for COVID-19 was 5.97% and for seasonal influenza was 3.75%. Whilst Schachtel (2023a) pointed out that COVID-19 was essentially just the flu. There were no novel symptoms and there was no novel treatment. M. Neil, Engler, and Hockett (2023) argued that COVID-19 symptoms are indistinguishable from those associated with influenza or bacterial pneumonia. They do not think that these symptoms can be explained by a single over-arching cause, that of a novel spikeopathy mechanism associated with SARS-CoV-2. Whilst Kory (2024a) maintained that there was a novel pathogen which caused a novel syndrome. Meanwhile, Dee (2024k) noted that if he were to summarise his 303 blog articles up to 29 January 2024, 'it would be to say that COVID-19 has not acted like a *bone fide* respiratory disease let alone a novel and deadly pathogen' and 'we appear to have experienced a mighty strange dissemination of a pathogen of sorts that appears to have been responsible for pretty much anything'. Looking at data from England and Wales, HART (2023a) argued that if we subtract the response-related deaths from the COVID-19 deaths, the COVID-19 epidemic was within the range seen in previous winters for influenza deaths, but was at an unusual time of year.

1.11 Herd Immunity

Epidemics tend to follow certain dynamics. During an epidemic and its aftermath, at any point in time a certain percentage of the population will be immune to infection. The herd immunity threshold is a function of the frequency of infection-producing contacts within the host population, the mean infectious period of time and the season, so varies through time. If the percentage of the population that are immune to infection is below the herd immunity threshold, the rate of infections will increase. Whilst if the percentage of the population that are immune to infection is above the herd immunity threshold, the rate of infections will decrease. Gomes et al. (2022) showed that individual variation in susceptibility or exposure to SARS-CoV-2 lowers the herd immunity threshold. Aguas et al. (2022) estimated that the herd immunity threshold for the original Wuhan virus in England and Scotland was around 25–29%. However, Lemoine (2021) showed with simulations that, if the population can be divided into networks of quasi-homogeneous mixing populations that are internally well-connected but only loosely connected to each other (which seems realistic), the effective reproduction number can undergo large fluctuations even in the absence of behavioural changes, and is essentially meaningless at the aggregate level. In April 2020 Hope (2020) suggested that the UK government could offer the opportunity for healthy people to choose to be immediately infected with COVID-19 in a controlled way and then confined to their homes until they are no longer infectious. He showed that this option would provide an overall net benefit for a representative young, healthy person of 0.34 to 0.71 Quality Adjusted Life Years (QALY). UK government scientists such as Professor Whitty misrepresented the concept of herd immunity (Bardosh, 2023a). He

branded herd immunity a 'dangerous' and 'clearly ridiculous' policy approach. Yet arguing against herd immunity is like arguing against gravity or fluid dynamics. It is an inevitable reality. In 'challenge' trials reported in 2024, researchers deliberately tried to infect participants with SARS-CoV-2, but found it impossible, even when they ramped up the dose 10,000-fold, due to high levels of immunity (Callaway, 2024).

1.12 Science

If we want to get policy right, we need to get the science right. But how do we recognise, and conduct, good science? Science is essentially Bayesian inference (M. Sewell, 2012), so the more surprising a hypothesis, the more evidence required to support it. For example, if someone's prior belief is that lockdowns/masks/vaccines are highly effective, then it would take a large body of evidence to convince them otherwise. In practice, the key to getting the science right is to understand the relevant underlying dynamics, consider various strands of evidence looking for convergences, and recognise any underlying human biases and keep these out of analysis. In the case of the pandemic, and matters of mitigation, the predominant bias is virtue signalling.

Carl Heneghan and Tom Jefferson argued that observational studies should not be used to assess respiratory virus interventions (Heneghan & Jefferson, 2023m; Jefferson & Heneghan, 2023f, 2023g). Observational studies have a high risk of bias because they are prone to confounding, and at times may include evidence that does not inform us whether the intervention works. Randomised controlled trial (RCT) results (high quality) may not support the dominant pro-lockdown and pro-mask narrative, whilst observational studies and models (low quality) will say what you want them to say (Jefferson & Heneghan, 2024c). During the pandemic, we ended up with large quantities of junk science reviews at scale and speed, further promoting the interventionist narrative. Tom Jefferson and Carl Heneghan wrote an open letter to the Cochrane Board complaining about a number of lower quality 'rapid reviews' published during the pandemic (Jefferson & Heneghan, 2024d).

In the UK, Lacour (2024) noted that the politicians (e.g. Boris Johnson) didn't understand the science, whilst their scientific advisors (e.g. Patrick Vallance and the Royal Statistical Society) got the science wrong. We actually needed politicians who were sceptical of 'the science'.

1.13 Data

There are various sources of COVID-19-related data available for free online. The UK government host a website for data and insights on COVID-19 (UK Government, 2024). Johns Hopkins University & Medicine hosted a Coronavirus Resource Center (Johns Hopkins University & Medicine, 2024). However, Verduyn (2024a) deduced that the JHU Covid database was based on computer modelling that was adjusted with empirical data, and concluded that it is and was so unreliable that it should never have been used for determining either COVID-19 cases or deaths. Our World in Data (OWID) is a scientific online publication that focuses on large global problems such as poverty, disease, hunger, climate change, war, existential risks and inequality, and provides COVID-19 data (Our World in Data, 2024a). The WHO have a COVID-19 dashboard (WHO, 2024c). Whilst Worldometer is a reference website that provides counters and real-time statistics for diverse topics, and includes COVID-19 data (Worldometer, 2024). Appendices A–D contain figures displaying data including lockdown stringency, mask index, vaccination rate, COVID-19 death rate and excess mortality for countries and continents, all from OWID.

1.14 Modelling

Data analysis is hard and messy (Silberzahn et al., 2018). The observed results from analysing a complex data set can be highly contingent on subjective, but justifiable, analytic decisions.

Uncertainty in interpreting research results is therefore not just a function of statistical power or the use of questionable research practices; it is also a function of the many reasonable decisions that researchers must make in order to conduct the research. This does not mean that analysing data and drawing research conclusions is an entirely subjective enterprise with no connection to reality. It does mean that many subjective decisions are part of the research process and can affect the outcome. The best defence against subjectivity in science is to expose it. Formerly, this can be done via Bayesian inference. But practically, transparency in data, methods and processes give the rest of the community the opportunity to see the decisions, question them, offer alternatives and test these alternatives in further research.

Modelling epidemics is difficult. Castro, Ares, Cuesta, and Manrubia (2020) state that the future of ongoing epidemics is so sensitive to parameter values that predictions are only meaningful within a narrow time window and in probabilistic terms, much like weather forecasts. Hudson (2023) explained that the SIR models, that generally assumed that there was a deadly virus and that lockdowns would slow the spread, failed because they ignored the actuarial control cycle, which entails testing the model against emergent evidence. M. Neil, Mr Law, Health and Technology, and Fenton (2024) concluded that epidemiological models of respiratory pathogens produce hopelessly exaggerated estimates based on assumptions about parameters that are either unknowable or are so difficult to measure that their credibility is highly suspect. In their book *Fighting Goliath*, N. Fenton and Neil (2024c) explained how the official COVID-19 narrative was based on flawed and manipulated data and science. Figures from *The Spectator* provide a powerful visual record of the spectacular failure of the modelling used by SAGE (Ridley, 2023a; TheSpectator, 2023).

1.15 Terminology

A note on terminology. What does a 'case' of COVID-19 actually mean? Typically, a single binary (positive or negative) polymerase chain reaction (PCR) test result is used to determine a 'case' of COVID-19. Unfortunately, this is an unreliable measure (Heneghan & Jefferson, 2024j). *Efficacy* can be defined as the performance of an intervention under ideal and controlled circumstances, whereas *effectiveness* refers to its performance under real-world conditions (Singal, Higgins, & Waljee, 2014). The *herd immunity threshold* is the minimum percentage of the population that are immune to infection when, if the population had zero infections and a small number of infections were introduced, zero infections is a stable equilibrium (Avery, Bossert, Clark, Ellison, & Ellison, 2020). Some argue that there was no pandemic (Engler & Neil, 2023; HART, 2023e; PANDA, 2024; Schachtel, 2023b), but I use the word as it is convenient. Some argue that the mRNA COVID-19 vaccine is not a vaccine (Banoun, 2023; Renz, 2024a), whilst others argue that it is Siri (2023). Again, I use the word 'vaccine' for convenience. A *breakthrough infection* is the term used when a vaccinated individual becomes infected.

1.16 Scope of Literature Review

Academic journal publications and the mainstream media tend to be biased towards accepting the pro-lockdown/mask/vaccine narrative, whilst social media tends to be biased towards taking an anti-lockdown/mask/vaccine stance. In essence, the former group tend to highlight the benefits, whilst the latter group focus on the costs. Both are good for science, and my literature review is biased towards good science and credible data analysis, whatever the source may be. Although this article seeks to be global in nature (the pandemic and responses were essentially global), there is a distinct bias towards the United Kingdom due to my location and bias towards local news sources. By August 2020, on average there were 377 articles published on COVID-19 every day (Heneghan & Jefferson, 2024d). By January 2021, global spending on COVID-19 research had hit $5 billion. Alas, there was plenty of poor-quality research published early on, and the majority of funding was wasted. LitCovid is a literature hub that provides access to

400,000 articles on COVID-19 in PubMed (NLM/NCBI BioNLP Research Group, 2024).

1.17 Rest of the Paper

As the title implies, this paper is effectively a trilogy, and considers the effectiveness of lockdowns, face masks and vaccination programmes vis-à-vis mitigating COVID-19. The following section, Section 2, covers lockdowns. The literature on the effectiveness of lockdowns is reviewed, and two experiments are conducted. Both analyse the UK lockdown, using Sweden as a control. The first fits the first derivative of a Gompertz function to the number of new daily infections and analyses the growth-rate coefficient. Whilst the second utilises the SIR model of disease propagation and analyses changes in β with respect to the proportion of the population that are susceptible. Neither experiment finds any evidence that the UK lockdown had a significant positive impact on COVID-19 infections/deaths. The collateral damage caused by lockdowns is considered, in terms of health, economic, social, political, legal, policing and transport issues, plus their impacts on children and the third world. The benefits of lockdowns are considered, in terms of air pollution, road traffic collisions and suicide. A cost–benefit analysis of the UK lockdown is conducted. Lockdowns fail spectacularly to pass a cost–benefit analysis, with the costs exceeding the benefits by orders of magnitude. In other words, lockdowns were an overreaction by an order of magnitude. There are various theoretical reasons why lockdowns don't work, essentially they fail to protect the vulnerable. Lockdowns were used and sustained, despite the evidence, due to a vicious circle: politicians felt the need to act, the media spread fear, the public supported lockdowns due to fear and virtue signalling, and the politicians, motivated to court the median voter, continued to sustain lockdowns. Lockdowns turned out to be the single biggest health economics mistake in modern history. Section 3, on face masks, includes the third experiment. The effectiveness of the policy in England of making masks mandatory in enclosed public spaces is tested. The results showed that the policy failed to mitigate COVID-19. This is consistent with quality randomised controlled trials that show that there is no evidence to support the effectiveness of face masks mitigating COVID-19. The harms caused by face masks are also considered. Face masks can cause dyspnoea, hypoxia, hypoxemia and hypercapnia, harbour pathogens, compromise communication, vision, exercise capacity, cognition and immunity, cause headaches, skin complaints, bad breath and particulate inhalation, facilitate crime and lead to pollution. In terms of mitigating COVID-19, masks have no place in healthcare, the community or, especially, classrooms. Section 4 discusses the effectiveness of vaccines and vaccination programmes, plus issues with vaccinations. Disturbingly, the fourth experiment suggested that vaccination programmes lead to an overall increase in COVID-19 deaths and all-cause mortality in both the short term, and post-pandemic. Other data suggest that vaccination programmes were effective against severe COVID-19 for the elderly in 2021, but otherwise caused more harm than good, compromising natural immunity, decreasing herd immunity and leading to herd-level original antigenic sin. Section 5 discusses excess mortality. Global excess mortality, earlier largely involving COVID-19 and iatrogenesis, and later often related to cardiovascular issues, has continued to be significantly elevated since COVID-19 appeared, largely due to both COVID-19 and the vaccinations (directly, indirectly, in combination and over the short and longer term), and the collateral damage caused by lockdowns. In Section 6 we discuss various issues. The world overreacted due to various cognitive biases. A self-perpetuating cycle of fear and virtue signalling developed, spiralling from politicians to the media to the public. The primary factors that determine the rate of COVID-19 cases/deaths are the degree of pre-existing immunity within the community, the proportion of the community who have become immune, seasonality, mortality displacement (a function of the severity of recent flu seasons) and the nature and progression of the dominant variant of the virus. It seems likely that influenza all but vanished during the pandemic due to inter-virus competition. There is evidence that hydroxychloroquine and ivermectin are effective treatments for patients with COVID-19 In Section 7 conclusions are drawn.

2 Lockdowns

2.1 Background

2.1.1 Pre-Pandemic

In January 2006 the WHO (2006a) published two articles on nonpharmaceutical interventions for pandemic influenza. The first was on international measures. It stated that screening and quarantining entering travellers at international borders did not substantially delay virus introduction in past pandemics, except in some island countries, and will likely be even less effective in the modern era of extensive international air travel. The second article addressed measures at the national and community levels (WHO, 2006b). It recommended that ill persons should remain home when they first become symptomatic, but forced isolation and quarantine are ineffective and impractical.

In December 2006, members of the Center for Biosecurity of UPMC, Maryland, US, published an article on mitigation measures for the control of pandemic influenza (Inglesby, Nuzzo, O'Toole, & Henderson, 2006). To quote the authors, 'the negative consequences of large-scale quarantine are so extreme… that this mitigation measure should be eliminated from serious consideration', 'travel restrictions… have historically been ineffective', 'a policy calling for communitywide cancellation of public events seems inadvisable' and many mitigation measures 'could result in significant disruption of the social functioning of communities and result in possibly serious economic problems'. Closing schools for more than 10–14 days was *not* recommended. Cancelling or postponing large events was *not* recommended. Quarantine of either individuals or groups was *not* recommended. Screening passengers at borders or closing air or rail hubs was *not* recommended.

In November 2011 the UK Department of Health's influenza pandemic preparedness strategy document (Department of Health, 2011) stated that an influenza pandemic would have a case fatality ratio of up to 2.5% if no treatment was available. The document stated that 'it almost certainly will not be possible to contain or eradicate a new virus in its country of origin or on arrival in the UK'. 'The expectation must be that the virus will inevitably spread and that any local measures taken to disrupt or reduce the spread are likely to have very limited or partial success at a national level and cannot be relied on as a way to 'buy time'.'

During the Ebola crisis of 2014–15, brief lockdowns were introduced in both Liberia and Sierra Leone (Green, 2021a). They were widely criticised as being ineffective and counterproductive.

In October 2019, in a publication on non-pharmaceutical public health measures for mitigating the risk and impact of epidemic and pandemic influenza, the WHO stated that they did not recommend contact tracing, quarantine of exposed individuals, entry and exit screening or border closure in any circumstances (WHO, 2019).

2.1.2 China

On 23 January 2020, in response to the COVID-19 outbreak, the central government of China imposed a lockdown in Wuhan and other cities in Hubei. The WHO stated that 'it is certainly not a recommendation the WHO has made', but was 'a very important indication of the commitment to contain the epidemic in the place where it is most concentrated' (Reuters, 2020).

2.1.3 Italy

On 21 February 2020, the first lockdown in Italy began, covering ten municipalities of the province of Lodi in Lombardy and one in the province of Padua in Veneto. In Sardinia, Italy, up to 21 April 2020 the case fatality rate was 7.9%, with a higher proportion of deaths in men than women (Deiana et al., 2020). Several concomitant serious diseases were found to be strong

predictors for a fatal outcome, such as diabetes mellitus, cardiovascular diseases and chronic lung diseases. To provide some context, in Italy in 2020, among people aged under 40, 712 were killed in transport accidents, 644 died of self-harm, 508 died of other accidental injuries and just 162 died of or with COVID-19 (Heneghan & Jefferson, 2023f). Engler (2022) reported that a statistical analysis of auto-correlation of excess deaths in Lombardy in spring 2020 reveals much less clustering than would be expected if a virus spreading across the region was responsible. M. Bryant (2023) evaluated the alleged Italian medical emergency, and concluded that 'Any excess deaths in Spring 2020 in Northern Italy were an artifact of already existing health conditions in an aging population, the obliteration of the existing health care infrastructure, massive industrial pollution creating chronic conditions, media generated hysteria, savage government lockdowns and administrative murder of the already fragile.' W. Jones (2024q) hypothesised that Lombardy was badly affected in the first wave because the population suffered from a very unfortunate case of antibody-dependent enhancement (ADE). This is when the binding of a virus to suboptimal antibodies enhances its entry into host cells, followed by its replication.

2.1.4 United States

In the US, there was a large increase in the number influenza tests given during the 2019–2020 flu season (B. Rice Jr., 2024b) (34% higher than 2018–2019). More people were experiencing flu, influenza-like illness or COVID-19 symptoms in the weeks and months *before* COVID-19 was supposed to be spreading in America. But there was no noticeable spike in all-cause deaths. It is possible that COVID-19 was spreading much earlier than claimed by authorities, but whatever caused it was not deadly.

2.1.4.1 New York

In the early stages of the pandemic, New York City was the worst-affected area in the United States, with over 2,000 deaths by 6 April 2020 (Wikipedia, 2023a). On 16 March 2020 New York City schools were closed, and on 20 March 2020 the New York State governor's office issued an executive order closing 'non-essential' businesses. Although Verduyn, Hockett, Engler, Kenyon, and Neil (2023) believe that the actual number and timing of the deaths in NYC in the spring of 2020 is different from the official government mortality records. Jessica Hockett presented a critical analysis of the reported COVID-19 death spike in New York City during the spring of 2020, raising several questions and concerns about the official narrative (Hockett, 2024a). Lyons-Weiler (2024k) argued that something is wrong with the data itself. Hockett (2024b) noted that a disproportionate number of deaths during the New York City spring 2020 death spike listed only COVID-19 as cause of death. Whereas Engler (2024c) argued that in New York it (whatever it was) was widespread before anyone noticed. And it was the response to being told there was something novel afoot which caused the 'pandemic'.

2.1.5 United Kingdom

The UK first went into lockdown on 23 March 2020. Neil Ferguson and Dominic Cummings convinced Patrick Vallance and Chris Whitty to lock down, 'abandoning the orthodox, consensus position of mitigation and protection of the vulnerable on the way to herd immunity, and, instead opting for the radical, untested, Chinese Communist Party-inspired lockdown' (Rendell, 2023b). Lerman (2024a) reported that in the UK, as in the US, the COVID-19 pandemic response switched abruptly in mid-March 2020 from long-established public health protocols to an unprecedented totalitarian lockdown-until-vaccine plan. The apparent impetus was the anticipation for the astronomical 'return' on mRNA vaccines, which had yet to be developed, tested or approved. Dee (2024e) took arrivals by ambulance as a proxy of the health of the nation. They peaked between 9 September 2019 and 10 January 2020, and he argued that that is when the pandemic proper took place. The lockdown came too late.

2.1.6 Global

Eventually, all countries except Sweden, Belarus, Japan, South Korea, Hong Kong, Taiwan, Tanzania, Nicaragua, two states in Brazil and certain US states locked down, most more than once. Was it all worth it?

2.2 Effectiveness of Lockdowns

2.2.1 Literature Review

Before conducting experiments to determine the effectiveness of lockdowns, let us first review the literature from around the world.

2.2.1.1 Australasia

Australia Kompas, Grafton, Che, Chu, and Camac (2021) used a SIQRM-compartment model for susceptible, infected, quarantined, recovered and mortalities fit to COVID-19 cases and a value of a statistical life year plus an age-adjusted value of a statistical life to perform cost–benefit analyses of Australia's policy of early suppression plus two counterfactuals, late suppression and the unmitigated case. They concluded that the optimal policy was early suppression. However, there are some issues with this paper. Firstly, the data set only went up to May 2020, so captured only the first and smallest wave of COVID-19 cases in Australia. Secondly, and importantly, the data for active cases looks spurious. Before 5 April 2020, not all states and territories reported recoveries, and the federal Department of Health began publishing recoveries on this date, which created a jump for some jurisdictions (covid19data.com.au, 2021). Thirdly, their compartmental model appears underdetermined. Paul Alexander, an epidemiologist focusing on clinical epidemiology, evidence-based medicine and research methodology, showed graphically that in Australia, with every lockdown, infections/cases went up dramatically, whilst making masks mandatory and business closures failed to mitigate COVID-19 (P. Alexander, 2022a).

New Zealand In a paper critical of New Zealand's stringent and expensive lockdown, Gibson (2020) analysed county-level data from the United States using regression analysis and concluded that lockdowns are ineffective at reducing COVID-19 deaths.

2.2.1.2 Europe

In a study, available as a preprint, that assessed the impacts of full lockdown strategies applied in Italy, France, Spain and the United Kingdom, Meunier (2020) computed the growth rate of the daily number of new cases. He found no evidence of any discontinuities and concluded that lockdowns performed no better than social distancing, and may not have saved any lives.

In a *Nature* publication, Flaxman et al. (2020) used a semi-mechanistic, joint Bayesian hierarchical model to study the effect of major interventions across 11 European countries for the period from the start of the COVID-19 epidemics in February 2020 until 4 May 2020, when lockdowns started to be lifted. The authors claim that their model showed that, on average, lockdowns reduced R_e by 81%. Whilst the banning of public events, school closures, self-isolation and social distancing had little impact on R_e. There are several issues with this model. Firstly, the authors' hypothetical counterfactual scenario assumed that, for each country, R_e would have remained constant, at the same level as at the start of the epidemic. Their model then assumes that it only changes when interventions occur. However, this is unrealistic (Colombo, Mellor, Colhoun, Gomes, & McKeigue, 2020; Herby, Jonung, & Hanke, 2022b; Kuhbandner & Homburg, 2020; N. Lewis, 2020). As above, even in the unmitigated case, as the number of susceptible individuals, S, decreases, R_e will decrease. The more susceptible will be infected earlier in the pandemic, causing R_e to decrease. Whilst voluntary acts of mitigation would have

also led to a decrease in R_e. Secondly, that lockdowns apparently have a huge impact and other interventions no significant impact is due to the unrealistic prior distributions chosen by the authors (N. Lewis, 2020) and likely an artefact of the fact that in nearly every country lockdown was the last intervention to occur (P. Bryant & Elofsson, 2020; Lemoine, 2020). Thirdly, the model is sensitive to the average delay from infection to death (N. Lewis, 2020). The authors use 22.9 days, whilst a more recent estimate put the figure at 26.8 days (S. N. Wood, 2021). Fourthly, the model ignores the impact of seasonality. Finally, the model makes overly weak assumptions concerning the dependency between the inputs and outputs. It is in effect too flexible, allowing the data to be explained in various ways, with assumptions being mistaken for conclusions (Soltesz et al., 2020).

Loewenthal et al. (2020) used daily mobility data from Apple up to 10 May 2020 to model social distancing in Europe. The authors found that neither lockdown strictness nor lockdown duration were significantly correlated with COVID-19 mortality. The authors also found that countries that had reduced mobility early relative to the start of their epidemic experienced lower overall COVID-19 mortality. However, countries that were popular destinations with a susceptible population would have experienced earlier epidemics and suffered higher overall COVID-19 mortality (e.g. USA, United Kingdom, Italy, France and Spain). In many countries stringency levels increased significantly after the WHO declared a pandemic, even when their case loads were low (E. He, 2020). In other words, the correlation of social distancing response time with overall COVID-19 mortality could be a statistical artefact.

Bjørnskov (2021) used regression analysis to explore the association between the severity of lockdown policies in the first half of 2020 and all-cause mortality rates in 24 European countries. Early lockdowns were not more effective, stricter lockdowns were not more effective, and lockdowns were associated with *higher* mortality among the population aged between 60 and 79 years. His overall conclusion was that there was no clear association between lockdown policies and mortality, and that the lockdown policies of the spring of 2020 were substantial long-run government failures.

In a preprint, Chin, Ioannidis, Tanner, and Cripps (2020) investigated the impact of non-pharmaceutical interventions (NPIs) and mobility on R_e in European countries. They compared three models, 1) NPIs, 2) mobility and 3) NPIs and mobility, using Bayesian measures of model fit, and concluded that model 2) was the best: R_e was better explained by mobility than non-pharmaceutical interventions. The authors concluded that lockdowns offered little to no benefit in most countries.

Quinn et al. (2024) examined the progression of the COVID-19 pandemic in six Northern European countries (Ireland, UK, Denmark, Norway, Sweden and Finland) over the duration of the pandemic (March 2020 to May 2023) and assessed how much of the pandemic progression could be explained in terms of three different factors, namely: the stringency of NPIs, the percentage of the population fully vaccinated with COVID-19 vaccines and the expected seasonality of human beta-coronaviruses. The waves of the pandemic correlated well with the seasonality of human beta-coronaviruses (HCoV-OC43 and HCoV-HKU1). In contrast, the authors could not find clear or consistent evidence that the stringency of NPIs or vaccination reduced the progression of the pandemic.

Denmark In a preprint, Kepp and Bjørnskov (2020) took advantage of the mink-induced selective lockdowns in northern Denmark to conduct a quasi-natural experiment. Using linear regression and data from 1 September 2020 to 30 November 2020 they concluded that lockdowns had no significant impact on the rate of infection.

Germany In a working paper, using data from 18 November 2020 to 28 February 2021, de Haas, Goetz, and Heim (2021) estimated the impact of local night curfews in Hesse, Germany, on the growth rates of incidences of COVID-19 cases. They found no statistical evidence that

night curfews were effective in slowing down the spread of the pandemic.

By June 2022, even German politicians began to concede that their lockdowns didn't achieve anything useful (eugyppius, 2022a).

Italy According to eugyppius (2022b), the lockdown in Lombardy, Italy, from February 2020, was not successful. The virus had subsided before the lockdown and testing, and the aggressive mechanical ventilation killed many patients.

Sweden In Sweden, at the onset of the pandemic, Swedish upper-secondary schools moved to online instruction, whilst lower-secondary schools remained open. This allowed for a comparison of parents and teachers differently exposed to open and closed schools. Keeping lower-secondary schools open doubled the infection rate for teachers, but had minor consequences for the overall transmission of SARS-CoV-2 in society (Vlachos, Hertegård, & Svaleryd, 2021).

Whilst Born, Dietrich, and Müller (2021) compared the number of infections and deaths in Sweden (which had no lockdown) with a counterfactual lockdown scenario for Sweden using a synthetic control unit composed of a combination of other countries that imposed a lockdown. The authors concluded that a nine-week lockdown in Sweden in the first half of 2020 would have reduced infections and deaths by about 75% and 38%, respectively. However, they do not consider mortality displacement (Herby, 2020; D. B. Klein, Book, & Bjørnskov, 2020). They also found that the lockdown effect started to impact infections after 25 days. This seems surprising, it could well be that the effect was not due to lockdowns.

F. N. G. Andersson and Jonung (2024) compared the health and economic outcomes in Sweden with those of comparable European OECD countries. Lockdowns were associated with higher overall levels of excess deaths, poorer economic performance and higher public debt (Clark, 2024). F. Andersson and Jonung (2024) concluded that the evidence from Sweden clearly showed that authoritarian restrictions did not save more lives.

United Kingdom In March 2020, and without the benefit of hindsight or empirical data, Neil Ferguson (a professor of mathematical biology at Imperial College London) and his team's influential model forecast 510,000 COVID-19 deaths in Great Britain in the unmitigated scenario over two years (N. M. Ferguson et al., 2020). Their model estimated that mitigation strategies could reduce the number of deaths by 95%. However, the paper, which was not peer-reviewed, was flawed. The model described didn't consider the possibility that COVID-19 was seasonal (prior to Omicron, it was). Whilst the model assumed that ICU bed capacity was fixed, which seems unrealistic. They used a baseline assumption for R_0 of 2.4, but examined values between 2.0 and 2.6, whilst more recent estimates put R_0 at 2.87 (Billah et al., 2020). Whilst they used an IFR of 0.9%, whilst more recent estimates for Europe put the value at 0.51% (Oke & Heneghan, 2020). Imperial College's modelling overestimated the number of deaths with lockdowns and in the unmitigated case respectively for Sweden by 126% and 392%, Taiwan 937020% and 1798180%, South Korea 8128% and 17461%, Japan 5131% and 11670%, and United States 95% and 288% (Magness, 2021). Kirkwood (2022) criticised the quality of the development process. He notes that the software was not updated sufficiently to reflect reality, and states that it seems that the modellers were supporting a pre-determined political programme. He also notes that the modelling was a one-sided analysis, the cost of non-pharmaceutical interventions was not modelled. He says that the same software was used to make mortality predictions for foot and mouth disease, mad cow disease, bird flu and swine flu, and notes that all four models were hopelessly pessimistic by between two and six orders of magnitude! Compartmental models of epidemics normally assume random mixing. S. Johnson (2024a) demonstrated that such an assumption produces an overestimation of the herd immunity threshold for a given R_0 and a (more significant) overestimation of R_0 itself. Neil Ferguson's modelling of March 2020 found more than 80% of people would be infected without restrictions. Samuel Johnson replicated this

modelling and found that only around 20% of the UK population would be infected in a single wave (Matthews, 2024).

By analysing deaths in England from 2017 to 2021, Joel Smalley showed empirically that, at best, the government COVID-19 policy interventions in spring 2020 were ineffective in mitigating COVID-19 mortality (Smalley, 2021a). Whilst according to Herby, Jonung, and Hanke (2023) the lockdown saved as few as 1,700 lives in England and Wales in spring 2020 (Donnelly, 2023b).

K. F. Arnold et al. (2022) attempted to estimate the effects of lockdown timing on COVID-19 cases and deaths in England by 1 June 2020. In what is an extraordinarily naive paper, the authors attempted to justify avoiding using a SEIR model, essentially because SEIR models involve estimating a couple of parameters. Instead, they elected to use a wrong model: one that simply assumes exponential growth in COVID-19 cases/deaths, forever, in the unmitigated case! They then assume that any deviation from exponential growth was due firstly to social distancing and then the lockdown. The authors, incredibly, conclude that acting two weeks earlier would have reduced cases by 93%, resulting in between 26,000 and 43,000 fewer deaths.

In the *Kennedy Institute of Ethics Journal*, Winsberg, Brennan, and Surprenant (2020) claimed that, whilst in theory lockdowns could be justified, governments did not meet their epistemic duties because they relied upon data, models and evidence of insufficiently good quality to justify their actions. They argue that governments are required to possess a certain level of justification before they may restrict citizens' liberties, and their actions could not be reconciled with the values of a free society. Writing in the *Kennedy Institute of Ethics Journal*, van Basshuysen and White (2021) disagreed, and claimed that the modelling that steered policy interventions in the UK towards restrictions wasn't overly pessimistic and in fact made quite accurate projections. Who turned out to be correct? As mentioned above, N. M. Ferguson et al. (2020) forecast 510,000 COVID-19 deaths in Great Britain in the unmitigated scenario over two years, whilst the actual number in the mitigated scenario turned out to be 158,881 (UK Government, 2021a). The main problem with N. M. Ferguson et al. (2020) is that they estimated that mitigation strategies could reduce the number of deaths by 95%, when it is quite possible that mitigation strategies actually *increased* all-cause mortality.

In an article in *The Lancet*, N. G. Davies et al. (2020) modelled the tiered restrictions and second national lockdown in the UK using mobility and social contact data with an age-structured model. The authors estimated a reduction in R_e of 2% for tier 2, 10% for tier 3, 35% for a Northern Ireland-stringency lockdown with schools closed, and 44% for a Wales-stringency lockdown with schools closed. Their model assumed that COVID-19 transmission is a function of mobility and contact patterns, which in turn are functions of control measures. Whilst in reality the rate of COVID-19 transmission is a function of the herd immunity threshold (which is a function of the infectiousness of the dominant variant and the season) and the proportion of the population that are susceptible.

HM Government (2020) showed that when England was in a regional three tier system, during tier 3 restrictions, epidemics in all Lower Tier Local Authorities (LTLAs) had a lower growth rate than before tiers were introduced and the vast majority were declining. However, this could simply be a case of mean reversion.

Marchant et al. (2022) surveyed the impact of COVID-19 mitigation strategies in primary schools (children aged 3–11) in Wales from October 2020 to December 2020. Reducing non-household direct contacts lowered infection rates. However, there was no evidence that two-metre social distancing or stopping children mixing was associated with lower odds of COVID-19 or cold infection rates in the school.

During the year starting with the onset of the epidemic (March 2020 to March 2021), the UK essentially experienced three waves of COVID-19, and three lockdowns. From March 2020 to May 2020 the UK underwent the COVID-19 epidemic (wave 1). Because COVID-19 at the time was seasonal, from October 2020 to February 2021 there was a winter resurgence (wave 2). The more transmissible Alpha variant swept across the UK from 10% in November 2020

to 90% in February 2021, giving the winter resurgence a second hump (wave 3). S. N. Wood (2021) showed that, for each wave, infections were most likely in decline before the lockdown even began. This is compelling evidence that lockdowns did not dictate the path of the epidemic curves.

England's restrictions were finally lifted on 19 July 2021, whilst those in Scotland, Wales and Northern Ireland were not. This provided an opportunity for a natural experiment. After this date, England had a similar rate of infection, a lower rate of COVID-19 deaths and likely lower excess mortality than the other three nations, evidencing that the restrictions were futile (Ali, 2022). England also fared well compared to the rest of Western Europe.

By the summer of 2022, even the mainstream media started to concede that lockdowns were a catastrophe (M. P. Senger, 2022c). *The Wall Street Journal* published 'The Revenge of the locked-down voters' and *The Telegraph* published 'Basket-case Britain is the definitive proof lockdown was an epic mistake'. In September 2023 the UK Health Security Agency concluded that there was a lack of strong evidence on the effectiveness of non-pharmaceutical interventions to reduce COVID-19 transmission.

2.2.1.3 North America

In March 2020 there was a COVID-19 outbreak on the USS Theodore Roosevelt aircraft carrier (Payne et al., 2020). In a study of 382 service members (mostly young healthy adults with close, congregate exposures), hand washing reduced the chances of being infected from 65% to 62%, wearing a face covering reduced the chances of being infected from 81% to 56% and social distancing reduced the chances of being infected from 70% to 55%. Though it seems probable that the analysis would have suffered from confounding effects, some people are simply risk averse in general.

In the US, Berenson (2020b) reported in June 2020 that the healthcare system was never in danger of collapsing, with or without lockdowns. He also noted that a German research institute reported in mid-April 2020 that lockdowns had been broadly useless (Berenson, 2020b).

Berry, Fowler, Glazer, Handel-Meyer, and MacMillen (2021) evaluated the effects of shelter-in-place (SIP) policies in the US from February to May 2020, and found no evidence that SIP policies led to reductions in new COVID-19 cases or deaths (both actually increased).

In the US, Huber (2020a) examined CDC data to determine whether a reduction in deaths happened in lockdown states. All-cause mortality data for the six US states that did not lock down ('free states') were compared with their immediate neighbours, and with the 44 states that locked down. Over the last five weeks of easing of lockdowns during the spring of 2020 (including peak COVID-19 mortality), the neighbouring locked down states as a group averaged 8%–11% more deaths than the free states, relative to the same weeks for each of the states in the years 2017 to 2019. She concluded, with certainty, that lockdowns did not reduce deaths in the US.

Pangallo et al. (2023) introduced a data-driven, granular, agent-based model that simulated epidemic and economic outcomes across industries, occupations and income levels. They validated the model by reproducing key outcomes of the first wave of COVID-19 in the New York metropolitan area. In counterfactual experiments, they showed that a similar trade-off between epidemic and economic outcomes exists both when individuals change their behaviour due to fear of infection and when non-pharmaceutical interventions are imposed. Both higher fear of infection and stricter closures led to saving lives at the expense of jobs, for low-income and high-income workers alike. However, for low-income workers, higher fear of infection or stricter closures had a larger effect, leading to more lives saved and more jobs lost, compared with high-income workers. In other words, lockdowns were no more effective at controlling the pandemic than letting people adapt their own behaviour to the threat, as happened in Sweden (E. Craig, 2023b).

In the US during July 2020 K. A. Fisher et al. (2020) assessed community and close contact

exposures associated with COVID-19, exposures reported by case-patients (symptomatic adults with SARS-CoV-2 infection confirmed by reverse transcription-polymerase chain reaction (RT-PCR) testing) were compared with exposures reported by control-participants (symptomatic outpatient adults from the same healthcare facilities who had negative SARS-CoV-2 test results). No significant differences were observed in the bivariate analysis between case-patients and control-participants in shopping, going to a gym, using public transportation, going to a bar/coffee shop or attending church/a religious gathering. However, case-patients were more likely to have reported dining at a restaurant (adjusted odds ratio (aOR) = 2.4) in the two weeks before illness onset than were control-participants.

In the Canadian online magazine *C2C Journal*, Krylova (2021) conducted two pairwise comparisons using US states that made markedly different policy choices regarding COVID-19 mitigation, but were otherwise similar (Minnesota (hard and extended lockdown) vs Wisconsin (short lockdown followed by moderate restrictions), and California (hard and ongoing lockdown) vs Florida (sought every opportunity to ease restrictions and reopen)). She concluded that stay-at-home orders seemed to have made no observable tangible impact on daily COVID-19 cases or deaths.

In a publication for the libertarian think tank Mises Institute, Rozmajzl (2021) showed that in the United States, there was no significant correlation between the strength of a state's lockdown measures and the total number of patients hospitalised or total number of COVID-19 deaths. Similarly, across 166 countries, there was no significant correlation between average lockdown stringency and total COVID-19 deaths per capita.

In the US, Cronin and Evans (2022) analysed nursing home quality (as measured by the Centers for Medicare and Medicaid (CMS) overall five-star rating), COVID-19 deaths and excess mortality. Higher-quality nursing homes were not better able to prevent COVID-19 from entering the home. Higher-quality nursing homes were more effective at preventing the virus' spread among their residents. Higher-quality nursing homes were not more effective in preventing the spread of COVID-19 among their staff. Higher-quality nursing homes had lower COVID-19 mortality. Higher-quality nursing homes had substantially higher non-COVID-19 deaths. Higher-quality nursing homes also had more total deaths than their low-quality counterparts. The authors suggested that higher-quality establishments did a better job of isolating residents from risks associated with both outside visitors and other residents. It seems likely that quality ranking was a surrogate for adherence to mitigation guidelines (Shahar, 2024b). CMS recommended that nursing homes (i) restrict visitors and non-essential personnel from entering the home and (ii) cancel in-person dining and other group activities. So higher-quality nursing homes would have led to increased loneliness, isolation and despair, which can expedite death. In other words, COVID-19 mitigation strategies increased all-cause mortality in care homes. Even for those most vulnerable to the virus, those who some argue should have received 'focused protection', mitigation measures did far more harm than good (W. Jones, 2024p). A better response would have been to carry on as normal.

In November 2021 Hugh McTavish reported that in the US lockdowns caused more loss of life (lost person-years of life) from the deaths they caused (mostly increased suicides, drug overdose deaths, alcohol deaths and increased murders from the increased crime) than they saved in prevented COVID-19 deaths (McTavish, 2021b).

Feltham, Forastiere, Alexander, and Christakis (2023) analysed the effect of political mass gatherings on the course of COVID-19. They examined five types of political event in 2020 and 2021: the US primary elections, the US Senate special election in Georgia, the gubernatorial elections in New Jersey and Virginia, Donald Trump's political rallies and the Black Lives Matter protests. The study period encompassed over 700 such mass gatherings during multiple phases of the pandemic. They used data from the 48 contiguous states, representing 3,108 counties. There were no statistically significant increases in cases, deaths or a measure of epidemic transmissibility (R_e) in a 40-day period following large-scale political activities. Carl

(2023c) noted that if even mass gatherings don't affect the spread of the virus, it seems difficult to believe that Western lockdowns had much of an impact.

Kerpen, Moore, and Mulligan (2022) examined the relationship between health outcomes, economic performance and education in US states throughout the pandemic. The correlation between health and economy scores was essentially zero, which suggests that states that withdrew the most from economic activity did not significantly improve health by doing so. Whilst the authors did not believe that there was a causal relationship between school closures and mortality. Pandemic mortality was greater in states where obesity, diabetes and old age were more prevalent before the pandemic.

Purdy (2022) analysed data from US states. He found no significant relationship between economic effects and health outcomes, and no significant relationship between closing schools and health outcomes. In short, lockdowns harmed the economy and shutting down schools compromised education, with no significant positive health outcomes.

Using data for US states, Zinberg, Blase, Sun, and Mulligan (2023) showed that more severe government interventions (as measured by the Oxford index) did not significantly improve health outcomes (age-adjusted and pre-existing-condition-adjusted COVID-19 mortality and all-cause excess mortality) in states that imposed them relative to states that imposed less restrictive measures. But the severity of the government response was strongly correlated with worse economic (increased unemployment and decreased GDP) and educational (days of in-person schooling) outcomes and with a worse overall COVID-19 outcomes score that equally weighted the health, economic and educational outcomes. There was also a significant negative correlation between states' government response measures and states' net pandemic migration, suggesting that people fled states with more severe lockdowns and moved to states with less severe measures.

Ruhm (2024) conducted a cross-sectional analysis of US state restrictions and pandemic deaths. He found that activity limitations were mostly not associated with death rates. He concluded that stringent COVID-19 restrictions, as a group, were associated with substantial decreases in pandemic mortality, with behaviour changes plausibly serving as an important explanatory mechanism. However, the main analysis started in July 2020, four months after the first substantial COVID-19 fatalities in the US. States that did badly when the pandemic first hit would have less dry tinder, and could perform better during the study period. When he estimated the model over the full pandemic period (March 2020 to June 2022), he excluded Connecticut, Massachusetts, New Jersey and New York because those states had high COVID-19 death rates between March 2020 and May 2020. Furthermore, he did not consider poverty, ethnicity, population density, obesity or latitude.

2.2.1.4 Global

Matrajt and Leung (2020) used an age-structured SEIR model to evaluate the effectiveness of social distancing interventions. Their results suggested that interventions started earlier in the epidemic delayed the epidemic curve, whilst interventions started later flattened the epidemic curve. However, note that this was a mathematical model, which assumed that contacts for various age groups were reduced by 95%, as opposed to empirical reality.

In the same issue of *Nature*, Hsiang et al. (2020) analysed anti-contagion policies in China, South Korea, Italy, Iran, France and the United States, up until 6 April 2020, and concluded that they had significantly and substantially slowed the growth of infections. However, again, the authors assumed that in the unmitigated case growth rates would be constant. They also considered cases rather than deaths. This is unreliable, because the number of cases is a function of the number of infections, the number of tests administered (which tends to increase) and the accuracy of the tests (which can generate false positives). The number of COVID-19 deaths is a good proxy for the number of infections (infections = deaths/IFR).

Haug et al. (2020) sought to assess the effectiveness of worldwide COVID-19 government interventions (during March–April 2020) using four methods (a case–control study, lasso regres-

sion analysis, random forest regression and transformer modelling) by measuring changes in R_e. The authors concluded that the most effective interventions were small gathering cancellations and the closure of educational institutions. However, the authors assumed that without changes in interventions R_e would remain constant. They also only consider cases (not deaths).

Chaudhry, Dranitsaris, Mubashir, Bartoszko, and Riazi (2020) performed multivariable negative binomial regression from the top 50 countries ranked by number of cases up until 1 May 2020. The authors found no significant correlation between lockdowns and cases, lockdowns and critical cases or lockdowns and deaths; but a significant positive correlation between lockdowns and recovered cases. The study shows correlation, not causation, but a lack of correlation strongly suggests a lack of causation. The authors test the significance of many variables, but do not account for this when using 95% confidence intervals, so overstate the significance of variables. The study provides evidence that lockdowns have no impact on cases or COVID-19 deaths.

Yilmazkuday (2021) used daily Google mobility data from 130 countries between 15 February 2020 and 2 May 2020 to measure the effect of changes in mobility on changes in COVID-19 cases and deaths. He concluded that a 1% weekly increase in being at residential places in a country, on average, resulted in 70 fewer cases and 7 fewer deaths, per week. Whilst an increase in visits to transit stations, retail and recreation, and workplaces increased the number of cases and deaths. The author uses absolute numbers of cases and deaths for each country, rather than the (more relevant) numbers relative to the size of the population. He also uses an insufficient lag between infections and deaths (a week as opposed to 27 days (S. N. Wood, 2021)).

Alfano and Ercolano (2020) conducted a global cross-country panel analysis on the effectiveness of lockdowns up to 10 May 2020 and concluded that lockdowns were effective at reducing the effective reproduction number, R_e. However, the authors failed to take into account the fact that, even in the unmitigated case, as the number of susceptible individuals, S, decreases, R_e will decrease. So we would expect R_e to decrease over time, regardless of any lockdowns. The authors also considered cases (rather than deaths).

In a global study published in *The BMJ*, Islam et al. (2020) used an interrupted time series analysis to test the effectiveness of physical distancing measures up to 30 May 2020, and concluded that the pooled estimates from 149 countries showed an overall decrease of 13% in the incidence of cases (17% for the United Kingdom). Restrictions on mass gatherings appeared to be the most effective measure, whilst school closures and lockdowns (stay-at-home regulations plus restrictions on movements within a country) appeared detrimental. The authors calculated incidence rate ratios (IRRs) of COVID-19 before and after the implementation of physical distancing interventions. However, they do not take into account the fact that, in the unmitigated case, the IRR will decrease over time. The authors also consider cases, not deaths.

Bendavid, Oh, Bhattacharya, and Ioannidis (2021) estimated case growth in subnational regions of ten countries (England, France, Germany, Iran, Italy, Netherlands, Spain, South Korea, Sweden and the United States) in the spring of 2020 using first-difference models with fixed effects. The authors concluded that mandatory stay-at-home and business closures did not reduce the growth of COVID-19 cases.

In an unpublished paper, Herby (2021) reviewed 22 studies that could illuminate the importance of voluntary and mandatory changes in behaviour in relation to how societies handled the COVID-19 pandemic in the spring of 2020. Mandatory behavioural changes accounted for a mean of 9% (median 0%) of the total effect on the growth of the pandemic stemming from behavioural changes, whilst voluntary behavioural changes accounted for the remaining 91% (median 100%).

In an article published in *Science*, Brauner et al. (2021) analysed the effectiveness of eight non-pharmaceutical interventions against COVID-19 in 41 countries from 22 January to 30 May 2020 using cases and deaths with a Bayesian hierarchical model to calculate the percentage reduction in R_e. The authors found that limiting gatherings to 10 people or fewer was the most

effective non-pharmaceutical intervention. However, they do not take into account the fact that R_e would decrease even in the unmitigated case.

In the *Sustainable Development Report 2020*, which considers the United Nations' Sustainable Development Goals (SDGs) and is published by Cambridge University Press, the authors concluded that lockdowns are very costly and inefficient, and that lockdowns in poor countries lead to increases in poverty and hunger (J. Sachs et al., 2020).

In a global analysis to 31 August 2020, De Larochelambert, Marc, Antero, Le Bourg, and Toussaint (2020) applied principal component analysis to various indices, and found that the stringency of lockdowns was not correlated with COVID-19 death rate (the correlation was actually positive but very small).

Because they deduced that COVID-19 is spread via aerosols, Lednicky et al. (2020) stated that 'measures such as physical distancing by 6 feet would not be helpful in an indoor setting, provide a false-sense of security, and lead to exposures and outbreaks'.

In an unpublished analysis using data for more than 160 countries until 30 September 2020, Bhalla (2020) sensibly fitted a Gompertz curve to COVID-19 cases and deaths, and determined whether the interventions altered estimates of the model's parameters. He found that lockdowns increase infections and deaths, later lockdowns perform better than earlier lockdowns, and less stringent lockdowns perform better than more stringent lockdowns. This is extremely damning for the effectiveness of lockdowns.

In December 2020 Sebastian Rushworth pointed out that no governments conducted a cost–benefit analysis on lockdowns, and also concluded that lockdowns and the fear-mongering that goes with them almost certainly kill many more people than they save, and certainly result in many more years of life lost (Rushworth, 2020b).

In a National Bureau of Economic Research (NBER) working paper, Agrawal, Cantor, Sood, and Whaley (2021) used an event study framework to quantify the changes in excess mortality following the implementation of shelter-in-place (SIP) policies in 43 countries and all US states in 2020. They found that following the implementation of SIP policies, excess mortality increased. Countries/US states that implemented SIP policies earlier had higher excess deaths than countries/US states that were slower to implement SIP policies. Whilst countries/US states in which SIP policies had longer to operate had higher excess deaths than countries/US states that implemented SIP policies with a shorter duration. One may hypothesise that SIPs were only implemented when and because excess deaths were increasing, and if this was the case, it would be incorrect to conclude that SIPs caused an increase in excess deaths. However, this was *not* the case, because the authors found that pre-SIP COVID-19 death rates did not influence excess death trends before or after the implementation of SIP policies. In short, this paper provides very damning evidence regarding the effectiveness of shelter-in-place policies.

In a review paper that focussed on papers published from March 2020 to January 2021, O. C. Robinson (2021) noted that lockdowns are associated with reduced mortality in epidemiological modelling studies, but not in studies based on empirical data from the COVID-19 pandemic. This is significant, and consistent with the findings of the current review. And the real world, of course, trumps models.

In April 2021 W. Jones (2021b) identified seven peer-reviewed studies that look at the question of lockdowns from a data point of view (Bendavid et al., 2021; Berry et al., 2021; Bjørnskov, 2021; Chaudhry et al., 2020; De Larochelambert et al., 2020; Gibson, 2020; Savaris, Pumi, Dalzochio, & Kunst, 2021), and all of them came to the same basic conclusion: lockdowns do not have a statistically significant relationship with COVID-19 cases or deaths. Each study is discussed separately in this article, except Savaris et al. (2021), which has since been retracted.

Talic et al. (2021) wrote a systematic review and meta-analysis of empirical studies (as of June 2021), published in *The BMJ*, that concluded that the following measures led to reductions in the incidence of COVID-19: handwashing (relative risk 0.47), mask-wearing (0.47) and physical distancing (0.75). As the authors note, in many studies there is a risk of confounding effects.

Thirty-four of the studies were observational and just one was a randomised controlled trial. With observational studies, the subjects who chose to wear masks were likely more risk averse than those who didn't and may have been more likely to practice social distancing. This creates a bias, and makes masks appear more effective than they are. I would add that there is likely a significant publication bias too, with papers showing that interventions have no significant effect appearing both surprising and controversial to journal editors.

In a literature review and meta-analysis, conducted 1–5 July 2021, Herby, Jonung, and Hanke (2022a) screened 18,590 studies, of which 24 qualified for inclusion in their meta-analysis. They found that lockdowns in Europe and the United States, on average, reduced COVID-19 mortality by just 0.2%, shelter-in-place orders (SIPOs), on average, reduced COVID-19 mortality by just 2.9% and specific non-pharmaceutical intervention (NPI) studies found no broad-based evidence of noticeable effects on COVID-19 mortality. However, closing non-essential businesses reduced COVID-19 mortality by 10.6%. The authors reached a strong conclusion: lockdowns should be rejected out of hand as a pandemic policy instrument.

Mader and Rüttenauer (2022) analysed the effects of ten different non-pharmaceutical interventions (NPI) on COVID-19 mortality for 169 countries from 1 July 2020 to 1 September 2021. They did not find substantial and consistent COVID-19-related fatality-reducing effects of any NPI under investigation.

An article on the Brownstone Institute (a non-profit think tank founded by Jeffrey Tucker) website lists an incredible 400 studies on the failure of COVID-19-related interventions (P. E. Alexander, 2021d).

In his book *The Year the World Went Mad*, Mark Woolhouse, Professor of Infectious Disease Epidemiology at the University of Edinburgh, shares his story as an insider, having served on advisory groups to both the Scottish and UK governments. He explains the follies of lockdowns (Woolhouse, 2022).

In a systematic review and meta-analysis, Herby et al. (2022b) (an updated version of Herby et al. (2022a)) screened 19,646 studies, with 32 studies qualifying. The studies were separated into three groups: lockdown stringency index studies, shelter-in-place-order (SIPO) studies and specific NPI studies. Stringency index studies found that the average lockdown in Europe and the United States in the spring of 2020 only reduced COVID-19 mortality by 3.2% (this translates into approximately 6,000 avoided deaths in Europe and 4,000 in the United States). SIPOs were also relatively ineffective in the spring of 2020, only reducing COVID-19 mortality by 2.0% (4,000 avoided deaths in Europe and 3,000 in the US). Based on specific NPIs, the authors estimated that the average lockdown in Europe and the United States in the spring of 2020 reduced COVID-19 mortality by 10.7% (23,000 avoided deaths in Europe and 16,000 in the US). In comparison, there are approximately 72,000 flu deaths in Europe and 38,000 flu deaths in the US each year. The authors concluded that lockdowns in the spring of 2020 had little to no effect on COVID-19 mortality.

A meta-analysis by Herby et al. (2023) found that lockdowns, as reported in studies based on stringency indices in the spring of 2020, reduced mortality by 3.2% when compared to less strict lockdown policies adopted by the likes of Sweden. A second approach employed by the authors combined studies that looked at how specific lockdown measures (such as school closures, mask-wearing, etc.) were actually used in Europe and the United States. Using this approach, the authors estimated that lockdowns reduced mortality by 10.7% in the spring of 2020. Surprisingly, gathering limits likely *increased* COVID-19 mortality by almost 6%.

Coquin de Chien (2023d) compared, from March 2020 to May 2020, Sweden with Massachusetts, New Hampshire, Vermont and Maine in the US. He concluded that the data and evidence strongly support the Swedish model of freedom and the government's belief in the responsible behaviour of its citizens.

Yanovskiy and Socol (2022) performed a narrative review of papers published before or in 2020 on the effectiveness of lockdowns. They estimated that lockdowns may claim 20 times more

life years than they save. Cummins (2022) concluded that the balance of evidence is strongly in favour of lockdown policies having no meaningful or substantial real-world empirical effect on primary outcomes. Whilst Swiss Policy Research (2023c) point out that, in most cases, lockdowns failed both to 'flatten the curve' in the short term and to reduce cumulative excess mortality in the long term.

Agrawal, Cantor, Sood, and Whaley (2023) used an event study approach and data from 43 countries and all US states to measure changes in excess deaths following the implementation of COVID-19 shelter-in-place (SIP) policies in 2020. The authors did not find that countries or US states that implemented SIP policies earlier had lower excess deaths. They did not observe differences in excess deaths before and after the implementation of SIP policies, even when accounting for pre-SIP COVID-19 death rates.

Bardosh (2023b) sought to uncover how the COVID-19 pandemic response harmed society globally during 2020 and 2021. He developed a harm framework spanning 10 categories: health, economy, income, food security, education, lifestyle, intimate relationships, community, environment and governance. His analysis synthesizes 600 publications with a focus on meta-analyses, systematic reviews, global reports and multi-country studies. This cumulative academic research showed that the collateral damage of the pandemic response was substantial, wide-ranging and will leave behind a legacy of harm for hundreds of millions of people in the years ahead. Many COVID-19 policies caused more harm than benefit.

Bendavid and Patel (2024) used daily data on 16 government responses in 181 countries in 2020–2021, and 4 outcomes—cases, infections, COVID-19 deaths and all-cause excess deaths—to construct 99,736 analytic models. They found no patterns in the overall set of models that suggest a clear relationship between COVID-19 government responses and outcomes: 'We cannot conclude that there is compelling evidence to support the notion that government responses improved COVID-19 burden, and we cannot conclude that there is compelling evidence to support the notion that government responses worsened the COVID-19 burden. The concentration of estimates around a zero effect weakly suggests that government responses did little to nothing to change the COVID-19 burden.'

The Royal Society reviewed the literature on the effectiveness of non-pharmaceutical interventions (NPIs) during 2020–2023 (The Royal Society, 2023). The authors concluded that 'There is clear evidence from studies conducted during the pandemic that the stringent implementation of packages of NPIs was effective in some countries in reducing the transmission of COVID-19'. Systematic reviews on non-pharmaceutical interventions are compromised by publication bias. The report ignored high-quality evidence, ignored critical biases and confounders, and ignored the substantial costs and harms of the interventions, plus one of the peer-reviewers for the project was apparently Professor Lockdown himself, Neil Ferguson (Bardosh, 2023c; Heneghan & Jefferson, 2023h; W. Jones, 2023g; Livermore, 2023b).

2.2.1.5 Conclusion

To summarise the literature review, whilst several of the epidemiological modelling studies gave credence to the effectiveness of lockdowns, most of the studies based on empirical data concluded that lockdowns had no effect on COVID-19 cases or deaths. Of those studies that concluded that lockdowns worked, restrictions on small gatherings was the most common measure deemed to be effective. However, most of the papers that concluded that lockdowns were effective failed to take into account the fact that even in the unmitigated case the effective reproduction number, R_e, decreases as the proportion of the population that are susceptible decreases. This systematic bias flatters the measured effect of any intervention, which means that, with such papers, no useful conclusions can be drawn regarding the overall effectiveness of lockdowns.

2.2.2 Analysis

Now for our own analysis. Did lockdowns work? If they do, we should see a decrease in all-cause mortality. First, let us look at global data. Throughout almost the entire timeline since the pandemic began, countries with a high lockdown stringency index had higher excess mortality than countries with a low lockdown stringency index (see Figure 1).

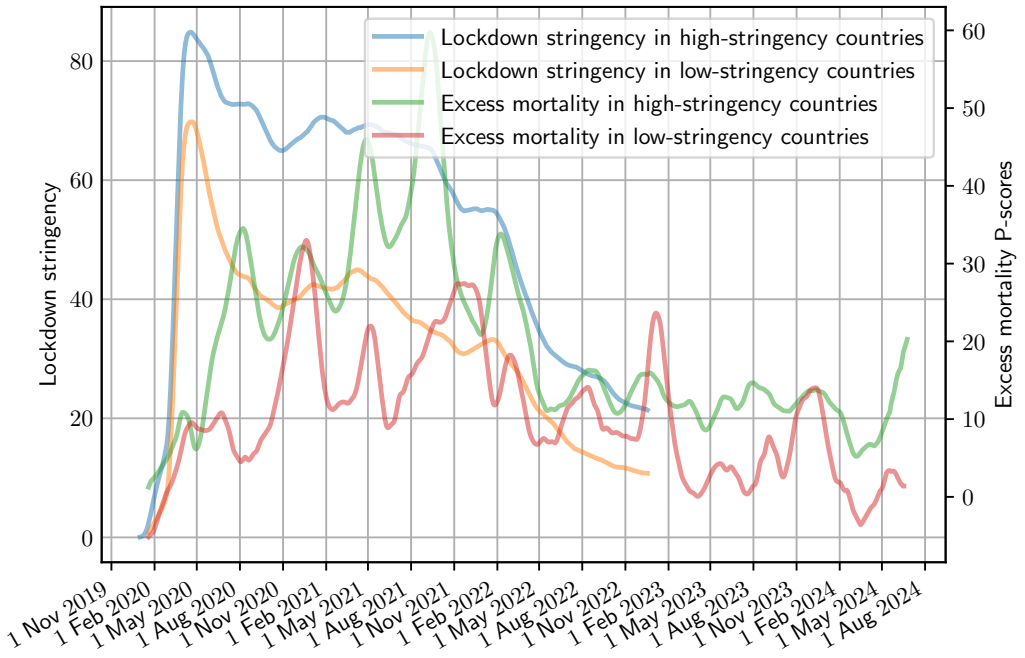

Figure 1: Lockdown stringency and excess mortality

Of course, there will be various confounding variables. Let us therefore first group countries by controlling for vaccination rates, then analyse the relationship between lockdown stringency index and excess mortality. This is far from perfect, but an improvement. Among countries with low vaccination rates, there was no consistent relationship between lockdown stringency index and excess mortality (see Figure 2). Among countries with medium vaccination rates, countries with a low lockdown stringency index had lower excess mortality for the majority of the time (see Figure 3). Among countries with high vaccination rates, countries with a high lockdown stringency index had higher excess mortality for the majority of the time (see Figure 4). Thus far, we have not seen any evidence that lockdowns worked; quite the contrary.

We shall now conduct two novel experiments, which only consider COVID-19 deaths.[1] One involving the parameters of the Gompertz function, and one involving the SIR model's β. Both compare the United Kingdom with Sweden. The United Kingdom had a typical lockdown, it was neither notably weak, nor notably strong (Hale, Webster, Petherick, Phillips, & Kira, 2021). The first UK lockdown began when the Prime Minster, Boris Johnson, addressed the nation in a press conference at 8.30pm on 23 March 2020, and the last day of this lockdown was 3 July 2020. The UK also has high-quality data, from the Office for National Statistics (ONS).[2] The UK, therefore, with a population of 68 million, represents a useful testbed for

[1]The Python and C++ code for all experiments conducted in this paper is available from `https://github.com/MartinSewell/COVID-19`.

[2]This is not the case for data relating to vaccinations, see Section 4.2.1.1.

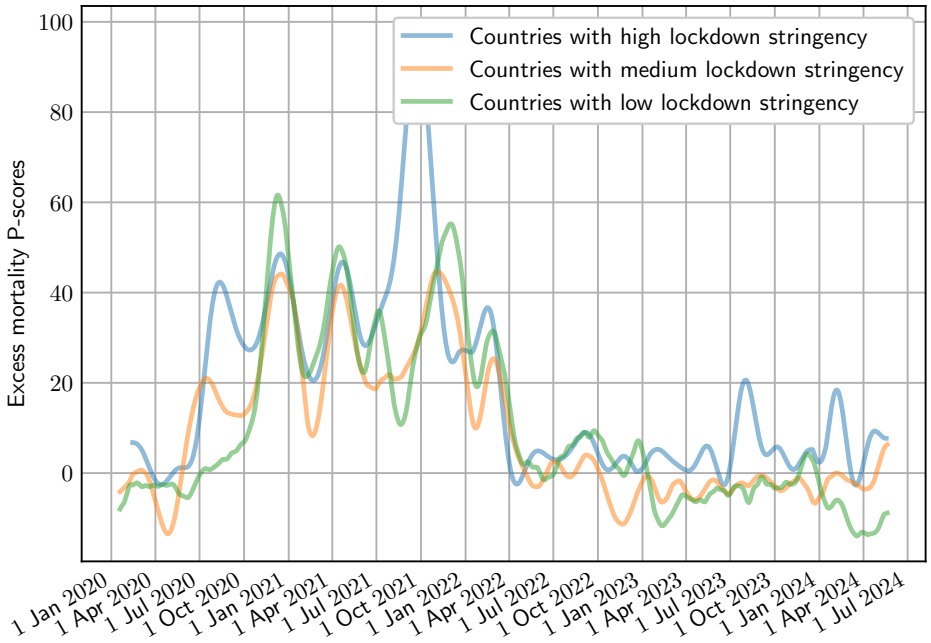

Figure 2: Excess mortality for countries with low vaccination rates

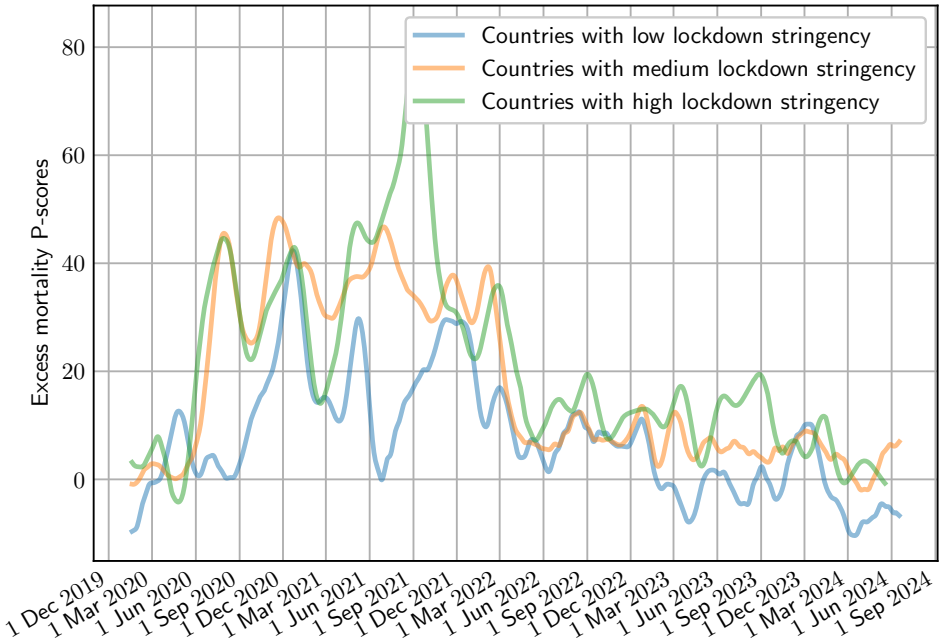

Figure 3: Excess mortality for countries with medium vaccination rates

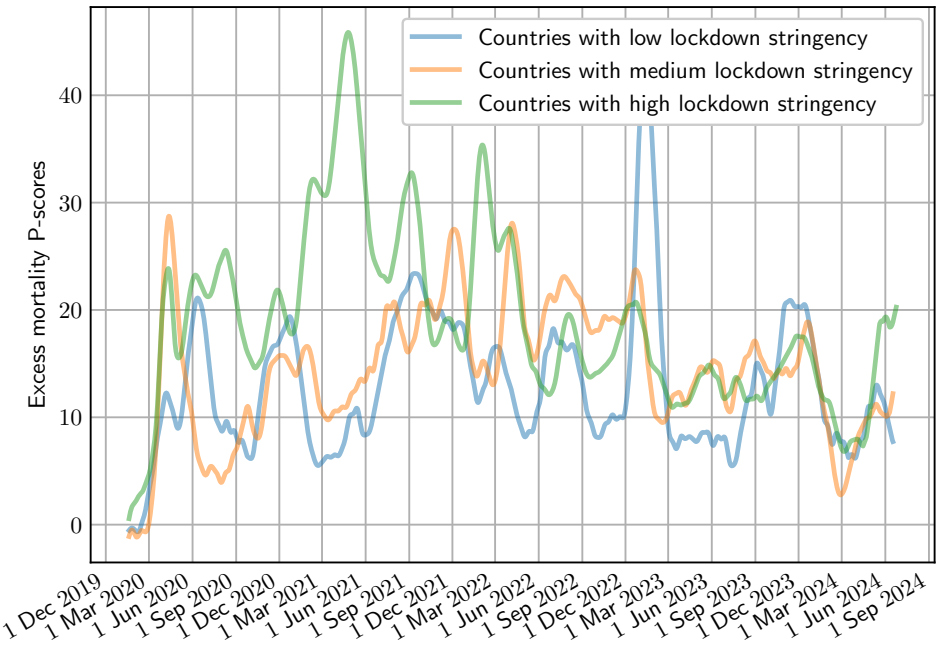

Figure 4: Excess mortality for countries with high vaccination rates

measuring the effectiveness of lockdowns. We wish to compare the actual data from the UK (with a lockdown) with that from a proxy for the UK with no lockdown. The closest we have to a country without a lockdown is arguably Sweden. One might argue that a better natural experiment would have been a comparison of 'no lockdown' Sweden with the rest of Scandinavia. However, Sweden actually had *more* restrictions in place than Denmark, Finland or Norway for half of 2020 (Carl, 2021). Also, Sweden's mobility was similar to that of the other Scandinavian countries, especially Denmark (el gato malo, 2022d). During the epidemic in Sweden, behaviour likely changed voluntarily, but the important point from a control perspective is that they had no lockdown. Although Carl (2023b) argued that the behaviour of the citizens of Sweden barely changed during the pandemic (there was no evidence of a 'voluntary lockdown'). COVID-19 deaths data for the UK and Sweden was downloaded from the UK Government[3] and the Public Health Agency of Sweden[4], respectively. Figure 5 shows the COVID-19 death rate for the UK and Sweden. It is striking how similar the two epidemic curves are, despite the fact that the UK had a lockdown, whilst Sweden did not, plus the countries have different population sizes, population densities and demographics. The main difference is that the UK had a higher death rate. In both cases the data can be wholly explained by an epidemic and a seasonal resurgence that was exacerbated by a more transmissible variant. All of this is consistent with the UK lockdown having no significant effect.

2.2.2.1 SIR Model

The SIR model (Kermack & McKendrick, 1927) is an epidemiological model of infectious diseases. Where S is the number of susceptible individuals, I the number of infectious individuals, R

[3] `https://coronavirus.data.gov.uk/details/deaths`

[4] `https://fohm.maps.arcgis.com/sharing/rest/content/items/b5e7488e117749c19881cce45db13f7e/data`

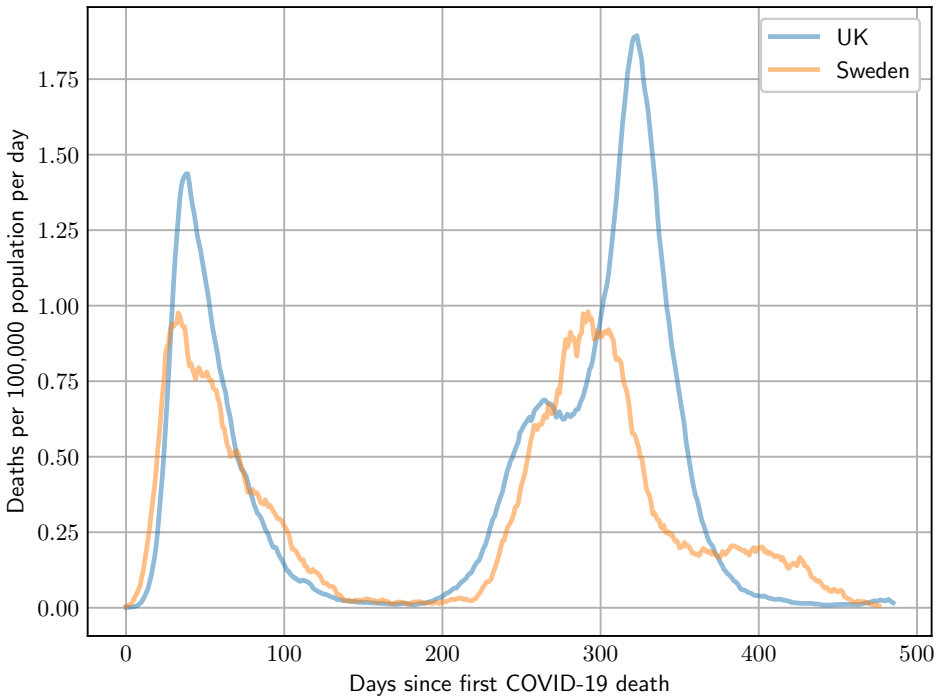

Figure 5: COVID-19 death rate in the UK and Sweden

the number of removed (and immune) or deceased individuals, β the average number of contacts per person per time multiplied by the probability of disease transmission in a contact between a susceptible and an infectious subject, and γ the reciprocal of the average period of time that an individual is infectious for, the model is defined by the following set of ordinary differential equations:

$$\begin{aligned}\frac{\mathrm{d}S}{\mathrm{d}t} &= -\frac{\beta IS}{N},\\ \frac{\mathrm{d}I}{\mathrm{d}t} &= \frac{\beta IS}{N} - \gamma I \quad \text{and}\\ \frac{\mathrm{d}R}{\mathrm{d}t} &= \gamma I.\end{aligned}$$

Because deaths, rather than cases, provide a more reliable estimate of infections, deaths plus an IFR for Europe of 0.51% (Oke & Heneghan, 2020) are used to construct SIR models for the UK and Sweden. It is assumed that the time from infection to death is 26.8 days (S. N. Wood, 2021). In the second experiment below, β is assumed to vary, whilst γ is assumed to be $\frac{1}{9}$ (Van Beusekom, 2020).

Is the SIR model correct? On his blog, eugyppius (2023c) explained that innate immune defences are powerful, and they make a solid majority of everybody invulnerable to respiratory virus infection at any given time. Viruses don't have free run of the entire uninfected population; only a small minority of respiratory tracts are open to them. The susceptible are a minority that wax and wane with the seasons. In the summer, it's very small indeed, and many viruses drop to nearly undetectable levels. In the winter, the number of susceptible increases substantially. In my model, I assumed that 35% of the population have pre-existing immunity (Doshi, 2020a).

2.2.2.2 Experiment 1: Gompertz Function Analysis

During the initial wave of an unmitigated COVID-19 epidemic in a temperate zone, the number of people who are or have been infected ($I + R$) is well described by a Gompertz function (Ohnishi, Namekawa, & Fukui, 2020). The first derivative gives us the number of newly infected people per day, $\frac{\mathrm{d}I}{\mathrm{d}t} + \frac{\mathrm{d}R}{\mathrm{d}t}$. The distribution is asymmetric and exhibits positive skew (a bell curve that rises rapidly then falls more slowly). The relative growth rate, $\frac{1}{I(t)+R(t)} \frac{\mathrm{d}(I(t)+R(t))}{\mathrm{d}t}$, decreases exponentially with time, reaching zero at infinity. The peak is reached after just $\frac{1}{\mathrm{e}} = 37\%$ of the total number due to be infected, are or have been infected. Figure 6 shows the first derivative of the Gompertz function fitted to the number of new infections per day for the epidemic (first wave) in Sweden. The curve takes three parameters: A represents the upper asymptote, r is the

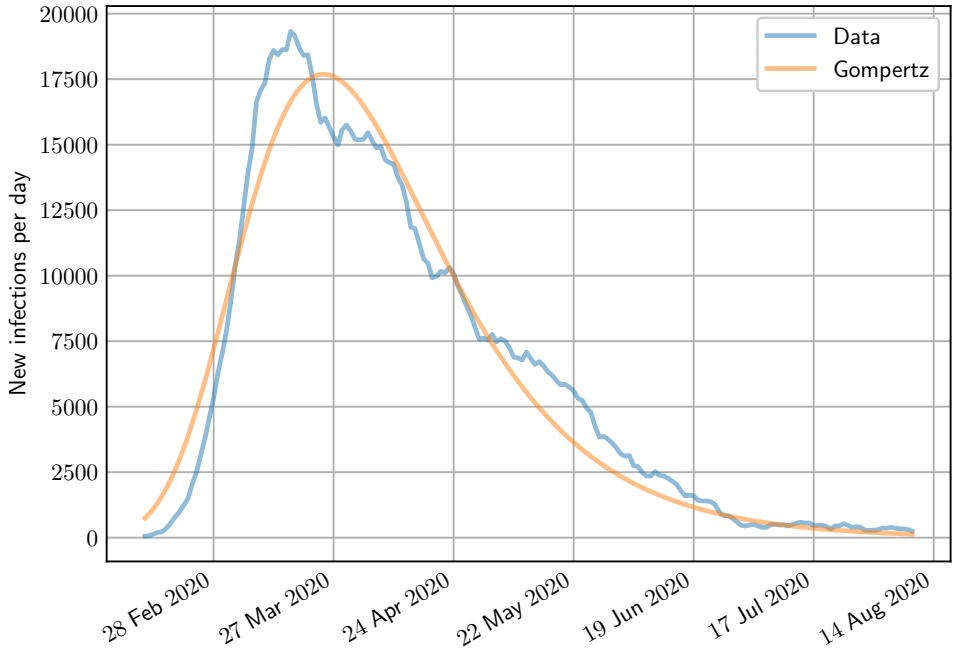

Figure 6: Sweden infections and fitted first derivative of the Gompertz function

growth-rate coefficient and t_0 is a location parameter that represents time at inflection.

$$I(t) + R(t) = A\mathrm{e}^{-\mathrm{e}^{-r(t-t_0)}}$$
$$I'(t) + R'(t) = Ar\mathrm{e}^{-\mathrm{e}^{-r(t-t_0)}-r(t-t_0)}$$

The first derivative of the Gompertz function was fitted to the number of new infections per day in the UK for the period of the epidemic before the lockdown, yielding the following parameters: $A = 6509003$, $r = 0.07864$, $t_0 = 39.390$. A and t_0 were then assumed to be fixed, and the first derivative of the Gompertz function was fitted to the period of the epidemic during the lockdown, yielding $r = 0.05529$.

Sweden didn't have a lockdown, but we wish to identify the part of Sweden's epidemic curve that corresponds to the UK's epidemic curve during the UK lockdown. It was assumed that the point at which the lockdown took effect was the same number of days after the peak of the epidemic, and that the lockdown lasted the same number of days. As for the UK, the first derivative of the Gompertz function was fitted to the number of new infections per day in

Sweden for the period of the epidemic before the UK lockdown took effect, yielding the following parameters: $A = 765735$, $r = 0.06728$, $t_0 = 34.532$. A and t_0 were then assumed to be fixed, and the first derivative of the Gompertz function was fitted to the Swedish data for the period of the epidemic during the UK lockdown, yielding $r = 0.03888$.

Our statistic of interest is the UK Gompertz growth-rate coefficient during the lockdown minus the equivalent for Sweden. If the UK lockdown had a significant impact on reducing the rate of infections, we would expect this number to be negative and significantly different from zero.

$$r_{\mathrm{UK}} - r_{\mathrm{S}} = 0.01641$$

We therefore conclude that the results of this experiment are consistent with the first UK lockdown having no significant positive impact on the rate of COVID-19 infections/deaths.

2.2.2.3 Experiment 2: SIR Model Analysis

Again, we wish to measure the impact of the first UK lockdown, whilst using Sweden as a control. As mentioned above, the UK and Sweden have different population sizes, population densities and demographics. We are interested in using a metric that would yield similar values under an unmitigated epidemic in the UK and an unmitigated epidemic in Sweden. In practice a population will be heterogeneous in terms of susceptibility and exposure, so β will not be constant. Seasonality aside, it is to be expected that as the proportion of the population that are susceptible, $\frac{S}{N}$, decreases, β will decrease, because the most susceptible and exposed are more likely to become infected earlier in time. So $\beta = f(\frac{S}{N})$. Figure 7 shows how β has varied with $\frac{S}{N}$ in the England and Sweden COVID-19 SIR models. As expected, during each wave β starts high and falls as $\frac{S}{N}$ decreases.

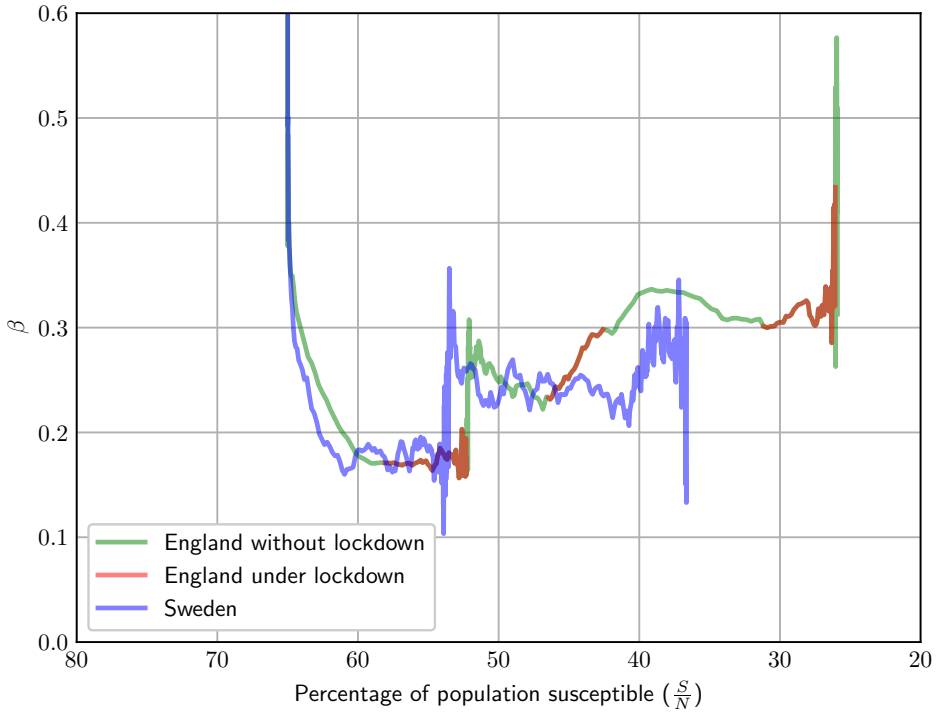

Figure 7: β vs $\frac{S}{N}$ in the COVID-19 SIR model, data up to 30 June 2021

For a given $\frac{S}{N}$, β may differ between countries, due to different population densities. A better

metric would likely be $\frac{\mathrm{d}\beta}{\mathrm{d}\frac{S}{N}}$ for a given $\frac{S}{N}$. As in the previous experiment, data from Sweden is used to construct a suitable control.

For each UK day:

1. Calculate $\frac{\mathrm{d}\beta_{\mathrm{UK}}}{\mathrm{d}\frac{S_{\mathrm{UK}}}{N_{\mathrm{UK}}}}$, we now need a control from the Sweden data.
2. Calculate $\frac{S_{\mathrm{UK}}}{N_{\mathrm{UK}}}$.
3. Cycle through all Sweden epidemic (first wave) days and identify the $\frac{S_{\mathrm{SE}}}{N_{\mathrm{SE}}}$ that is closest in value to the above $\frac{S_{\mathrm{UK}}}{N_{\mathrm{UK}}}$.
4. Select the corresponding $\frac{\mathrm{d}\beta_{\mathrm{SE}}}{\mathrm{d}\frac{S_{\mathrm{SE}}}{N_{\mathrm{SE}}}}$ from the same day, this is our control.

We can now construct our statistic of interest.

$$\frac{1}{\text{no. days}} \sum_{\text{start date}}^{\text{end date}} \frac{\mathrm{d}\beta_{UK}}{\mathrm{d}\frac{S_{UK}}{N_{UK}}} - \frac{\mathrm{d}\beta_{SE}}{\mathrm{d}\frac{S_{SE}}{N_{SE}}} \tag{1}$$

The first full day of the first UK lockdown was 24 March 2020. Simon Wood of the University of Edinburgh estimated that the time from infection to death has a mean of 26.8 days and a standard deviation of 12.4 days (S. N. Wood, 2021). We wish to capture a time period that transitions from the vast majority of infections taking place before the lockdown began, to the vast majority taking place during the lockdown. Taking two standard deviations on either side of the mean gives us 28 February 2020 to 17 April 2020 (50 days). Figure 8 shows how $\frac{\mathrm{d}\beta}{\mathrm{d}\frac{S}{N}}$ for the UK, Sweden and the control varied during this period. If the first UK lockdown had a

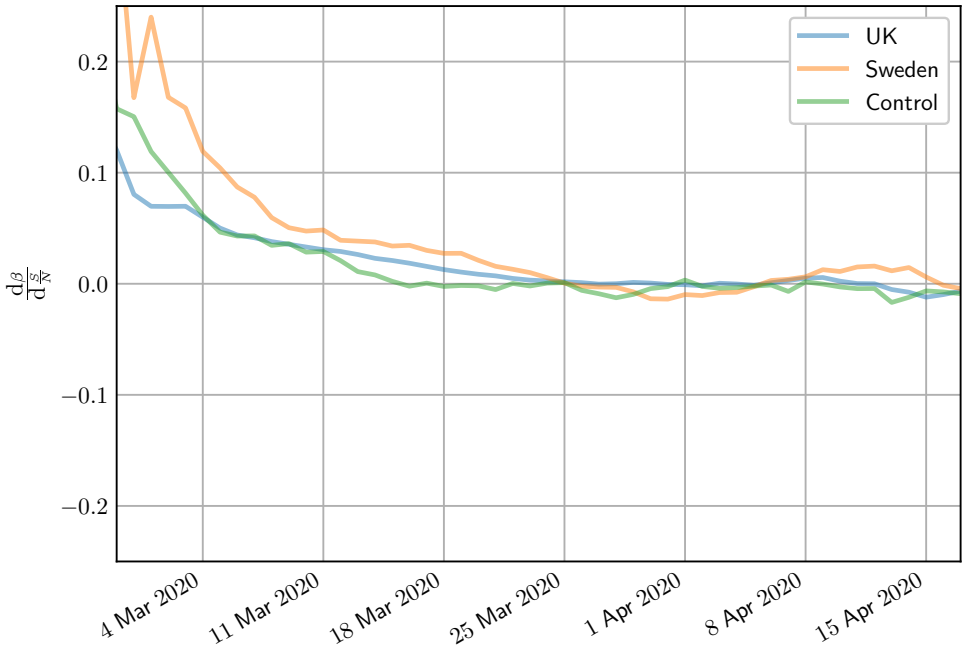

Figure 8: Smoothed $\frac{\mathrm{d}\beta}{\mathrm{d}\frac{S}{N}}$ as the UK transitioned into its first lockdown

significant impact, the result of equation (1) should be positive and significantly greater than zero.

$$\frac{1}{50}\sum_{26\text{ March }2020}^{14\text{ May }2020}\left(\frac{\mathrm{d}\beta_{UK}}{\mathrm{d}\frac{S_{UK}}{N_{UK}}}-\frac{\mathrm{d}\beta_{S}}{\mathrm{d}\frac{S_{S}}{N_{S}}}\right)=0.00126$$

Because the statistic is not significantly different from zero, we can conclude that the first UK lockdown had no significant impact on COVID-19 transmission. Whilst Figure 7 suggests that, if anything, the data is consistent with the second and third lockdowns in England coinciding with *increases* in COVID-19 transmission (β increases during the lockdowns).

2.2.2.4 Conclusion

To conclude the analysis, our best estimate is that the first lockdown in the UK had no significant impact on COVID-19 transmission, cases or deaths.

2.2.3 Conclusion

Most of the empirical research, including my own, is consistent with lockdowns having no significant impact on the transmission of COVID-19. In 2024 even Boris Johnson admitted that he wasn't sure whether lockdowns worked or not (B. Johnson, 2024).

2.3 Collateral Damage Caused by Lockdowns

Regardless of whether lockdowns reduce COVID-19 cases/deaths, lockdowns cause collateral damage.

2.3.1 Health

Lockdowns can be bad for your health. For example, in wealthy nations under lockdown, those with small heart attacks or strokes may have avoided going to hospital during the lockdown, leading to greater harm later on.

2.3.1.1 General

Estonia In Estonia, between 2019 and 2022, *The Telegraph* reported that sick days surged by 72% (Nolsøe, 2024).

Germany In Germany, working days lost to ill health rose by 38% between 2019 and 2022 (Nolsøe, 2024).

United Kingdom In an interview in *spiked*, Swedish epidemiologist and biostatistician Martin Kulldorff stated that lockdowns were a disaster for public health, and Sweden had been vindicated (Kulldorff, 2024b). In July 2023 it was reported that there was a 21% increase in the number of people who are economically inactive (neither in work nor looking for work) because of ill health, compared with pre-pandemic levels (T. Wallace & Chan, 2023). The most common problems were mental health issues and musculoskeletal conditions. There was also a sharp rise in the share of the population that have disabilities and are of working age, and in NHS England referral-to-elective treatment waiting lists. The Office for Budget Responsibility (OBR) estimates that foregone income tax, National Insurance contribution averages and other Government receipts totals £8.9bn. Whilst sick days rose by 36% between 2019 and 2022 (Nolsøe, 2024). By December 2023 there were over 2.6 million people economically inactive because of long-term sickness, an increase of nearly 500,000 since the pandemic (Salvoni, 2023).

Professor Karol Sikora, a consultant oncologist, reported in December 2023 that, thanks to the lockdowns, the NHS was clogged up with people who should have been treated with an

earlier stage illness. The healthcare system, he notes, has a new mantra: 'Stay home, protect the NHS, die early'. In the UK the number of working-age people newly awarded disability benefits doubled between July 2021 and July 2022 (Joyce, Ray-Chaudhuri, & Waters, 2022). Essentially all ages saw their claim rate roughly double, although for teenagers it tripled. Around a third of the new claims were for mental or behavioural conditions, although among claimants under 25 that figure rose to 70%. Health of the working-age population worsened, from 8.5% to 9.6% reporting that their health limited their daily activities 'a lot'. There was also a significant rise in the number of (non-COVID) working-age deaths from late 2021 through 2022, compared to pre-pandemic years. Lockdown-induced 'phobias and anxieties' fuelled a long-term sickness crisis (Penna, 2023). As of June 2023, some 2.5 million people were economically inactive because of long-term sickness, a figure that rose by about 360,000 since the start of the pandemic. Also, musculoskeletal problems rose since the lockdowns, likely as a consequence of bad posture among home workers. In January 2024, the UKHSA were concerned about the growing number of cases of measles. This was because the uptake of the MMR vaccine was at its lowest level in more than a decade. Toby Young points out that this was likely due to the conversion of the NHS into a COVID-19-only service from March 2020 to July 2021, meaning lots of parents failed to get their children vaccinated (T. Young, 2024). In other words, it is another consequence of the government's mismanagement of the pandemic.

United States T. Rogers (2024) argued that in the US the lockdowns led to hundreds of thousands of deaths of despair from drug overdoses, alcohol poisoning and suicide over the four years following the start of the pandemic.

Europe According to the WHO, there was a 30-fold increase in measles cases across Europe in 2023 (T. Young, 2024).

Global ÓhAiseadha et al. (2023) conducted a narrative review of studies investigating the unintended consequences of NPIs. NPIs were found to have considerable adverse consequences for mental health, physical activity and obesity. Whilst the impacts on alcohol and tobacco consumption varied greatly within and between studies. According to the International Labour Organisation (ILO), due to a significant rise in sick days, globally, on average, workers now toil for around 41 hours a week on average, compared to 42 hours before the pandemic (Nolsøe, 2024).

2.3.1.2 Delayed Healthcare

Europe In Germany the COVID-19 pandemic was associated with a significant decrease in all-cause admission and admissions due to acute cardiovascular and potentially cerebrovascular events in the emergency department (V. Schwarz et al., 2020).

Cuschieri, Borg, Agius, Scherb, and Grech (2022) analysed hospital activity in Malta. A&E, hospital admissions and outpatient clinics attendances declined by 31.88%, 23.89% and 29.57% respectively with the onset of COVID-19 until April 2021 when compared to pre-COVID-19 years (2017–2019).

In England A&E visits fell by 25% in a week after lockdown (Thornton, 2020). Whilst compared with the period 24 February 2020 to 1 March 2020, visits to emergency departments after the lockdown were down 49%. Some people may be harmed by not accessing treatment.

In February 2021 in England nearly 388,000 people had been waiting for more than a year for non-urgent surgery compared with just 1,600 before the pandemic began (BBC News, 2021a). In England, by the end of July 2022, there were 6.84 million people (nearly one in eight) waiting for treatment (BBC News, 2022b). It was a record number, before the pandemic there were 4.2 million waiting for treatment.

In July 2020 the UK government reported that more than 200,000 people could die from the impact of lockdown and protecting the NHS (Knapton, 2020). Projected increased deaths within one year were as follows: COVID-19 50,000, delayed healthcare short term 12,000–25,000, delayed healthcare long term 185,000, recession 600–12,000, suicide 500, domestic violence 20 and accidents at home low tens. Even the UK Government's Technical Report on the COVID-19 Pandemic in the UK (UK Government, 2022) conceded the following. 'There is little doubt that delays in presentation, reductions in secondary prevention (such as statins and antihypertensives), postponement of elective and semi-elective care and screening will have led to later and more severe presentation of non-COVID illness both during and after the first 3 waves. The combined effect of this will likely lead to a prolonged period of non-COVID excess mortality and morbidity after the worst period of the pandemic is over.' In January 2024 in the UK Professor Karol Sikora, a leading cancer specialist, complained of 'A tunnel vision focus on one virus led to millions and millions of patients suffering delays in diagnosis and treatment for every single aspect of healthcare' (Searles & Butcher, 2024). 'Lockdowns, and the associated delays, are undoubtedly the driving factor behind these horrific statistics. In cancer alone, I estimate that there will be significantly more life years lost to unnecessary delays than the virus sadly took.' In the UK lockdowns caused NHS waiting lists to explode in 2020. Yet in 2024 neither Conservative nor Labour election campaigns admited this, as both parties were culpable. In Northern Ireland, just prior to the COVID-19 era (end of December 2019), 94.4% of cancer patients were treated within 31 days of diagnosis, but by March 2024 this dropped to 86.5%. Despite the fact that the number of cancer patients was clearly (and inevitably) increasing since 2010, the number treated dramatically dropped from a pre-COVID-19 peak of 2,708 in March 2020 to just 2,287 in September 2020 (after which it started increasing again). Ludlow (2024) reported that in the UK during the lockdown, some patients with illnesses other than COVID-19 felt neglected, as if they were left to die.

In December 2023 F. Nelson (2023a) reported that telling the public to 'protect the NHS' had deadly consequences. Thousands of people were dying from preventable causes and missed diagnoses. The NHS was never at risk of being overwhelmed. Health officials, rather than amplifying fear, should have encouraged the public to keep using the health service and keep going out (as health officials in Sweden did). The NHS is there to protect people, not the other way around. In England, there was a drop in recorded prostate cancer incidence of 31% in 2020 and 18% in 2021 (Lemanska et al., 2024). An estimated 20,000 prostate cancer diagnoses were missed due to lockdowns.

Maul et al. (2024) estimated that there were 111,464 years of life lost (YLL) due to pandemic-associated delay in melanoma diagnosis in Europe, and estimated total additional costs were $7.65 billion.

North America In the US, experts are concerned that a dip in diagnostic screening in 2020 likely resulted in countless missed opportunities to treat cancers early, which would have increased the odds of a person's survival, potentially leading to a spike in cancer deaths in the coming years (Morrison, 2023). Diagnoses of breast, lung, colorectal, thyroid, prostate and pancreatic cancers fell (Han et al., 2023). The monthly number of new cancer diagnoses (all stages) decreased substantially after the start of the COVID-19 pandemic in March, 2020, although monthly counts returned to near pre-pandemic levels by the end of 2020. The decrease in diagnoses was largest for stage I disease, leading to lower odds of being diagnosed with stage I disease in 2020 than in 2019 (aOR 0.946 for stage I vs stage II–IV); whereas, the odds of being diagnosed with stage IV disease were higher in 2020 than in 2019 (1.074 for stage IV vs stage I–III). There was an approximately 15% decrease in cancer diagnoses in the USA from 2019 to 2020, cancer registration statistics in England showed that the number of cancer diagnoses decreased by 12% from 2019 to 2020, and those in Canada in 2020 showed a decrease of 6% compared with the annual average for 2015–19.

2.3.1.3 Immunity Debt

Even if lockdowns 'work' by reducing exposure to viruses, this may prove to be harmful in the longer term. A lack of exposure to regular bacteria and viruses can create an 'immunity debt' (Hatter, Eathorne, Hills, Bruce, & Beasley, 2021). Bean et al. (2024) found that prior infection with SARS-CoV-2 protected against symptomatic endemic coronavirus (common cold) infection. The authors found that $CD8^+$ T cell responses specifically targeting two nonstructural endemic coronavirus proteins, nsp12 and nsp13, were enriched only in those with prior infection. The data suggested that $CD8^+$ T cell responses against conserved proteins may confer protection against a broad array of coronaviruses. There is evidence of harms caused by immunity debt in Australia, the UK and the US.

Australia In Australia, in late 2020, unprecedented widespread RSV outbreaks occurred. Eden et al. (2022) demonstrated that delayed or forgone RSV seasons may increase the cohort of young children susceptible to RSV infection and increase the age of first infection leading to larger outbreaks of RSV when they do finally occur. So, even if mitigation measures work, they can disrupt seasonal patterns and cause larger or more severe outbreaks. So-called 'pandemic babies' born and raised in the two years where New South Wales, Australia, had virtually no other viruses besides COVID-19, have no immunity, and in 2022 many were ending up in intensive care with respiratory illnesses (Bharadwaj, 2022).

United Kingdom In the UK in 2022, Strep A bacterial infections killed more children than COVID-19 did during the first year of the pandemic (Knapton, 2022c).

United States In a retrospective cohort study of children younger than five in the US, Suss and Simões (2024) found that hospitalisations for RSV and bronchiolitis demonstrated atypical seasonality in 2021 and 2022, with an overall increase in RSV encounters. Incidence rate ratios of hospitalisation of RSV increased for all ages in 2021 and 2022 compared with 2015 to 2019. Children aged 24 to 59 months were 4.86 times as likely to be hospitalised in 2022 compared with 2015 to 2019, whereas infants aged 0 to 5 months were 1.77 times as likely. Meanwhile, bronchiolitis hospitalisation was decreased or unchanged compared with earlier seasons.

In Section 2.7.6 we provide further evidence of how lockdowns can create immunity debt.

2.3.1.4 Accidents

In the UK in 2022 the number of calls for ambulances because of falls was more than 16% higher than in each of the previous two years, indicating worrying after-effects of the lockdowns of 2020 and 2021 (Connolly, 2024). A 2021 Age UK report found that 17% of older people believed they were more unsteady on their feet than before the pandemic. Immobility, lack of exercise, lack of sunshine and Vitamin D3 all make muscles weaker and the nervous system less able to compensate.

2.3.1.5 Deaths

Sabhlok and Gavrilis (2022) analysed various sources of global data, including the Oxford lockdown severity index, and concluded that lockdowns increase COVID-19 deaths. According to a report by Statistics Canada in July 2021, the consequences of government-enforced lockdowns killed more Canadians under the age of 65 than the COVID-19 virus itself (Faulkner, 2021). Whilst Dodsworth (2024b) reported in April 2024 that suicide rates are now the highest they have been in England for 25 years. For further evidence of excess deaths caused by lockdowns, see Section 5.5.

2.3.1.6 Cardiovascular Disease

United Kingdom In the UK, in 2020 the 'protect the NHS' messaging likely caused collateral damage as the number seeking help for heart attacks fell dramatically (Knapton, 2022a). 3 million people missed cancer screenings. 2 million patients waited more than 18 weeks for routine hospital treatment. There was a 50% drop in heart attack A&E attendances. The number of people seeking help fell by 35% for small heart attacks and 17% for major heart attacks. Admissions for heart failure declined by 28%. There was a 38% drop in emergency heart surgery in London in the second half of March 2020, due to worried patients. Dr Foster (2020) quantified NHS activity reduction during the peak of the epidemic. During April–May 2020, there was a 41% reduction in the number of patients presenting with nonspecific cardiac chest pain and a 44% reduction in those with abdominal pain.

In August 2022, the *Daily Telegraph* reported that ONS statistics suggest that the effects of lockdown may be killing more people than are dying of COVID-19 (Knapton, 2022b). From the beginning of June 2022, there were nearly 10,000 more deaths than the five-year average, more than three times the number of people who died because of the virus over the same period. The Office for Health Improvement and Disparities stated that the majority were linked to largely preventable heart, stroke and diabetes-related conditions. In England, deaths from heart failure in the 15 weeks from the week ending 24 March 2023 to the end of June 2023 were 27% higher than the level expected for the same period in 2020 Rendell (2023d). Whatever is causing the elevated rate of heart failure deaths is not causing elevated deaths from cancer or dementia. It therefore seems unlikely that the primary driver can be the failings of the health service, or due to an ageing population.

Global Lockdowns led to lower levels of physical activity, increases in alcohol intake and a lack of access to healthcare, all of which are contributing factors to stroke (R. Watson, 2023g). In a systematic review and meta-analysis on non-COVID-19 cardiovascular diseases, Nadarajah et al. (2022) analysed 158 studies, covering 49 countries and 6 continents. The authors estimated that there was over an hour greater delay between symptoms to first medical contact during the pandemic. The total number of cardiac surgical operations fell during the pandemic by 34%. During the pandemic, the number of implantations of permanent pacemakers fell by 45%. For both ST-elevation myocardial function and heart failure, in-hospital mortality increased during the pandemic by 17%.

2.3.1.7 Cancer

United Kingdom The lockdown led to delays in cancer diagnosis. During the pandemic a GP triage system was introduced by the NHS to restrict face-to-face appointments to prevent the spread of COVID-19 (Narain, 2024). Oliver Philpott, 34, in Hastings contacted his GP six times during the lockdown before he was given a face-to-face appointment, then died of cancer three days later. His father, wracked by guilt and grief over the death of his son, subsequently took his own life. In an article published in *The Lancet*, Maringe et al. (2020) used a routes-to-diagnosis framework to analyse the impact of delays in diagnosis on cancer survival outcomes in four major tumour types (breast, colorectal, lung and oesophageal) in England. They estimated that across the four major tumours, 3291 to 3621 avoidable deaths and an additional 59,204 to 63,229 years of life lost (YLLs) will be attributable to delays in cancer diagnosis alone as a result of the COVID-19 lockdown.

The lockdown also led to a fall in cancer diagnoses. From March 2020 in South East London there was an 18.2% reduction in new cancer diagnoses, a 3.9% increase in stage III and IV cancer presentation and a 6.8% increase in stage IV cancer presentation (Purushotham et al., 2021). Dr Foster (2020) reported that, during April–May 2020, breast cancer diagnoses fell 30% below expected, colon cancer 39%, prostate cancer 64% and cervical cancer 32%. Whilst

chemotherapy and radiotherapy observed volumes were found to be 32% and 49% below their expected volumes respectively. We don't yet know how badly the pandemic impacted cancer care in the UK (Sikora, 2022). However, Karol Sikora, a leading world authority on cancer stated 'I can honestly say that in almost 50 years working in oncology, this is the biggest crisis I have ever experienced.' Whilst estimates from Cancer Research UK showed that around three million people missed their cancer diagnostics during the UK lockdown, with more since.

The lockdown led to increases in waiting time for treatment. *The Times* reported in August 2023 that Cancer Research UK analysis revealed that 2023 was the worst on record for cancer care (Hayward, 2023). 40% of cancer patients were having to wait longer than the two-month target to start treatment such as chemotherapy, surgery or radiotherapy, endangering chances of survival.

There was a subsequent significant increase in serious cancers. Karol Sikora, who has spent over 40 years in the NHS, says that the explosion in serious cancers may have a more serious long-term effect than the virus itself (Sikora, 2023b). He described the almost two-year-long lockdown experiment as the greatest policy mistake in his lifetime.

Survival rates deteriorated. In Scotland, for all cancers combined, one-year survival rates were 71.1% for patients diagnosed in 2018 and 2019, and 67.5% for those diagnosed in 2020 (McArdle, 2023a).

Europe According to the European Cancer Organisation (2021), the COVID-19 pandemic has meant that an estimated one million cancer cases could be undiagnosed in Europe. An estimated 100 million cancer screening tests were not performed in Europe during the pandemic, leading to later-stage diagnoses and decreased overall survival. Up to 50% of people with potential cancer symptoms were not urgently referred for diagnosis. Whilst 20% of cancer patients in Europe were currently still not receiving the surgical or chemotherapy treatment they needed.

United States Screening for cancer was compromised. At Mass General Brigham hospital, relative to the previous year, during the pandemic 74% fewer patients were screened for cancer whilst 33% fewer patients were diagnosed with cancer (Bakouny et al., 2021). Between 2019 and 2020, the NCI Community Oncology Research Program (NCORP) in New Mexico saw a 25% reduction in the number of cancer diagnoses (NCI, 2021). R. C. Chen, Haynes, Du, Barron, and Katz (2021) found that in the US screening for breast, colorectal and prostate cancers declined sharply in March through May of 2020 compared with 2019, with the sharpest decline in April (breast, -90.8%; colorectal, -79.3%; prostate, -63.4%). Van Haren et al. (2021) found that in the US COVID-19 caused significant disruption in lung cancer screening, leading to a decrease in new patients screened. Disturbingly, the proportion of nodules suspicious for malignancy increased from 8% before the pandemic to 29% once screening resumed. During California's stay-at-home order, cervical cancer screening rates among women in the Kaiser Permanente Southern California (KPSC) network decreased about 80% compared with rates in 2019 (M. J. Miller et al., 2021).

Global Heneghan, Brassey, and Jefferson (2021) reviewed 69 studies from 23 countries and concluded that the COVID-19 pandemic led to wide-scale global disruption of cancer care across a broad range of cancers.

2.3.1.8 Mental Health

Australia Foster and Frijters (2024) noted that in Australia and elsewhere there was mental health damage to those made lonely or idle.

United Kingdom There is evidence that lockdowns compromised mental health in the United Kingdom. It was reported in June 2024 that almost a million people had started claiming Universal Credit (UC) for mental health problems since the end of lockdown (S. P. Chan & Nolsøe, 2024). In England, the number of people prescribed antidepressants increased by 7% in 2020/21 relative to the previous year (Cline, 2022). The increase was 9% for those aged 17 and under. In 2021 a survey by mental health charity Mind found that two-thirds of adults said their mental health had worsened since the first national lockdown. One-quarter of those polled said they had experienced mental distress for the first time during the pandemic. According to an Ipsos MORI poll conducted in the UK in July 2020, half of the public had concerns about the impact of the pandemic on their mental health, with loneliness the top concern (Ipsos MORI, 2020a). According to a survey conducted in Wales, those who complied with lockdown rules during March to September 2020 the most strictly were the most likely to be suffering from stress, anxiety and depression during February to May 2023 (D. Campbell, 2023). In other words, obeying lockdown rules compromised mental health three years later. Creese et al. (2020) found that, among the middle-aged and elderly in the UK, during the lockdown loneliness increased and physical activity decreased, which led to an increase in depressive symptoms and anxiety symptoms. In England, Bu, Steptoe, and Fancourt (2023) found that more stringent policy responses (measured by stringency index) were associated with increased depressive symptoms, in particular, during lockdown periods. Higher COVID-19 deaths were also associated with increased depressive symptoms, but this association weakened over time. Similar results were also found for anxiety symptoms. In July 2023 the ONS revealed that the number of people who are economically inactive due to long-term sickness had grown by 400,000 to 2.5 million since 2019 (Clark, 2023a). More than half of these people, 1,350,000, reported depression and anxiety as either the primary or secondary cause of their absence from the workplace. In 2020 49.6% of Britons reported high levels of anxiety (Knapton, 2022a). The *World Happiness Report* concluded that, using data from the UK, during 2020 life satisfaction declined slightly, whilst anxiety increased more significantly (Helliwell et al., 2021). According to the ONS, the percentage of adults with moderate to severe depressive symptoms in Great Britain approximately doubled during the pandemic (Leach, Finning, Kerai, & Vizard, 2021). Office for Health Improvement and Disparities (2022) reported that in England the proportion of adults aged 18 and over reporting a clinically significant level of psychological distress increased from 20.8% in 2019 to 29.5% in April 2020, then fell back to 21.3% by September 2020. There was a subsequent increase to 27.1% in January 2021, followed by a further decrease to 24.5% in late March 2021. Pawlak and Sahraie (2023) found that, in the UK, people were less able to recall the timeline of very recent events coinciding with COVID-19 lockdowns. Their findings were consistent with poor perception of event timeline reported previously in prison inmates. Primary care electronic health records showed a sharp rise in teenage girls in the UK developing eating disorders and self-harming during the COVID-19 pandemic (Trafford et al., 2023).

Europe In Iceland, elevated depressive symptoms and worsened mental well-being across boys and girls aged 13–18 years were observed and maintained up to two years into the pandemic, despite the easing of social restrictions (Thorisdottir et al., 2023).

North America Daly et al. (2021) found that in Canada individuals who experienced a period of COVID-19 quarantine were at increased risk of adverse mental health impacts, including suicidal ideation and deliberate self-harm, compared to those who did not. However, those who were self-isolating specifically due to recent travel were not found to have higher odds of suicidal ideation or deliberate self-harm.

In a sample of US adults with no reported prior history of a mental condition, more than 1 in 4 experienced psychological distress in the early phases of the COVID-19 pandemic (Holingue et al., 2020). Specifically, 15% experienced some psychological distress (2 symptoms for at least

3 days in the past week) and 13% experienced significant psychological distress (3–5 symptoms for at least 3 days) during the beginning of the COVID-19 pandemic (19–24 March 2020). Also in the US, Makridis (2022) investigated the effects of state-level house of worship restrictions on subjective well-being between March 2020 and May 2021. The adoption of these restrictions led to a 0.117 standard deviation reduction in current life satisfaction and a 4.8% rise in self-isolation among the religious, relative to their counterparts.

Asia In a large population-based study in Israel, Bilu et al. (2023) found that SARS-CoV-2 infection was *not* associated with an elevated risk for mental distress in adolescents. SARS-CoV-2 infection was significantly associated with *reduced* risks for dispensation of antidepressants (hazard ratio (HR) 0.74), diagnoses of anxiety (HR 0.82), depression (HR 0.65) and stress (HR 0.80). In other words, it was lockdowns, not COVID-19, that caused mental distress. Also in Israel, in 2019, before COVID-19, 64 people were hospitalised for eating disorders at Sheba Medical Center (Heller, 2023). By March 2021 that number had jumped to 124 patients—almost doubling. Whilst the incidence of depression increased by 36% during COVID-19 among 12–17-year-olds. There was a 25% increase in dispensation of antidepressants and a 28% increase in antipsychotics. Worse, the Israeli government was well aware of the damage being done to the mental health of its population early on. In April 2020 mental health experts warned of a coming mental health crisis, foreseeing increased anxiety, depression and suicides.

Global Madan (2020) reported that about 30% of children or their parents who are subjected to quarantine at home or are isolated suffer from acute stress disorder, depression and adjustment problems caused by the dramatic change in their daily lifestyle. Whilst in a global study using data from January 2020 to January 2021 published in *The Lancet*, COVID-19 Mental Disorders Collaborators (2021) found that increases in the prevalence of major depressive disorder and anxiety disorders were associated with increasing SARS-CoV-2 infection rates and decreasing human mobility.

2.3.1.9 Physical Exercise

Exercise is good for one's physical and mental health (Penedo & Dahn, 2005).

Running In England, in 2021 and 2022, fewer people participated in running (Statista, 2024).

The free weekly timed 5 km running event, *parkrun*, that has attracted over two million participants globally, was suspended in the United Kingdom from March 2020 to July 2021 due to COVID-19. Was this justified? Parkrun commissioned a review of the evidence for outdoor transmission of COVID-19 by Canterbury Christ Church University's Centre for Sport, Physical Education and Activity Research (spear) (Weed & Foad, 2020). The authors concluded that the outdoor environment presents a low risk of transmission of COVID-19, due to the normal conventions of personal space. Plus, the systematic review referenced earlier concluded that only around 5% of COVID-19 transmission takes place outdoors (Bulfone et al., 2021). Whilst allowing the young and healthy to mingle increases herd immunity and can lead to fewer deaths in the long term (K. Rice, Wynne, Martin, & Ackland, 2020). In the UK, when parkrun resumed in July 2021, attendance was around 20% lower than before the lockdown (parkrun, 2024). In January 2023, the BBC News reported that participation in parkrun was still down 20% on pre-pandemic levels across the UK (BBC News, 2023b). It was reported in October 2023 that junior parkrun participation had still not fully recovered from being forced to shut between March 2020 and April 2021 (J. Wilson, 2023). A high of 16,500 children finished events up and down the country in 2019 compared to an average of 14,000 in October 2023. Despite being outdoors and thus posing a limited risk of COVID-19 transmission, parkrun had to wait well

over a year to return following the first national lockdown and there was briefly even doubt over its entire future. A sensible cost–benefit analysis would inform us that parkrun should never have been suspended. Worse, because parkrun is non-excludable and non-rivalrous, it is a public good, which means that it can be argued that the government should subsidise it if necessary.

Swimming Indoor swimming pools were forced to close during lockdown in 2020. Since reopening, to restrict the number of people who visit the facilities in a given time period and reduce the risk of COVID-19 transmission, many operate under a system in which swimmers have to book timed slots to access the facilities. In July 2024, such systems were still in place. Karol Sikora, a cancer specialist, called for the removal of such systems and suggested they act as a barrier to individuals exercising. According to a Swim England report, some 221 swimming pools in England remained closed after lockdown restrictions were eased.

2.3.1.10 Obesity

United Kingdom According to the Institute for Fiscal Studies (IFS), in 2019 households consumed an average of 270 calories each week from fast food outlets and takeaways, accounting for around 31% of their total 'out-of-home' food intake (Searles, 2024c). This surged during the pandemic and hit a peak of 470 calories per week during the third national lockdown in 2021, and had hardly come down as of April 2024. In the first quarter of 2022 people were still eating 400 calories per week on average from takeaways, more than 50% more than before the pandemic.

United States A. L. Lin, Vittinghoff, Olgin, Pletcher, and Marcus (2021) found that in the US, during shelter-in-place (SIP) orders, their study participants experienced steady weight gain at a rate of 0.27 kg every 10 days, irrespective of geographic location or comorbidities.

2.3.1.11 Sperm

Kriel (2024c) reported a very significant 30%-plus decrease in motile sperm concentration between 2019 and 2022. Scientists' leading theory is that lockdowns, working from home and less exercise caused our sperm to become as lazy as we are (Deacon, 2024a).

2.3.1.12 Fertility Treatment

Foster and Frijters (2024) noted that in Australia and elsewhere there were disrupted fertility treatments that prevented greatly wanted lives from being born. During the first UK lockdown, the Human Fertilisation and Embryology Authority (HFEA), which regulates Britain's fertility industry, ordered private and NHS clinics to stop treating patients who were in the middle of an IVF cycle, and all new treatments were banned (D. Ferguson, 2020). Thousands of couples may have missed their last chance of conceiving. Gürtin et al. (2022) found that in the UK delays and disruptions to fertility treatments were highly concerning, upsetting and anxiety-inducing for patients. Female fertility patients felt powerless/helpless, frustrated and anxious in response to clinic closures, and were especially concerned about time delays to accessing fertility treatment, length and prioritization of waiting lists and losing contact with clinic staff. Only 6.0% of patients actually wanted to wait due to concerns related to COVID-19.

2.3.1.13 Alcohol

Germany Swiss Policy Research (2023b) reported that Germany saw an unprecedented increase in alcohol deaths (average age 40), likely a result of prolonged lockdowns, isolation and bankruptcies (e.g. 10% of German hotels and 20% of German bars went bankrupt).

United Kingdom According to the ONS, in 2020, there were 8,974 deaths (14.0 per 100,000 people) from alcohol-specific causes registered in the UK, an 18.6% increase compared with 2019 (7,565 deaths; 11.8 per 100,000 people) and the highest year-on-year increase since the data time series began in 2001 (A. Butt & John, 2021). Alcohol-specific deaths started trending higher from the lockdown, and by 2021 had risen by 28% since 2019, reaching a new high (Donnelly, 2022a). Jefferson and Heneghan (2023c) calculated that in the UK in 2021, thanks to the lockdowns, at least 27.4% more people than in 2019 had drunk themselves to death. Alcohol-specific deaths in 2021 were the highest on record, and a 27.4% increase since 2019 (Maani, van Schalkwyk, & Petticrew, 2023).

Stearn (2024) reported that, using data from 2001 to 2022, alcohol-related deaths in Britain increased every year from 2019 onwards, reaching an all-time high in 2022. They rose quickest from March 2020 onwards, after the first national lockdown came into force and got progressively worse. It was an increase of 32.8% from pre-pandemic levels (31% for men, 37% for women). Women aged 50–54 saw the largest increase, of 48%. Surveys found that boredom, having more time to drink and anxiety fuelled these worrying trends in alcohol consumption during lockdowns. Swiss Policy Research (2023b) reported in November 2023 that in England alcohol deaths increased substantially for working-aged people. Deaths from alcohol poisoning, which had been dropping before the pandemic, had risen 15.4% by December 2023 (Salvoni, 2023).

United States Swiss Policy Research (2023b) reported that in the United States and several other Western countries alcohol overdose deaths increased, likely as a direct result of lockdowns, isolation and desperation.

2.3.1.14 Drugs

Germany Swiss Policy Research (2023b) reported that Germany saw an unprecedented increase in opioid deaths (average age 40), likely a result of prolonged lockdowns, isolation and bankruptcies.

United Kingdom In the UK during lockdown 86% more people sought help for addictions (Salvoni, 2023; Tominey, 2023b). By December 2023 there had been a 63% increase in deaths of people on methadone compared to before the pandemic (Salvoni, 2023). Swiss Policy Research (2023b) reported that in England drug deaths increased substantially for working-aged people.

United States In the United States in the 12 months ending in May 2020, over 81,000 drug overdose deaths occurred, the highest number of overdose deaths ever recorded in a 12-month period (CDC, 2020). Synthetic opioids (primarily illicitly manufactured fentanyl) appeared to be the primary driver of the increase in overdose deaths, increasing 38.4% from the 12-month period leading up to June 2019 compared with the 12-month period leading up to May 2020. Among those aged 15–24 in 2020–21, compared to 2018–19, 5× as many died in drug overdoses (Coddington, 2023d). These figures are horrendous. The number of drug overdoses among 25–34-year-olds in the US in 2020 and 2021 relative to 2018–19 showed increases of 34.5% and 50.5% respectively (Coddington, 2023a). Whilst the number of drug overdoses among 35–44-year-olds in the US in 2020 and 2021 relative to 2018–19 showed increases of 39.6% and 61.6% respectively. Swiss Policy Research (2023b) also reported that in the United States and several other Western countries drug overdose deaths (especially opioid deaths) increased, likely as a direct result of lockdowns, isolation and desperation.

2.3.1.15 Smoking

Many people smoked more during the pandemic (Geller & Cavale, 2020). Although, ironically, and somewhat counterintuitively, people who smoke are around 50% *less* likely to catch COVID-

19 (Simons, Shahab, Brown, & Perski, 2020; Snowdon, 2022). One hypothesis is that nicotine competes with the virus for the ACE2 receptor. But note that this result showcases an example of a systematic bias in reporting; this inconvenient truth has been buried (Snowdon, 2022).

2.3.2 Economic

If the economy grows faster than the money supply, we have deflation and price levels fall, and employers need to pay their staff less. But in practice, wages are 'sticky', and if employers decrease salaries, this can lead to unemployment. Similarly, during the lockdown many employees became accustomed to working from home, and may be reluctant to return to the office even if this was better for productivity. This would be detrimental to the economy, because in general working from home is less productive than being in an office (The Economist, 2023b).

2.3.2.1 Africa

The devastating effect of lockdowns on the third world was predictable, and thus avoidable. In March 2020 UNDP (2020) estimated that income losses were expected to exceed $220 billion in developing countries, and nearly half of all jobs in Africa could be lost. Due to sub-Saharan Africa's low median age (under 20), only around 3.5% of global COVID-19 deaths were in Africa (Green, 2023). However, the WHO advised that all countries should follow the same lockdown containment model, and most African countries felt they had little option but to follow recommendations, at least in 2020. In 2020 Africa plunged into a recession, and at the same time was encouraged to spend unprecedented amounts of money on Western biomedical measures to contain a virus which was not a major health concern for most Africans. Notably, Tanzania rejected lockdowns, and was unique among African countries in that its economy actually grew in 2020. The economic effects of the COVID-19 lockdown response on Africa were profound, and continued to be felt three years later, in the form of a deep-seated debt crisis, fuelling a socio-economic disaster.

2.3.2.2 Asia

In Japan, if you caught COVID-19, not only you but also your friends, family and coworkers would have to self-isolate regardless of symptoms (Gin, 2023f). This was known as close-contact quarantine (CCQ), and compromised earnings. Whilst stuck at home, 22.6% of workers saw their earnings decrease and 35.6% worked fewer hours. For those 22.6% who lost earnings, the average loss was a substantial 55.4%. 12% of workers still earned less after quarantine ended. And these reductions lasted three months on average, with average monthly reductions in the range of 40%. It got even worse for 8.5% of workers, who either quit or lost their jobs after CCQ, with 18.6% of them not finding other employment.

2.3.2.3 Australasia

Australia's Institute of Public Affairs (IPA), a conservative non-profit free market public policy think tank, reported that Australia's failed zero-COVID policy cost the country over $938 billion (Begg & Wild, 2022). Meanwhile, a *Nature Index* article highlighted the fact that the stringent lockdown imposed on Melbourne, Australia's highest-ranked city for scientific research, compromised the inflow of the best students and researchers from overseas, and thus its science output.

2.3.2.4 Europe

Italy In Italy, in 2019 (before the pandemic) 7.7% of the population were unable to buy goods and services essential to achieve 'a minimally acceptable standard of living' (Reuters,

2021). In 2020, this figure rose to 9.4% of the population. In other words, lockdowns increased the number of people in poverty by 22%.

United Kingdom The UK's lockdown was expensive. Spending on the COVID-19 pandemic in the UK totalled £376 billion from February 2020 to 31 March 2022 according to the National Audit Office (TaxPayers' Alliance, 2024). This figure is over 16 times greater than the cost of bailing out the banks in 2007–2009. The pandemic was the most expensive domestic crisis of the 21st century. In November 2023 Cebr (2023) estimated that lockdowns cost the UK in total £118 billion in lost GDP (and possibly more than that in additional public spending), or 7.6% of annual GDP at 2019 values. The first lockdown cost £86 billion and the second lockdown £32 billion. The UK's furlough was then the most expensive scheme in the history of British government, and cost £69 billion (F. Nelson, 2023b). Putting the economy into deep freeze whilst making furlough payments left the public finances burdened by a massively higher national debt (*The Telegraph*, 2024a).

Lockdowns led to higher debt, higher taxes, higher inflation and a smaller workforce. In the UK in May 2023, *The Telegraph* reported that the national debt is a fifth of GDP higher than it was, inflation has soared to double digits, economically sub-optimal work from home remains deeply entrenched, labour shortages abide, and many people still complain of long-term sickness, much of it unrelated to COVID-19 as such but seemingly triggered by the pandemic's deprivations, with record numbers claiming out of work benefits (Warner, 2023). In the UK Matthew Lynn pointed out that the lockdown led to excess debt, destroyed the country's work ethic with furlough schemes and home working, created a backlog in the health service and in other public services, and resulted in huge tax rises including deeply damaging corporation tax increases that dented competitiveness and crushed growth (Lynn, 2023). In January 2024, data from the Institute for Fiscal Studies (IFS) showed how damaging the lockdowns were for the economy (W. Jones, 2024o; Tapsfield, 2024b). Public expenditure as a share of GDP surged towards 55% during lockdowns, higher than at any time since the war. Public sector net debt had gone from around 35% as a proportion of GDP in 2005 to nearly 100%, driven by the credit crunch and then lockdowns. Whilst taxes as a share of GDP are now heading towards 37.7%, the highest since the Second World War. McVey (2024) reported that the lockdowns had two huge economic consequences. The first was the massive financial cost—£400 billion—which has led to high taxes. The second was that when the country finally came out of lockdown, there was a huge surge in demand that inevitably led to steep increases in the price of goods and energy, fuelling damaging inflation.

Consider inflation. Dixon (2023) reported that the £350 billion of support offered by the Government to counter the impact of lockdown meant borrowing hit war-time levels and relative debt hit the highest levels since the 1960s. The restrictions also contributed to the cost-of-living crisis and drove up inflation. In Britain, the Bank of England printed more money in the first year in the pandemic than it did in the ten years leading up to it (K. Andrews, 2023a). The Chancellor Jeremy Hunt admitted that the massive money printing in the pandemic contributed to high inflation (W. Jones, 2023b).

Various attempts to mitigate COVID-19 turned out to be a colossal waste of taxpayer's money. For example, the UK's NHS Test and Trace cost £13.5 billion in 2020–21, yet, according to a House of Commons report, failed to achieve its main objective of breaking the chains of COVID-19 transmission and enabling people to return towards a more normal way of life (The Committee of Public Accounts, 2021). Ministers wasted nearly £400 million of taxpayers' money on hotel quarantine, as just one in 50 passengers from red list countries tested positive for COVID-19 (Hymas, 2022). The UK government wrote off almost £10bn worth of personal protective equipment that was purchased during the pandemic (Iacobucci, 2024b). The Department of Health and Social Care's accounts for 2022–23, showed that £9.9bn of the £13.6bn worth of PPE that it bought between 2020 and 2022 was unusable or its value had plummeted

since it was purchased.

The lockdowns led to the UK becoming workshy. Generation Z saw the end of their school days and university careers blighted by lockdowns (J. James, 2023). Now in a work environment, company bosses have described the generation as 'entitled' and 'workshy'. L. Johnson (2012) argued that post-lockdown idleness, furlough and working from home have fed into an entitlement culture which could ultimately bankrupt the entire welfare state. The lockdowns created an epidemic of absence from work (Sigsworth, 2023). The average British employee took 7.8 days off sick in the 12 months to September 2023, up from 5.8 before the pandemic struck. The largest growth has been among the young: 16–24-year-olds up 58%, 24–34-year-olds up 43%, 35–49-year-olds up 27% and 50–64-year-olds up 35%. The UK's post-lockdown work-from-home boom led to some graduates, in 2023, demanding to work from home full-time, whilst some won't even come into the office for an interview (Brady, 2023). In the UK, the number of people neither in work nor looking for work was on a downward trend until the first lockdown, at which point the trend reversed and the number has been on an upward trend ever since (S. P. Chan & Lawford, 2024).

In the UK during lockdown 1.2 million more people went on working-age benefits (Salvoni, 2023; Tominey, 2023b). By December 2023 the total Universal Credit caseload had risen by 106% since March 2020 and the number of claimants with No Work Requirements had increased by 186% (Salvoni, 2023). In February 2024 it was reported that the lockdown generation lacked basic workplace skills because school closures deprived pupils of practical lessons, which caused a post-pandemic staffing crisis in the hospitality industry (Tingle & Robinson, 2014).

Lockdowns included rolling out hurried and generous government schemes that invited fraud and error. In September 2020 the UK government said that up to £3.5bn in Coronavirus Job Retention Scheme payments may have been claimed fraudulently or paid out in error (BBC News, 2020b). In April 2024 it was reported that the British taxpayer suffered losses of more than £10 billion due to fraud and error in COVID-19 support schemes, according to the Government's own figures (W. Hazell, 2024).

Philip Thomas, Professor of Risk Management at the University of Bristol, calculated in November 2020 that in the UK the lockdown-induced recession could cost 560,000 lives—greater than the UK's military and civilian losses in World War II (P. Thomas, 2020).

Lockdowns increased relative poverty in the UK. The Institute for Fiscal Studies (IFS) found that in the UK 48% of the 50- to 70-year-olds who left employment in 2020–21 ended up in relative poverty (Beckford, 2023). The number of people experiencing destitution in the UK increased by 148% from 2017 to 2022 (P. Butler, 2024).

2.3.2.5 North America

Canada On his blog, using data from Statistics Canada, Acker (2024) estimated that Canada lost at least $152 billion of economic activity due to the government's response to the pandemic. GDP was below the level it would have been without the lockdowns from Q1 2020 until Q3 2021, but was back to its pre-pandemic trajectory by Q4 2021.

United States Lockdowns in the US were expensive. The US appropriated $6 trillion to respond to the pandemic, which was more than they spent on World War I, World War II, the Korean War, the Vietnam War and the Gulf War combined. The pandemic relief was the largest bailout in history, and the government may have lost a trillion dollars due to fraud (Woods, 2023). A trillion. In a study on the economic cost of the pandemic in the US, Hanushek (2023) found that students on average face 2–9% lower lifetime incomes depending on the state in which they live. By virtue of the lower-skilled future workforce, the states themselves are estimated to face a GDP that is 0.6% to 2.9% lower each year for the remainder of the 21st century compared to the learning expectations derived from pre-pandemic years. California is

estimated to have lost $1.2 trillion because of learning losses during the pandemic. These losses are permanent unless a state's schools can improve on their pre-pandemic levels.

In August 2023 Horowitz (2023) pointed out that inflation and the housing crisis were a direct or indirect effect of COVID-19 policies. Whilst 21% of professionals entitled to paid leave took time off sick in 2019, the figure rose to 30% in 2023, with the largest increase in time off being among 25–34-year-olds (Sigsworth, 2023).

Wilbur Ross, former Trump secretary, said that welfare payments given to furloughed staff during the pandemic were a 'disease' that was now driving male worklessness.

2.3.2.6 Global

The Organisation of Economic Co-operation and Development (OECD) said that lockdowns threaten to wipe at least £700bn off the global economy, warning that this could have a persisting negative impact on the level of productivity over the next 30 to 40 years (S. P. Chan, 2024b). Herby and Jonung (2023) noted that lockdowns taught us many painful lessons: economies cannot be shuttered for many months without consequence and needless money printing will fuel inflation. Daley (2024b) argued that lockdowns and money printing have destroyed Western economies. She stated that the desire to work and earn a living has been crushed out of the population by high welfare and high taxes. The Bank of International Settlements (BIS) said workers' preferences have shifted in favour of fewer working hours since the pandemic (Nolsøe & Wallace, 2023). The unwillingness to work longer hours has been most pronounced in countries that gave citizens the biggest handouts during the pandemic, such as the UK, as well as the US and Canada. A lack of willingness to work hard risks fuelling inflation as companies are forced to pay higher wages to attract employees and keep their businesses fully staffed. There has also been a notable rise in early retirement since the pandemic.

The World Bank estimated that the pandemic (i.e. lockdowns) led to 97 million more people being in poverty in 2020 (Mahler, Yonzan, Lakner, Aguilar, & Wu, 2021). This estimate represents a historically unprecedented increase in global poverty. In the UK and US the lockdowns caused the cost-of-living crisis, according to Tim Martin, the founder and chairman of Wetherspoons (Trim, 2022) and Peter Schiff, the American stock broker (Paxton, 2022).

2.3.3 Social

The interdisciplinary book *Pandemic Response and the Cost of Lockdowns* (Sutoris, Murphy, Borges, & Nehushtan, 2022) exposed the tragic consequences of governments claiming to 'follow the science', but omitting to pay attention to the humanities and social sciences. The book exposes the tragic consequences of this omission during 2020–2021, and demonstrates the potential for a different path in the future—a path in which we pay attention to power, complexity and our biases.

2.3.3.1 Well-Being

Liz Earle, author of over 35 books on beauty, nutrition and well-being, spent months researching the impact of lockdown on Britain's most deprived communities for the Two Nations report for the Centre for Social Justice, and concluded 'I do feel passionately that we should never be locked down again' (Mills, 2023). In the UK, a December 2023 Centre for Social Justice report revealed that during lockdown calls to a domestic abuse helpline rose 700%, mental ill-health in young people went from one in nine to one in six, and nearly a quarter amongst the oldest children, severe school absence jumped by 134%, 1.2 million more people went on working-age benefits, 86% more people sought help for addictions, prisoners were locked up for more than 22 hours per day, and a household became homeless every three minutes (Centre for Social Justice, 2023).

2.3.3.2 Withdrawal

Since the lockdowns, L. Hodgkinson (2024) pointed out that fewer people can be bothered to work in an office, go shopping, attend concerts or events, visit the theatre, the cinema, museums, art galleries, restaurants or pubs, go to church, travel or go on holiday. And, unsurprisingly, obesity has increased. Morris, Speroni, and Taylor (2024) examined data for 34,000 respondents to the American Time Use Survey from 2019 (the pre-pandemic period), 2021 (the pandemic period), and 2022 and 2023 (the post-pandemic period). Compared with just before the COVID-19 pandemic, people are spending about 51 minutes less a day doing activities outside the home (Taylor & Francis, 2024). Fitzgerald (2024) argued that the establishment reaction to COVID-19 in the West alienated men and continues to act as one of the key drivers of current sex-based political polarisation (W. Jones, 2024f). The approaches adopted by governments and institutions during the pandemic years was based on a set of values foreign to many men, and accelerated male withdrawal from aspects of mainstream society.

2.3.3.3 Communication

In the US universities were teaching students that came of age during the pandemic the art of small talk (Pavia, 2023). Lessons on interpersonal communications became compulsory for students at Michigan State University's business school in 2022, a response to concerns that students appeared more awkward in social settings. A handbook offering students guidance on how to conduct themselves at networking events tells them to begin with: 'Hello, my name is [first and last name].'

2.3.3.4 Infantilisation

Frost (2023b) argued that the lockdown left Britain infantilised, people felt that they had no agency over the course of their lives. In the UK, public perceptions on the responsibility of the government changed between 2016 and 2022 (The Naked Emperor, 2023d). For example, the proportion of people who believe that the government should keep prices under control over doubled, from around 30% to almost 70%. This is worrying. With price controls, price cannot react in a timely way, it is not a reliable signal, production is not aligned with consumer preferences and we end up with empty shelves and black markets. Reliance on governments during the pandemic infantilised populations, who now want the government to do everything for them. This leads to socialist policies and a poorer country. Pro-lockdown obsessives miss being told what to do (J. Lewis, 2023). Lacking regular announcements on how to live their lives, many continued following infection prevention measures.

2.3.3.5 Entitlement

In the UK, thanks to COVID-19 restrictions, the young are growing up in a post-lockdown society riddled with entitlement and laziness (Denham, 2024a, 2024b). On 1 February 2020 there were 8.4 million people out of work but not looking for a job. By 1 June 2024 the figure had risen to 9.4 million, a 12% increase. It was reported in August 2024 that since the eve of COVID-19, some 830,000 UK-born people had dropped out of work.

2.3.3.6 Ethics

Regarding the decision to lock down, Paton and Keown (2024) argued that not only was there an evident lack of adequate ethical reflection in the decision-making process, but it appears that the government sidelined expert bodies that existed to provide ethical input. Lockdowns imposed unprecedented restrictions on human rights and freedoms, including the right to education, to work or run a business and to practice one's religion.

Amnesty International claimed that the UK government's response to the COVID-19 pandemic violated the human rights of older people in care homes in England:

> Every single one of the family members and care home staff interviewed by Amnesty International expressed concern that the prolonged isolation of care home residents from their families and friends—and from the outside world—has had devastating consequences. Many feel that the lack of stimulation and social contact has caused significant deterioration in residents' physical and mental health and wellbeing. Relatives and care home managers have told Amnesty International that many residents have suffered loss of movement, reduced cognitive functions, reduced appetite, and loss of motivation to engage in conversation and other activities which they used to enjoy before lockdown. The closure of care homes to outside visitors and the restriction on movements inside care home, as well as the increased demands upon staff in regard to IPC and the provision of care to residents with COVID-19, has also resulted in increased isolation and neglect of residents in some cases.

Beck (2024) reported that more than 50,000 care home residents died across the UK. Often in circumstances where the imposition of visiting restrictions meant that they were not in the company of those who loved them, but surrounded by PPE.

2.3.3.7 Prejudice

The Institute for Strategic Dialogue (ISD), a London-based think tank 'dedicated to safeguarding human rights and reversing the rising tide of polarisation, extremism and disinformation worldwide', claimed that anti-lockdown movements 'bring together anti-vaccine conspiracy theorists, anti-government actors and extreme right-wing movements, have engaged in a range of harmful activities including hate speech, harassment and intimidation, and in some cases threats of violence or actual violence against politicians, police and journalists' (ISD, 2021). In other words, there was an irrational prejudice against those who opposed the lockdowns.

2.3.3.8 Religion

In the UK a Catholic Union survey on 'Covid and Places of Worship', found that 93% of respondents did not think politicians gave enough consideration to people's faith when making decisions (The Christian Institute, 2023). Other findings show that only a quarter of participants thought it was necessary to close places of worship by law at the start of the pandemic, whilst 62% said that their physical or mental health had been affected by church closures. In 2021, the Court of Session ruled that the Scottish Government's ban on public worship during the pandemic was unlawful. *The Telegraph* analysed data from the Church of England's Statistics for Mission 2022 report, and found that across the country, usual Sunday church attendance was at 81% of 2019 levels, meaning that 133,200 regular parishioners had not returned to the Church despite the end of COVID-19 restrictions (Butcher & Swerling, 2024). In the UK, in an article for the Jubilee Centre, Rev. Dr Ian Stackhouse argued that the lockdown's overreach and church closures revealed a troubling readiness among Christians to trade their faith for fear (Stackhouse, 2024).

2.3.3.9 Crime

Italy Italy's highest court of appeal overturned the life sentence handed to a nurse who strangled his doctor girlfriend to death during lockdown because a lower court failed to account for 'Covid stress' he was under during the pandemic (Amalaraj, 2024).

United Kingdom Anne Longfield, the children's commissioner for England during the pandemic, reported that lockdowns were followed by a surge in knife crime and pupil violence (Clarence-Smith, 2023a). In the UK during lockdown calls to a domestic abuse helpline rose by 700% (Tominey, 2023b).

United States In the US lockdowns led to an increase in homicides. The US murder rate rose by 30% between 2019 and 2020, the largest year-on-year rise since at least 1905, and possibly ever (Gramlich, 2021), and was likely caused by lockdowns (Corley, 2021). In the US among those aged 15–24 in 2020–21, compared to 2018–19, four times as many died in homicides (Coddington, 2023d). The number of homicides among 35–44-year-olds in the US in 2020 and 2021 relative to 2018–19 showed increases of 30.6% and 39.2% respectively (Coddington, 2023a). Whilst the number of homicides among 25–34-year-olds in the US in 2020 and 2021 relative to 2018–19 showed increases of 34.1% and 45.0% respectively. These figures are horrendous. In the US homicides, relative to 2018–2019, were up 30% in 2020, 39% in 2021 and 32% in 2022 (Coddington, 2023c). There was a major trend shift starting in 2020 Q2 when COVID-19 mitigation policies were first implemented. There was a significant and disturbing increase in gun crime in the US between 2019 and 2020 (Gun Violence Archive, 2022). Deaths increased by 26%, injuries 31%, children killed or injured 44%, teens killed or injured 33%, mass shootings 47% and unintentional shootings 22%.

2.3.4 Political

2.3.4.1 Democracy

Pandemic restrictions damaged democratic freedoms in 2020, and even more so in 2021 (The Economist, 2022). The Economist Intelligence Unit published their annual Democracy Index (EIU, 2022), which stated that 'The pandemic has resulted in an unprecedented withdrawal of civil liberties among developed democracies and authoritarian regimes alike, through the imposition of lockdowns and restrictions on travelling and, increasingly, the introduction of "green passes" requiring proof of vaccination against COVID-19 for participation in public life. It has led to the normalisation of emergency powers, which have tended to stay on the statute books, and accustomed citizens to a huge extension of state power over large areas of public and personal life.' Interestingly, Latin America (a region that had some severe lockdowns) suffered the greatest setback. The change in the region's score in 2021 was the biggest year-on-year decline experienced by any region since the start of the Democracy Index in 2006. The book *The Covid Consensus* provides an internationalist-left perspective on the world's COVID-19 response, explaining that it had devastating consequences for democratic rights and the poor worldwide (Green & Fazi, 2023). In his positive review, B. Martin (2024) provides an overview of the book.

On Twitter Changizi (2023a) explained that the COVID-19 restrictions were not merely authoritarianism, but totalitarianism, 'which is best described as decentralized and distributed authoritarianism, enforced not just top down, but also by a billion civilians, civilians who went beyond the mandates'. Bell (2023a) pointed out that the COVID-19 response ignored norms of epidemic management and human rights to institute a regime of suppression, censorship and coercion. Public health, presented as a series of health emergencies, was used to facilitate a fascist approach to societal management. In China, Red Emperor Xi Jinping cynically used the pandemic to create the ultimate Big Brother society (Sheridan, 2024). A two-month lockdown on the 25 million citizens of Shanghai left people screaming in despair from their windows. In the streets, desperate youngsters waved blank white sheets of paper to express their inability to speak out.

2.3.4.2 Trust

In the US, in the online magazine Persuasion, McLean (2024) reported that the government's pandemic responses led to a breakdown of trust in government. Institutions, from capitalism to public health, rely upon trust, and trust itself is fragile. Once people lose trust in institutions, they become more open to conspiracy theories. Australia's federal Covid Inquiry found that extreme public health restrictions, coupled with lack of transparency about the evidence informing these decisions, led to a major slide in public trust.

2.3.4.3 Inequalities

United Kingdom In June 2020 it was reported that in Britain 26% felt they would miss lockdown more than not miss it, whilst 61% felt they would not miss it overall (Picheta, 2020). Those who were more likely to have enjoyed the lockdown included those who earned more, those who did not have underlying mental health conditions, adults aged between 30 and 59, those who lived with others and those who had children in their household. In other words, happy middle-class families were happy with the lockdown, whilst the more disadvantaged majority suffered. The lockdown was particularly harmful for the least well-off, increasing inequality (Tominey, 2023b). The most disadvantaged are now no better off than they were during the global financial crisis of 2007–2008. In the UK lockdowns had a 'catastrophic effect' on the country's social fabric, according to an inquiry by the Centre for Social Justice (CSJ), with inequality increasing (Salvoni, 2023). In the UK the lockdown compromised equality (Burton, 2024). Before the pandemic, women made up 19.7% of the top 1% of earners, by 2024 women made up only 19.4% of the top 1% of earners. In England and Wales, fines for breaking COVID-19 rules were three times more likely to be handed to Black people than White people, and seven times more likely to be issued in the poorest areas than the richest (Dodd, 2023). In other words, Black people and poor people were more likely to break irrational rules.

United States Supreme Court of Florida (2024) concluded that: 'Effectively, lockdowns traded the immediate welfare of a smaller, affluent, well-represented group of older Americans who could afford to stay home for the longer-term welfare of a larger, less-affluent, poorly-represented group of children, teens, twenty-, thirty- and forty-somethings who could not. If anything, the result of this was a modest benefit to the former group at the expense of the latter.' Kriel (2024a) reported that those who benefitted from the COVID-19 policy response included the *über*-wealthy and the social engineers who wished to see a 'Great Reset' involving reduced consumption.

Global Gyngell (2022) pointed out that lockdowns reorganised society to protect the wealthy whilst sacrificing the poor and the vulnerable. She claims that they proved to be the biggest driver of inequality in our lifetime. In a narrative and scoping review Schippers, Ioannidis, and Joffe (2022) explained that lockdowns exacerbated existing inequalities, and described macro-dynamics that were taking place as a result of lockdowns and psychological tactics to influence public behaviour, such as mass formation and crowd behaviour.

2.3.4.4 Immigration

Rendell (2023h) suggested that an overreaction to COVID-19 in Africa led to young, middle-class, well-educated, motivated Africans wishing to leave their home countries in ever greater numbers. In other words, lockdowns exacerbated the problems of mass immigration.

2.3.4.5 Political Parties Voted Out

Janet Daley noted in May 2024 that the political parties in power during the pandemic were being rejected across Europe (Daley, 2024a). In June 2024 she reported that virtually all of the Western governments who presided over the pandemic years were being voted out (Daley, 2024c). For good reason. In the UK, Government policies devised to deal with the pandemic (and the energy crisis created by the war in Ukraine) tanked the economy. Lockdowns and paying people not to work destroyed the possibility of creating new wealth and saw governments print mountains of money that debased the currency. Lockdowns sank both Sunak and the Conservatives in the UK and Trudeau and the Liberals in Canada (Coren, 2024).

2.3.4.6 UK Election Conspiracy of Silence

Monteith (2024) pointed out in June 2024 in *The Scotsman* that during the UK general election campaign there was a conspiracy of silence among parties regarding their opponent's record during the COVID-19 pandemic. The government's reaction to the pandemic resulted in citizens being under constant supervision, caused early deaths, wrecked businesses, denied education, delayed healthcare, cost jobs, compromised savings and ruined lives, whilst quantitative easing contributed to inflation and subsequent higher taxes. Yet Keir Starmer, Leader of the Opposition, kept quiet because the policies that he called for at the time (like a 'circuit-breaker' lockdown) were even harsher, and thus even worse. Likewise, Halligan (2024) noted that during the election campaign there seemed to be a conspiracy of silence between the main parties to keep quiet about lockdown. Presumably because it was the single biggest public health mistake in history, and all of them agreed with it and helped to reinforce it. Similarly, Kriel (2024b) noted that during the election debate over NHS waiting lists, neither the Left or the Tories mentioned the elephant in the room—the lockdowns—because both sides were to blame. W. Jones (2024l) argued that the failure to talk about lockdowns was a failure of democratic accountability. It could be due to embarrassment, the misguided assumption that a lockdown was inevitable or the fact that pandemics are rare.

2.3.5 Legal and Policing

2.3.5.1 South Africa

South Africa had some of the world's toughest restrictions. More than 400,000 South Africans were arrested during the country's lockdown for trying to make a living and not adhering to the curfew (Moeti, 2023). More than 340,000 were convicted for not wearing masks, consuming alcohol and breaking curfew, among other violations (Maseko, 2023). Thankfully, South Africa's parliament has since passed a bill that will expunge criminal records for those convicted of breaching COVID-19 lockdown laws.

2.3.5.2 United Kingdom

The lockdowns in the UK led to many fines for seemingly innocuous behaviour, which were unfitting for a modern liberal democracy. More than 28,000 people in England and Wales have been convicted of breaches of COVID-19 regulations (McClenaghan, 2023). People were severely penalised for relatively minor infractions. In Leeds, two men who organised a mass snowball fight during the lockdown were each fined £10,000 (BBC News, 2021d). In Welwyn Garden City, Toriano Reid was fined £14,300 for a mistake made by someone else he was living with. He had been working at the local supermarket and was not at the illegal gathering held in his garden, but because the house was in his name he was the recipient of the fine. Almost four years on he lost his family home, his partner and at times even his will to live. He set up a crowdfunding page to help him pay the fine, and after appearing on the news, he raised enough money to pay the fine

(ITV, 2023). An investigation into a stalker, Michael Sellers, who is believed to have gone on to murder a 23-year-old woman, Gracie Spinks, was dropped after officers from Derbyshire Police were redeployed to monitor lockdown breaches (Bolton, 2023). Derbyshire Police came under fire during the pandemic for a number of overzealous incidents relating to lockdown breaches. On one occasion they filmed walkers with drones to deter visitors from the Peak District. The force also took further drastic measures to prevent gatherings by dyeing a 'blue lagoon' black in Harpur Hill, Buxton. They also fined two women £200 each when they drove five miles to go for a walk. In the UK, in total, 124,771 fines had been issued up to October 2023 for violation of pandemic rules (Brand, 2023). But almost half, 54,122, were not paid, totalling £16.7 million in fines. Between March 2020 and June 2021, police handed out over 117,000 fixed penalty notices to people who broke lockdown laws by pressing ahead with everyday activities, such as going for a walk in the countryside, meeting a friend or visiting relatives (Oakeshott, 2024a). Isabel Oakeshott argued that lockdown rule-breakers don't deserve to be treated like criminals, and that there must be an amnesty for the convicted. In June 2024, Sir Robert Buckland, the former Justice Secretary who oversaw the courts during the pandemic, called for amnesty for more than 29,000 people given criminal convictions for breaking COVID-19 rules (Hymas & Butcher, 2024). In June 2024 David Davis, former Cabinet minister, described COVID-19 fines as 'bonkers' (Hymas, 2024). He backed calls for the amnesty.

Echoing my own sentiments, Laura Dodsworth pointed out in *spiked* that people are naturally obsessed with rule-breaking, but should instead be questioning whether the rules were proportionate or effective in the first place (Dodsworth, 2023b). For the best part of two years, perfectly normal human behaviour was effectively criminalised. Meanwhile, Dixon (2023) reported that the justice system ground to a halt and crown court backlogs are double their pre-pandemic norm.

2.3.6 Transport

In the US, Morris et al. (2024) found that since the pandemic, there was an almost 12-minute reduction in time spent on daily travel such as driving or taking public transportation, due to a decline in out-of-home activities (Taylor & Francis, 2024). In the UK, Pasternack (2024) reported in August 2024 that lockdowns created a backlog of approximately one million driving tests. In Weybridge, UK, during the pandemic a traffic-blocking bollard was installed to allow for social distancing (C. Roy, 2024). As of September 2024, it is still there, and killing a once-thriving town.

2.3.7 Children

2.3.7.1 Introduction

Although COVID-19 mainly affects the elderly, lockdowns had a significant detrimental effect on children, even before they were born. In the US, Shuffrey et al. (2022) examined the associations between maternal SARS-CoV-2 infection during pregnancy, being born during the COVID-19 pandemic regardless of maternal SARS-CoV-2 status, and neurodevelopment at age six months. In utero exposure to maternal SARS-CoV-2 infection was not associated with significant differences in neurodevelopment, regardless of infection timing or severity. However, compared with the historical cohort, infants born during the pandemic had significantly lower scores for gross motor, fine motor and personal-social development. In other words, COVID-19 was not a problem for children, but lockdowns were. W. Jones (2024k) noted that in left-wing outlets it's always the 'pandemic' or 'Covid' that's to blame, never lockdowns—even though the virus didn't close any schools or confine the population to their homes. The Government did that. It wasn't 'the virus' that 'disrupted' children's lives. It was the extreme (and ineffective) response.

A *Mail* investigation in the UK revealed the devastating effect the lockdown had on children, including classrooms of 5-year-olds still wearing nappies, children talking like the cartoon

characters they binge-watch, children being unable to feed or dress themselves and children in reception classes sucking on dummies and so weak they're still using pushchairs (Sergeant, 2022). Also in the UK, among children, lockdowns fuelled an increase in eating disorders, social anxiety, self-harm and dropping out of school; and a decrease in writing, grammar and spelling, maths and science ability (J. Williams, 2023).

Global A group led by University College London (UCL), focusing on England, Brazil and South Africa, found that children were forgotten by policymakers during COVID-19 lockdowns because they rarely got seriously ill from the virus itself (Pinkstone, 2023a). Foster and Frijters (2024) noted that the damage was severe for children of disadvantaged backgrounds across the world who witnessed severe disruptions to their education and development.

2.3.7.2 Health

Italy In a hospital in northern Italy, presumably due to the fear of contracting COVID-19, the number of admissions to the paediatric A&E during March 2020 was 76% lower than the corresponding time frame the previous year (Ciacchini et al., 2020).

United Kingdom Sir Chris Whitty announced that childhood obesity was significantly worse as a result of lockdowns (Donnelly, 2022b). For 4- and 5-year-olds, before the pandemic 23% were overweight or obese, since the pandemic 27.7% were overweight or obese. For 10- and 11-year-olds, before the pandemic 35.2% were overweight or obese, since the pandemic 40.9% were overweight or obese. Repeated lockdowns and the lack of school routines led to a rise in snacking and an increased consumption of junk foods, whilst many lives became more sedentary. In England from 2020 to 2021 unprecedented increases were seen in the prevalence of obesity of 4.7 percentage points in Reception boys, 4.4 percentage points in Reception girls, 5.6 percentage points in Year 6 boys and 3.3 percentage points in Year 6 girls (OHID, 2022).

In September 2024 it was reported that children's eyesight was much worse than before lockdown (M. Cates, 2024c). This was likely due to extended periods of time spent indoors, or worse, staring at a tiny screen.

United States Zweig (2023a) pointed out that during the lockdown children missed not just learning, but medical care too. In the US, Tabet, Kirby, and Xaverius (2023) found that 27.6% of children aged 0 to 17 years had delayed or missed preventive care due to the COVID-19 pandemic. In Washington State, N. M. Corrigan, Rokem, and Kuhl (2024) collected MRI structural data longitudinally from adolescents prior to and after the pandemic lockdowns. Their analysis revealed accelerated cortical thinning in the post-COVID brain, which was more widespread throughout the brain and greater in magnitude in females than in males. When measured in terms of equivalent years of development, the mean acceleration was found to be 4.2 years in females and 1.4 years in males. In other words, the lockdown measures enacted during the COVID-19 pandemic resulted in unusually accelerated brain maturation (ageing) in teenagers.

2.3.7.3 Mental Health

United Kingdom In the UK during lockdown mental ill health issues in young people went from one in nine to one in six and nearly a quarter amongst the oldest children (Salvoni, 2023; Tominey, 2023b). In the UK in 2019–20 there were 98,953 new referrals of patients aged 17 or under where the primary cause was anxiety (Gregory, 2024). In 2023–24 the total was 204,526 (a 107% increase). In other words, NHS referrals for anxiety in children more than doubled after lockdowns. According to early results from the Co-SPACE study, parents/carers of children aged 4–10 years of age reported that over a one-month period during the first lockdown, they saw

increases in their child's emotional difficulties, such as feeling unhappy, worried, being clingy and experiencing physical symptoms associated with worry (University of Oxford, 2020). Surveys found that 11% of children reported a life-limiting disability such as ADHD lasting more than a year in 2021–22, compared to 8% in 2019–20 (Smyth & Ellson, 2024). Deacon (2024b) reported a published letter from a mother in Wales, describing her family's experience of lockdown:

> Both she and her husband had to work full-time from home – while their only child, a boy of six, grew desperately lonely. For months, he had no children to play with, and his parents were busy on Zoom calls, which he'd been told not to interrupt. And one day, this poor mother wrote, it just got too much for him. The little boy burst into tears – and sobbed: "Nobody wants me around."

In Scotland the draconian COVID-19 rules caused children to attempt to take their own lives and parents to consider 'suicide pacts' (Sanderson, 2023).

United States Comparing data for Texas (which had low school closures) and Massachusetts (which had high school closures), Dvir, Ryan, and Lee (2023) found that longer COVID-19 school closures were associated with more emergency department visits for suspected suicide attempts among persons aged 12 to 25 years.

2.3.7.4 Intelligence

Intelligence is the ability to perform novel cognitive tasks. We can measure intelligence by conducting various cognitive tests, applying factor analysis and identifying the primary dominant factor. IQ is an estimate of intelligence. An individual's IQ score is generally stable over time. Deary, Whalley, Lemmon, Crawford, and Starr (2000) found that the corrected correlation between test scores at age 11 and age 77 was 0.73. Before considering the effect of lockdowns on intelligence, note that catching COVID-19 itself does *not* compromise cognition or lower your IQ (Carl, 2024a; Weerman et al., 2024).

Germany Breit, Scherrer, Blickle, and Preckel (2023) investigated the impact of the pandemic on intelligence test performance in a sample of German secondary school students. Intelligence test results in the pandemic 2020 sample were 7.62 IQ points lower than the 2002 sample and 6.54 IQ points lower than the 2012 sample.

United States In the US, Deoni, Beauchemin, Volpe, D'Sa1, and the RESONANCE Consortium (2021) compared general childhood cognitive scores in 2020 and 2021 with those in the preceding decade, 2011–2019. They found that children born during the pandemic have significantly reduced verbal, motor and overall cognitive performance compared to children born pre-pandemic. Males and children in lower socioeconomic families were the most affected. During the pandemic, pregnant women experienced significantly more anxiety and depression (Moyer, 2022). There is evidence that pandemic-related prenatal stress during pregnancy can negatively affect foetal brain development. Weaker connections between the amygdala (a brain region involved in emotional processing) and the prefrontal cortex (an area responsible for executive functioning skills) were found. Infants born during the pandemic scored lower, on average, on tests of gross motor, fine motor and communication skills compared with those born before it. Pandemic-born babies scored almost two standard deviations lower than those born before it on a suite of tests that measure development in a similar way to IQ tests. Babies from low-income families experienced the largest drops.

2.3.7.5 Development

Japan A cohort study of children in Japan found that children exposed to the pandemic were 4.39 months behind in development at age five years compared with those not exposed to the pandemic (Sato, Fukai, Fujisawa, & Nakamuro, 2023).

United Kingdom In the UK in September 2024, it was reported that NHS staff were being drafted into schools to coach lockdown children on potty training (Searles, 2024b). There had been a year-on-year increase in children starting school in nappies. In October 2024, P. Wood (2024) reported that children who grew up during lockdown were arriving at primary school still in buggies, not toilet trained, using books incorrectly (many swiping or tapping them as though they were using a smartphone) and unable to properly communicate or socialise with other children.

2.3.7.6 Communication

United Kingdom In the UK, Ofsted reported that lockdowns had affected children's communication and language development (Ofsted, 2022). There had been a negative impact on children's personal, social and emotional development, with many children lacking confidence in group activities. Whilst some early years providers noticed delays in babies' physical development. The Ofsted report found that COVID-19 restrictions had left babies and toddlers struggling to crawl and communicate, low in confidence and with speech and language difficulties (Rudgard, 2022). Using parent-report data on 8-to-36-month-olds in the UK, C. Davies et al. (2021) found that lockdowns compromised both receptive vocabulary growth (especially for children from less advantaged backgrounds) and growth of cognitive executive functions (for children from all socioeconomic backgrounds). The Office for Health Improvement and Disparities found that, in England, the percentage of children at or above the expected level of development at age 2–2½ was lower in 2020/2021 than it was in 2019/2020 in all domains of development: communication skills, gross motor skills, fine motor skills, problem-solving skills and personal-social skills (OHID, 2021). In November 2023 it was reported that children were starting school unable to speak. Data from health visitor checks in England for 2022–2023 showed nearly 15% of children aged 24 to 30 months were below the expected level in communication skills, a rise from 11% in 2018. In September 2024 it was reported that Elizabeth Selby Infants' School in London had to employ a speech and language therapist for its pre-school class for the first time (V. Clarke, 2024). 34% of pre-schoolers at the school had speech and language needs during the last school year, up from 25% in 2020. Some five-year-olds' language skills were so severely impacted by lockdowns that teachers were forced to improvise with sign language to communicate (Ludlow, 2024; Oates, 2024).

United States In the US, children born during or slightly before the pandemic were more likely to have problems communicating compared with those born earlier (Toy, 2023). Children born nine months into the COVID-19 pandemic produced significantly fewer vocalisations (37th percentile compared to 56th percentile) and experienced fewer conversational turns (40th percentile compared to 53rd percentile) in the first months of life than those born before the pandemic (LENA, 2022). This means there is a greater risk of experiencing language delays. The differences were greatest among children from families in the lowest socioeconomic status (SES) quartile.

2.3.7.7 Learning and Education

Education has a causal impact on mortality (in 1960, one more year of education increased life expectancy at age 35 by as much as 1.7 years) (Lleras-Muney, 2005). Lockdowns, social distancing and homeschooling harmed children's education, with children falling behind by several

months (de Quetteville, 2022). The International Monetary Fund (IMF) suggested that disruption to children's education will hold back economic growth for years (T. Wallace, 2023). The number of pupils missing half their classes or more has doubled since 2019. Pupils who received worse quality education will suffer for the rest of their lives as they lose out in a competitive job market to those who were given a full and proper education. Analysts at the Institute for Fiscal Studies estimated that the 8.7m pupils in the UK who lost out on schooling will end up missing out on a cumulative £350bn in lifetime earnings.

Germany Ludewig et al. (2022) examined the difference between fourth graders' (aged 9–10 years) reading achievement in 111 elementary schools in Germany in 2016 and 2021. In 2016 the mean reading achievement was 1,000 points, whilst in 2021 the mean reading achievement was 980 points. The decline corresponds to one-third of a year of learning.

Sweden Sweden kept primary schools open. Hallin, Danielsson, Nordström, and Fälth (2022) analysed reading assessment data from 97,073 Swedish primary school students (grades 1–3). Results showed that word decoding and reading comprehension scores were not lower during the pandemic compared to before the pandemic, that students from low socio-economic backgrounds were not especially affected and that the proportion of students with weak decoding skills did not increase during the pandemic.

The Netherlands Engzell, Frey, and Verhagen (2021) revealed that in the Netherlands primary school children, on average, learnt essentially nothing whilst learning from home during the lockdown. The learning loss was more pronounced for students from less-educated homes.

Uganda In Uganda, schools closed for almost two years. Uganda's National Planning Authority in August 2021 projected that 4.5 million children will likely not return to school (Athumani, 2022). There were various reasons for this: teen pregnancies increased, many poor children were forced to start working to help their families, and in an economy pinched by the pandemic many families could not afford the fees.

United Kingdom In the UK, the Education Endowment Foundation (2022) found that COVID-19-related disruption negatively impacted the attainment of all pupils, particularly those from disadvantaged backgrounds. There was some evidence that in primary schools, younger year groups (5–7-year-old children) had been the most significantly affected, with lower attainment than previous cohorts across all subjects. Most evidence showed that despite some recovery by summer 2021, on average pupils were not performing as well in both maths and reading as pre-pandemic cohorts. There was also emerging evidence that suggested the pandemic had negatively impacted children's mental health. Only 59% of pupils in England met the expected standard in reading, writing and maths in 2022, compared with 65% the last time the exams were conducted in 2019 (Clarence-Smith & Clark, 2022). In the UK, the number of 7-year-olds with very poor reading skills doubled from 2.5% in March 2020 (when they were in Reception and Year 1) to 4.9% in the spring term of 2023 (Clarence-Smith, 2023c). In July 2023 it was reported that in England the proportion of pupils reaching the expected standard in all of the three Rs was 59%, down from 65% before lockdown (Woolcock & Willoughby, 2023). 2023's A-level results in England showed the biggest year-on-year drop on record (Sturdy, 2023). Clearly, education has still not recovered from the lockdown. Grades no longer reflect a student's ability, but rather which year they took their exams in. The lockdowns and school closures have compromised academic standards. Key Stage 2 test results, which assess attainment in literacy and maths for Year 6 pupils in England (children 10–11 years old), showed only 61% of pupils achieved the expected level in the three core disciplines in 2024 (Bodkin, 2024b). This was one

percentage point up compared to 2023, but still significantly off the 65% achieved in 2019, before the COVID-19 pandemic and lockdowns. The hit on learning and education also increased inequality. In the UK, 42% of GCSE students in the most deprived areas said they fell behind due to COVID-19 'disruption', compared with 26% in more affluent areas (Beal, 2023).

United States A reduction in educational attainment is associated with a reduction in life expectancy. During the pandemic, many schools were closed. Christakis, Cleve, and Zimmerman (2020) estimated that school closures in the US likely led to an increase in the total number of years of life lost (YLL), compared to leaving schools open. In 2022 in the US, the National Center for Education Statistics (NCES) conducted a special administration of the National Assessment of Educational Progress (NAEP) long-term trend reading and mathematics assessments for age 9 students to examine student achievement during the COVID-19 pandemic (National Assessment of Educational Progress, 2022). Average scores for age 9 students in 2022 declined 5 points in reading and 7 points in mathematics compared to 2020. This was the largest average score decline in reading since 1990, and the first ever score decline in mathematics. In the US, Harvard Graduate School of Education (2023) reported that the average US public school student in grades 3–8 lost the equivalent of a half year of learning in maths and a quarter of a year in reading. Test scores declined more in places where daily routines of families were most significantly restricted. The declines in test scores were similar for all groups of students, rich and poor, White, Black and Hispanic. The researchers also looked at data from the decade prior to the pandemic to determine to what extent students recovered after significant learning loss due to disruption in their schooling. Affected students recovered 20–30% of the lost ground in the first year, but then made no further recovery in the subsequent three to four years. In other words, school closures caused unnecessary and permanent damage to the learning, and thus future outcomes, of millions of children.

Global In March 2021 UNICEF reported that schools for more than 168 million children globally had been completely closed for almost an entire year due to COVID-19 lockdowns (UNICEF, 2021). Furthermore, around 214 million children globally, 1 in 7, had missed more than three-quarters of their in-person learning. A joint report by UNESCO, UNICEF, and The World Bank (2021) considered the state of education globally. The global disruption to education caused by the pandemic constituted the worst education crisis on record. School closures affected more than 1.6 billion learners. Whilst more than 370 million children globally missed out on school meals during school closures. Learning losses were large and inequitable, with younger and more marginalised children often missing out the most. There were substantial losses in maths and reading, in all countries alike, that disproportionately affected the most marginalised students. In low- and middle-income countries, the share of children living in learning poverty, which was already over 50% before the pandemic, rose sharply, potentially up to 70%. This generation of students risks losing $17 trillion in lifetime earnings in present value as a result of school closures, or the equivalent of 14% of today's global GDP (far more than the $10 trillion estimated in 2020). School closures placed an estimated 10 million more girls at risk of early marriage in the next decade and at increased risk of dropping out of school. Students in São Paulo, Brazil learnt only 28% of what they would have in face-to-face classes and the risk of dropout increased more than threefold. Whilst in rural Karnataka, India, the share of grade three students in government schools able to perform simple subtraction fell from 24% in 2018 to only 16% in 2020. Betthäuser, Bach-Mortensen, and Engzell (2023) conducted a pre-registered systematic review, quality appraisal and meta-analysis of 42 studies across 15 countries to assess the magnitude of learning deficits during the pandemic. Students lost out on about 35% of a normal school year's worth of learning. The learning deficits had persisted for at least two and a half years. Due to data availability, their sample of studies was skewed towards richer countries. Had the sample included more studies from poorer countries, the overall learning loss

would have been even greater (Carl, 2024b). The Organisation for Economic Cooperation and Development (OECD) found that there was a particularly concerning drop in attainment for 15-year-olds in reading and mathematics between 2018 and 2022, in countries where schools were closed during long periods of the pandemic. The OECD warned that the impact on educational standards, and therefore future growth potential, is likely to be with us for decades to come, and reduce the size of G20 advanced economies by at least 1%. An international review by Major, Eyles, Lillywhite, and Machin (2024) suggested that children suffered a significant COVID-19 learning loss of up to six months, with children from low-income backgrounds experiencing an extra two months of learning loss. Norbert Schady, chief economist for human development at the World Bank, said young children learned 'nothing' on average during lockdown, and that lockdown disruption to education will be damaging for multiple generations (S. P. Chan, 2024b). Cognitive deficit in today's toddlers means they could ultimately earn 25% less at peak than previous generations. Herby and Jonung (2023) noted that lockdowns taught us that school closures have a catastrophic effect on pupils' education.

2.3.7.8 Exams

In the UK, it was reported in August 2024 that more students had been applying for special exam access arrangements since the pandemic as they were anxious about being assessed in a crowded exam hall (Busby, 2024).

2.3.7.9 School Closure

Australia In Australia, education experts said that mass school closures that stretched for months during the pandemic were unnecessary and led to a cascade of social and educational problems that threaten a generation of children (J. Baker & Carroll, 2024).

United Kingdom In the UK, The Children's Rights Organisations alliance (which includes Save the Children, Just for Kids Law and the Children's Rights Alliance for England) gave written evidence to the Covid-19 Inquiry (Corless & Martin, 2023). Social distancing and the closure of schools and playgrounds during the pandemic had 'long-lasting and era-defining impacts'. Children suffered during the pandemic because the UK Government failed to adequately consider their rights and interests. In short, the lockdown harm to children was preventable. The closure of schools during the pandemic meant some families lost sight of the value of education (Sallust, 2024). Both parents' and children's mental health have become strained, and school attendance has become problematic. The Nuffield Foundation in the UK presented a model of children's evolving socio-emotional and cognitive skills to assess how the educational and lifetime prospects of children of different ages, genders and socio-economic backgrounds were affected by mass school closures in England during the COVID-19 pandemic (Major et al., 2024). They estimated that the educational damage wrought by COVID-19 will have an economic cost to the national economy due to lower lifetime earnings because of falling GCSE achievement of £31.4 billion in today's prices. Successive COVID-19 cohorts are on course for the biggest overall decline in basic GCSE achievement for at least two decades, with an unprecedented widening of the socioeconomic gap in GCSE prospects. This will impact on children taking GCSEs well into the 2030s. Boys at age five at the time of COVID-19 school closures are up to 4.4% less likely to achieve five good GCSEs and females 4.8% less likely to do so. Professor Elliot Major, one of the report's authors, said that 'Without a raft of equalising policies, the damaging legacy from COVID-19 school closures will be felt by generations of pupils' (Simmons, 2024). The Department for Education has made almost £5bn available since 2020 for education recovery initiatives (Adams, 2024). Professor Sir David Spiegelhalter told the BBC that COVID-19 infections were falling before the first lockdown, and he really regretted not having evidence sooner that closing schools was pointless (de la Bédoyère, 2023).

United States In the US, Shope et al. (2023) conducted a prospective surveillance cohort study from April 2021 to March 2022 with the objective of characterising SARS-CoV-2 incidence and transmission in children attending childcare centres (CCCs), their childcare providers and household contacts. The CCC secondary attack rate was 2.7–3.0%, whilst the household secondary attack rates were 50% for children and 67% for adults. In other words, children are far less likely to spread COVID-19 in childcare centres than at home (Tsai, 2023). Even in August 2024, despite the evidence of harm, a couple of schools in the US closed briefly due to COVID-19.

Global The evidence suggests that the benefits of a national closure of schools to combat COVID-19 are very weak, whilst the economic and social costs can be profound (Viner, Russell, et al., 2020).

2.3.7.10 Absence From School

Lockdown has given us a truancy epidemic.

United Kingdom In the UK, during the autumn term of 2017/18, 4.4% of lessons were missed across state-maintained schools; during the autumn term of 2021/22, 6.9% of lessons were missed (Eyles, Lillywhite, & Major, 2023). In 2017/18, 11.7% of pupils missed ten or more sessions (defined as half a day of school); in 2021/22, 23.5% of pupils missed 10 or more sessions. Overall, the number of pupils classed as persistently absent rose from 921,927 to 1,672,178 between 2019/20 and 2021/22. The rate of persistent absence doubled for non-FSM (free school meals) pupils across the country, going from 10.5% to 20.0%. The rate for FSM pupils increased from 23.8% to 33.6%. Overall absence increased from 4.3% to 6.0% for non-FSM pupils (a 40% rise) and 7.6% to 9.7% for FSM eligible pupils (a 28% rise). In the UK in September 2022, it was reported that around 93,000 pupils, known as 'ghost children', had simply vanished and fallen off school registers since the COVID-19 pandemic began (Akass & Kaur, 2022). In addition, in 2021 more than 100,000 children missed at least 50% of the autumn term. In November 2023 it was reported that school absence numbers were still at record highs and more than double the level they were pre-pandemic (Simmons, 2023c).

Many children are persistently absent from school. In the UK during lockdown more children were serially missing school, with severe absence jumping 134% (Salvoni, 2023). Statistics from the Children's Commissioner (2023) showed the proportion of Year 11 pupils who were persistently absent: 2017/18 16%, 2018/19 16%, 2020/21 19% and 2021/22 32%. And the proportion of Year 11 pupils who were severely absent: 2017/18 1.6%, 2018/19 1.8%, 2020/21 2.0% and 2021/22 3.7%. In England, persistent absence from school, in the autumn term, rose from 13.1% in 2019–20 to 25% in 2022–23 (Smyth, 2023). Up to 9,000 more young offenders, including 2,000 violent criminals, could be on Britain's streets by 2027 because of the rise in school absence, according to calculations based on official studies. The surge in offending would cost taxpayers £100 million. In the UK, as of June 2023, the number of schoolchildren regularly missing class had *more than doubled* since the pandemic, after the pandemic 'normalised' truancy (Phillips, 2023). In August 2023 *The Times* reported that in England the total number of persistently absent pupils rose again to 1.89 million, about 20% of pupils and two and a half times the number that regularly missed school before the pandemic (Kendix & Woolcock, 2023). The number of pupils who qualify for free school meals who were missing school had tripled from pre-pandemic levels, to 765,000. For those poorer pupils in secondary schools, persistent absence rates had reached 47%, up from 28% before the pandemic.

In the UK, thousands of children never returned to school (Sergeant, 2023). In June 2023 Dixon (2023) reported that there were around 124,000 'ghost children' who had not returned to school as a result of the pandemic.

In April 2024 in the UK, Swerling and Butcher (2024) reported that the number of pupils suspended from school had reached a record high as experts warned that bad behaviour had increased since lockdown school closures. Children who stayed home during the pandemic were 'taking it out on teachers' after being forced to return to classrooms. The Department for Education data revealed that permanent exclusions rose from 2,179 for spring 2021–22 to 3,039 (a record high) for spring 2022–23—an increase of 39% (Sturdy, 2024). During the same period, suspensions increased by 31%, from around 200,000 to over 260,000. Closing schools during the pandemic in 2020 and 2021 affected the behaviour of many children. It seems that some pupils now resent being in the classroom so much that they're taking it out on their teachers and fellow pupils.

Parents' attitudes have changed. In the UK in January 2024 polling found that more than a quarter of parents believed the pandemic showed it was not essential for children to attend school daily (*The Telegraph*, 2024b). Amanda Spielman, Chief Inspector of Office for Standards in Education, Children's Services and Skills (Ofsted) said that since the lockdown parents seemed to believe that they could 'pick-and-choose' when children attend school and which rules they obey (Clarence-Smith & Corfe, 2023). According to the consultancy Public First, lockdowns caused a 'seismic shift' in parents' attitudes to school attendance (M. Robinson, 2023). It became 'socially acceptable' to keep pupils at home and go on holiday during term-time. Pandemic closures and teacher strikes damaged the social contract between schools and families, with 24,700 children missing education on one sample day in spring 2023. Dorrell (2023) reported that the social contract between parents and schools was broken by lockdowns. Many parents no longer feel it is their responsibility to get their children to school full-time. Persistent school absence has doubled since the end of the pandemic. M. Cates (2024b) also reported that lockdowns broke the social contract between schools, parents and teachers.

In January 2024 the UK government came out with a plan to get children back into school, with the marketing slogan 'Moments matter, attendance counts' (Bristow, 2024). The problem is the hypocrisy, the government clearly had other priorities (like appeasing teaching unions) during the pandemic.

United States In the US, before the pandemic 15% of students were classified as chronically absent (Joseph, 2023). In the 2021–22 school year it was more than 25%.

2.3.7.11 Behaviour

Lockdowns have led to behavioural issues among youngsters. S. P. Chan (2024a) reported that the lockdown sparked an epidemic of hostile and angry boys. In the UK, according to the Department for Work and Pensions (DWP), in November 2019 there were 534,000 under-18 disability living allowance (DLA) claimants. By August 2024 the figure had risen to 730,000, an increase of 37%. Boys aged between five and ten years old were the most common subjects of claims. Whilst C. Stevens (2023) reported that the lockdowns created troubled teens, many now have serious problems with behaviour or mental health. Meanwhile, teachers have to cope with distressed children, which can reduce education to a sideline. In the UK, children affected by lockdowns continued to behave badly in later years (Pinkstone, 2024).

2.3.7.12 Crime

In the UK, Camilla Tominey reported in September 2024 that there has been an alarming rise in criminality amongst children since 2020 (Tominey, 2024). They have been turned feral by lockdown, she says, and are leaving the rest of us living in fear. There has been a serious rise in the number of crimes being committed by children—some of them very violent. The number of under 18s arrested for all offences had risen by 16% since the beginning of the pandemic in

2020. Whilst the number of children arrested for violence against the person, which ranges from assault to murder, had increased by 22% since the pandemic.

2.3.7.13 Social

United Kingdom McGrogan (2023) pointed out the obvious fact that children need to socialise and that this is critical to their healthy development, and children should never have had to go through the experience of lockdown. Cowood (2023) reported that lockdowns had a devastating impact on children's social skills and emotional well-being, and we will see the effects for years. The Institute of Fiscal Studies (IFS) and the UCL Institute of Education surveyed 6,095 parents in England with children aged 4 to 16 about the impact of the first year of the pandemic (Clarence-Smith & Corless, 2023; Stringer, 2023). 48% reported that their sons and daughters' social and emotional skills deteriorated. Children whose parents were furloughed were significantly more likely to experience a worsening in their socio-emotional skills than those whose parents had not been furloughed (51% versus 45%).

2.3.7.14 Inequalities

United Kingdom The Institute for Fiscal Studies in the UK published 'Early childhood and inequalities' (Cattan et al., 2022), which noted that lockdowns exacerbated early inequalities. In the UK, 42% of GCSE students in the most deprived areas said they fell behind due to COVID-19 'disruption' compared with 26% in more affluent areas (Beal, 2023).

2.3.7.15 Abuse

Italy Parente et al. (2021) conducted a retrospective study using data from January 2014 to December 2020 on patients seen in the paediatric emergency department of a hospital in Bologna, Italy. The number of family dog bites in children increased in 2020, especially during the lockdown period.

United Kingdom The British child protection charity NSPCC reported that their helpline received a record number of calls during the pandemic (NSPCC, 2021). Lockdown restrictions at the height of the COVID-19 pandemic were used as a cover by abusers to hurt their children (Haigh, 2023). Usual safeguarding methods or chances to spot serious abuse such as schools, health workers and children's clubs were absent or moved online during the pandemic, meaning abusers could harm children in their care with impunity. During the lockdown in the UK, tragically, several children were killed at the hands of their parents or guardians (May, Matthews, & Dollimore, 2023). A 10-month-old baby, Finley Boden, killed by his drug-addled parents, was failed by care agencies who were hampered by COVID-19 lockdown restrictions (J. Robinson, 2024).

Global Globally, an article in *The Lancet Global Health* estimated that if routine health care is disrupted and access to food is decreased (as a result of unavoidable shocks, health system collapse or intentional choices made in response to the pandemic) for six months, this could lead to 253,500–1,157,000 additional child deaths and 12,200–56,700 additional maternal deaths (Roberton et al., 2020).

2.3.7.16 Deaths

In the US, accidental gunshot deaths by children handling a gun increased by 31% during the start of the COVID-19 pandemic compared to a year earlier (J. Diaz, 2021). According to Everytown for Gun Safety (an organisation that advocates for gun control), this was due to

COVID-19 lockdowns, lack of childcare, record gun sales in the US during the pandemic and a reported surge in first-time gun owners.

2.3.7.17 Conclusion

Ladhani (2022) concluded that, despite having the lowest risk of severe disease from SARS-CoV-2 infection, children have endured the most disproportionate disruption to their lives during their most formative years. W. Jones (2024h) pointed out that children bore a terrible burden for the misguided efforts of adults to protect themselves from a virus that was scarcely dangerous to them, and almost completely harmless to the children themselves. Far more children will have died of the consequences of lockdowns, such as abuse and neglect, plummeting mental health and the immunity debt that was responsible for the spike in child RSV, hepatitis and Strep A. The consequences for their learning and life prospects will be with them for decades to come. In March 2022 Smalley (2022z, 2023q) analysed QALY losses for England and Wales. He concluded that no intervention whatsoever could be merited for anyone under 45 on the basis of any cost–benefit analysis. The impact of those interventions was already profound and showed no sign of abating, and was increasing. Marlow (2023) reported that Britain will be paying the price for the lockdown generation for years to come. Student attendance and in-class participation at university remained far lower than it was before the pandemic. Whilst new graduates at large accountancy firms lack confidence when giving presentations, talking more generally at meetings, collaborating with colleagues, interacting with clients and networking. In the UK a parents' campaign group, Us For Them, may issue a legal challenge, via a judicial review, if the Covid-19 Inquiry fails to consider the impact that isolation had on children, the group that was the least likely to die from the virus, yet suffered the most from lockdowns and school closures (Hookham, 2023). The cancer specialist Professor Karol Sikora argued that successive lockdowns, and the associated harm inflicted on Britain's children, were the biggest policy mistake in all of our lifetimes (Sikora, 2023d).

2.3.8 Third World

In the third world, matters are even worse. Foster and Frijters (2024) noted that the effects in poorer countries are several times worse than those in richer countries, as the disruption to education, economic growth and health services are more keenly felt in places with lower initial settings on all of these things. In July 2020 the United Nations reported that virus-linked hunger led to the deaths of 10,000 more children per month over the first year of the pandemic (PBS, 2020). Further, more than 550,000 additional children each month were being struck by what is called wasting—malnutrition that manifests in spindly limbs and distended bellies. In a May 2021 article entitled 'For poor countries, lockdowns cost more lives than they save' published in *Prospect*, Green (2021b) pointed out that when GDP falls in low-income countries, life expectancy falls dramatically as well. In poorer countries, saving lives involves protecting the economy. Ceesay and Green (2023) reported in July 2023 that as a result of its response to a contagion that had a relatively low impact on African mortality, Africa now faces a decade or more of austerity. For example, the aggregated effect of The Gambia's COVID-19 response was a massive reduction in farming revenue and available food. The policies led to food price inflation, hunger and malnutrition. The West is ultimately to blame. Gambian politicians implemented these harmful policies because creditor pressure from the EU and other Western embassies, from the World Bank and the WHO, made it almost impossible to do anything else.

2.3.8.1 Women

Lockdowns in developing countries devastated opportunities for women and girls (Bell, 2023b). According to UNICEF and UNFPA, two million additional cases of female genital mutilation

may occur over the next decade as COVID-19 policy shut schools and disrupted programmes that help protect girls from this harmful practice (Fore & Kanem, 2021).

2.3.8.2 Children

A United Nations report estimated that COVID-19 disruptions in South Asia in 2020 likely contributed to 228,000 deaths among children under five years old, 6,000 deaths from malaria, tuberculosis, HIV/AIDS and typhoid among adolescents and 11,000 maternal deaths (UNICEF, UNFPA, WHO, & SickKids' Center for Global Child Health, 2021). It was reported in *Nature* in January 2022 that in parts of sub-Saharan Africa, including Ethiopia, Kenya, Liberia, Tanzania and Uganda, research suggests that some children have lost as much as a full year of learning (Moyer, 2022). In April 2022 the WHO and UNICEF issued a joint news release, warning of a heightened risk for the spread of vaccine-preventable diseases which could trigger larger outbreaks, particularly of measles, affecting millions of children (Public Health Scotland, 2022). Pandemic-related disruptions, increasing inequalities in access to vaccines and the diversion of resources from routine immunisation were leaving too many children without protection against measles and other vaccine-preventable diseases.

2.3.9 Conclusion

In the UK, Graham Brady, Chairman of the 1922 Committee from 2010 to 2024, had a unique insight into British politics. He highlighted the negative impacts of pandemic measures, including £400 billion in public debt, NHS backlogs and increased mental health issues among children. Professor Mark Woolhouse told the UK Covid-19 public inquiry that 'The harms of the social distancing measures - particularly lockdown, the economic harms, the educational harms, the harms to access to healthcare, the harms to societal wellbeing … just the way we all function … mental health - were not included in any of the work that SPI-M-O [Scientific Pandemic Influenza Group on Modelling, Operational sub-group] did and, as far as I could tell, no one else was doing it either' (T. Thomas, 2023). 'I think it's fair to describe lockdown not as a public health policy, but as a failure of public health policy', he added. Jefferson and Heneghan (2024a) gave a list of harms caused by lockdowns, which included the disruption of the free flow of people and goods with a massive impact on the economy, which will be felt for decades to come; the division of society into 'vaxxers' and 'anti-vaxxers', 'maskers' and 'anti-maskers' that undermined solidarity and unity, the very fabric of society; and the solitary confinement of the elderly and the frail. Whilst, when surveyed in 2024, 67% of scientists thought that the government did not pay sufficient attention to lockdown's long-term impact (Knapton & Pinkstone, 2024). Silverman (2024) reported how the impact of lockdowns continued to affect every generation, and will do for decades to come. Young children suffered developmentally, teenagers suffered from poor mental health, young adults missed out on student life or learning from colleagues at work, the middle-aged started drinking more and pensioners' cognitive function and working memory declined. In summary, the collateral damage caused by lockdowns in terms of health, economic, social, political, legal, policing and transport issues has been significant, whilst the impact on children and the third world has been particularly bad, with long-term effects.

2.4 Benefits of Lockdowns

Using death records data from China, Qi et al. (2021) provided empirical evidence that strict city and community lockdowns brought about unintended short-term health benefits. They observed fewer deaths from cardiovascular diseases, traffic accidents and non-COVID-19 pneumonia during the lockdowns. The authors state that this result was likely driven by the significant improvement in air quality, reduction in traffic volume and fewer human interactions.

2.4.1 Air Pollution

The response of secondary pollutants (namely O_3 and $PM_{2.5}$) to COVID-19-induced emission changes in the concentrations of VOCs and NO_x is complex, nonlinear and uncertain (Kroll et al., 2020).

2.4.1.1 China

The COVID-19 quarantine in China is thought to have reduced ambient air pollution. However, Shen et al. (2021) showed that despite a decrease in ambient $PM_{2.5}$ during the quarantine, the total population-weighted exposure to $PM_{2.5}$ considering both indoor and outdoor environments increased by 5.7 µg m^{-3}.

2.4.1.2 Europe

R. Schneider et al. (2022) analysed the impact of government lockdown policies on reducing air pollution levels and related mortality in Europe during February–July of 2020. Based on estimates for NO_2, O_3, $PM_{2.5}$ and PM_{10}, they estimate that the lockdowns could have avoided 486, 37, 175 and 134 deaths, respectively.

2.4.1.3 United States

Bekbulat et al. (2021) estimated that during stay-at-home orders in the US, average $PM_{2.5}$ levels were slightly higher (∼10% of its multi-year interquartile range (IQR)) than expected; average ozone, NO_2, CO and PM_{10} levels were slightly lower (∼30%, ∼20%, ∼27% and ∼1% of their IQR, respectively) than expected. In sum, any reduction in pollution was modest and transient.

2.4.1.4 Global

Venter, Aunan, Chowdhury, and Lelieveld (2020) estimated from 34 countries that lockdown events reduced the population-weighted concentration of NO_2 by about 60% and $PM_{2.5}$ levels by about 31%, with mixed effects on O_3. Reductions in transportation sector emissions are largely responsible for the NO_2 anomalies. Except for ozone, satellite measurements of the troposphere indicated much smaller reductions. Meanwhile, Greenstone, Hasenkopf, and Lee (2022) found that the global population weighted-average $PM_{2.5}$ level declined from 27.7 µg/m^3 in 2019 to 27.5 µg/m^3 in 2020. Especially given that this figure has trended down since 2011, lockdowns had no significant impact on global particulate pollution. In South Asia, the world's most polluted region, pollution actually rose during the first year of the pandemic. In a systematic review that included Europe and North America, Bakola, Carballo, Jelastopulu, and Stuckler (2022) concluded that NO_x, CO_x and PM levels fell substantially in association with COVID-19 lockdowns. In contrast, ozone tended to increase, as nitrous oxide levels dropped. In short, COVID-19 lockdowns may have contributed to lower air pollution levels.

2.4.2 Road Traffic Collisions

Reduced mobility during COVID-19 lockdowns meant fewer vehicles at risk of collision, but also provided an opportunity to speed on empty streets.

2.4.2.1 Greece

In March and April 2020 in Greece, there were about 1226 fewer collisions, 72 fewer deaths, 40 fewer serious injuries and 1426 fewer minor injuries compared with what would have been expected in the absence of the pandemic (Vandoros, 2022).

2.4.2.2 United States

In the US among those aged 15–24 in 2020–21, compared to 2018–19, twice as many died in car accidents (Coddington, 2023d).

2.4.2.3 Global

In a narrative review Yasin, Grivna, and Abu-Zidan (2021) assessed the global impact of the COVID-19 pandemic on road traffic collisions. Traffic volume dropped sharply during the COVID-19 pandemic, which was associated with a significant drop in road traffic collisions globally and a reduction of road deaths in 32 out of 36 countries in April 2020 compared with April 2019, with a decrease of 50% or more in 12 countries, 25–49% in 14 countries and by less than 25% in six countries. Similarly, there was a decrease in annual road deaths in 33 out of 42 countries in 2020 compared with 2019, with a decrease in road deaths of 25% or more in 5 countries, 15–24% in 13 countries and less than 15% in 15 countries.

2.4.2.4 Conclusion

Overall, a reduction in traffic led to a reduction in traffic accidents. Although note that a decrease in road traffic collisions due to lockdowns does not represent an overall increase in utility, otherwise countries would elect to ban motor vehicles.

2.4.3 Suicide

2.4.3.1 United Kingdom

The UK Government was warned that more children would die from suicide than from COVID-19 before they ordered damaging school closures (Clarence-Smith, 2023b). COVID-19-related factors including school issues were reported to have contributed to deaths in 12 of the 25 cases of suicide by under-18s identified during the first lockdown in England. The government missed no less than nine opportunities to avert the damage caused by school closures during the pandemic.

2.4.3.2 Global

Globally, there was a slight *decrease* in suicides during the lockdowns (Pirkis et al., 2021). This could be because people knew that lockdowns were temporary, people tend to pull together in times of crisis and some may have relished working from home. However, they may have acted in ways that increased their longer-term risk of mortality, such as missing hospital appointments and creating less healthy habits such as a more sedentary lifestyle.

2.5 Lockdown Cost–Benefit Analysis

A government's job is to maximise the aggregate utility of the population over time (but in practice governments are motivated to court the median voter). It does so via economics, which involves the efficient allocation of scarce resources. One can argue for state intervention if there are negative externalities. For example, an infected person imposes a negative externality on others. However, during a lockdown, the government have imposed a negative externality on everyone. One can also argue for state intervention on the basis of paternalism (for example, seat belts save lives). Furthermore, herd immunity is a public good, which means that, if necessary, the government should pay for it. However, in all cases, in principle policies should be justified by cost–benefit analyses. Let us review the literature, then conduct our own cost–benefit analysis for the UK lockdowns.

2.5.1 Literature Review

2.5.1.1 Australia

Lally (2022) estimated that the Australian government pursuing a lockdown rather than mitigation cost at least $175b, but saved 11,500 to 40,000 lives, equivalently 46,000 to 160,000 QALYs with a value of $4.6b to $16b (for health interventions in Australia, the generally employed figure for a QALY is $100,000). So the lockdowns do not seem to have been justified by reference to the standard benchmark. According to Begg and Wild (2022), the costs of joblessness and not working as a result for the first nationwide lockdowns in March and April 2020 were 31 times greater than the maximum possible benefits of all lockdowns throughout 2020 and 2021. Foster (2022) estimated that the maximum benefits from Australia's lockdown policies were 343,800 WELLBYs, and the minimum costs from lockdowns were 23.41 million WELLBYs. This indicates that the costs of Australia's COVID-19 lockdowns were at least 68 times greater than the benefits they delivered.

2.5.1.2 Canada

D. W. Allen (2021) reviewed over 100 studies that related to COVID-19 lockdown cost–benefit analyses. He concluded that lockdowns had, at best, a marginal effect on the number of COVID-19 deaths. Using a cost–benefit methodology devised by Bryan Caplan, he calculated that in Canada the costs of the lockdown were 6,283,333 years of life lost, and the benefits 44,430–111,081 life years, with 44,430 being closer to reality, giving a cost/benefit ratio of 141. He concluded that lockdowns must rank as one of the greatest peacetime policy disasters of all time.

2.5.1.3 Ireland

In a preprint, Ryan (2021) estimated that in Ireland the benefits of the lockdown were 74,662 QALYs/522,631 WELLBYs (which he described as 'generous') to 14,932 QALYs/104,526 WELLBYs ('probable'), whilst the costs of the lockdown were 184,397 QALYs/1,290,777 WELLBYs ('conservative') to 386,913 QALYs/2,708,392 WELLBYs ('probable'). So the benefits minus the costs were -109,735 QALYs/-768,145 WELLBYs to -371,981 QALYs/-2,618,798 WELLBYs (with the latter figures being more probable). In other words, the costs exceed the benefits by a factor of 2.5–26 (with the higher figure being more probable).

2.5.1.4 Sweden

TaxPayers' Alliance (2024) calculated that Sweden spent almost four times less as a percentage of GDP than the UK on their COVID-19 response and saw around half as many excess deaths.

2.5.1.5 United Kingdom

In a prescient article written in March 2020, Toby Young was the first to conduct a decent cost–benefit analysis of the UK's lockdown (T. Young, 2020a). He estimated that the government was implicitly valuing a life at £500,000, whilst NICE would value them at £330,000. Plus there is the loss of life caused by the lockdown and inevitable economic recession. He concluded that the government overreacted to the COVID-19 crisis, and that the drastic measures put in place would harm us more in the future. And he was right.

In April 2020 I concluded that we cannot justify a lockdown, but that we should protect the most susceptible (who are easily identified) (M. Sewell, 2020a). Then in June 2020 I reviewed the relevant literature on lockdowns (M. Sewell, 2020b). Using the median from the results (taken at face value) from the literature available at the time (which was likely rushed and flawed, and certainly varied widely) suggested that a lockdown reduced peak daily deaths by about 50% (in

the light of new evidence, this figure seems absurdly high). Whilst the cost of the UK lockdown implied that it was only worthwhile if it reduced the death rate by about 90%. I concluded that the UK lockdown was not justified.

In July 2020 the UK Government estimated that, using total figures for the UK including the past and the future, COVID-19 would directly lead to the loss of 688,000 QALYs, with changes in care resulting in a loss of 700,325 QALYs and the impacts of the recession resulting in a loss of 349,000 QALYs (UK Government, 2020). They also claimed that social distancing measures would save 906,300 QALYs, and that in the unmitigated case 7,500,000–12,500,000 QALYs would be lost.

D. K. Miles, Stedman, and Heald (2020) calculated that the costs of the first UK lockdown were in the range £200 billion to £550 billion, and the benefits in the range £3 billion to £141 billion (see also D. Miles, Stedman, and Heald (2020)). The authors assumed that 20,000–440,000 lives were saved and that 5 or 10 QALYs were lost for each COVID-19 death. The lower figures in both cases (20,000 lives saved and 5 QALYs lost) seem more realistic, and imply that the benefits were £3 billion, and the costs exceed the benefits by two orders of magnitude.

Rowthorn and Maciejowski (2020) presented a cost–benefit analysis inspired by optimal control theory that incorporated the SIR model. They concluded that a 10-week lockdown was only optimal if the value of the life of a COVID-19 victim exceeded £10 million, which is an order of magnitude greater than most estimates.

Using estimates for the UK, P. Jenkins, Sikora, and Dolan (2021) compared COVID-19 deaths prevented by lockdowns with excess cancer deaths caused by lockdowns, and showed that it is possible that preventing COVID-19 deaths through lockdowns may have resulted in more life-years being lost than saved.

With a focus mainly on UK data, O. C. Robinson (2021) conducted an interdisciplinary biopsychosocial review. Deaths associated with economic harms or underfunding of other health issues may outweigh the deaths that lockdowns save, and the extremely high financial cost of lockdowns may have negative implications for overall population health in terms of diminished resources for other health issues. He concluded that lockdowns will likely lead to more life lost than life saved.

In a review paper on the effectiveness of lockdowns, Herby et al. (2023) concluded that a cost–benefit analysis of the lockdowns applied suggested that the policy of lockdowns represented a global policy failure of gigantic proportions. The benefits of lockdowns were described as 'a drop in the bucket compared to the staggering collateral costs' imposed (Donnelly, 2023b). Lockdowns prevented just 1,700 deaths in England and Wales, yet the costs were enormous (Ibrahim, 2023).

Professor Karol Sikora, the cancer specialist, voiced in October 2023 'I have little doubt that if a reasoned and fair analysis is ever conducted, the number of life-years lost to lockdown and its consequences will be far greater than those tragically taken by the virus' (Sikora, 2023c). In September 2024, Chief Medical Officer Chris Whitty conceded that, in hindsight, ordering 2.3 million people to cut themselves off from the world entirely for 12 weeks may have done more damage than it prevented (Oakeshott, 2024b).

2.5.1.6 United States

Schonberger, Listokin, Ayres, Yaesoubi, and Shelley (2020) performed a cost–benefit analysis of limited reopening relative to a herd immunity strategy or shelter in place for SARS-CoV-2 in the United States. The authors concluded that a limited reopening to achieve partial mitigation of COVID-19 was cost-effective relative to a full reopening if an effective therapeutic or vaccine could be deployed within 11.1 months of late May 2020. They estimated that one additional month of shelter-in-place restrictions should only be imposed if it saves at least 154,586 lives per month before the development of an effective therapeutic or vaccine relative to limited reopening. In their book *The Price of Panic: How the Tyranny of Experts Turned a Pandemic*

Into a Catastrophe, Axe, Briggs, and Richards (2020) concluded that the human cost of the emergency response to COVID-19 far outweighed the benefits. More recently, the Supreme Court of Florida (2024) concluded that on average, when one includes all age groups, lockdowns were not a good trade. Comparative data showed that jurisdictions that held to them tended to end up with higher overall excess mortality.

2.5.1.7 Global

In August 2020 Berenson (2020c) published a booklet that evidenced that lockdowns were a mistake. In November 2021 Joffe and Redman (2021) wrote a review article on lockdowns in high income countries. In all eleven cost–benefit analyses considered, the costs exceeded the benefits, typically by a factor of at least 10. In an interesting descriptive-comparative paper using data for 124 countries from 11 March 2020 to 11 March 2021, L. E. Andersen and Rocabado (2021) estimated that 1.2 billion quality life years were lost due to mobility reductions, which was 25 times as many as life years lost due to COVID-19-related deaths. In a thoughtful narrative review, Joffe (2021) estimated that the cost of the world's response to COVID-19 was 360 million well-being-adjusted years (WELLBYs), and the benefits 1.813 billion WELLBYs. So the costs exceeded the benefits by a factor of 5, but he calculated that the factor could be as high as 87. Whilst Foster and Frijters (2024) reported that estimates from six different teams across the Anglo-Saxon world indicated that the costs to society as a whole, measured in terms of WELLBYs taken from the whole population, outweighed the benefits of lockdown by a ratio ranging between 4:1 and 1000:1. By 2024, Tony Blair believed that COVID-19 lockdowns in the developing world did more harm than good (UnHerd, 2024).

2.5.2 Analysis

Now let us conduct a cost–benefit analysis of the UK lockdowns. In order to conduct a cost–benefit analysis on a potential policy the government need to put a value on a life.[5] The National Health Service (NHS), largely funded by general taxation, follows guidelines issued by the National Institute for Health and Care Excellence (NICE) to inform decisions that affect the allocation of NHS resources. NICE use the concept of a quality-adjusted life year (QALY) when evaluating the value of medical interventions. The value that NICE puts on a QALY is £20,000 to £30,000 (NICE, 2012). The cost, in principle, is an estimate of the opportunity cost to the NHS, and is not based on empirical research or directly related to the NHS budget (Badano, John, & Junghans, 2017; Rawlins & Culyer, 2004). An equitable healthcare system like the NHS should, in general, use the same metric across all of healthcare, including COVID-19. In practice the National Health Service became the National Covid Service, which was wrong. In the UK, for a COVID-19 fatality the average number of discounted QALYs lost is 3.47 (A. H. Briggs et al., 2021). Using the average value that NICE puts on a QALY, it seems reasonable that the Government should attribute a cost of $3.47 \times £25,000 = £86,750$ to each COVID-19 death. In March 2021 the Centre for Economics and Business Research (Cebr) estimated that over the previous year (the year following the start of the first UK lockdown) COVID-19 had reduced the UK's gross value added (GVA) by £251 billion (Cebr, 2021). Note that because COVID-19 largely curtails the lives of the elderly and those with comorbidities, COVID-19 itself would have actually saved the government billions of pounds in pension, benefit and healthcare payments. So the economic downturn was caused by lockdowns and fear of COVID-19, not the disease itself.[6] So the lockdown was justified if it prevented at least £251 billion/$£86,750 = 2,893,372$ deaths during this period. There were 125,602 deaths in the UK during this period (UK Government, 2021a), so the lockdowns were worthwhile if and only if they reduced the number of deaths by

[5] Of course, this is not the same as the intrinsic value that one puts on their own life or the life of a loved one (Worstall, 2020b).

[6] Note that the fear was disproportionate, see Section 6.1.4.1.

at least 96%. As this paper concludes, it is far more likely that lockdowns made no significant positive impact on deaths at all.

2.6 Degree of Overreaction

The reason that lockdowns were not justified is because the costs exceeded the benefits. In other words, the UK, and the world, overreacted. In addition to the above calculations, we can use intuitive arguments to approximate the extent that the UK, and the world, overreacted to the COVID-19 pandemic.

M. Neil, Fenton, and Engler (2024) concluded that, as the argument there was a genuine pandemic caused by the novel SARS-CoV-2 viral pathogen largely relied on data from highly inaccurate and unreliable PCR testing, this line of argument is no longer tenable.

2.6.1 Asia

2.6.1.1 China

Having examined the data regarding COVID-19 cases and deaths in China in the first three months of 2020, Verduyn (2024c) concluded that there was:

- no evidence that the Chinese lockdown had any impact on the trajectory of either COVID-19 cases or deaths;
- no evidence that SARS-CoV-2 was highly transmissible;
- no evidence that COVID-19 was unusually lethal;
- no evidence that anything significant happened in China as a result of COVID-19 (other than the lockdown itself); and
- nothing that can support the WHO's decision to consider COVID-19 a pandemic.

2.6.1.2 Israel

In Israel, a country with a population of almost 10 million, the number of people aged 18–49 years of age with no underlying morbidities who died of COVID-19 was *zero* (Onely, 2023).

2.6.2 Europe

In Europe, in the first year of the pandemic, excess mortality was somewhat higher than in a year with severe flu (Shahar, 2022a). In the second year, excess mortality was about twice as high as in a year with severe flu. Whilst Noah Carl pointed out that increases in mortality during COVID-19 were small relative to pre-existing differences across Europe (Carl, 2022a).

2.6.2.1 Austria

In a nationwide retrospective cohort study of previously SARS-CoV-2-infected adults in the general population of Austria during the Delta wave and with extended follow-up, there was a 0.003% absolute risk of COVID-19-associated mortality (Chalupka et al., 2024). For that, we shut down the planet, forced babies into masks and engaged in vaccine-related discrimination for years (I. Miller, 2024h).

2.6.2.2 Ireland

If you take into account changes in population size and demographics, between 2020 and 2022 Ireland's overall death rate was actually *lower* than expected (The Naked Emperor, 2024c).

2.6.2.3 Isle of Man

COVID-19 made no difference to the Isle of Man's overall mortality (Smalley, 2023d).

2.6.2.4 Italy

M. Bryant (2023) evaluated the alleged medical emergency in Northern Italy in Spring 2020 and concluded that there was no pandemic.

2.6.2.5 Slovakia

In the official investigation into Slovakia's COVID-19 policy in June 2024 Peter Kotlár, the government's representative, reported to parliament that there had been no pandemic in Slovakia.

2.6.2.6 United Kingdom

Hospitals The UK spent £532 million on NHS Nightingale Hospitals that were barely used (Parker, 2023). Hundreds of the beds were sold for as little as £6, despite being bought for £2,500 each.

Mortality In the UK, up until 2008 the age-standardised mortality rate was higher than the rate for 2020 (Appleby, 2021; Office for National Statistics, 2020b). Smalley (2024l) showed that according to this raw mortality data, the worst burden of short-term mortality in England and Wales in the last 55 years occurred right at the start of 1970. The COVID-19 anomaly in April 2020 is pretty much in line with December 1989 and January 2000, so not totally unprecedented. Looking at data from England and Wales, HART (2023a) argued that if we subtract the response-related deaths from the COVID-19 deaths, the COVID-19 epidemic was within the range seen in previous winters for influenza deaths, but was at an unusual time of year. Using mortality data for England and Wales from 1970 to 2021, Smalley (2023x) argued that there was no unusually novel, deadly pathogen in spring 2020 in the UK, and COVID-19 was just a 'bad flu'. In England, from March 2020 to February 2021, for those aged 0–18, the COVID-19 mortality rate was 0.0002% (C. Smith et al., 2021) (to put things in perspective, for the same time period and among the same age group, five times more people died from suicide).

In Northern Ireland, in the entire four-year period of COVID-19 up to March 2024 there were a total of just 275 deaths due to COVID-19 alone, and that figure includes deaths which mentioned COVID-19 with pneumonia. In the 15–44 age group there were just eight deaths. Moreover, the youngest person in this age group was 38, so no one younger than 38 died from COVID-19 in Northern Ireland in the entire four-year period.

Now let's consider Scotland. In Dumfries and Galloway, in 2020 there were only four deaths where COVID-19 was listed as the sole cause of death on a death certificate within all hospitals in the Dumfries and Galloway health board and all deaths were above 69 years of age (Biologyphenom, 2024a). In the pandemic year deaths were below average. The funeral numbers for the region released by the council showed that in 2020 burials were the lowest on record. Similarly, NHS Highland reported that there were only four deaths where COVID-19 was the sole cause of death in 2020 (Biologyphenom, 2024b). Deaths from all causes showed normal hospital mortality in 2020. Also, funeral data showed no unusual change in the death rate in 2020 compared to prior years. Scottish Ambulance Service data showed that heart-related incidents in 2020 (the year of the pandemic) were just 2.5% above average (Biologyphenom, 2024c). The National Records of Scotland confirmed that no child attending a school in Scotland has ever died of COVID-19 (Biologyphenom, 2024d). For comparison, from 2020 until the end of 2021 (over just a two-year period), there were tragically 56 deaths from suicide in Scotland in those under 20 years of age. Whilst 0.08% of educators died 'involving' COVID-19 over a 3-year

period (more during the year of vaccinations than the year of the pandemic, 18 in 2020, 21 in 2021, 3 in 2022). Yet schools were closed and vaccinations promoted.

No Pandemic In the UK John Dee analysed respiratory diagnosis requiring treatment with a respiratory procedure and concluded that there was no pandemic (Dee, 2024a, 2024c, 2024d). Likewise, M. Cates (2024a) pointed out that if you didn't know there had been a global pandemic, you wouldn't spot it from a chart of UK deaths. Also, Joel Smalley argued that there was no COVID-19 pandemic, and COVID-19 was no cause for alarm over and above a bad flu (Smalley, 2024j). He analysed life expectancy in England and Wales from 1974 to the present, and concluded that COVID-19 was nothing more than an ordinary, seasonal pathogen (Smalley, 2024g).

Conclusion As of 19 March 2020, COVID-19 was no longer considered to be a high-consequence infectious disease (HCID) in the UK (UK Health Security Agency, 2018). Despite COVID-19's limited impact on mortality, due to the Government's overreaction, in 2020 the UK suffered its worst recession in more than 300 years (L. Campbell, 2020). In September 2024, Chief Medical Officer Chris Whitty finally conceded that 'we overdid it' regarding COVID-19 restrictions (Oakeshott, 2024b). Whitty, who played a key role in the UK's pandemic response, seemed to regret the government's scare-mongering (Myers, 2024). He acknowledged that the risks of the virus may have been 'overpitched', at least for younger, healthier people. In summary, in the UK a once-in-a-decade 'epidemic' was met by a response that caused a once-in-a-century recession: an overreaction by an order of magnitude.

2.6.3 North America

2.6.3.1 United States

Alex Berenson, previously a reporter for *The New York Times*, wrote a book entitled *Pandemia*, in which he details how our response to the pandemic has been an epic overreaction driven by a disastrous confluence of public and private interests—all of them purporting to 'follow the science' (Berenson, 2021b). From an American perspective he describes the response as the worst failure of public policy since World War I. In March 2020, Andrew Cuomo, governor of New York at the time, warned that New York may need 40,000 ventilators. In the end, New York never had more than 4,000 COVID-19 patients on ventilators, making Cuomo's estimate off by an order of magnitude (Berenson, 2020b). In the US, COVID-19 deaths (from March to May 2020) made up 10.5% of the total life years lost (Wetzler et al., 2020). Ischemic heart disease (from March to May 2018) made up 10.7% of the total life years lost. Alegria and Nunes (2024) found that there was a systematic over-reporting of COVID-19 when reported as underlying cause of death, when compared to influenza and pneumonia during the same period. The average over-reporting factor was about 2.5 to 3 for all ages. Only about 30% of the reported COVID-19 deaths were 'from COVID-19' as the underlying cause (Redshaw, 2024b). In September 2023 doctors in the US admitted that they could no longer tell the difference between the symptoms of COVID-19 and allergies or a common cold (L. Andrews, 2023). Huber and Borovoy (2021) examined CDC mortality data, obituaries in 2019 and 2020 and earnings statements of the largest medical suppliers in the US (to see whether their sales of medical oxygen and other medical equipment prove a pandemic). They concluded that there was no pandemic in the US in 2020. Briand (2021) observed that excluding New York City, New Jersey and to a lesser extent, bordering states, from all cause weekly deaths, no evidence appears of pandemic-level mortality in the US in 2020. The impact of COVID-19 as a high mortality pandemic is not reflected in demographic data.

2.6.4 Global

2.6.4.1 Mortality

To put things in perspective, L. E. Andersen and Rocabado (2021) calculated that globally about 48 million life years were lost during the first year of the pandemic, corresponding to 0.018% of all expected life years. Whilst at least double the amount of life years are lost every year due to children dying of diarrhoea. To further put things in perspective, globally, over the first year of the pandemic, COVID-19 accounted for 4.1% of deaths, motor vehicle collisions 2.3%, alcohol use 5.1%, tobacco use 13.7%, fossil fuel combustion fine particulate matter pollution 14.9% and poor diet 18.8% (Joffe & Redman, 2021). Levitt, Zonta, and Ioannidis (2023) analysed age-stratified death information on an annual basis during the period 2009–2021 for 33 countries. For Europe, for the pandemic years (2020–2021), the relative excess deaths were only 2.46%, which was less than 2009–2010 (5.57%) and 2010–2011 (3.30%). When considering two-year periods, 2009–2010 was the worst pair of years in 25 out of 33 countries, whilst in 9 of the 33 countries the pandemic years (2020–2021) were the worst. When considering three-year periods, in 31 of the 33 countries 2009–2011 was the worst. When considering four-year periods, in 31 of the 33 countries 2009–2012 was the worst. Lataster (2023f) noted that we only lost around 0.1% of the population 'with COVID' during the whole pandemic, compared with the up to 1% we lose from all causes every single year. After a 2023 global analysis, Verduyn, Engler, and Kenyon (2023) concluded that if we take official COVID-19 mortality data at face value, all the patterns and evidence suggest that if governments and the media had never mentioned COVID-19, nobody would have noticed anything out of the ordinary. In terms of health, 2020 was arguably only the worst year for the past twelve years.

2.6.4.2 Epidemiological Statistics

At a global level, pre-vaccination infection fatality rate (IFR) may have been as low as 0.03% and 0.07% for 0–59 and 0–69-year-old people, respectively (Pezzullo et al., 2023). In mid-March 2020 we were told that the case fatality rate (CFR) for this novel new virus was 3.4%. It turned out to be 0.3%–0.5% (B. Rice Jr., 2024a).

2.6.4.3 No Pandemic

As referenced above in the section on the UK, some argue that there wasn't even a COVID-19 pandemic. In February 2022 Gupta (2022) pointed out that SARS-CoV-2 was nothing more than a textbook seasonal coronavirus. 'It is headed towards endemicity (rather than eradication); its dynamics are determined by the waxing and waning of natural immunity against a background of seasonality in transmission; it was never any more virulent than the other seasonal coronaviruses (people were not specifically immune to it, so the vulnerable were especially at risk); and it evolved to evade natural immunity or to marginally improve transmissibility (which is all it needed to outcompete the prevailing variant).' According to HART (2023e), using the long-established definition of 'pandemic', there was in fact no global pandemic in 2020. Schachtel (2023b) also argued that there was no pandemic, and thus no 'lessons to be learned from the pandemic', except not to put your trust in the hands of the government. Similarly, Engler and Neil (2023) argued that the evidence suggests that there was no pandemic in 2020, by any reasonable definition of that word. All the harm observed since spring 2020, he argued, was caused by the dystopian response to the perceived threat, including the rollout of a number of vaccines which were neither safe nor effective. Whilst PANDA (2024) (for an executive summary, see Engler (2024b)) argued that under any reasonable and commonly held understanding of the meaning of the word 'pandemic', there was no pandemic.

2.6.4.4 Conclusion

Globally, from 2003 to 2008, more people died from HIV/AIDS per annum than died from COVID-19 in 2020 (Roser & Ritchie, 2019). Even the WHO finally declared, in May 2023, that COVID-19 no longer represented a 'global health emergency' (Mundasad & Roxby, 2023). Meanwhile, according to World Bank forecasts the pandemic and shutdown measures to contain it plunged the global economy into the deepest recession since World War II (The World Bank, 2020). In other words, lockdowns were an overreaction by an order of magnitude.

2.7 Why Don't Lockdowns Work?

How could it be that lockdowns failed to make a significant positive impact on COVID-19 cases or deaths? The lockdowns worked in the sense that they reduced mobility. In London, if normal mobility was 100%, during the first lockdown, in spring 2020, the Apple Mobility Index reached a minimum of 13%, the Citymapper Mobility Index 8% and the Google Mobility Report 20% (UK Government, 2021c). So the lockdown controlled the population, yet failed to control the virus. How is this possible? There are theoretical arguments that explain why lockdowns may increase COVID-19 infections and/or deaths. Intuitively, one might assume that the laws of physics dictate that social distancing must work. So, a priori, one might assume that lockdowns must work. The key to reconciling such a seemingly unintuitive outcome is to understand the dynamics of epidemics, and the significance of the degree of immunity in the population. I next consider 17 potential reasons why lockdowns failed to work.

2.7.1 SARS-CoV-2 is Airborne

If COVID-19 is spread by aerosols that fill a room after a certain period of time, which seems likely, then social distancing won't help (Bazant & Bush, 2021). In other words, our intuition that the laws of physics dictate that social distancing must work is incorrect.

2.7.2 Hope-Simpson's Model of Influenza Applies to COVID-19

R. Edgar Hope-Simpson's model of influenza may apply to COVID-19. Hope-Simpson (1992) hypothesised that the influenza virus lays dormant in people and is reactivated by a seasonally-mediated stimulus. If this applies to COVID-19, which seems likely, then reducing person-to-person contact will be less effective at mitigating COVID-19.

2.7.3 The Majority Are Exposed, Susceptibility Is What Matters

It is not surprising that interventions don't work when we accept that COVID-19 spreads like influenza: it is complex and not fully understood, but the majority are exposed, with only a minority being susceptible (C. Craig, 2021a). Will Jones wisely argued that almost all people are exposed during a surge, but the vast majority are already immune, so that relatively few of them are infected (W. Jones, 2021e). The surge then ends when enough of that small minority have been infected (herd immunity is reached). And, seasonality aside, there won't be a new wave unless there is a new variant. So, what prevents people from contracting the virus is their level of susceptibility, not their level of exposure.

2.7.4 Long-Term Costs

Note that even if lockdowns 'worked' in the sense that they reduced the total number of infections during an epidemic or seasonal wave, there may be short-term benefits but greater long-term costs. Reducing the rate of infection across the entire community has the effect of increasing the average age at which infections occur. Because COVID-19 mortality increases exponentially with age (J. R. Goldstein & Lee, 2020), this can lead to a greater number of severe cases and

deaths (T. Cohen & Lipsitch, 2008). Of course, the long-term matters more to individuals than politicians.

2.7.5 Lockdowns Merely Postpone the Inevitable

The number of infections per day will peak when a certain proportion of the population has been infected (the herd immunity threshold). Although the herd immunity threshold is dynamic, at any point in time, we can expect a fixed proportion of the population to become infected, it is just a question of time, and who gets infected en route. This would mean that lockdowns, if they worked, would merely postpone the inevitable, by slowing the rate of infection, but not decrease the final number of infections. This could still be beneficial if the healthcare system was at risk of being overwhelmed (which, at least in the UK and the US, it wasn't). For an article on how close hospitals were, or were not, to collapse, see Reed (2024b).

2.7.6 Lockdowns Can Create Immunity Debt

We saw in Section 2.3.1.3 evidence of harms caused by immunity debt. We now consider the evidence that lockdowns could compromise immunity and reduce the spread of mild endemic viruses to our detriment.

Social distancing can cause reduced resistance to infection, later leading to picking up more frequent and longer-lasting respiratory infections (Lay, 2023). According to Professor Charin Modchang, a disease modeller at Mahidol University in Bangkok, 'Pandemic-related measures including masking and social distancing have led to many individuals, especially children, missing out on opportunities to build natural immunity'. Analytics firm Airfinity and Bloomberg compiled data from over 60 health organisations looking at 13 different infectious pathogens. They compared the worst outbreaks in the years preceding 2020, with the largest epidemics in the years since, and found that at least one disease surged to rates at least 10 times higher than the pandemic baseline in 44 countries and territories. In the UK, experts have suggested that the lockdowns ending created the ideal niche to accelerate the global spread of monkeypox (Newey, 2022a). Other diseases have also found a foothold as immunity has fallen after two years of limited exposure to pathogens, such as RSV in Australia and the flu in the US. Whilst a mystery surge of severe hepatitis in children has also been linked to changing disease trends caused by lockdowns. When international travel restrictions in New Zealand were partially relaxed, there was a rapid increase in RSV cases and hence an increase in admissions due to bronchiolitis (Hatter et al., 2021). At the peak (week 28, 2021), RSV surveillance numbers were more than five times the 2015–19 peak average. Redshaw (2024e) argued that social distancing may have contributed to the surge in RSV in children in the US in 2021 and 2022 (Suss & Simões, 2024).

Radagast (2022h) argued that lockdowns are what made SARS-CoV-2 so deadly. If social distancing prevents COVID-19 from spreading, it would also be preventing competing mild respiratory viruses, such as an adenovirus, from spreading too. COVID-19, being novel, would have a higher effective reproduction number, R_e, than the milder virus, so the milder virus would be driven towards extinction, allowing COVID-19 to prosper. The very mild benign viruses are our friends. When you lock down and put hand sanitiser on every corner, it's the old endemic viruses that take the hit first (eugyppius, 2023c). In preventing these infections, you effectively reserve precious susceptible respiratory tracts for the somewhat faster novel virus.

In short, even if lockdowns worked in the sense that they reduced the spread of infections, they could make us worse off in the longer term.

2.7.7 We Do Not Wish to Reduce Infections Across the Entire Community

Allowing the young and healthy to become infected increases herd immunity, which in the long term can lead to fewer severe cases and deaths (K. Rice et al., 2020). Locking down the young and healthy compromises this. Spending more time with smaller children, and their germs, and

contracting an illness like the common cold could actually help strengthen your immune system against severe outcomes from COVID-19 infection (Onque, 2022). Lockdowns acted to equalise the risk across age groups, ensuring those most at risk of adverse events had the same risk as those with the least risk (Heneghan & Jefferson, 2023c).

2.7.8 Lockdowns Lead to a Higher Herd Immunity Threshold

As noted above, although it is a moving target, the cumulative number of people who eventually become infected by COVID-19 is essentially proportional to the herd immunity threshold. The herd immunity threshold is a decreasing function of variation in exposure among individuals (Gomes et al., 2022). A lockdown reduces mobility, mostly for the most mobile, and thus reduces variation in exposure, and raises the herd immunity threshold. The implication is that, with a lockdown, more people get infected, and more people will die.

2.7.9 Those With the Highest Relative Mobility Will Now Include the Old

Those with the highest relative mobility are more likely to become infected. Without a lockdown, this will be the young. With a lockdown, mobility will be more equal across the board, so those with the highest relative mobility will now include a greater proportion of the elderly and vulnerable. The old and vulnerable will therefore receive a greater proportion of infections, and more people will die.

2.7.10 Reducing Mobility Can Increase the Spread of Disease

In 2017, before any COVID-19-induced pro-lockdown biases, Gómez-Gardeñes, Soriano-Paños, and Arenas (2018) revealed a regime of the reaction–diffusion process in which, counter-intuitively, mobility is detrimental to the spread of disease. Smalley (2022m) analysed England COVID-19 deaths in the context of Google mobility data. Reducing mobility failed to mitigate COVID-19 deaths.

2.7.11 Lockdowns Make Key Workers (Not the Young) The Most Mobile

During a lockdown, key workers risk exposure to continue providing goods/services to middle-class people working from home. Some will be ultra-mobile, such as delivery drivers, whilst some will be static with a high volume of contacts, such as shopkeepers. Again, we have a new group of those at higher risk, that now includes those of lower socioeconomic status, who statistically have a higher risk of comorbidities (Mbuya-Bienge, Simard, Gaulin, Candas, & Sirois, 2021). So, a greater number of potentially vulnerable people are infected, and more people will die.

In Sweden, which didn't lock down, after adjusting for socioeconomic factors (education, income and country of birth), there were no occupational groups with clearly elevated (statistically significant) COVID-19 mortality (Billingsley et al., 2022). Neither a measure of exposure within occupations nor the share that generally can work from home were related to working-aged adults' risk of COVID-19 mortality. Elderly individuals, however, faced higher COVID-19 mortality risk both when living with a delivery or postal worker or worker(s) in occupations that generally work from home less, even when their socioeconomic factors are taken into account. That pure exposure was not related to an elevated mortality risk suggests that lockdowns would have made little difference. That the elderly were worse off suggests that focused protection would have made more sense.

2.7.12 More Time Spent at Home

Lockdowns can increase the amount of time that people spend indoors, and, as referenced earlier, 95% of COVID-19 transmission takes place indoors (Bulfone et al., 2021). The frequency

of secondary attacks was highest in home/quarantine settings. H. A. Thompson et al. (2021) conducted a systematic review to estimate secondary attack rates and observed reproduction numbers in different settings. Households showed the highest transmission rates. Forcing everyone to stay home transiently increased infections and significantly impacted health and well-being (Heneghan & Jefferson, 2023c).

A simple intuitive consideration of seasonal variation in influenza suggests that lockdowns don't work. In the cooler middle latitudes we spend more time indoors during the colder seasons, and more time outdoors during the hotter seasons. Whilst influenza is rife during the colder seasons, and minimal during the hotter seasons. Whatever causes influenza to ebb and flow, it is clear that being couped up indoors does the opposite of mitigating transmission.

2.7.13 Can Create Congestion

Lockdown-inspired policies can create congestion, where the infected and uninfected are forced to mingle (Frijters, 2021). For example, if a hospital accident and emergency department had some form of COVID-19 screening process near the entrance, a queue would form.

2.7.14 SARS-CoV-2 Could Become More Infectious

Livermore (2023a) pointed out that non-pharmaceutical interventions (NPIs) created bottlenecks, not walls, against COVID-19. This is problematic. For example, lockdowns could select for variants with increased infectiousness. He concluded that the lockdown experiment must never be repeated.

2.7.15 SARS-CoV-2 Could Become More Virulent

Viruses evolve towards maximising propagation. If the host population is active, with frequent contacts, it doesn't need to be particularly virulent to spread. If the host population is static, with few contacts, it may evolve to be more virulent, so that the host coughs more. On this basis, Matt Ridley claims that lockdowns may keep the virus spreading mainly in hospitals and care homes among the very ill, leading to more lethal strains dominating milder ones (Ridley, 2020). Indeed, it turned out that prior to Omicron, each variant of COVID-19 was more severe than its predecessor.

2.7.16 Other Factors Dominate

Of huge significance is the reality that other factors dominate. Globally, annual COVID-19 mortality is likely largely a function of pre-existing immunity and the severity of recent flu seasons. Whilst locally, the season, the extent of immunity within the community and the transmissibility and progression of the current dominant variant of the virus tend to govern the rate of infection. So, in practice, before a vaccination programme is rolled out, there is little that a government can do to mitigate the epidemic. The positive impact of interventions appears to be non-existent, or lost as noise.

2.7.17 Long-Term Dynamics

Finally, the dynamics of an infectious disease with a heterogeneous population mean that the long-term effectiveness of an intervention may be weaker than our intuition would have us believe. Let p be the probability of being infected on a particular day. The probability of being infected at some point during a year is

$$1 - (1 - p)^{365}.$$

Imagine an intervention, such as social distancing, that, for an individual, reduces the probability of infection on a given day by 10%. For an individual with pre-existing immunity, the intervention would have no effect. A highly susceptible individual with a 1% chance of infection per day without the intervention would have a 0.9% chance of infection per day with the intervention. After a year, he or she would have a 97.4% chance of infection without intervention and a 96.3% chance of infection with intervention. In other words, for those with pre-existing immunity the intervention did nothing, whilst for the highly susceptible the intervention that reduced the daily risk by 10% reduced the annual risk by just 1.2%.

2.7.18 Conclusion

In summary, not only are there several theoretical reasons why lockdowns don't work, there are compelling arguments as to why they are fundamentally a bad idea.

2.8 If Lockdowns Don't Work, Why Were They Used?

If lockdowns don't work, why were they used, and why were they sustained?

2.8.1 Why Were Lockdowns Used in the First Place?

Why did most countries globally implement a lockdown in the first place? Cummins (2022) concluded that there was no clear indication as to why the WHO and the Western world abandoned their scientific principles and decades of data, in favour of adopting strategies from China in 2020.

2.8.1.1 China

After the initial outbreak of COVID-19 in Wuhan in January 2020, the Chinese government implemented a strict local lockdown, with images being portrayed to the rest of the world. Some have argued that this was partly for show (Rushworth, 2021d). It turned out that many of the early iconic images of the pandemic from China, Italy and New York City were elaborately staged to tell a particular story and achieve certain political outcomes (T. Rogers, 2023a). The shocking Wuhan videos of January 2020 were not staged by the Chinese government, but were spread by the West (Swiss Policy Research, 2021b).

2.8.1.2 Italy

Roberto Speranza, the Minister of Health in the Italian government, who was responsible for the first lockdown outside China, in Lombardy, was motivated by his desire to implement far-left political reforms across Italy (M. P. Senger, 2022a).

2.8.1.3 Ferguson's Paper

Neil Ferguson's influential model forecast an overly pessimistic 510,000 COVID-19 deaths in Great Britain in the unmitigated scenario over two years (N. M. Ferguson et al., 2020). Whilst the UKHSA's 'evidence' for COVID-19 restrictions relied on many very poor models (Heneghan & Jefferson, 2023k).

2.8.1.4 Pueyo's Paper

In March 2020, Tomas Pueyo wrote a widely-circulated Medium article recommending a strategy that he called the 'hammer and the dance'. In retrospect, the article was very naive, he assumed that lockdowns (and vaccines) were highly effective: 'If you hammer the coronavirus, within a few

weeks you've controlled it and you're in much better shape to address it. Now comes the longer-term effort to keep this virus contained until there's a vaccine' (Pueyo, 2020). In November 2021 eugyppius (2021c) reviewed Pueyo's 'The hammer and the dance': 'It's unsurprising, looking back at Pueyo's work today, to see that he was completely wrong about almost everything that matters. What is perhaps more bizarre, is the extent to which his zombie theses continue to dictate containment and also vaccination policy almost everywhere, despite their near-total falsification.'

2.8.1.5 United Kingdom

The high death rate in northern Italy spooked the UK government. Neil Ferguson believed that the data showed that China's lockdown was effective (Whipple, 2020). SAGE initially didn't believe that they could get away with a lockdown in Europe. Then Italy locked down, and they realised that they could. The UK government's main aim was to prevent the NHS from being overrun (Whipple, 2023). A poll conducted on 24 March 2020 showed that 93% of Britons supported the first UK lockdown (M. Smith, 2020).

2.8.1.6 Collective Hysteria

Bagus, Peña-Ramos, and Sánchez-Bayón (2021) concluded that collective hysteria may have contributed to policy errors during the COVID-19 pandemic that were detrimental to public health.

2.8.1.7 Politics

In an unpublished review, Yanovskiy and Socol (2021) concluded that the unprecedented and unjustified use of lockdowns was due to the special interests of the decision-making groups and the fact that the public abandoned the care of public affairs to the state.

2.8.1.8 Politician's Syllogism

The *politician's syllogism* is a logical fallacy that manifests itself as 'something must be done!'[7] And a lockdown is certainly something. The Ethical Skeptic (2022a) terms this *quod fieri*. Mowrey (2023f) argued that lockdowns occurred because they gave scared, (literally) non-essential Western professionals 'something to do'. Lataster (2023f) argued that doing nothing would have been better than lockdowns, face masks and vaccinations.

2.8.1.9 Technology

Bhattacharya (2023b) argued that Zoom enabled lockdowns to happen. The laptop class would never have survived without it.

2.8.1.10 Scientists

Why did scientists, who should have known better, go along with the lockdown mania? Lerman (2023) argued that it was because the military-intelligence-biodefence leadership was in charge and the public health leaders were used as trusted 'experts' to convey biowarfare edicts to the population.

[7] `http://www.youtube.com/watch?v=vidzkYnaf6Y&t=10s`

2.8.1.11 Conclusion

Swiss Policy Research (2023c) concluded that the imposition of COVID-19 lockdowns was driven by several factors, including 1) the biosecurity strategy of 'maximum suppression until mass vaccination'; 2) the West African Ebola outbreak and the false belief that the COVID-19 outbreak was similar to an Ebola outbreak, not a flu pandemic; 3) the seemingly successful Wuhan lockdown; 4) the misleading WHO report; 5) bogus modelling studies; 6) pressure by international institutions such as the IMF; 7) partisan politics in some cases; 8) demographic and psychological factors; 9) the possibility of digital and remote work; and 10) large-scale propaganda campaigns and psychological operations. In my mind, lockdowns were implemented due to frightening images from China and Italy, overly-pessimistic modelling from the UK, politicians' need to be seen to be taking action, and the irrational fear of the public, which was reflected by the media.

2.8.2 Why Were Lockdowns Sustained?

In October 2020, the WHO stated that they did *not* advocate lockdowns as the primary means of control of this virus (Doyle, 2020). Yet in many countries lockdown policies were sustained through 2021. Why?

2.8.2.1 Lockdowns Appeared to Work

Lockdowns may have *appeared* to work for two reasons. Firstly, in the UK, the best estimate is that infections peaked on 20 March 2020 (S. N. Wood, 2021), three days before the first UK lockdown began on 23 March 2020. Paton (2021) listed seven indicators that showed that infections were falling in England before the third lockdown. The King's College (Zoe) symptom app, NHS triage, positive tests, positivity percentage, ONS infection survey, hospital admissions and deaths all evidenced that cases peaked before the national lockdown began formally on 6 January 2021. Secondly, people had already changed their behaviour voluntarily. In the UK, by 23 March 2020, when the first lockdown was announced, the number of people travelling to a workplace had already fallen by 28% of pre-pandemic levels, visits to shops had fallen by 33% and public transport use had plummeted by 40%. Clark (2023b) reasonably asks whether virus transmission could have been controlled by purely voluntary means, by giving people information, but letting them exercise their own personal judgement.

2.8.2.2 Politics

Politicians are motivated to retain or attain power, so listen to and court the median voter (who is now both fearful and happy to signal his/her virtue so states that he/she supports lockdowns), rather than perform a cost–benefit analysis. A vicious circle develops: fear sustained lockdowns, and lockdowns sustained fear. According to a Russell Group University-trained epidemiologist, governments were able to implement lockdowns due to rising secularism and progressivism (wokeism) (Anonymous, 2021).

2.8.2.3 Media

The media are biased towards focusing on unusual and unexpected events (news, by definition, is unpredictable, as discussed in Section 6.1.3) which distorts people's perceptions of reality and can instil unnecessary fear. The public, now locked down whilst being exposed to saturated media coverage of people dying in ICUs, became afraid, and the majority supported the lockdown. M. Betrus (2022) comprehensively articulated how the media fuelled the lockdowns. Government interventions were swift due to 1) broadband and laptops, and 2) the media. In the US, 85% of media coverage supported continued lockdowns, school closings and making face masks mandatory. Whilst Facebook, YouTube and Twitter censored posts that challenged the narrative.

2.8.2.4 Public Opinion

United Kingdom In the UK during the pandemic both Boris Johnson and Keir Starmer were tracking public opinion polls almost obsessively, as well as running their own private surveys and focus groups (O'Flynn, 2020). In a July 2020 Ipsos MORI poll conducted in the UK, 50% of respondents agreed that the measures the Government had taken did not go far enough and more should be done. Whilst just 6% believed that the measures the Government had taken went too far and were not at all necessary (Ipsos MORI, 2020a). When polled on 9–10 October 2020, 86% of British adults were concerned about the risk of COVID-19 to the country as a whole (Ipsos MORI, 2020b). 56% supported implementing curfews to close pubs, bars and restaurants in the evening. 45% said that the current COVID-19 measures were not strict enough, 33% that they were about right and 15% that they were too strict. If the number of confirmed COVID-19 cases was to continue to increase in the future, 50% supported closing all university campuses, whilst 28% opposed such action. If the number of confirmed COVID-19 cases was to continue to increase in the future, 36% supported closing all school premises, whilst 43% opposed. Foad, Whitmarsh, Hanel, and Haddock (2021) found that in the UK people judged COVID-19 to be a severe threat because the government imposed a lockdown. In other words, they thought 'it must be bad if the government's taking such drastic measures'. The public presumed a lockdown was necessary from the very existence of such measures, and the government and the media presumed such measures were desired by the public. In the UK, in September/October 2021, under the hypothetical scenario of high cases but low hospitalisations, 41% of the public wanted social distancing introduced and 23% wanted nightclubs closed (Kekst CNC, 2021). Young adults have become less appreciative of the value of free speech. When presented with a list of 15 UK political parties, in 2022, just 13% of UK undergraduates stated that none should be banned from speaking at an event at a higher education institution (down from 27% in 2016) (Hillman, 2022).

M. Mitchell (2023) argued in March 2023 that young people still supported lockdowns due to a suspicion of democracy that bred an authoritarian streak. He stated that 'In the confused Gen Z psyche, lockdowns are a bit like what university has become — nothing more than a comforting formal restraint on the overwhelming prospect of freedom'. In April 2023 Noah Carl considered why the British were still pro-lockdown (Carl, 2023f). First, many are not that concerned about liberty. Second, they massively overestimated the risks of COVID-19, particularly the risks to the young. Third, the theoretical case for 'flattening the curve' appeared to be compelling (although in practice it didn't work). Fourth, case numbers did start falling around the time of each lockdown in 2020 (although they were already in decline before each lockdown). Fifth, whilst the supposed benefits of lockdown were obvious and immediate, the costs were largely delayed. Sixth, credentialed scientists informed the public that lockdown was the right policy, and that the Government was 'following the science' (they turned out to be wrong, whilst dissenting scientists were marginalised). Somewhat alarmingly, it turned out that supposedly freedom-loving societies are remarkably willing to submit to authoritarian rule, especially if paid to stay at home, as was the case with furlough in the UK (Warner, 2023). Even the Government was surprised by the obedience. As late as November/December 2023, in the UK, 8% strongly supporting the rule of six, limiting the amount of people who can meet outside.

Switzerland The Swiss population, who have a lot of referendums, voted to sustain COVID-19 laws and vaccination certificates (The Naked Emperor, 2023f).

United States Americans were surveyed in January 2022 (Reports, 2022). The fascist tendencies of Democratic Party voters have to be seen to be believed. Perhaps they presumably assumed that the vaccine stopped spread, but by this time it was clear that this was not the case. 59% of Democratic voters favoured a government policy requiring that citizens remain confined to their homes at all times, except for emergencies, if they refuse to get a COVID-19 vaccine.

55% of Democratic voters would support a proposal for federal or state governments to fine Americans who choose not to get a COVID-19 vaccine. 48% of Democratic voters think federal and state governments should be able to fine or imprison individuals who publicly question the efficacy of the existing COVID-19 vaccines on social media, television, radio, or in online or digital publications. 47% of Democrats favoured a government tracking programme for those who won't get the COVID-19 vaccine. 45% of Democrats favoured governments requiring citizens to temporarily live in 'designated facilities' or locations if they refuse to get a COVID-19 vaccine. 29% of Democratic voters supported temporarily removing parents' custody of their children if parents refuse to take the COVID-19 vaccine. Among voters who have a very favourable impression of Biden, 51% were in favour of government putting the unvaccinated in 'designated facilities', and 54% in favour of imposing fines or prison sentences on vaccine critics.

2.8.2.5 Conclusion

Resisting the lockdown lunacy was possible, but it required either a strong political will (such as in Belarus, Nicaragua, and some US states), or strong constitutional provisions that prevented weak governments from imposing lockdowns (such as in Sweden and Japan) (Swiss Policy Research, 2023c). In summary, lockdowns were sustained because the fearful public assumed that because they were implemented, they must be necessary, so supported them. Whilst politicians continued to appease the median voter. Meanwhile, the media printed what their customers appreciated, sustaining their irrational fear.

2.9 Conclusion

Most of the quality empirical research is consistent with lockdowns having no significant impact on the transmission of COVID-19. Whilst there is overwhelming evidence that lockdowns have had negative impacts on physical and mental health. With, most notably, an increase in heart disease deaths and the diagnosis and treatment of cancer being compromised, lockdowns have caused significant collateral damage. Not to mention the huge financial costs in the form of tax rises and inflation. Children and the third world had the least to gain and the most to lose from lockdowns, and the costs were severe and long-term. To conclude, the data is consistent with lockdowns having no significant impact on COVID-19 infections or deaths, with an increase in non-COVID-19 deaths in both the short term and the long term, and a long-term financial burden.

2.9.1 Australia

Foster and Frijters (2024) argued that the lockdowns enacted in Australia and elsewhere in 2020 and 2021 were a disproportionate and largely ineffective policy response to COVID-19. The first author, Professor Gigi Foster, an economist at the University of New South Wales (UNSW), stated that COVID-19 lockdowns would go down eventually as the worst peace-time policy failure in Australia's history (Barnett, 2024f).

2.9.2 Sweden

In a Cato Institute publication, Norberg (2023) concluded that Sweden's laissez-faire approach seemed to have paid off. He noted that Sweden did much better than other countries in terms of the economy, education (elementary school students have not suffered learning losses), mental health and domestic abuse, and still came away from the pandemic with fewer excess deaths than in almost any other European country. Jacoby (2023) pointed out that, considering every important measure—health, the economy and education, Sweden had the right response to COVID-19. In September 2023 the UK Health Security Agency head, Jenny Harries, suggested

that if the UK were to face another pandemic, they would take a more Swedish approach to social distancing (Nuki, 2023).

2.9.3 United Kingdom

In economics, an *externality* is an indirect cost or benefit to an uninvolved third party that arises as an effect of another party's (or parties') activity. Whyte (2023) identifies two flaws in using externalities to justify lockdowns. Firstly, external costs are often accepted voluntarily. Someone might visit the pub during the pandemic, because according to their own utility the benefits outweigh the costs. Secondly, when a government is making a decision for everyone, they are not bearing the costs and benefits of their actions to any significant degree. In short, the government should have left each individual to decide for himself how to respond. The author notes that lockdowns were merely a dramatic example of a mistake politicians make all the time.

After flip-flopping during the pandemic, in September 2023 the UKHSA discovered that 'there is a lack of strong evidence on the effectiveness of NPIs to reduce COVID-19 transmission, and for many NPIs the scientific consensus shifted over the course of the pandemic' (Duval et al., 2023; Heneghan & Jefferson, 2023l). Well, yes. The problem with the early lockdown models is that they assumed that lockdowns worked, and disregarded voluntary changes in behaviour (Simmons, 2023a). The models vastly exaggerated hospitalisations, beds occupied and deaths.

The lockdowns were a mistake. In the UK Nick Rendell wrote in November 2023: 'While I suppose panic may account for the adoption of this policy in March 2020 it looks nothing short of criminal to have opted for lockdown again in November 2020 and January 2021, and still to be defending it now' (Rendell, 2023b). In June 2024, Nigel Farage said that 'I actually believe the long-term economic and psychological damage from lockdowns two and three perhaps represents the biggest mistake any British government, supported by the opposition, has ever made in peacetime' (W. Jones, 2024i). He presumably, wrongly, excluded the first lockdown because he supported it at the time. Grant (2024) reported that by January 2024, it was becoming clear that much of what happened during the COVID-19 era was a mistake. One by one, the myths of lockdown were crumbling. Even the UK's Covid-19 Inquiry essentially admitted that lockdown was a mistake (Green, 2024). Baroness Hallett's team concluded that 'the imposition of a lockdown should be a measure of last resort [...] indeed, there are those who would argue that a lockdown should never be imposed'.

In October 2023 Sikora (2023c) noted that lockdown sceptics were rapidly being vindicated. In September 2023 Kate Andrews pointed out in *The Telegraph* that it would be nice to forget about the lockdown (K. Andrews, 2023b). However, she reminds us, many cannot. For example, the thousands of children who never returned to school, or the millions of people on NHS waiting lists. The lockdowns have given us the highest tax burden in over 70 years. But it's worse than that, there is now a far greater demand for health and welfare. The public have become accustomed to the government stepping in to provide financial support for salaries, energy bills and even mortgage payments. The cost and impact of lockdowns should never be forgotten. Daniel Hannan pointed out in June 2024 that a lot of people have edited their memories, and now complain about restrictions which, at the time, they wanted to be harsher (Hannan, 2024). Paradoxically, both Boris Johnson and Rishi Sunak were more sceptical of the lockdown than most of those who now blame them for it. Keir Starmer opposed the loosening of restrictions, and even wanted them reimposed at the end of 2021. In the UK in May 2024, McGrogan (2024) reported that those who brought about the lockdown were unrepentant. They think of the lockdown as an inevitable response to an act of God, rather than a political decision which involved making many foreseeable trade-offs that would have serious long-term repercussions.

2.9.4 United States

In his book *COVID-19: The Science vs. The Lockdowns*, M. G. Betrus (2021) explained how the lockdowns betrayed the science. Nocera and McLean (2023b) pointed out that 'there was never any science behind lockdowns — not a single study had ever been undertaken to measure their efficacy in stopping a pandemic'. The lockdowns, they say, were little more than a giant experiment. One that turned out to be a failure.

In November 2023 Jeffrey Tucker reported that anti-lockdown sentiment had gone mainstream (Tucker, 2023a). He noted that 'Lockdowns were always an impossible means of pandemic management. We knew that from a century ago. It was not even controversial. The orthodoxy in public health survived even up to a few weeks before the lockdowns began.'

2.9.5 Global

The film 'COVID Collateral' takes a sceptical view of government policies that, in retrospect, caused more harm than the virus itself, and exposes the political suppression of science that led to lockdowns (Thacker, 2024c). Whilst Changizi (2024b) gave a hierarchy of arguments against COVID-19 interventions:

1. There was no emergency, and the data showed this in March 2020.
2. Even if the data were unclear, uncertainty does not justify overturning society.
3. Even if the data about a perceived pandemic appeared certain, one should doubt it, because people have an instinctual fear of the mythical pandemic, and are prone to seeing one where there isn't one.
4. The interventions did not slow the spread, were recommended against as of 2019, and were only done out of panic, looking to be doing something, and copycatting other nations.
5. Even if the interventions had narrowly slowed the spread, no cost–benefit analysis was done demonstrating that the benefits outweighed the harms. Instead, the one thing—infections—received infinite weight to all else. The interventions in fact had epic harms.
6. Even if the interventions had narrowly slowed the spread and cost–benefit analyses were in its favour (and we could trust the analysis wasn't biased), such analyses never consider the inevitable creation of an 'unclean' out group, those sceptical of the interventions thrust upon society, who can easily become the victims of democide, and if that happens the mainstream community will only say to themselves, 'good riddance'.
7. Even if the interventions worked and had no harms of any kind, people would do them voluntarily.
8. Even if the interventions worked etc. and people wouldn't do them voluntarily, our civil liberties are *for* the perceived emergencies.

3 Face Masks

3.1 Introduction

In some ways, masks have come to represent the face of lockdowns. Face masks were introduced in the UK partly due to The Royal Society and the DELVE group (Sidley, 2023a).

Surgical face masks were originally developed to contain and filter droplets of microorganisms expelled from the mouth and nasopharynx of healthcare workers during surgery, in order to provide protection for the patient (Vincent & Edwards, 2016) (although they fail to do this (Tunevall, 1991)). Masks were later adopted to protect healthcare workers against acquiring infection from their patients (they also fail to do this (Jefferson et al., 2020)).

Girardot (2022b) pointed out that we are all already effectively wearing a mask. Nature has given us an air filtration system that is optimised for our bodies and for respiration. We have evolved to have nostrils, nasal hair, a vortex-creating topography, tonsils and mucus to trap and process most of the infectious material thrown at it. Also, our immune system needs to regularly sample and test from the environment, as this is how mucosal immunity is maintained during a pandemic. Note also that regardless of how effective masks are, COVID-19 can be transmitted through the eyes (Dawood, 2021).

In this section we shall consider masks worn in healthcare, in the community and by children. Masks either work or they don't, in all settings. But the point rather is that we can assume that they are worn correctly within healthcare, intermediate within the community and poorly by children. It is worth being mindful of the hierarchy of evidence: meta-analysis and systematic reviews are best, and randomised controlled trials trump observational studies. Although Mowrey (2022a) argued that randomised controlled trials (RCTs) cannot be used to evaluate the reality of masks.

3.2 Exhaled Particles

Before considering masks, we shall first consider the size and infectivity of virus particles. First, let us first consider the pre-COVID-19 literature.

To put particle size in context, note that cigarette smoke particle sizes are 0.1–1.0 µm in diameter, with a mode of 0.21 µm and a geometric mean of 0.23 µm (Keith & Derrick, 1960). How large, or small, are exhaled particles? Almstrand et al. (2010) found that the most frequent diameter of an exhaled particle is 0.3–0.4 µm or smaller. K. Schwarz, Biller, Windt, Koch, and Hohlfeld (2010) found that a healthy person exhales particles of diameter 0.1–1.0 µm, with a count median diameter of 0.3 µm. Whilst according to Gralton, Tovey, McLaws, and Rawlinson (2011), individuals expel particles in the range 0.01–500 µm .

What size are infectious particles? Individuals expel particles associated with infection in the range 0.05–500 µm (Gralton et al., 2011). Infectious particles sized less than 10 µm have more serious health implications because they are able to penetrate deeper into the lower respiratory tract to establish infection.

What is the minimum amount of a virus required to cause infection? A *virion* is an entire (infectious) virus particle. Zwart et al. (2009) provided qualitative experimental evidence that the action of a single virion is sufficient to cause disease (Wageningen University and Research Centre, 2009).

3.2.1 Influenza

In a study on influenza, Yan et al. (2018) found that humans generate infectious aerosols. Sneezing is rare and not important for, and coughing is not required for, influenza virus aerosolisation. The *minimum infective dose* (*MID*) or *infectious dose* is the smallest quantity of a pathogen (e.g. a virus, bacterium or parasite) required to establish an infection in a host. It is the lowest

number of infectious units needed to cause a detectable infection, which may or may not lead to symptoms. According to Basu (2020), the infective dose of influenza A virus infection is 1950–3000 virions. Whilst the nasal infectious dose of influenza A is several orders of magnitude larger than the airborne infectious dose (T. P. Weber & Stilianakis, 2008). With influenza, Milton, Fabian, Cowling, Grantham, and McDevitt (2013) determined that fine particles (smaller than 5 µm) contained 8.8 times more viral copies than did coarse particles (larger than 5 µm). The infectious dose via aerosol is about two orders of magnitude lower than via large droplets. With reference to the influenza A virus, Teunis, Brienen, and Kretzschmar (2010) determined that the probability of infection from an aerosol (3 µm) or a droplet (100 µm) was approximately equal. Although the droplet provided a slightly higher risk of illness due to the higher doses involved. Nicas and Jones (2009) calculated the relative contributions of four exposure pathways (surface contact ('fomites'), airborne respirable cough particles (< 10 µm), airborne nonrespirable cough particles (between 10 µm and 100 µm) and cough droplets (> 100 µm)) to influenza infection risk. If the infectivity of a virus deposited in the lower respiratory tract is the same as that for the upper respiratory tract, fomite transmission dominates. Whilst if the infectivity of a virus deposited in the lower respiratory tract is much greater than the upper tract, droplets contribute the most, followed by fomites, then respirable particles. Influenza A virus can survive in aerosols for several hours and on hands for a few minutes (T. P. Weber & Stilianakis, 2008).

3.2.2 COVID-19

3.2.2.1 Aerosols

In a *Wired* article, Molteni (2021) tells the historical tale of why the WHO were slow to catch on to the fact that SARS-CoV-2 is airborne. Essentially, due to a decades-old misunderstanding, the droplet–aerosol dichotomy was assumed to pivot around 5 µm, whilst it should have pivoted around 100 µm. In a pretentious but otherwise reasonable article, Greenhalgh, Ozbilgin, and Contandriopoulos (2021) argue that scientific and policy bodies failed to acknowledge and act on the evidence base for airborne transmission of SARS-CoV-2 in a timely way because the dominant actors were those working in infectious disease control, notably hospital clinicians aligned with the evidence-based medicine movement, who promoted the droplet theory of transmission, whilst aerosol scientists—typically, chemists and engineers—were systematically excluded from key decision-making networks and committees. In a review, Sosnowski (2021) discussed the role of aerosols in SARS-CoV-2 transmission from a biophysical perspective. The respiratory system may be considered a sequential filter. Upon inhalation, different mechanisms of flow and deposition allow aerosols to arrive at various levels of the respiratory system and land with size-dependent efficiency on the surface covered by protective liquid layers of the bronchial mucus or pulmonary surfactant. Interactions with these lung fluids can affect the fate and activity of the virus in a given lung region. Lednicky et al. (2020) showed that patients with respiratory manifestations of COVID-19 produce aerosols that contain viable SARS-CoV-2, and these aerosols may serve as a source of transmission of the virus. Note that droplets that evaporate into aerosols are even more dangerous than original aerosols because they contain a droplet-size quantity of viruses, but are concentrated down into a tiny aerosol (Burch, 2020). Edwards et al. (2021) observed that 18% of human subjects accounted for 80% of the exhaled bioaerosol of a group.

3.2.2.2 Particle Size

What size are exhaled particles containing SARS-CoV-2? Basu (2020) established that the most common size of COVID-19 droplets that are deposited at the nasopharynx (infection sites) are in the range of 2.5–19 µm. Whereas Edwards et al. (2021) found that with rhesus macaques and African green monkeys the majority of exhaled breath particles were 0.3 µm or smaller. In a

letter to *The New England Journal of Medicine* in April 2020, Meselson (2020) pointed out that so-called 'super spreaders' produce many more aerosol particles, with diameters in the micron range, than other persons. These particles are too small to settle due of gravity, but are carried by air currents and dispersed by diffusion and air turbulence, and have only a slight reduction in infectivity during a 3-hour period. Exhaled respiratory droplet number increases with degree of COVID-19 infection, body mass index (BMI) and age (Edwards et al., 2021).

A *viable virus* is a virus that is capable of infecting a host cell and replicating. What size is a viable virus? B. U. Lee (2020) calculated that the minimum size of a respiratory particle that can contain SARS-CoV-2 is approximately 9.3 µm. Although the minimum size of the particles can decrease due to the evaporation of water on the particle surfaces. Whereas high viral loads can decrease the minimum size of respiratory particles containing SARS-CoV-2, thereby increasing the probability of aerosol generation of the viruses. Santarpia et al. (2021) determined that SARS-CoV-2 RNA exists in respired aerosols less than 5 µm in diameter. However, according to Basu (2021), the probability of droplets smaller than 5 µm carrying a SARS-CoV-2 virion is often insignificant; e.g. the probability of containing a virion is only around 1.7% for a 5 µm droplet. Lednicky et al. (2021) isolated SARS-CoV-2 from the air in a car driven by a COVID-19 patient with mild illness. Only viable virions can cause disease. Remarkably, viable virus was *only* detected in the size range of 0.25–0.50 µm.

The minimum infective dose of SARS-CoV-2 is estimated to be of the order of 100 particles (Basu, 2021; Karimzadeh et al., 2021). In her book, M. K. Mansell (2022) stated that respiratory emissions from a transmissible individual can be shown to reach 100,000–750,000 virions per minute. Whilst the minimum infective dose is estimated to be 100–1000 virions, and one exhale is capable of containing enough viral load to infect five or more people.

3.2.2.3 Duration

The infectivity of a SARS-CoV-2 virus decreases through time, and after 20 minutes it is about 10% of the starting value (Oswin et al., 2022). In an article published in *NEJM*, van Doremalen et al. (2020) found that SARS-CoV-2 remained viable in aerosols throughout the duration of their experiment (3 hours), but had an exponential decay in virus titre across all experimental conditions. Fears et al. (2020) found that SARS-CoV-2 retained infectivity and virion integrity for up to 16 hours in respirable-sized aerosols.

3.3 Effectiveness of Face Masks

Now we shall consider masks, and their effectiveness. In November 2020, Berenson (2020d) reported that the proof that masks do any good was far weaker than almost anyone understood. Let's review the literature.

3.3.1 Effectiveness of Face Masks as a Filter

First, let us consider the ability of masks to act as a filter.

C.-C. Chen and Willeke (1992) measured the collection efficiencies of surgical masks with two aerosol-size spectrometers. They concluded that, although surgical mask media may be adequate to remove bacteria exhaled or expelled by health care workers, they may not be sufficient to remove the submicrometer-sized aerosols containing pathogens to which these health care workers are potentially exposed.

Some studies used manikins to measure the effectiveness of masks as a filter. Bowen (2010) tested three different masks and an N95 respirator using a Styrofoam manikin head fitted with a sample probe and a nebulizer. The protective efficiencies were 89.6% for the N95 respirator, 33.3% for the surgical mask, 11.3% for the bandana and 6.1% for the dust mask. The author concluded that all three masks offer very little protection when compared to the N95, and

wearing these face masks may produce a false sense of protection. Sterr, Nickel, Stranzinger, Nonnenmacher-Winter, and Günther (2021) conducted experiments on a manikin head in a chamber using generated aerosol particles (0.3–2 µm) to determine the filtration efficiency of masks as a protector. The efficiency of cloth masks was 11.3%, and non-EU-certified face masks 14.2%. Shah, Kurelek, Peterson, and Yarusevych (2021) tested the efficiencies of masks as a source control experimentally by using a seated manikin in an indoor environment and measuring the dispersion and accumulation of exhaled aerosol particles (produced by atomizing olive oil into particles with a mean diameter of about 1 µm). Their results showed that the apparent exhalation filtration efficiency of cloth masks was 10%, and surgical masks 12%.

Tessarolo et al. (2021) reported the effort of seven Italian university laboratories who set up facilities for testing face masks during the emergency period of the COVID-19 pandemic. Data on differential pressure (DP) and bacterial filtration efficiency (BFE) of 120 masks, including different materials and designs, were collected over three months. More than 60% of the masks satisfied requirements for DP and BFE set by the standard. Masks made of nonwoven polypropylene with at least three layers (spunbonded–meltblown–spunbonded) showed the best results, ensuring both good breathability and high filtration efficiency. The masks were not tested on humans, or with COVID-19.

3.3.1.1 Influenza

In an article published by the Center for Biosecurity of UPMC on mitigation measures for the control of pandemic influenza (Inglesby et al., 2006), the authors state that 'studies have shown that the ordinary surgical mask does little to prevent inhalation of small droplets bearing influenza virus'. With influenza, Milton et al. (2013) determined that surgical masks reduced viral copy numbers in the fine fraction by 2.8-fold and in the coarse fraction by 25-fold. Overall, surgical masks produced a 3.4-fold reduction in viral aerosol shedding. N. H. L. Leung et al. (2020) collected exhaled breath from participants infected by seasonal human coronavirus, influenza virus or rhinovirus with and without a surgical face mask. For coronavirus, surgical masks reduced the detection of viral copies in large respiratory droplets and in aerosols. For influenza virus, surgical masks efficaciously reduced the emission of influenza virus particles into the environment in respiratory droplets, but not in aerosols. For rhinovirus, there were no significant differences between detection of virus with or without face masks, both in respiratory droplets and in aerosols.

3.3.1.2 COVID-19

Ueki et al. (2020) conducted experiments using two manikin heads inside a test chamber, one 'infected' with COVID-19, and the other uninfected. They used an exhaled mist of virus suspension with particle sizes of 20% $<$ 3 µm, 40% 3–5 µm and 40% 5–8 µm. With various combinations of masks worn by the two manikin heads, they measured virus titres and the copy numbers of viral RNA after twenty minutes, as shown in Table 1. The experiments showed that masks work

Table 1: For each entry, the first number represents virus titres, and the second the copy numbers of viral RNA. The numbers are percentages relative to the scenario where no masks are worn. Source: Ueki et al. (2020).

		Receiver			
		None	Cotton	Surgical	N95
Spreader	None	100/100	83/63	53/50	43/14
	Cotton	35/43	32/33	26/31	18/11
	Surgical	35/50	40/31	29/24	31/12
	N95	5/4			

better as a source control (a mask worn by an infected person protects an uninfected person not wearing a mask), than as a protector of an uninfected person wearing the mask. In summary, with cotton/surgical masks, when used as a source control masks reduced the virus measured by 60%, when used as a protector, masks reduced the virus measured by 38%, and when used by both, masks reduced the virus measured by 69%.

In the US, Adenaiye et al. (2022) recruited COVID-19 cases to give blood, saliva, mid-turbinate and fomite (phone) swabs, and 30-minute breath samples whilst vocalising into a Gesundheit-II, with and without masks at up to two visits two days apart. They detected SARS-CoV-2 RNA in 36% of fine (≤5 µm), 26% of coarse (>5 µm) aerosols, and 52% of fomite samples overall. Masks reduced viral RNA by 48% in fine aerosols and by 77% in coarse aerosols. Cloth and surgical masks were not significantly different. The quantity of viral RNA in the fine-aerosol fraction was 1.9-fold greater than in the coarse-aerosol fraction. Also in the US, J. Lai et al. (2024) compared the efficacy of masks (cloth and surgical) and respirators (KN95 and N95) as source control for SARS-CoV-2 viral load in exhaled breath of volunteers with COVID-19 using a controlled human experimental study with a Gesundheit-II human exhaled bioaerosol collector. N95 respirators reduced viral load in total exhaled breath aerosol by 98%, cloth masks by 87%, surgical masks by 74% and KN95 respirators by 71%. It could be that to some extent masks redirect the viral load backwards, which would be less likely to be picked up by the bioaerosol collector. Of course, what actually matters is clinical outcomes, which are not measured. The authors failed to reference the Cochrane review.

3.3.2 Face Mask Fit

If masks are not fitted correctly, such that there is leakage around the mask perimeter, this results in a notable decrease in mask efficiency (Shah et al., 2021). Oberg and Brosseau (2008) evaluated the filter performance and facial fit of nine surgical masks. They concluded that none of the masks exhibited adequate filter performance and facial fit characteristics to be considered respiratory protection devices. All subjects failed their first qualitative fit test when masks were donned without assistance, and most failed it after receiving assistance. In a cohort study of healthcare workers practising N95 respirator reuse, R. C. Wang et al. (2024) found that the incidence of fit failure after one shift was 38.7%.

If a surgical mask has a filtration efficiency of 100%, with a leak of just 2% of the area the filtration efficiency is reduced to 50% for particles of size 0.03–2.5 µm and 25% for particles of size 10 µm (Drewnick et al., 2021). See Table 2.

Table 2: Filtration efficiency for surgical masks, for particles of size 0.03–2.5 µm and 10 µm. Source: Drewnick et al. (2021).

Area of leakage	Filtration efficiency	
	0.03–2.5 µm	10 µm
0.0%	100%	100%
0.5%	88%	65%
1.0%	71%	47%
2.0%	50%	25%

Ortiz, Ghasemieshkaftaki, and Bluyssen (2021) assessed the fit of masks by testing the outward leakage of exhaled breath based on the visualisation of coloured mist exhaled by a manikin head. Results are shown in Table 3. Masks, unsurprisingly, reduce the volume of particles travelling forwards, but increase the volume of particles travelling sideways. Although the mask reduced the volume of particles moving forwards by 64%, it reduced the total volume of particles by just 30%.

Table 3: Outward leakage of masks. Source: Ortiz et al. (2021).

	No mask	Mask	Total
Front	36.7%	13.2%	49.9%
Side	6.4%	17.0%	23.4%
Total	43.1%	30.2%	

3.3.3 Face Masks in General

Above we have essentially considered the degree to which masks could work as a filter. However, what we are really interested in measuring is actual *clinical outcomes*.

3.3.3.1 Pre-COVID-19

Shooter, Smith, and Hunter (1959) found that surgical masks protect the area in front of the mouth from many of the wearer's mouth and nose organisms, and there was some evidence that they reduced the number of staphylococci shed. In a review, Cowling, Zhou, Ip, Leung, and Aiello (2010) concluded that whilst there is some experimental evidence that masks should be able to reduce the infectiousness of the person wearing the mask under controlled conditions, there is less evidence on whether this translates to effectiveness in natural settings. Whilst there is little evidence to support the effectiveness of wearing face masks to reduce the risk of becoming infected.

In a systematic review and meta-analysis, Long et al. (2020) tested the effectiveness of N95 respirators versus surgical masks against influenza. The use of N95 respirators compared with surgical masks was not associated with a lower risk of laboratory-confirmed influenza. The authors concluded that N95 respirators should not be recommended for the general public or non-high-risk medical staff who are not in close contact with influenza patients or suspected patients.

In an April 2020 update of a Cochrane review, a systematic review and meta-analysis of 14 randomised trials investigating the effect of masks in healthcare workers and the general population was conducted (Jefferson et al., 2020). Compared to no masks, there was no reduction of influenza-like illness (ILI) cases or influenza for masks in the general population, nor in healthcare workers. Whilst there was no difference between surgical masks and N95 respirators for ILI or for influenza.

3.3.3.2 COVID-19

Ian Miller, an expert on face masks, stated that 'Every available piece of high quality evidence has consistently shown that masks do not work to prevent the spread of highly infectious respiratory viruses' (I. Miller, 2023g). Høeg, Haslam, and Prasad (2023) conducted a retrospective cross-sectional study of *Morbidity and Mortality Weekly Report* publications pertaining to masks from 1978 to 2023. The publications drew positive conclusions about mask effectiveness >75% of the time despite only 30% testing masks and <15% having statistically significant results. No studies were randomised, yet over half drew causal conclusions. The level of evidence generated was low and the conclusions were most often unsupported by the data.

Now, most importantly, what do systematic reviews—especially of randomised controlled trials (RCTs)—tell us? Chu et al. (2020) conducted a systematic review and meta-analysis of studies on MERS, SARS and COVID-19 in healthcare and community settings to investigate the optimum distance for avoiding person-to-person virus transmission and to assess the use of face masks and eye protection to prevent the transmission of viruses. They concluded that physical distancing, face masks and eye protection worked. However, there were no RCTs. In the public

policy magazine *City Journal*, J. H. Anderson (2021a) reviewed the evidence on masks. In sum, of 14 RCTs that tested the effectiveness of masks in preventing the transmission of respiratory viruses, eleven suggested that masks are either useless or actually counterproductive. A further, January 2023, update to the Cochrane review (another systematic review and meta-analysis that included healthcare and community settings) confirmed that there was no significant evidence that wearing masks in the community reduces the spread of colds, the flu or COVID-19 (Jefferson et al., 2023). Consider the RCTs that use the more reliable outcome of laboratory-confirmed influenza/SARS-CoV-2. If masks work, the risk ratio should be significantly less than 1. The RCTs for masks vs no masks that tested for laboratory-confirmed influenza/SARS-CoV-2 had a pooled risk ratio of 1.01. Whilst the RCTs for N95/P2 respirators vs medical/surgical masks that tested for laboratory-confirmed influenza infection had a pooled risk ratio of 1.10. In another critical review that included COVID-19 and other respiratory infections in healthcare and community settings, I. T. Liu, Prasad, and Darrow (2023) found that fourteen of sixteen identified RCTs comparing face masks to no mask controls failed to find statistically significant benefit in the intent-to-treat populations. Of sixteen quantitative meta-analyses, eight were equivocal or critical as to whether evidence supported a public recommendation of masks, and the remaining eight supported a public mask intervention on limited evidence primarily on the basis of the precautionary principle.

3.3.4 Face Masks in Healthcare

3.3.4.1 Pre-COVID-19

First, let us review the literature on the effectiveness of face masks in healthcare before the pandemic, in chronological order. In an operating theatre in the UK, throughput, wounds and infection rates were measured during a 6-month period (March–August) over 5 years (Orr, 1981). Masks were worn for the first four years, but no masks were worn in the final year. When masks were not worn, the number of infections per wound fell from 4.4% to 1.9%. In other words, it appears that wearing masks over doubled the rate of infections! Furthermore, the 8 infections that did occur bore no relation to the throat or nose cultures from the theatre team. The authors concluded that the wearing of a mask has very little relevance to the well-being of patients undergoing routine general surgery and it is a standard practice that could be abandoned. In the US, Laslett and Sabin (1989) prospectively evaluated the experience of 504 patients undergoing percutaneous left heart catheterization, seeking evidence of a relationship between whether caps and/or masks were worn by the operators and the incidence of infection. No infections were found in any patient, regardless of whether a cap or mask was used. Thus, they found no evidence that caps or masks need to be worn during percutaneous cardiac catheterization. In Sweden, Tunevall (1991) found that masks worn by surgeons do not protect the patient from wound infections. In a controlled study with 3088 patients, the number of postoperative wound infections was actually *higher* when masks were worn (4.7%) than when no masks were worn (3.5%). In the UK, N. J. Mitchell and Hunt (1991) conducted an experiment in an operating room by monitoring airflow and mouth and nose bacteria dispersal and concluded that the wearing of face masks by non-scrubbed staff working in an operating room with forced ventilation seems to be unnecessary. Whilst in the US, Belkin (1997) reported that there was no evidence that surgical masks reduced surgical wound infection. Bahli (2009) conducted a systematic literature review and analysis of all available randomised controlled trials regarding use of surgical face masks in elective surgeries. No significant difference in the incidence of postoperative wound infection was observed between masked groups and groups operating with no masks. There was no increase in infection rate in 1980 when masks were discarded. In fact there was a significant decrease in infection rate ($p < 0.05$). In Japan, Jacobs et al. (2009) conducted a randomised controlled trial to test whether surgical face masks reduced the incidence of the common cold when worn by health care workers. They concluded that face mask use in health care workers

did not provide a benefit in terms of cold symptoms or getting colds. In 2009 Raina MacIntyre, the author of various articles on face masks, stated that 'it would not seem justifiable to ask healthcare workers to wear surgical masks' (Phend, 2009). In Canada, Loeb et al. (2009) found that in a healthcare setting, the incidence of laboratory-confirmed influenza was similar for nurses wearing a surgical mask and those wearing an N95 respirator (surgical masks had an estimated efficacy within 1% of N95 respirators). Note that this result is consistent with both the masks and respirators having no effect. Eisen (2011) reviewed the available evidence for the efficacy of surgeon's garb in reducing surgical site infections. Masks have not been shown to reduce overall bacterial counts within the operatory. Several studies have failed to show reductions in surgical site infections (SSIs) with the use of masks. The numbers of *Staphylococcus* originating from the oropharynx are insignificant compared with those from the skin and may explain the lack of dramatic SSI reduction with mask use. A 2014 report from the Center for Infectious Disease Research and Policy, University of Minnesota, states categorically that no clinical trials have ever demonstrated that surgical masks are effective even for their original purpose of preventing wound infection by healthcare workers' emission of respiratory particles (Brosseau & Jones, 2014). In a 2014 review, Salassa and Swiontkowski (2014) concluded that the current literature had been unable to support the use of surgical masks in reducing rates of surgical site infection in the operating room, although the evidence was somewhat limited.

In Vietnam, MacIntyre et al. (2015) conducted a cluster randomised trial to compare the effectiveness of cloth masks with medical masks in healthcare workers. Those wearing cloth masks had significantly higher rates of influenza-like illness compared with the control arm (standard practice, which may or may not include mask use), likely due to moisture retention, reuse and poor filtration. In a review, Da Zhou, Sivathondan, and Handa (2015) considered the evidence base behind the use of face masks in surgery, and concluded that, overall, there was a lack of substantial evidence to support claims that face masks protect either patient or surgeon from infectious contamination. Under laboratory experimental conditions, N95 respirators are superior to surgical masks for filter penetration, face-seal leakage and total inward leakage. However, J. D. Smith et al. (2016) conducted a systematic review and meta-analysis of clinical studies on the effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection, and found no significant difference between N95 respirators and surgical masks in associated risk of (a) laboratory-confirmed respiratory infection, (b) influenza-like illness, or (c) reported workplace absenteeism. These results are consistent with both N95 respirators and surgical masks having no effect. Also, masks can be shown to 'work' under laboratory experimental conditions, but fail to work in the real world. In an excellent review paper published in 2016, John Hardie explained why face masks don't work in the context of dentistry (Hardie, 2016). Face masks are worn for historical reasons (they have been worn by dental personnel for decades), because they are cheap, safe and give the appearance of doing something, rather than for evidential reasons. The author also states that 'wearing a mask during surgery has no impact whatsoever on wound infection rates during clean surgery', 'the filter material of face masks does not retain or filter out viruses or other submicron particles', 'neither the filter performance nor the facial fit characteristics of face masks qualify them as being devices which protect against respiratory infections' and 'there are no convincing scientific data that support the effectiveness of masks for respiratory protection'. In a systematic review and meta-analysis on the protective effect of face masks and respirators against respiratory infections among healthcare workers, Offeddu, Yung, Low, and Tam (2017) found no clear benefit of either medical masks or N95 respirators against pandemic H1N1 influenza (pH1N1). Although their meta-analysis of randomised controlled trials (RCTs) indicated a protective effect of masks and respirators against clinical respiratory illness (CRI) (risk ratio (RR) = 0.59) and influenza-like illness (ILI) (RR = 0.34). In China, MacIntyre et al. (2017) examined the efficacy of medical masks and respirators in protecting against respiratory infections in healthcare workers using pooled data from two homogenous randomised control clinical trials. The authors could not

demonstrate the efficacy of medical masks against any outcome, but demonstrated superior clinical efficacy of continuous use of an N95 respirator. Two of the authors had connections with 3M, a mask manufacturer. Autorino et al. (2019) reported that the use of face masks and surgical caps by inhabitants in the operating room had not been shown to impact surgical site infection rates, but with the limited evidence available a recommendation for or against patient usage could not be made. Radonovich et al. (2019) conducted a randomised clinical trial comparing the effect of N95 respirators vs medical masks for preventing influenza among healthcare personnel. They concluded that among outpatient healthcare personnel, N95 respirators vs medical masks as worn by participants in the trial resulted in no significant difference in the incidence of laboratory-confirmed influenza. In a systematic review, Dugré et al. (2020) found that in health care workers, surgical masks were superior to cloth masks for preventing influenza-like illness (RR = 0.12), and N95 masks were likely superior to surgical masks for preventing influenza-like illness (RR = 0.78) and any clinical respiratory infections (RR = 0.95). MacIntyre and Chughtai (2020) conducted a systematic review of the efficacy of face masks and respirators against coronaviruses and other respiratory transmissible viruses. Randomised controlled trials in health care workers showed that respirators, if worn continually during a shift, were effective but not if worn intermittently. Whilst medical masks were not effective, and cloth masks were even less effective.

3.3.4.2 COVID-19

Now let us consider the literature on face masks in healthcare in the context of COVID-19. More than anywhere, masks have been ubiquitous in hospitals and other healthcare settings. In the UK, the NHS attempted to justify their mask policies by citing flawed studies and computational modelling (Sidley, 2022b, 2022d). An article published in *NEJM* stated that the extent of the marginal benefit of universal masking in healthcare over and above foundational measures is debatable (Klompas, Morris, Sinclair, Pearson, & Shenoy, 2020). Requirements to wear surgical masks in a large London hospital during the first ten months of Omicron activity (December 2021 to September 2022) made no discernible difference in reducing hospital-acquired SARS-CoV-2 infections (European Society of Clinical Microbiology and Infectious Diseases, 2023). Patterson, Mehra, and Breathnach (2023) analysed routinely collected infection control data on nosocomial SARS-CoV-2 infection over a 40-week period from a large South West London hospital using a controlled interrupted time series design. The intervention was the removal of a staff/visitor surgical mask-wearing policy for the majority of wards at week 26 of this period (study group) with a subset of specific wards retaining the mask policy (control group). They found no evidence that a mask policy significantly impacted the rate of nosocomial SARS-CoV-2 infection with the Omicron variant. In a systematic review and meta-analysis Kunstler et al. (2022) examined the differences in likelihood of SARS-CoV-2 infection among healthcare workers using respirators and surgical masks. Twenty-one studies were included, with most having a high risk of bias. There was no statistically significant difference in respirator or surgical mask effectiveness in preventing SARS-CoV-2 infection (odds ratio (OR) = 0.85).

3.3.5 Face Masks in the Community

We are interested in quality evidence, which means randomised controlled trials with clinical outcomes, and we are especially interested in the effectiveness of face masks when worn in the community.

3.3.5.1 Influenza

Let us first consider the effectiveness of face masks against influenza, when worn in the community. Again, we shall consider the literature in chronological order. Back in 1921, in a monograph

for *The American Journal of Hygiene*, Warren Vaughn wrote 'Certainly the face mask as extensively used during the 1918 epidemic was of little benefit and in many cases was, without a doubt, a decided detriment' (Vaughan, 1921). He concluded that 'It is safe to say that the face mask as used was a failure'. In 2006 the WHO (2006b) published an article on nonpharmaceutical interventions for pandemic influenza, which stated that routine mask use in public places should be permitted but not required. Canini et al. (2010) conducted a cluster randomised intervention trial in France during the 2008–2009 influenza season. Influenza-like illness was reported in 24/148 (16.2%) of the contacts in the intervention arm and 25/158 (15.8%) of the contacts in the control arm. They observed a good adherence to the intervention. In various sensitivity analyses, the authors did not identify any trend in the results suggesting effectiveness of face masks. In conclusion, they did not show any significant difference in influenza-like illness (ILI) proportion among household contacts between the intervention arm and the control arm. The authors note that their study was clearly underpowered due to its premature termination. The early stopping was because H1N1v emerged and the French national preparedness included mass distribution of surgical face masks in households. In other words, the study evidenced that face masks don't work, but was compromised because the French authorities assumed that face masks worked. The UK Department of Health's influenza pandemic preparedness strategy document (Department of Health, 2011) stated that 'Although there is a perception that the wearing of facemasks by the public in the community and household setting may be beneficial, there is in fact very little evidence of widespread benefit from their use in this setting.' In an article published in *Influenza and Other Respiratory Viruses*, bin Reza, Chavarrias, Nicoll, and Chamberland (2012) undertook a systematic review of masks and respirators to help inform pandemic influenza guidance in the United Kingdom. 17 studies, with an outcome of laboratory-confirmed/clinically-diagnosed influenza/other viral respiratory infections, were included. None of the studies they reviewed established a conclusive relationship between mask/respirator use and protection against influenza infection. The authors concluded that there is a limited evidence base to support the use of masks and/or respirators in healthcare or community settings. In 2018 the Centers for Disease Control and Prevention and the National Institute for Occupational Safety and Health stated that a surgical mask 'Does NOT provide the wearer with a reliable level of protection from inhaling smaller airborne particles and is not considered respiratory protection' (CDC and NIOSH, 2018).

Just as the COVID-19 pandemic was taking hold, researchers in Hong Kong conducted systematic reviews, supported by the WHO, in preparation for the development of guidelines by the WHO on the use of nonpharmaceutical interventions for pandemic influenza in non-medical settings (Xiao et al., 2020). In their pooled analysis of ten randomised controlled trials on face masks they did not find evidence that surgical-type masks are effective in reducing laboratory-confirmed influenza transmission, either when worn by infected persons (source control) or by persons in the general community to reduce their susceptibility. In October 2019, before the issue became political, with reference to an influenza pandemic, the WHO stated that there was no evidence that face masks are effective in reducing transmission of laboratory-confirmed influenza (WHO, 2019). Then in June 2020, they stated that there was 'no direct evidence (from studies on COVID-19 and in healthy people in the community) on the effectiveness of universal masking of healthy people in the community to prevent infection with respiratory viruses, including COVID-19' (WHO, 2020a). Perski, Simons, West, and Michie (2020) conducted a rapid evidence review using Bayesian analysis on whether face masks prevent community transmission of viral respiratory infections. They concluded that available evidence from RCTs is equivocal as to whether or not wearing face masks in community settings results in a reduction in clinically- or laboratory-confirmed viral respiratory infections. In a systematic review, Dugré et al. (2020) found that the use of masks in the community did not reduce the risk of influenza, confirmed viral respiratory infection, influenza-like illness, or any clinical respiratory infection. However, in the two trials that most closely aligned with mask use in real-life community settings, there

was a significant risk reduction in influenza-like illness (risk ratio (RR) = 0.83). Whilst the use of masks in households with a sick contact was not associated with a significant infection risk reduction in any analysis, regardless of whether masks were used by the sick individual, the healthy family members, or both. Alfelali et al. (2020) conducted a cluster-randomised trial on the effectiveness of face masks against viral respiratory infections among Hajj pilgrims. Over three consecutive Hajj seasons (2013, 2014 and 2015) pilgrims' tents in Makkah were allocated to 'face mask' or 'no face mask' groups. By intention-to-treat analysis, face mask use did not seem to be effective against laboratory-confirmed viral respiratory infection nor against clinical respiratory infection. The authors concluded that the trial failed to provide definitive evidence for the effectiveness of facemasks during the Hajj. In December 2020, the WHO were clear that surgical masks would not be effective against a respiratory disease like COVID-19 (WHO, 2020d). 'The main intended use of surgical masks is to protect patients and clinical areas from biological agents present in the nose and mouth of the person wearing the mask. When worn to protect the wearer, they provide limited splash and droplet protection. As such, surgical masks are not classified as respiratory protective equipment. The use of proper respiratory protective equipment should be considered, if the risk assessment so dictates.'

3.3.5.2 COVID-19

In the spring of 2020, we knew that face masks were ineffective at mitigating COVID-19 in the community, and the likes of ASA, JAMA, PHE, CIDRAP and NEJM made this explicit. In March 2020 in the UK, advertisements that claimed that face masks could prevent the spread of COVID-19 were banned by the Advertising Standards Authority (ASA) because they were deemed to be misleading (BBC News, 2020a). On 4 March 2020, the journal *JAMA* published a 'JAMA Patient Page' that stated that 'Face masks should not be worn by healthy individuals to protect themselves from acquiring respiratory infection because there is no evidence to suggest that face masks worn by healthy individuals are effective in preventing people from becoming ill' (A. N. Desai & Mehrotra, 2020). Furthermore, 'Because N95 respirators require special fit testing, they are not recommended for use by the general public'. In March 2020, Jake Dunning, a consultant in infectious diseases at Public Health England (PHE), stated that there was very little evidence of a widespread benefit from wearing masks. An April 2020 review by the Center for Infectious Disease Research and Policy (CIDRAP) in the US concluded that cloth masks and face coverings are likely to have limited impact on lowering COVID-19 transmission, because they have minimal ability to prevent the emission of small particles, offer limited personal protection with respect to small particle inhalation, and should not be recommended as a replacement for physical distancing or reducing time in enclosed spaces with many potentially infectious people (Brosseau & Sietsema, 2020). A perspective published in *NEJM* in April 2020 stated that 'We know that wearing a mask outside health care facilities offers little, if any, protection from infection' (Klompas et al., 2020).

In an April 2020 review paper, the preprint version concluded that 'The evidence is not sufficiently strong to support widespread use of facemasks as a protective measure against COVID-19' (Brainard, Jones, Lake, Hooper, & Hunter, 2020b), whilst the published version (in *Eurosurveillance*, December 2020) concluded that 'Wearing face masks may reduce primary respiratory infection risk, probably by 6–15%' (Brainard, Jones, Lake, Hooper, & Hunter, 2020a). Clearly, by late 2020, thou shalt not publish anti-mask sentiment. A comprehensive literature review by the European Centre for Disease Prevention and Control on using face masks in the community to reduce the transmission of COVID-19, published in February 2021, concluded that we have low to moderate certainty that face masks have a small to moderate protective effect (European Centre for Disease Prevention and Control, 2021). Whilst in a very thorough and balanced critical review published as a Cato Institute (an American libertarian think tank) working paper, I. T. Liu, Prasad, and Darrow (2021) concluded that the evidence for the effectiveness of cloth face masks in the community is weak. In a comprehensive review of the literature, J. Droz jr

(2021) concluded that a mask is unlikely to be a net benefit to the wearer or the public. In his book *The Face Mask Cult*, Hector Drummond provides a comprehensive overview of the literature, including research that employed the Gesundheit-II machine. He concludes that face masks are pointless because they don't stop COVID-19. Mader and Rüttenauer (2022) analysed the effects of non-pharmaceutical interventions (NPI) on COVID-19 mortality for 169 countries from July 2020 to September 2021. Face masks did not appear to reduce deaths (the data was actually consistent with a small increase). Swiss Policy Research (2020a) provide an overview, updated in February 2023, of the evidence regarding the effectiveness of face masks. They conclude that face masks in the general population might be effective, at least in some circumstances, but there is currently little to no evidence supporting this proposition. If COVID-19 is primarily transmitted via indoor aerosols, face masks are unlikely to be protective. Thus, health authorities should not assume or suggest that face masks will reduce the rate or risk of infection. 17,000 doctors and medical scientists signed a declaration declaring that, among other things, 'masks are not and have never been effective protection against an airborne respiratory virus in the community setting' (International Alliance of Physicians and Medical Scientists, 2021).

Asia The only relevant study in Asia sourced here is the influencial Bangladesh mask study (Abaluck et al., 2021). The lead author of the study, Jason Abaluck, was the lead author of an earlier unpublished article, dated 1 April 2020, that concluded that 'Public officials should encourage and support universal cloth mask adoption immediately. These masks should be dust-prevention quality (as sold in hardware stores) or home-made fabric masks that are worn snugly) until which time as surgical or N95 masks are no longer in short supply' (Abaluck et al., 2020). He was clearly under the misapprehension that even cloth masks help to mitigate COVID-19.

Abaluck et al. (2021) conducted a cluster-randomised trial of community-level mask promotion in rural Bangladesh from November 2020 to April 2021. The best thing about the trial was the size of it, with 600 villages and 342,126 adult participants. Half of the villages were provided with free (cloth and surgical) masks and subjected to mask promotion campaigns, whilst the other half received no interventions. After eight weeks, the interventions led to a 9.3% reduction in symptomatic SARS-CoV-2 seroprevalence. Both mask-wearing and physical distancing were reported to have increased in the intervention villages. Plus, there was a significant reduction in people being observed in tea stalls and restaurants in the intervention villages. Unfortunately, it is difficult to ascertain the relative influence of mask-wearing and physical distancing. If masks mitigate COVID-19 in rural Bangladesh, it seems reasonable to assume that at least to some degree they work as a source control, and there is plenty of intergenerational mixing in rural Bangladesh, so if masks were effective, we'd expect a decrease in infections across all age groups. Whilst if physical distancing reduced infections, we'd expect a reduction in the number of infections in the age groups that practised physical distancing. Likewise, if a group of participants exhibit demand characteristics such as the good-subject effect (subjects tend to want to please the researchers), we'd expect a reduction in the number of infections in the age groups that exhibit such a bias. So, what were the results across age groups? The reduction in symptomatic SARS-CoV-2 seroprevalence in the intervention villages was concentrated among individuals aged over 50, with no significant effect found for those aged under 50. It is feasible that the over-50s, being at greater risk of severe outcomes from COVID-19, practised more physical distancing and visited fewer restaurants and tea stalls. The over-50s may have also been slightly less willing to come forward with symptoms in the intervention villages (the good-subject effect). It seems likely that the authors—despite aiming to promote masks—have unwittingly shown that wearing masks in a community setting doesn't work.

On his blog, el gato malo (2021e) described the study as one of the worst he has ever seen in any field, and stated that it proves nothing apart from the credulity of many mask advocates. The start state was unknown, so the cohorts were not balanced for the start state.

Furthermore, the authors failed to isolate the variable they wished to measure, masks. Whilst the results were based on self-reporting. He concluded that the study is meaningless except possibly as a sociology footnote about how older Bangladeshis are more likely to seek to please researchers/susceptible to peer and social suasion than young ones when faced with widespread pressure in their communities (el gato malo, 2021i). William Briggs argued that the Bangladesh mask study showed, at best, a population seroprevalence reduction Of 0.0026%, and likely smaller (W. M. Briggs, 2021b). Whilst Ben Recht argued that the effect size was small (less than a factor of 1.1) and sensitive to measurement (Recht, 2021b), there was a large differential between the control and treatment groups (Recht, 2021c) and the result is not statistically significant once we take into account the intra-cluster correlation (Recht, 2021a).

Chikina, Pegden, and Recht (2021) analysed the data and concluded that the impact of the mask intervention was highly effective at modifying behaviours (distancing, mask-wearing, symptom reporting), but that any effect on actual symptomatic seropositivity was much more subtle. In particular, whatever effects the intervention had on the rate of symptomatic seropositivity in the villages was certainly not large relative to other factors contributing to variance in this parameter across villages. The authors suggest that the very large causal effects on consent rates and thus population denominators urge caution in interpreting the small differences we see in symptomatic seropositivity between treatment and controls, which are not statistically significant according to standard nonparametric paired tests. The same authors reanalysed the trial using simple non-parametric tests (Chikina, Pegden, & Recht, 2022). They found that staff behavioural biases in both unblinded and supposedly blinded steps produced a highly significant 8.6% difference between the number of people who agreed to take part in the control and intervention arms. Thus one should not conclude that a similar-sized effect—seroprevalence in the treatment arm was 8.7% lower than in the control arm–was causal. When Chikina and colleagues calculated the difference in seroprevalence measured as a count rather than as a rate (i.e. by comparing the absolute number of cases in each arm, whilst ignoring the denominator) they found that it was only 1.8%.

A statistician working for Steve Kirsch concluded that, when one takes into account internal correlation, false positives and sample size issues, the study does not indicate a real-world benefit of masks, and it clearly doesn't justify a public policy of making masks mandatory (Anon, 2021). Norman Fenton, Professor of Risk Information Management at Queen Mary University of London, analysed the Bangladesh mask data using a Bayesian causal modelling approach, and concluded that there is only a 52% probability that the seropositivity rate among people subject to a mask intervention campaign is lower than those who are not. Therefore, there is almost no support at all that the mask intervention procedures reduce the seropositivity rate (N. Fenton, 2022a). A further issue is that there were a (highly significant) 9% more people enrolled in the mask arm (Prasad, 2022a). One possibility is that concealment was violated, and people knew that they might get something for free (a mask) in one arm, but not in the other. This would have compromised the randomised aspect of the trial.

Europe Spira (2022) conducted an observational analysis of the correlation between mask compliance and COVID-19 outcomes (cases and deaths) in the 2020–2021 winter in Europe. Countries with high levels of mask compliance did not perform better than those with low mask usage.

Bundgaard et al. (2021) conducted a randomised controlled trial in Denmark in April and May 2020. A total of 3030 participants were randomly assigned to the recommendation to wear masks, and 2994 were assigned to control; 4862 completed the study. The primary outcome was SARS-CoV-2 infection in the mask wearer at one month by antibody testing, polymerase chain reaction (PCR) or hospital diagnosis. They estimated that when worn by a healthy person for one month masks reduce the risk of becoming infected by 18%. However, the result was not considered statistically significant.

In Germany, since April 2022 masks were no longer mandatory in 14 German states. But there was a control group, in two federal states there was still a comprehensive mask mandate. Prof. Freedom (2022) showed that mandatory masking made no difference. Similarly, eugyppius (2023b) showed that making masks mandatory in Germany had no effect whatsoever.

In Norway, Elgersma, Fretheim, Elstrøm, and Aavitsland (2023) examined the association between face mask use and the incidence of SARS-CoV-2 infection using cross-sectional data from 3,209 participants in a randomised trial on the effectiveness of using glasses to reduce the risk of infection. They found that the incidence of self-reported COVID-19 was 33% higher in those wearing face masks often or sometimes, and 40% higher in those wearing face masks almost always or always, compared to participants who reported wearing face masks never or almost never. They also noted that recommendations to wear face masks in the community are largely informed by low certainty evidence from observational studies. Also in Norway, Solberg et al. (2024) conducted a pragmatic randomised superiority trial, published in *The BMJ*, that tested the effectiveness of wearing surgical face masks in public spaces. Among those not wearing masks 12.2% had self-reported symptoms consistent with respiratory infection, among those wearing masks the figure was 8.9%. However, no statistically significant effect was found for self-reported (by PCR or antigen test) or registered COVID-19 infection. Whilst 6.3% of participants in the unmasked arm and 4.5% in the masked arm reported needing healthcare during the trial. Of these participants, 20% in the unmasked and 23% in the masked arm reported that this was due to respiratory symptoms, whereas 28% participants in the unmasked arm and 26% in the masked arm reported other reasons. Gin (2024b) suggested that reporting bias explains the results: mask-wearers (non-wearers) who believed masks to be effective reported fewer (more) sniffles. Whilst Demasi (2024a) argued that an absolute reduction of 3% in self-reported symptoms from people wearing masks was not a clinically meaningful result.

In a cohort study in Catalonia, Spain, with 314 patients with COVID-19, 753 contacts and 282 clusters, M. Marks et al. (2021) did not find any evidence of decreased risk of transmission in individuals who reported using masks.

In November 2023 Dame Jenny Harries, chief executive of the UK Health Security Agency (UKHSA), told the UK's Covid-19 Inquiry that the evidence that face coverings reduced transmission is 'uncertain', and recommending them was 'not evidence-based' (E. Craig, 2023c). She admitted that there was no good evidence that face coverings prevent COVID-19 transmission (Dodsworth, 2023a). Also in the UK, research published by the University of East Anglia showed that wearing face masks did not reduce the risk of COVID-19 infection after the first Omicron wave (Hunter & Brainard, 2024; UEA, 2024).

North America Guerra and Guerra (2021) found that in the US neither making masks mandatory nor mask use was associated with lower SARS-CoV-2 spread. Schauer, Naylor, April, Carius, and Hudson (2021) analysed the effect of making masks mandatory using publicly reported county-level data from Texas to perform a mixed-methods before-and-after analysis. They were unable to detect a reduction in per-population daily mortality, hospital bed, ICU bed, or ventilator occupancy attributable to the implementation of a mask order.

N95 Respirators An *N95 respirator* is a disposable filtering facepiece respirator or reusable elastomeric respirator filter that meets the US National Institute for Occupational Safety and Health (NIOSH) N95 standard of air filtration, filtering at least 95% of airborne particles that have a mass median aerodynamic diameter of 0.3 micrometers under 42 CFR Part 84. An *FFP2 mask* is similar to an N95 respirator, but meets a European respirator standard (94% filtration). M. Mansell (2023) demonstrated that for N95 respirators, even if we assume perfect capture of 95% of particles, given the ratio of emitted particles to plaque forming units (PFUs) and the minimum infective dose (MID) threshold, after an hour or so we can still expect many individuals to become infected with SARS-CoV-2. In a rapid review conducted by the UK Health

Security Agency, Harrison, Fernandes, and Meadows (2023) failed to find any evidence for the effectiveness of N95 and equivalent face masks as wearer protection against COVID-19 when used in the community by people at higher risk of becoming seriously ill from COVID-19. To conclude, even N95 and FFP2 face masks worn in the community do not mitigate COVID-19 (el gato malo, 2021j).

P100 Respirators A *P100 respirator* is another respirator with a NIOSH air filtration rating. A respirator with a P100 classification would be at least 99.97% efficient at removing particles of size 0.3 µm. P100 respirators are effective (but only for the wearer) against COVID-19, nothing less (Kirsch, 2022f). Masks that protect the wearer are incentive compatible, so all that is necessary. Furthermore, because such masks do not protect other people, there is no reason to make them mandatory.

3.3.6 Face Masks in Schools

3.3.6.1 Influenza

Uchida et al. (2017) conducted an observational epidemiological study involving all elementary schoolchildren in Matsumoto City, Japan, on seasonal influenza during the 2014–2015 season. Among the schoolchildren without a mask 21.4% caught influenza, among those with a mask 19.5% caught influenza.

3.3.6.2 COVID-19

Finland Juutinen, Sarvikivi, Laukkanen-Nevala, and Helve (2023) conducted joinpoint regression analysis in Finland on the changes in the incidence of COVID-19 in cities with different school mask policies. They concluded that making face masks mandatory did not impact the incidence of COVID-19 among 10–12-year-olds.

Spain Coma et al. (2022) conducted a retrospective population-based study on the effectiveness of making face masks mandatory using a cohort of children in Catalona, Spain. In schools in Catalonia, children aged up to five were not required to wear masks, whilst children aged six and above were required to wear masks. This enabled a quasi-experimental comparison between 5-year-old children as a control group, and 6-year-old children as an interventional group. The authors concluded that making face-covering masks mandatory in schools was not associated with lower SARS-CoV-2 incidence or transmission, suggesting that the intervention was not effective.

United Kingdom During the Autumn 2021 school term masks remained mandatory in Scotland, but were made optional in England. Hammer (2022) noted that over this period children in Scotland had greater increases in weekly cases and higher test positivity than children in England. Meanwhile, Marchant et al. (2022) found that in primary schools (children aged 3–11) in Wales, staff face covering was not associated with lower odds of school COVID-19 cases and was associated with *higher* self-reported cold symptoms. School staff reported that wearing face coverings meant that they had to stand closer to pupils and raise their voices to be heard.

United States The blogger el gato malo (2021p) analysed COVID-19 case rates in US schools with and without rules that made masks mandatory. Students in masked schools had a 21% higher case rate than students in schools without masks. The staff case rate was 23% higher in masked schools. Whilst areas imposing masks had a 19% higher overall community case rate. Burns and Stevenson (2022a) analysed data on mask policies in US school districts and paediatric COVID-19 cases and concluded that the mask policies had no effect; differences in cases were

best explained by differential regional seasonality. Chandra and Høeg (2022) replicated a highly cited CDC study (Budzyn et al., 2021) showing a negative association between school mask mandates and paediatric SARS-CoV-2 cases in the US. They then extended it to more districts and a longer period, employing seven times as much data. They examined the relationship between mask mandates and per-capita pediatric cases, using multiple regression to control for observed differences. They successfully replicated the original result using 565 counties; non-masking counties had around 30 additional daily cases per 100,000 children after two weeks of schools reopening. However, after nine weeks, cases per 100,000 were 18.3 in counties with mandates compared to 15.8 in those without them ($p = 0.12$). In a larger sample of 1832 counties, between weeks 2 and 9, cases per 100,000 fell by 38.2 and 37.9 in counties with and without mask requirements, respectively ($p = 0.93$). The authors conclusion was that they found no association between mask requirements and pediatric cases. I. Miller (2023a) suggested that the CDC deliberately cherry picked dates. In an unpublished article, Sood, Heick, Stevenson, and Høeg (2022) conducted a natural experiment of two adjacent K-12 school districts in Fargo, North Dakota, one which made masks mandatory, and one which did not, in the autumn of the 2021–2022 academic year. In the winter both districts adopted a masks-optional policy, allowing for a partial crossover study design. The authors observed no significant difference between student case rates whilst the districts had differing masking policies nor whilst they had the same mask policies. In a cohort study on the secondary attack rate of SARS-CoV-2 in schools in Massachusetts (S. B. Nelson et al., 2023), the rate of potential infections when both individuals were masked was 2.3%, compared to 1.7% when neither were masked (I. Miller, 2023f).

Cowger et al. (2022) used a difference-in-differences analysis for staggered policy implementation to compare the incidence of COVID-19 among students and staff in school districts in the greater Boston area that lifted masking requirements with the incidence in districts that sustained masking requirements during the 2021–2022 school year. The authors found that the lifting of masking requirements was associated with an additional 44.9 COVID-19 cases per 1000 students and staff during the 15 weeks after the statewide masking policy was rescinded, which corresponded to an estimated 29.4% of the cases in all districts during that time. However, Chandra, Høeg, Ladhani, Prasad, and Duriseti (2024) showed that the estimated effects of the intervention were not robust to changes in study design, such as the use of different control groups in statewide analysis, data restriction to only major infectious waves, or stratification by students and staff. They found that maintaining school mask mandates was compatible with both significant decreases and increases in district case rates depending on the choice of control group and whether students or staff were studied. It is overwhelmingly likely that whatever effect the original authors found was entirely statistical noise, wiped out by confounding factors and time effects (I. Miller, 2024a). Yet they made a causal conclusion regardless. The media repeated the unjustified claims from the original study, but the correction was mostly ignored.

Global In a comprehensive review of the literature, J. Droz jr (2021) concluded that a mask is unlikely to be a net benefit to the wearer or the public, especially for children in a school setting. Similarly, in a review article on face masking for children in the *Journal of Infection*, Ladhani (2022) concluded that there is no robust evidence to recommend face masks for children. Sandlund et al. (2023) performed a systematic review to assess research on the effectiveness of mask-wearing in children. They screened 597 studies and included 22 in the final analysis. The authors concluded that real-world effectiveness of child mask mandates against SARS-CoV-2 transmission or infection has not been demonstrated with high-quality evidence. 'The current body of scientific data does not support masking children for protection against COVID-19.' On his blog, eugyppius (2023d) noted the almost total overlap between the studies with the greatest risk of bias and the studies that find child mask mandates are effective. He argued that by far the greatest idiocy among the bad science and policy attaches to those who are most eager to force

masks upon children. He rightly points out that 'Masking kids is stupid, harmful and pointless, and there is no good evidence anywhere that it does anything about Covid.' Having reviewed the systematic review by Sandlund and colleagues, Gin (2023a) provided a simple cost–benefit analysis. Costs: potentially language learning and communication issues, worse psychological well-being and negative physiological effects. Benefits: none.

3.3.7 Cochrane Review

Cochrane is a British international charitable organisation formed to synthesize medical research findings to facilitate evidence-based choices about health interventions involving health professionals, patients and policy makers. At its core is the collection of *Cochrane Reviews*, a database of systematic reviews and meta-analyses which summarize and interpret the results of medical research. Cochrane systematic reviews and meta-analyses are regarded as the 'gold standard' for high-quality information and are widely used to inform healthcare policy and practice (Seidler et al., 2020). Above, we have cited Cochrane reviews on the effectiveness face masks when worn by healthcare workers and when worn in the community at mitigating influenza (Jefferson et al., 2020) and COVID-19 (Jefferson et al., 2023). Since 2006, Cochrane has examined masks and other physical interventions multiple times and has never found high-quality evidence of any substantial effect of masks on the spread of respiratory viruses (Thacker, 2023a). Cochrane reviews found that randomised studies failed to show that face masks showed significant benefit. Bhattacharya (2023a) made an excellent point on Twitter:

1. If making masks mandatory in the community mitigates COVID-19 then randomised studies will demonstrate a significant benefit in disease prevention.

2. Randomised studies failed to show significant benefit.

What can we conclude if both of these two statements are true? The answer, of course, is that masks don't work.

Scientific American published a poor article by Naomi Oreskes, which argued that the Cochrane Library misled the public by prioritising rigour over reality (Oreskes, 2023). Oreskes is actually arguing that the researchers should have lowered their standards and relied on weaker evidence in their review (Demasi, 2023a). This is ridiculous. Randomised controlled trials trump observational studies. However, unfortunately, Cochrane reviews did accept lower quality evidence during the pandemic (Heneghan & Jefferson, 2024c). Cochrane grandees attempted to undermine the quality of the reviews by permitting 'rapid reviews' of junk science that included mathematical models (Jefferson & Heneghan, 2024b).

In response to the 2023 Cochrane review, absurdly, Tufekci (2023) (a professor of Sociology and Public Affairs at Princeton University and a columnist for *The New York Times*) wrote an article in the *NYT* entitled 'Here's why the science is clear that masks work'. Thacker (2023a) wrote of Zeynep Tufekci: 'Neither scholar nor journalist, Tufekci ignores academic rigor by posing as professor and then peer reviewing research in her own Times' essays. She then flouts journalistic ethics by failing to report facts that don't fit her academic opinion.' Meanwhile, the editor-in-chief of the Cochrane Library, Karla Soares-Weiser, was unhappy with the popular interpretations of the analysis and issued a rare statement saying they would rethink the wording to make it clear that masks might work because the confidence interval was broad (Prasad, 2024g). However, the conclusions made by Jefferson and colleagues in the 2023 Cochrane review are in line with the standardised approach created by Cochrane (S. L. Miller, Tuia, & Prasad, 2023). There is no evidence that masks make any difference. Jefferson (2024) noted that the Cochrane Editors' statement was misleading and spun. After a lengthy discussion among the staff, Cochrane eventually concluded and confirmed that its mask review would not be changed (Heneghan, 2024; Prasad, 2024g). The editor-in-chief lost. But the damage, undermining their own reviewers and creating confusion, had been done. Thacker (2024a) explained how Karla

Soares-Weiser colluded with Zeynep Tufekci, who falsely claimed she 'corrected' the Cochrane mask review. Thacker (2024b) argued that the entire saga called into question Zeynep Tufekci's ethics and whether Soares-Weiser was still fit to lead Cochrane. What should have been a routine Cochrane review became a political football (Jefferson & Heneghan, 2024e). Jefferson and Heneghan (2024f) summarised the story of the Cochrane Review.

3.3.8 Face Masks in Aeroplanes

Regardless of masks, due to HEPA (high-efficiency particulate air) filters, the chances of catching COVID-19 on a plane are minuscule (International Air Transport Association (IATA), 2020). So the absolute risk is minuscule and masks fail a cost–benefit analysis. Some evidence suggests that masks are effective at reducing transmission on flights (Freedman & Wilder-Smith, 2020). However, this was not replicated. Luo, Li, Xiao, and Lei (2023) conducted a meta-analysis of inflight transmission of SARS-CoV-2, influenza and SARS-CoV-1. The inflight SARS-CoV-2 attack rates ranged from 2.6% to 16.1%. SARS-CoV-2 has a similar transmission characteristic to the influenza A(H1N1)pdm09 virus. The transmission of the two viruses on an aircraft mainly occurs at a close range, and short-range airborne transmission may play an important role in it. In the two flights with mask use the mean SARS-CoV-2 attack rate was 7.94%, whilst in the flights without mask use the mean attack rate was 5.91%. Clearly, masks didn't work.

3.3.9 Could Face Masks *Increase* the Spread of COVID-19?

Some authors have argued that wearing masks in the community could actually *increase* the spread of COVID-19. In a July 2020 survey of peer-reviewed studies, L. Goldstein (2020) argued that universal mask-wearing is likely to increase the spread of COVID-19. He claims that even if a mask-wearer has no infection, their mask can pick up COVID-19 and other germs from the air and from dust particles. These masks can then spread the virus because every time the wearer exhales, COVID-19 and any other germs that have accumulated in the mask spread into the air. Huber (2021c) claimed that masks increase the incidence of COVID-19, and explained how this may be possible:

> Two physical mechanisms are proposed to directly contribute to this finding, based on current available research. The first is scatter mechanics of dispersed respiratory droplets becoming aerosolized on collision with the mesh of a mask on outward exhalation and then lingering in air. The second is the pressurized and distant peripheral jets of unfiltered exhaled aerosol from the nozzled edges of a mask. These phenomena result in viral particles lingering longer and traveling farther in airspace from a masked person than exhaled respiratory droplets falling close to the body from the orifices of an unmasked person. There are also chemical mechanisms for increased COVID-19 cases in masked populations. This is likely due to immune suppression caused by hypoxic and hypercapnic conditions, as well as acidotic, immobilized cilia in the lungs, and reduced skin surface available to sunlight for Vitamin D production.

3.3.9.1 Europe

In March 2020, Jenny Harries, Deputy Chief Medical Officer for England, stated that face masks could trap the COVID-19 virus, increasing the risk of infection (Baynes, 2020). In the previously referenced study on the correlation between mask compliance and COVID-19 outcomes (cases and deaths) in the 2020–2021 winter in Europe (Spira, 2022), the correlations for mask compliance in all of Europe, Eastern Europe and Western Europe vs cases and deaths were all positive, with the correlations between all of Europe and deaths and Western Europe and deaths being significant. The authors even concluded that 'the moderate positive correlation between mask usage and deaths in Western Europe (0.627) also suggests that the universal use of masks

may have had harmful unintended consequences'. In one of the Norway studies referenced above, Elgersma et al. (2023) that found that the incidence of self-reported COVID-19 was 33% higher in those wearing face masks often or sometimes, and 40% higher in those wearing face masks almost always or always, compared to participants who reported wearing face masks never or almost never, the authors concluded: 'Our findings suggest that wearing a face mask may be associated with an increased risk of infection'.

3.3.9.2 North America

Fischer et al. (2020) noticed that speaking through some masks (particularly a neck gaiter) seemed to disperse the largest droplets into a multitude of smaller particles. Given that smaller particles are airborne for longer and can penetrate further into the lungs, the use of such masks could be counterproductive. In a paper published in *Medicine*, Fögen (2022) noted that in the summer of 2020 in Kansas counties that made masks mandatory had significantly higher case fatality rates than counties that did not. He hypothesised that virions that enter the mask and virions that are coughed out in droplets are retained in the face mask tissue, and after quick evaporation of the droplets, hyper-condensed droplets or pure virions (virions not inside a droplet) are re-inhaled from a very short distance during inspiration. The virions then spread (because of their smaller size) deeper into the respiratory tract. They bypass the bronchi and are inhaled deep into the alveoli, where they can cause pneumonia instead of bronchitis. Moreover, this phenomenon, which he termed the 'Foegen effect', could increase the overall viral load because virions that should have been removed from the respiratory tract are returned. Viral reproduction in vivo, including the reproduction of the re-inhaled virions, is exponential compared with the mask-induced linear droplet reduction.

3.3.9.3 Global

In a paper using self-reported data among self-selected unvaccinated individuals, using global data from October 2021 to February 2022, Verkerk, Do, Mbchb, and Lindley (2022) found that those who never wore a mask had the fewest COVID-19 symptoms (though no causal relationship could be inferred).

3.3.10 Experiment 3: The Effectiveness of the Face Covering Policy in England

Let us now conduct our own experiment to determine whether making masks mandatory helped to mitigate COVID-19. First, consider global data. Countries with high masking had higher excess mortality throughout almost the entire period (see Figure 9). Naturally, there will be many confounders. So let us first group countries according to vaccination rates, then analyse the relationship between mask stringency and excess mortality. Among countries with low vaccination rates, there is no consistent relationship between mask stringency and excess mortality (see Figure 10). Among countries with medium vaccination rates, countries with high mask stringency had greater excess mortality for the majority of the time (see Figure 11). Among countries with high vaccination rates, countries with high mask stringency had greater excess mortality for the majority of the time (see Figure 12).

In England face coverings became compulsory in enclosed public places for those aged 11 and above on 24 July 2020. The aim of this experiment is to ascertain the effectiveness of this policy. Although we don't have the gold standard in terms of evidence, a randomised controlled trial, we essentially have an experiment with no less than 46 million people, a high rate of compliance and high-quality relevant data. COVID-19 deaths data for England and Sweden (as before) was downloaded from the UK Government[8] and the Public Health Agency of Sweden[9], respectively.

[8] `https://coronavirus.data.gov.uk/details/deaths?areaType=nation&areaName=England`

[9] `https://fohm.maps.arcgis.com/sharing/rest/content/items/b5e7488e117749c19881cce45db13f7e/`

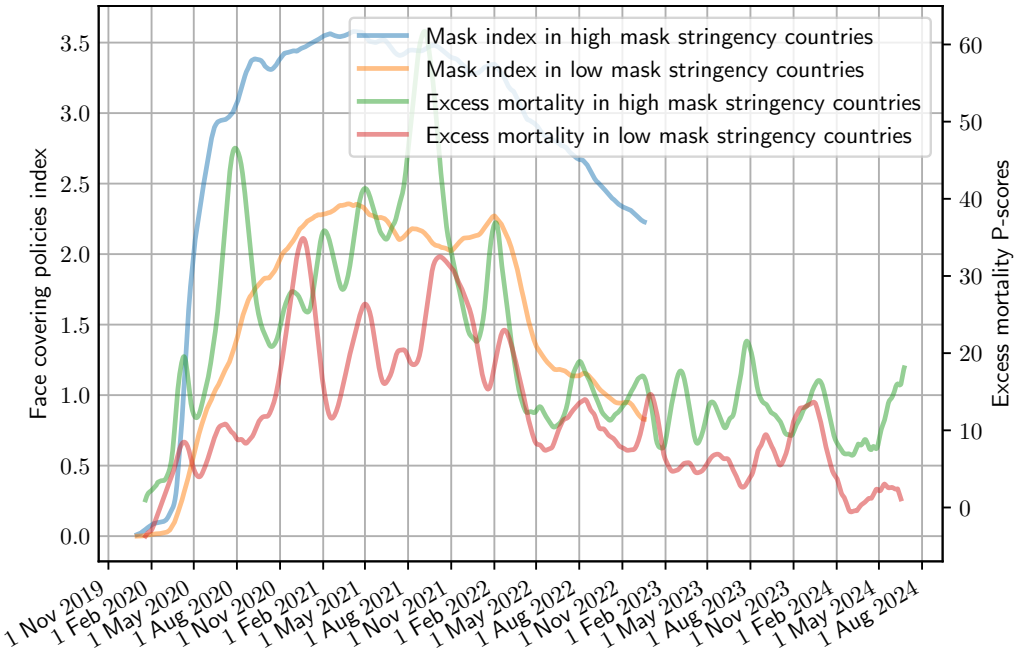

Figure 9: Face masks and excess mortality

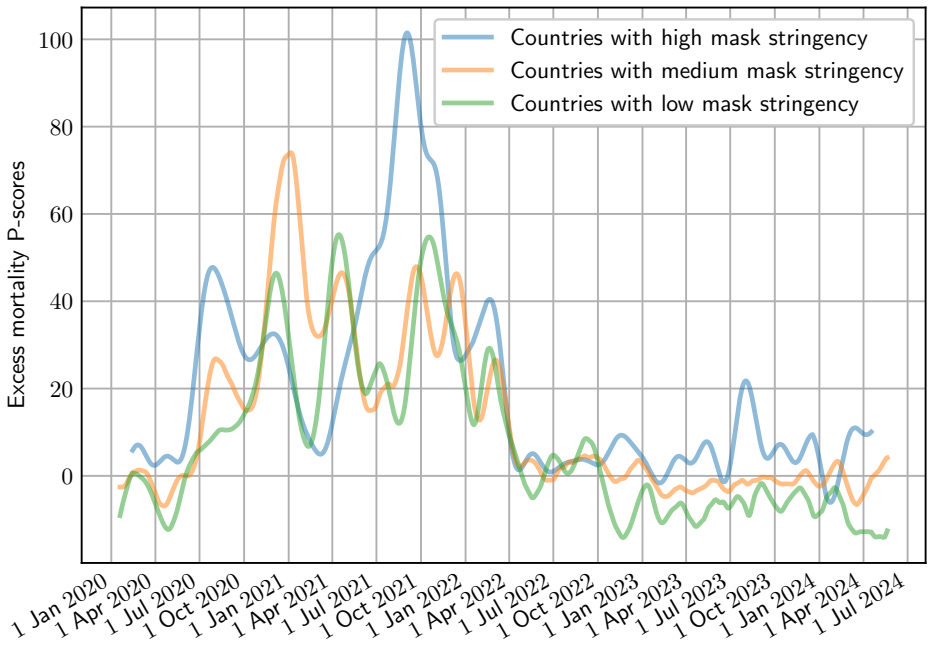

Figure 10: Excess mortality for countries with low vaccination rates

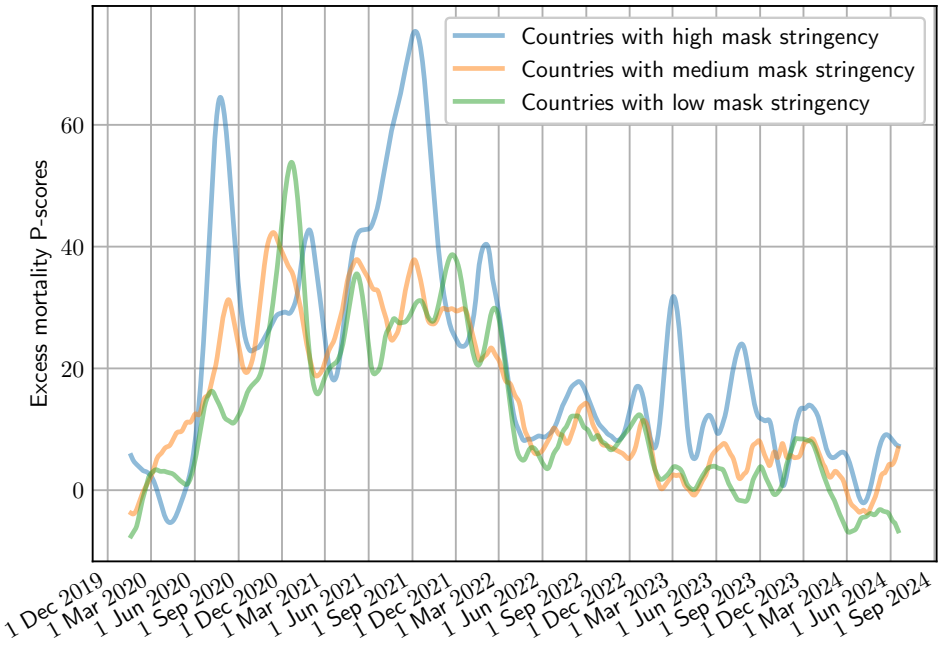

Figure 11: Excess mortality for countries with medium vaccination rates

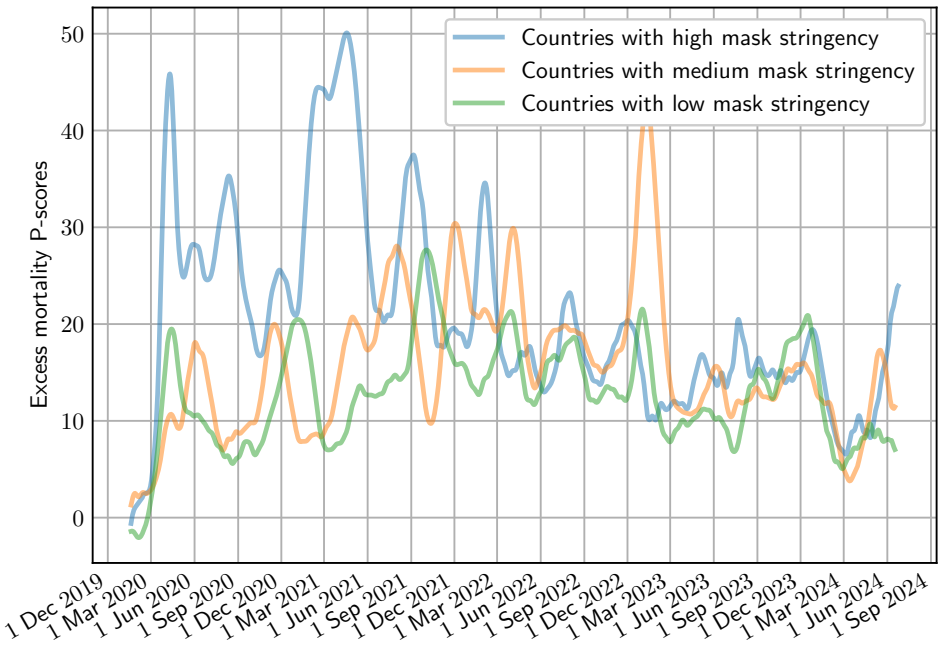

Figure 12: Excess mortality for countries with high vaccination rates

As defined above, in the SIR model β is the average number of contacts per person per time multiplied by the probability of disease transmission in a contact between a susceptible and an infectious subject, and is straightforward to calculate equation (2).

$$\beta = -\frac{N}{IS}\frac{\mathrm{d}S}{\mathrm{d}t} \tag{2}$$

If the face coverings policy was effective, it should have reduced β with immediate effect. Because we have inferred infections from deaths, and the time from infection to death is 26.8 days with a standard deviation of 12.4 days (S. N. Wood, 2021), we can inspect the change in β between minus two and plus two standard deviations around 24 July 2020. So we are interested in the difference between β on 17 August 2020 and β on 29 June 2020. However, there may be a seasonal effect during this 50-day period, so again we use Sweden as a control, matching the data by aligning the first death in Sweden with the first death in England.

If the mask policy was effective, we expect (3) to be negative and significantly different from zero.

$$(\beta^{\text{England}}_{\text{17 August 2020}} - \beta^{\text{England}}_{\text{29 June 2020}}) - (\beta^{\text{Sweden}}_{\text{26 August 2020}} - \beta^{\text{Sweden}}_{\text{8 July 2020}}) = 0.09001 \tag{3}$$

Because the statistic is positive, the results of this experiment are consistent with the face mask policy in England having no overall beneficial effect in mitigating COVID-19. Figure 13 shows how β drifts upwards, both in absolute terms and relative to Sweden, over the period in which masks became mandatory in enclosed public places in England.

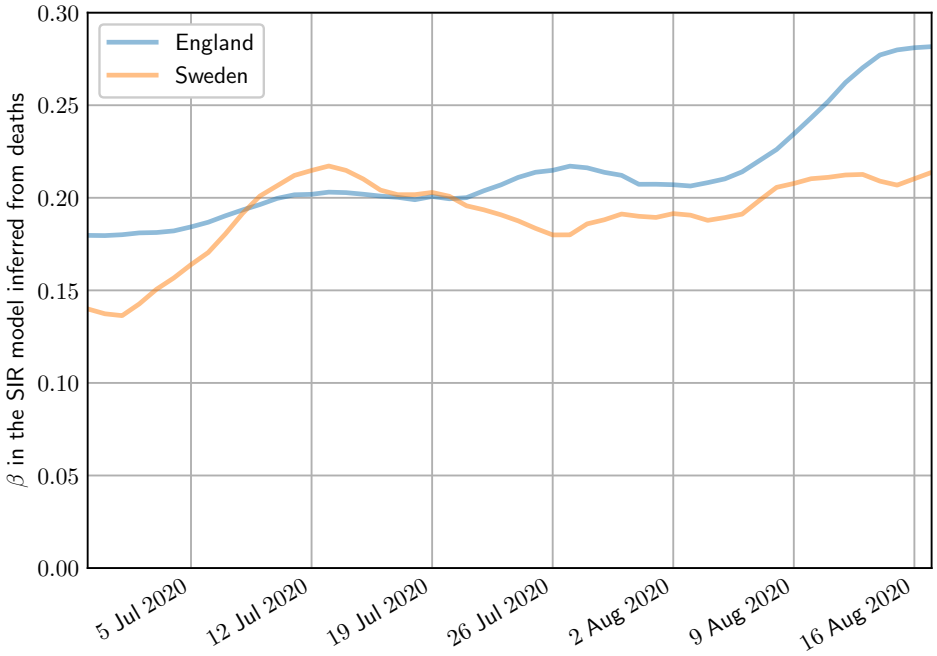

Figure 13: The effect of making masks mandatory in enclosed public places in England

The UK government's, ultimately political, decision to make face coverings mandatory in shops and most other enclosed public places was clearly not justified because the policy failed to mitigate COVID-19. And the timing was even worse. In England face coverings became compulsory in enclosed public places on 24 July 2020. On that day in the UK just one person

`data`

in 88,000 became a COVID-19 case (UK Government, 2021b). The government should have used the summer to build up herd immunity in advance of the winter resurgence. From 19 July 2021 England dropped its rule making masks mandatory in enclosed public places, whilst Scotland kept theirs. In England, cases fell (because the date coincided with the Delta variant peak). Whilst Scotland's seasonal resurgence began soon afterwards. This further evidences the insignificance of masks.

3.3.11 Conclusion

Why is the literature on face masks so mixed and difficult to interpret? Most randomised controlled trials carried out before and during the COVID-19 pandemic concluded that the role of masks in preventing respiratory viral transmission was small, null, or inconclusive. Conversely, ecological studies, performed during the first months of the pandemic, comparing countries, states, and provinces before and after the implementation of mask mandates almost unanimously concluded that masks reduced COVID-19 propagation. However, mask mandates were normally implemented after the peak of COVID-19 cases in the first wave, which might have given the impression that the drop in the number of cases was caused by the increment in mask usage.

Furthermore, we have been listening to the wrong 'experts'. If you want to know what you can do to mitigate exposure to infectious/hazardous agents, you shouldn't ask a doctor or rely on the advice from mainstream media, you should ask an industrial hygienist (Walkos, 2023). Pezeshki (2023) pointed out that from the field of industrial hygiene we always knew what it takes to stop transmission of a respiratory virus at an individual level: BSL-3 PPE. We also knew that cloth, surgical and N95 masks would fail at an individual level. He argues that we didn't know whether cloth/surgical/N95 would help mitigate COVID-19 at a population level if everyone wore them. We now know, thanks to the Cochrane review, that they do not.

Jim Meehan, a physician, understood the science of masks in July 2020 (Meehan, 2020): 'The CoVID-19 pandemic is about viral transmission. Surgical and cloth masks do nothing to prevent viral transmission. We should all realize by now that face masks have never been shown to prevent or protect against viral transmission. Which is exactly why they have never been recommended for use during the seasonal flu outbreak, epidemics, or previous pandemics.' In August 2022, J. H. Anderson (2022) concluded that the best scientific evidence continued to suggest that masks don't work. Whilst the public health establishment continued to ignore that evidence.

The two large randomised controlled trials that measured the effectiveness of face masks at mitigating COVID-19 were the Danish study (Bundgaard et al., 2021) and the Bangladesh study (Abaluck et al., 2021). Whilst the latest Cochrane Review (Jefferson et al., 2023) includes all quality evidence and essentially supersedes previous publications. To conclude, there is no quality evidence that face masks mitigate COVID-19.

3.4 Harms Caused by Face Masks

What are the *costs* of wearing a mask? Note that whereas any benefits of face masks increase as the rate of infection increases, the costs of face masks are mostly fixed, they are not dependent on the rate of infection. In her book *The Defeat of COVID*, Huber (2021a) includes a comprehensive review of the negative impacts of masks: particulate inhalation, dysbiosis and physiological changes. Hornblas (2021) conducted a survey in Vermont, US, from July 2020 to the first week of October 2020, on the negative health effects of face masks worn in the community. Among respondents who reported experiencing difficulties every time they wear a mask, the most common problems were difficulty breathing, mental/emotional discomfort, physical discomfort, difficulty communicating clearly and difficulty cleaning your hands every time you touch your mask. Among respondents who reported experiencing difficulties only occasionally or never the

main issues were difficulty cleaning your hands every time you touch your mask and difficulty communicating clearly.

3.4.1 General

3.4.1.1 False Sense of Security

Changizi (2023b) pointed out that if people believe that masks work, both the infected and the immunocompromised would be more likely to mingle. Because, in fact, masks don't work, we end up with an increase in the spread of COVID-19 and an increase in severe outcomes. Similarly, Dame Jenny Harries, chief executive of the UK Health Security Agency (UKHSA), told the UK's Covid-19 Inquiry that the evidence that face coverings may even have given people a 'false sense of security' that they could reduce their risk of becoming infected if they wore one whilst mixing with others (E. Craig, 2023c). It was reported in October 2021 that a higher percentage of Americans (58%) planned to wear a mask at least sometimes during the coming flu season than intended to get a flu vaccination (49%).

3.4.1.2 Breathing

Dyspnoea *Dyspnoea* means shortness of breath, the uncomfortable feeling of not being able to breathe well enough. Person, Lemercier, Royer, and Reychler (2018) found that when subjects performed the six-minute walk test whilst wearing a surgical mask, when compared to not wearing a mask, dyspnoea variation was significantly higher and the difference was clinically relevant. Epstein et al. (2021) assessed the physiological effects of wearing surgical masks and N95 respirators during a short-term strenuous workout. When wearing an N95 respirator, even at rest, end-tidal carbon dioxide ($EtCO_2$) levels increase, whilst during exercise they increase significantly. The effect of the surgical mask on $EtCO_2$ was milder and seemed to be significant only during a heavy workout. The increase in $EtCO_2$ is due to re-breathing expired air which remains within the mask, which increases the dead space (the volume of air that is inhaled that does not take part in the gas exchange), and may cause a slight shortness of breath. Whilst Swiatek et al. (2021) found that when healthy volunteers performed the six-minute walk test, once with a (droplet or cloth) mask and once without, there was a significant difference in perception of dyspnoea. Similarly, Radtke, Porcari, Foster, Miller, and Helget (2021) found that when older community-dwelling adults completed the six-minute walk test, wearing an N95 mask was associated with significantly higher perceived dyspnoea.

Hypoxia *Hypoxia* is a condition in which not enough oxygen (O_2) makes it to the tissues of the body. In a review article on the side effects of masks, Kisielinski et al. (2021) found significant evidence that masks cause hypoxia and fatigue. Borovoy, Huber, and Crisler (2020) found reduced oxygen and increased carbon dioxide in a masked airspace at levels that they claim can damage multiple organ systems. Chandrasekaran and Fernandes (2020) argued that exercising with face masks may reduce available oxygen (O_2) and increase air trapping preventing substantial CO_2 exchange. They claim that the hypercapnic hypoxia may potentially increase acidic environment, cardiac overload, anaerobic metabolism and renal overload, which may substantially aggravate the underlying pathology of established chronic diseases. Prenatal hypoxia can cause impaired brain development and functioning (Nalivaeva, Turner, & Zhuravin, 2018). Kisielinski, Wagner, Hirsch, Klosterhalfen, and Prescher (2023) argued that wearing face masks could lead to hypoxia, potentially having serious teratogenic implications, such as spinal malformations.

Hypoxemia *Hypoxemia* is an abnormally low level of oxygen in the blood. Kao et al. (2004) analysed the physiological impact of wearing an N95 mask during haemodialysis as a

precaution against SARS in patients with end-stage renal disease. 70% of the patients showed a reduction in partial pressure of oxygen (PaO_2), and 19% developed various degrees of hypoxemia. Wearing an N95 mask significantly reduced the PaO_2 level, increased the respiratory rate, and increased the occurrence of chest discomfort and respiratory distress.

Hypercapnia *Hypercapnia* is a condition of abnormally elevated carbon dioxide (CO_2) levels in the blood. Fresh air has around 0.04% CO_2, whilst wearing a mask for more than five minutes means inhaling 1.41% to 3.2% CO_2 (Kisielinski, Wagner, et al., 2023). Wearing a face mask has the potential to exceed chronic (0.5% CO_2 for 8 h) and even acute (3% CO_2 for 15 min) National Institute for Occupational Safety and Health (NIOSH) limits for carbon dioxide respiration. In a critical review, Du, Tandoc, Mack, and Siegel (2020) concluded that both pure CO_2 alone at elevated concentrations and low ventilation indicated by high indoor CO_2 concentrations are sometimes found to significantly affect various brain functions and work or school performance. Epstein et al. (2021), referenced under dyspnoea above, also concluded that wearing an N95 respirator (even at rest) or a surgical mask during a heavy workout may contribute to mild hypercapnia. Carbon dioxide (CO_2) rebreathing has been recognised as a concern regarding respirator/mask use and is related to symptoms of discomfort, fatigue, dizziness, headache, muscular weakness and drowsiness. C. L. Smith, Whitelaw, and Davies (2013) showed that speech and low work (exercise) rates significantly increase CO_2 rebreathing in respirators/masks. Restricted breathing can cause deoxygenation and hypercapnia, which can be particularly harmful for children and pregnant women (M. K. Mansell, 2022). Wearing a mask for more than five minutes could increase the risk of testicular dysfunction for adolescent men, stillbirths for pregnant women and cognitive decline for young children (Kisielinski, Wagner, et al., 2023).

3.4.1.3 Cardiopulmonary Exercise Capacity

Cardiopulmonary means relating to the heart and lungs. Face masks have a significant negative impact on cardiopulmonary exercise capacity, as well as ventilation and comfort (Fikenzer et al., 2020).

3.4.1.4 Temperature

The use of protective face masks negatively impacts respiratory and dermal mechanisms of human thermoregulation through impairment of convection, evaporation, and radiation processes (Roberge, Kim, & Coca, 2012). Increases in core temperature directly attributable to the wearing of face masks are relatively minor, suggesting that associated perceptions of increased body temperature may have a significant psychological component or that regional or global brain temperature changes are involved.

3.4.1.5 Pathogens

Pathogens are infectious microorganisms such as bacteria, viruses and fungi. Masks can become contaminated with pathogens. Boris Borovoy (2020) showed that face masks are more likely to trap and re-circulate respiratory droplets and microbes, with incubation and proliferation of the same, inside the masked airspace and airways, which increases—not decreases—the risk of infections for major respiratory pathogens, bacterial, fungal and viral. In an article published in *Scientific Reports*, A.-M. Park et al. (2022) found several pathogenic microbes on used face masks: *Bacillus cereus*, *Staphylococcus saprophyticus*, *Aspergillus* and *Microsporum*. The authors recommended that immunocompromised people should avoid repeated use of masks to prevent microbial infection. Masks accumulate biological matter from respiratory emissions, airborne microbes and periodontal bacteria, plus epithelial cells shed from the skin (M. K. Mansell,

2022). Delanghe et al. (2021) found that a considerable number of bacteria, including pathobionts and antibiotic-resistant bacteria, accumulate on surgical and (even more) on cotton face masks after four hours of use. One study found that face masks became seeded 'almost instantaneously' with oral and nasopharyngeal bacteria, and bacterial growth was found on the inside of 97.2% of masks and on the outside of 90.2% (Bankhead, 2021). Jenny Harries, Deputy Chief Medical Officer for England, stated that face masks could trap the COVID-19 virus, increasing the risk of infection (Baynes, 2020). Chughtai et al. (2019) studied the presence of viruses on the surface of medical masks in hospitals in Beijing, China. The overall virus positivity rate was 10.1% (15/148). The isolated viruses from masks samples were adenovirus ($n = 7$), bocavirus ($n = 2$), respiratory syncytial virus ($n = 2$) and influenza virus ($n = 2$). Respiratory pathogens on the outer surface of the used medical masks may result in self-contamination. The risk of mask contamination was associated with duration of mask use and number of patients seen. 83.8% of the participants reported at least one problem associated with mask use. Commonly reported problems were pressure on the face (16.9%), breathing difficulty (12.2%), discomfort (9.5%), trouble communicating with the patient (7.4%) and headache (6.1%).

3.4.1.6 Skin

A study with 20 women instructed to wear a mask for at least six hours a day for four weeks concluded that wearing a mask for extended periods increases skin wrinkles and pores (M. Park et al., 2021). Gelardi, Giancaspro, Luperto, and Cassano (2022) found increasing reports of skin damage, occupational dermatoses, irritant contact dermatitis and allergic contact dermatitis related to surgical and N95 face masks. Similarly, Di Altobrando, La Placa, Neri, Piraccini, and Vincenzi (2020) found that prolonged mask contact may result in an increased incidence of irritant contact dermatitis, flare-ups of pre-existing dermatoses and allergic contact dermatitis. İnan Doğan and Kaya (2021) showed that with individuals who have dermatological diseases long-term mask use caused primary skin symptoms, such as itching, redness, rash, dryness and peeling, burning, oily skin and acne formation, and also increased the existing dermatological facial diseases. The most common finding in all patients after mask use was itching with a rate of 64.7%. Similar rates were detected for other symptoms. A significant increase was detected in the severity of acneiform and inflammatory dermatosis after the use of masks. Thatiparthi, Liu, Martin, and Wu (2021) conducted a systematic review of studies reporting adverse facial reactions associated with the use of face masks during the COVID-19 pandemic. A total of 954 cases of dermatological adverse effects were reported. Over 17 different adverse facial reactions were found, including the top 10 in order: itch (370, 38.8%), indentation/ear pain (102, 10.7%), discomfort (90, 9.4%), erythema (72, 7.5%), dryness (62, 6.5%), rash (60, 6.3%), scarring (42, 4.4%), desquamation (22, 2.3%), pain (19, 2.0%), burning (19, 2.0%) and wheals (7, 0.7%). Face masks can increase acne ($n = 44$), rosacea ($n = 14$) and seborrheic dermatitis ($n = 9$).

3.4.1.7 Eyes

During the pandemic, there has been an increase in ocular irritation and dryness among regular mask users (Moshirfar, West, & Marx, 2020). This raises concerns for increased risk of disease transmission through the ocular route. An increasing number of regular mask users with no history of ocular surface pathology have been presenting with dry eye symptoms. Tang and Chong (2021) report a case of face mask-associated ocular complication. After an initial cornea abrasion from mask use, a patient developed recurrent corneal erosion syndrome that was complicated by microbial keratitis after the enforcement of mandatory mask use in public areas.

3.4.1.8 Vision

Masks can also compromise vision. A. Weber, Hohberger, and Bergua (2021) found that visual field function was observed to be significantly impaired in the inferior-nasal sector whilst persons were wearing a mouth–nose mask, especially when the nose clip was not correctly used. And for those who wear glasses, the lenses can steam up. Wearing a face mask compromises visual information from the lower peripheral field and may therefore, whilst walking, increase the chance of tripping or falling (Kal, Young, & Ellmers, 2020).

3.4.1.9 Nose

Zhu, Lee, Wang, and Lee (2014) found that when a surgical face mask or an N95 respirator was worn for three hours and then removed, nasal resistance was elevated, potentially due to nasal physiological changes, and did not recover even after 1.5 hours. Klimek et al. (2020) reported on 46 patients who presented with irritative rhinitis-like symptoms (such as sneezing, itching, nasal blockage and rhinorrhea) after wearing filtering facepiece particle (FFP) masks. They found polypropylene fibres in nasal lavage fluid, with a maximum of 47 fibres in one patient, and a maximum length of 42 mm in one patient. Gelardi et al. (2022) reported a case of a superinfected irritant contact dermatitis of the narinal region complicated in nasal vestibulitis, characterised by purulent secretions, narinal edema and nasal obstruction, caused by wearing the same surgical mask for multiple days.

3.4.1.10 Bad Breath

When wearing a mask, people tend to breathe through their mouth instead of through their nose (Licea, 2022). This increases dryness of the mouth and leads to a decrease in saliva. Saliva prevents the buildup of bad bacteria, cleanses your teeth and neutralises acid in the mouth (helping to prevent tooth decay and gum disease). So wearing a mask can indirectly lead to bad breath, tooth decay and gum disease.

3.4.1.11 Particulate Inhalation

Bhangare, Tiwari, Ajmal, Rathod, and Sahu (2023) found that new masks emit 5000 to 9000 microplastic particles over a period of usage of 8 hours, whilst used masks emitted 6500 to 15,000 microplastic particles over the same period. Kisielinski et al. (2024) conducted a scoping review on wearing face masks as a potential source for inhalation and oral uptake of inanimate toxins. Most studies (63%) showed alarming results with high micro- and nanoplastics (MPs and NPs) release and exceedances could also be evidenced for volatile organic compounds (VOCs), xylene, acrolein, per-/polyfluoroalkyl substances (PFAS), phthalates (including di(2-ethylhexyl)-phthalate, DEHP) and for Pb, Cd, Co, Cu, Sb and TiO_2. An article in *Ecotextile News* reported that German scientists have found that wearing certain types of face masks for long periods of time could result in potentially hazardous chemicals and harmful microplastics being inhaled deep into human lungs (Mowbray, 2021). Using µFTIR analysis, Jenner et al. (2022) identified microplastics in all regions of the human lungs. Their results supported inhalation as a route of exposure. Borovoy, Huber, and Makeeta (2020) noted that if even a small portion of mask fibres is detachable by inspiratory airflow, or if there is debris in mask manufacture or packaging or handling, then there is the possibility of not only entry of foreign material to the airways, but also entry to deep lung tissue, and potential pathological consequences of foreign bodies in the lungs. Verleysen et al. (2022) analysed twelve face masks meant to be worn by the general population, and observed titanium dioxide (TiO_2) particles in all of them, from 0.8 to 152 mg per mask. TiO_2 is a suspected human carcinogen when inhaled. Ryu and Kim (2023) found that KF94 masks (similar to N95/FFP2) may expose wearers to dangerous levels of toxic compounds linked to seizures and cancer (Joshu, 2023). Chemicals released by these masks had eight times

the recommended safety limit of toxic volatile organic compounds (TVOCs). Inhaling TVOCs has been linked to health issues like headaches and nausea, whilst prolonged and repeated use has been linked to organ damage and even cancer.

3.4.1.12 Communication

Faces You cannot see most facial expressions of a person wearing a mask. Face masks compromise people's ability to recognise emotions, especially toddlers (Gori, Schiatti, & Amadeo, 2021; Ruba & Pollak, 2020; J. Schneider et al., 2022). At Ariel University in the West Bank in Israel, Fitousi, Rotschild, Pnini, and Azizi (2021) conducted experiments on the impact of face masks on the processing of facial identity, emotion, age and gender. Their results revealed that masks hindered the perception of virtually all tested facial dimensions (i.e. emotion, gender, age and identity), interfering with normal speed and accuracy of categorisation.

Speech Masks degrade the speech signal, serving as a low-pass filter by attenuating high frequencies spoken by the wearer; the decibel level of attenuation ranges from 3 to 4 dB for simple medical masks and close to 12 dB for N95 masks (Charney, Camarata, & Chern, 2021). Speech perception also involves audiovisual integration of information. Salient visual cues contribute to speech processing during crucial periods of language and speech development. Wearing masks means that articulatory gestures may be obscured. For children with hearing loss, who are more dependent on lip-reading, matters are even worse. When face masks are worn, lip-reading obviously becomes impossible (Chodosh, Weinstein, & Blustein, 2020).

Smiles Most importantly, wearing masks compromises communication: speech becomes muffled, smiles become hidden (Swaminathan & Meeracorresponding, 2020). In 2023 in Japan it was reported that customers were paying instructors to teach them how to smile again after spending three years hiding their faces behind masks amid the pandemic (Bridge & Bateman, 2023; C. Oliver, 2023).

3.4.1.13 Social

Wearing a face mask may also communicate to the other party that the individual with the mask is either 1) infectious or 2) believes that the person they are talking to is infectious. Both assumptions could compromise the interpersonal relationship between the two parties. Sidley (2023b) pointed out that anyone with a brain and eyesight can recognise that humans need faces. In *Homo sapiens*, faces are there for a fundamental reason: to convey the essence of being human. Mowrey (2022a) explained that masks are intrinsically political, and that public masking is perverted, antisocial insanity. The American theoretical cognitive scientist Mark Changizi had enough material to produce no less than 36 videos covering the complex psycho-societal problems with masks (Changizi, 2022).

Trust Humans assess trustworthiness from people's faces, even before the face is consciously perceived (Freeman, Stolier, Ingbretsen, & Hehman, 2014). This ability is obviously compromised when the face is behind a mask. Masks make people, at least children, less honest (F. G. Miller & Rowold, 1979).

Compliance Masks generally make us more docile and compliant (Fagan, 2020). Masks make us appear dumb and unattractive. Masks infantilise adults and emasculate men. J. H. Anderson (2021b) pointed out that faceless people make compliant subjects, not good citizens. He summarised masks well:

> In sum, not only do masks apparently not work as advertised, they are uncomfortable and unhygienic. They obscure our humanity and undermine our children's development. They prevent us from seeing the emotions, sensibilities, and affections of others, or sharing our own. They limit communication and erode understanding. They profoundly compromise human interaction and substantially reduce our quality of life.

C. J. Baker (2023) pointed out that masks don't work by controlling the virus, they work by controlling the people. Masks signal compliance and submission, instil fear in people, and are effective as virtue signals of compliance, bolstering the submissive person's ego. Masks also impose a very strong peer-pressure effect, which pushes those who are uncertain towards following the crowd. Masks are effective at humiliating people. They are uncomfortable, ugly, dirty, unnatural and degrading. In an informative Twitter thread on masks, Goddek (2023) concluded that face masks worked perfectly: to gaslight, frighten and manipulate the public.

3.4.1.14 Cognition

Using a descriptive cross-sectional study with a pretest–posttest design and nursing students at a state university in Turkey, Sezer, Çınar, and Kılıç Akça (2023) determined that the use of surgical masks during full-time face-to-face teaching increased students' cognitive fatigue and decreased their cognitive reaction rates. In other words, this is evidence that face masks literally make the wearer more stupid (whilst catching COVID-19 does not (Carl, 2024a; Weerman et al., 2024)).

3.4.1.15 Immunity Debt

Radagast (2022e) pointed out that your body needs exposure to mild respiratory viruses, to prevent a novel virus from catching your body by surprise. Measures that reduce transmission of SARS-CoV-2 also reduce the transmission of other benign respiratory viruses. So, in general, we should not wear masks, even if they worked!

3.4.1.16 Crime

Masks obviously benefit those who prefer to avoid recognition. Masks have been put to good effect by criminals (Ward, 2020), and made identifying them more difficult (Mullaley, 2020). Oakeshott (2023) pointed out that due to the legacy of the pandemic, the use of face masks has been normalised. This enables thugs, thieves and other criminals to hide in plain sight. C. Moore (2024) reported that face masks provide cover for violence and extremism. They intimidate people and prevent identification by police, and are intended to do so. Whilst in England a man hit another man in the head with a metal pole for not wearing a mask in McDonald's (Cotterill, 2023).

3.4.1.17 Accidents and Deaths

Accidents In the US, after wearing an N95 mask for several hours, a New Jersey woman, whilst driving, passed out behind the wheel and crashed her car into a wooden power pole in Lincoln Park, New Jersey (Gearty, 2020). According to police, the crash was due to insufficient oxygen intake/excessive carbon dioxide intake. Whilst in the UK, a cocker spaniel puppy nearly died after eating a face mask (Giordano, 2020). The one-year-old, from Liverpool, needed emergency surgery to remove the piece of material after it blocked his intestines, causing him to be sick.

Deaths Unfortunately, although face masks don't mitigate COVID-19, they have led to the deaths of several people. In Taiwan in January 2024, an 11-month-old boy died after being forced to wear a face mask at nursery (R. Watson, 2024e). The mask was saturated with tears and mucus, causing it to stick to his nose and mouth and suffocate him. He died as a direct result of having been forced to wear a face mask. In April 2020, two schoolboys in China, aged 14 and 15, died suddenly after wearing face masks whilst running in physical education (PE) classes (W. Lin, 2020). In Toronto in May 2020 Stephanie Warriner was choked to death by hospital security guards for wearing a face mask too low (P. Stevens, 2023). Whilst in July 2020 in Bayonne in south-west France a bus driver was beaten to death after he asked men to get off for not wearing face masks correctly (Rhoden-Paul, 2023). More generally, Changizi (2023b) pointed out that if people assume that masks work, both the infected and the immunocompromised would be more likely to mingle, which, because masks don't work, could potentially kill people.

3.4.1.18 Pollution

Land Many masks become litter, so are bad for the environment (Kassam, 2020). *The Guardian* reported that in the UK 53.3m face masks are sent to landfill each day (Laville, 2020). Disposable face masks release microfibres into the environment (Rathinamoorthy & Raja Balasaraswathi, 2022). In a toxicology journal, la Torre, Pizarro-Ortega, Dioses-Salinas, Ammendolia, and Okoffo (2021) determined that face masks release microplastics, which are directly inhaled during use or transported through the environment. In the latter case they can adsorb chemical contaminants and harbour pathogenic microbiota, and once consumed by organisms, they can translocate to multiple organs upon intake, potentially causing detrimental and cytotoxic effects. Polymer-based face masks have played a key role in microplastic pollution, and the management of such waste needs addressing (Fadare & Okoffo, 2020).

Water *The Guardian* reported that in the UK masks were being found in streams, rivers and oceans. Morgana, Casentini, and Amalfitano (2021) found that a single face mask in water could release thousands of microplastic fibres and up to 10^8 submicrometric particles, mostly nano-sized ($< 0.5\,\mu m$). Sullivan, Delgado-Gallardo, Watson, and Sarp (2021) discovered that when disposable face masks are exposed to water, they leach microparticles, nanoparticles and heavy metals. Similarly, BBC News (2021c) reported that disposable face masks could be releasing chemical pollutants and nano-plastics into the environment. A team from Swansea University found that heavy metals and plastic fibres were released when throw-away masks were submerged in water. The problem of pollution and environmental degradation created by dumping PPE is global (Heneghan & Jefferson, 2024h).

3.4.2 Healthcare

Rosner (2020) conducted a cross-sectional study among healthcare professionals, primarily located in New York City, who worked in the hospital during the COVID-19 pandemic. Of the 343 participants in the survey, 59.2% primarily wore an N95 mask and 40.8% wore a surgical mask throughout their shift, and 91.5% reported one or more adverse events. In a systematic review and meta-analysis Kunstler et al. (2022) examined the differences in likelihood of adverse events (AEs) among healthcare workers using respirators and surgical masks. Twenty-one studies were included, with most having a high risk of bias. Healthcare workers experienced significantly more headaches (odds ratio (OR) 2.62), respiratory distress (OR 4.21), facial irritation (OR 1.80) and pressure-related injuries (OR 4.39) when wearing respirators compared to surgical masks.

3.4.2.1 Breathing

Hypoventilation occurs when ventilation is inadequate to perform needed respiratory gas exchange. By definition it causes an increased concentration of carbon dioxide (hypercapnia) and respiratory acidosis. Tong et al. (2015) conducted a two-phase controlled clinical study on healthy pregnant healthcare workers between 27 to 32 weeks gestation breathing through N95 respirator material when performing low-intensity work. They concluded that the N95 mask may impede gaseous exchange resulting in hypoventilation and impose an additional workload on the metabolic system. When anaesthetists wore close-fitting face respirator masks the average end-tidal CO_2 level rose from 5.18 kPa to 5.95 kPa after 20 minutes (Fletcher, Clark, & Stanley, 2006). In another instance, it reached 6.3 kPa after 30 minutes. The rise in end-tidal CO_2 is due to rebreathing of expired alveolar gas that is 'trapped' in the respirator, with the degree of rebreathing being proportional to the volume of the respirator ('dead space'). Moderate (6.18 kPa) to high (7.5 kPa) levels of end-tidal CO_2 have been shown to significantly impair cognitive and psychomotor performance. If healthcare workers wear these respirators for prolonged periods, problems with hypercapnia might become an issue. Bharatendu et al. (2020) analysed the effect of N95 respirator masks on healthcare workers. Wearing them resulted in a significant increase in mean flow velocity, a significant decrease in pulsatility index and an increase in end-tidal CO_2. The authors concluded that the use of the N95 respirator mask results in significant alterations in cerebral hemodynamics. Roberge, Coca, Williams, Powell, and Palmiero (2010) assessed the physiological impact of the N95 filtering facepiece respirator (FFR) on healthcare workers. The FFR dead-space CO_2 and O_2 levels were significantly above and below, respectively, the Occupational Safety and Health Administration's ambient workplace standards, and elevated P_{CO_2} (partial pressure of carbon dioxide) was a possibility. When anaesthesiologists wore surgical masks for more than two hours, their peripheral oxygen saturation (SpO_2) decreased (98.0 vs 97.0, $p < 0.05$) and respiratory rate increased (16.0 vs 17.0, $p < 0.01$) (S. Yang et al., 2022).

3.4.2.2 Pathogens

In a cross-sectional study of used surgical masks collected from hospital personnel at a hospital in Bangkok, Luksamijarulkul, Aiempradit, and Vatanasomboon (2014) found that the inside and outside of masks can become contaminated with bacteria and fungi.

3.4.2.3 Headaches

Surgical Masks Jacobs et al. (2009) found that when health care workers wore surgical masks they were significantly more likely to experience a headache and more likely to 'feel bad'. Rosner (2020) conducted a cross-sectional study among healthcare professionals, primarily located in New York City, who worked in the hospital during the COVID-19 pandemic. Of the 343 participants in the survey, 59.2% primarily wore an N95 mask and 40.8% wore a surgical mask throughout their shift. 71.4% suffered from a headache.

N95 Respirators E. C. H. Lim et al. (2006) found that healthcare providers may develop headaches following use of an N95 face mask. Similarly, Ong et al. (2020) found that most healthcare workers developed *de novo* N95 face mask-associated headaches or experienced exacerbation of their pre-existing headache disorders. Bharatendu et al. (2020) analysed the effect of N95 respirator masks on healthcare workers. 80% of the healthcare workers developed *de novo* headaches, whilst 25% developed migraines.

3.4.2.4 Skin

Rosner (2020) conducted a cross-sectional study among healthcare professionals, primarily located in New York City, who worked in the hospital during the COVID-19 pandemic. Of the

343 participants in the survey, 59.2% primarily wore an N95 mask and 40.8% wore a surgical mask throughout their shift. 53.1% suffered from acne and 51% suffered from skin breakdown.

3.4.2.5 Communication

In the *International Journal of Language & Communication Disorders*, Marler and Ditton (2021) conclude that there are numerous logistical, physiological, psychological, social and economic complications associated with the wearing of masks: 'the ability of healthcare staff to successfully communicate with patients and with colleagues is jeopardized, which may adversely affect the efficiency, effectiveness, equitability and, most notably, safety of therapeutic intervention'. Gary Sidley, a retired clinical psychologist, argued that the ubiquity of face masks in healthcare settings represents a triumph of culture over science: 'a sphere of society where one might reasonably expect a reliance upon evidence-based practice, is now the outlier in persisting with the unscientific and pervasively damaging mass-masking phenomenon' (Sidley, 2022a). Dr Sidley points out that masks compromise the therapeutic relationship between the caregiver and receiver because they make rapport, warmth, compassion, mutual trust and a demonstration of empathy harder (Sidley, 2022e). Sidley (2024a) reported that the Scottish Covid Inquiry uncovered the harms caused by care home residents wearing masks. 'The evidence demonstrated that the use of masks caused distress, confusion and considerable difficulties with communication. Residents couldn't see smiles, had difficulty recognising relatives and those with hearing difficulties couldn't lip-read or read facial expressions or visual clues. Some witnesses spoke to being made to wear them, even for window visits. Lucy Challoner said that her gran felt that people were laughing at her behind them.'

3.4.2.6 Cognition

In the Rosner (2020) study among healthcare professionals in New York City (with 59.2% wearing an N95 mask and 40.8% wearing a surgical mask), 23.6% suffered from impaired cognition.

3.4.2.7 Mental Health

Sidley (2024a) reported that the Scottish Covid Inquiry uncovered the harms caused by care home residents wearing masks. 'If you are surrounded by a group of people 24/7 wearing masks, and you don't see people smile for up to two years, what kind of effect is that going to have on your mental health and wellbeing?'

3.4.3 Children

Masks appear to cause numerous real or perceived issues for children in particular (e.g. irritability, headache, difficulty concentrating, less happiness) (S. Schwarz, Jenetzky, Krafft, Maurer, & Martin, 2021).

3.4.3.1 Breathing

In Germany, Walach et al. (2022) measured the CO_2 inhaled by healthy children wearing a surgical or an FFP2 mask in a seated resting position. The CO_2 content of the inhaled air rose quickly on average to 13,000–13,750 ppm with both types of mask. This is beyond the 1,000 ppm that is normal for air in closed rooms and far beyond the level of 2,000 ppm considered the limit of acceptability. In Italy, Martellucci, Flacco, Martellucci, Violante, and Manzoli (2022) measured end-tidal CO_2 using professional side-stream capnography, with water-removing tubing, (1) without masks, (2) wearing a surgical mask and (3) wearing an FFP2 respirator (for 5 minutes each whilst seated after 10 minutes of rest), in 146 healthy volunteers aged 10 to 90 years, from the general population of Ferrara. The proportion showing a CO_2 concentration higher than

the 5000 ppm (8-hour average) acceptable threshold for workers was 41.1% with surgical masks and 99.3% with FFP2 respirators. The minors showed substantially higher CO_2 concentrations than adults.

3.4.3.2 Pathogens

Masks worn by children have been found to have been contaminated with pneumonia-causing bacteria and meningitis-causing bacteria, among other pathogens (Cabrera, 2021).

3.4.3.3 Communication

Language Masks are particularly harmful to children during critical language and social development stages (M. K. Mansell, 2022). In England, Ofsted reported that a few early years providers felt that wearing face masks had a negative impact on children's communication and language skills (Ofsted, 2022; Rudgard, 2022). Children turning two years old would have been surrounded by adults wearing masks for their entire lives and would have been unable to see lip movements or mouth shapes as regularly. Some providers reported that delays in children's speech and language development led to them not socialising with other children as readily as they would have expected previously. In the US, Jaclyn Theek, a clinic director and speech-language pathologist at a speech and learning institute in Florida, reported that they'd seen a 364% increase in patient referrals of babies and toddlers from paediatricians and parents (Kelly, 2021). She described the children as speech-delayed.

Face Perception and Emotion Recognition In Canada, Stajduhar, Ganel, Avidan, Rosenbaum, and Freud (2022) found that with children face masks led to a profound deficit in face perception abilities. In the UK, using a sample of 74 children from North West England (aged 4–8 years), Bourke, Lingwood, Gallagher-Mitchell, and López-Pérez (2023) found that face masks had a significant effect on the children's emotion recognition accuracy. Masked angry faces were more easily recognised, whilst masked happy and sad faces were less easily recognised.

3.4.3.4 Missing School

Burns and Stevenson (2022b) showed that schools in US districts with a mask policy experienced, on average, four times the number of disrupted learning days as those in mask-optional districts. In Japan, COVID-19 measures in schools included masks, silent lunches and close-contact witch hunts (Gin, 2023b). The number of elementary and junior high school children who refused to go to school for at least 30 days in fiscal 2022 jumped 22.1% from the previous year to a record 299,048 (Jiji, 2023). This is hardly surprising.

3.4.3.5 Immunity Debt

In *The Epoch Times*, Megan Redshaw interpreted Suss and Simões (2024), and argued that masking may have contributed to the surge in RSV in children in 2021 and 2022 in the US (Redshaw, 2024e).

3.4.3.6 Conclusion

A review article published by the libertarian think tank *American Institute for Economic Research* is unequivocal: masking children is tragic, unscientific and damaging (P. E. Alexander, 2021b). I concur. In Germany in April 2021 a family judge ruled that children at two schools in Weimar did not have to wear COVID-19 masks in class, contrary to the rules set at the time by the Thuringian Ministry of Education (DPA/Local, 2023). He was given a two-year suspended sentence. For following the science. In my mind, masking children was one of the

most ridiculous, and unforgivable, aspects of the COVID-19 era. We knew from the start that masks didn't even work among professional healthcare workers (Jefferson et al., 2020).

3.4.4 Conclusion

Writing from Germany in September 2022, eugyppius (2022f) argued that masks are ugly, they stink, many of them are full of carcinogens, and they're ruining our kids and our lives. He concludes with: 'This simply has to stop. I don't know how to do it, but it's very important. Community masking is not healthy, it's not hygienic, it's not safe, it's not reasonable. It's sick. It's profoundly sick. I'm tired being forced to perform sickness.'

Some masks are more harmful than others. Y. Li et al. (2005) analysed the effects of wearing N95 and surgical face masks with and without nano-functional treatments. In general, the ratings for humidity, heat, breath resistance and overall discomfort increased gradually with time and increase of workload. Mean heart rate, microclimate temperature, humidity and skin temperature inside the face mask, together with perceived humidity, heat, breathing resistance in the face mask, and itchiness, saltiness, odour, fatigue, feeling unfit, tightness and overall discomfort, were significantly higher for N95 masks than for surgical masks. The higher the mask filtration, the more negative the mask health consequences (J. Droz jr, 2021). So there is no sweet spot.

It was widely believed, and stated by mask aficionados, that wearing a mask was a small cost to pay, because they are harmless. Except, having reviewed the literature, it turns out that they can cause dyspnoea, hypoxia, hypoxemia and hypercapnia, harbour pathogens, compromise communication, vision, exercise capacity, cognition and immunity, cause headaches, skin complaints, bad breath and particulate inhalation, facilitate crime and lead to pollution.

3.5 Financial Cost

Like lockdowns, face masks must pass a cost–benefit analysis. The costs include the harms listed above, but also the financial cost, which includes a colossal waste. In fact, if masks fail to provide any benefit, all costs were wasted. In August 2020 Dyer (2020) reported in *The BMJ* that fifty million face masks bought by the UK government as part of a £252m (€280m; $330m) contract at the height of the COVID-19 crisis would not be used in the NHS because of safety concerns. The FFP2 masks, supplied under a contract awarded without advertisement or tender, had ear loops rather than head ties, and the fixings may not be adequate to protect NHS frontline staff from COVID-19. P. Stevens (2022) reported that the Scottish government spent £4,500,000 of taxpayers' money on transparent masks that were not only ineffective but not recommended for use in most situations. In the UK, the House of Commons Public Accounts Committee reported that of the £12bn spent on personal protective equipment (PPE) in 2020–21, £9bn was wasted due to inflated prices or shoddy equipment (Heneghan & Jefferson, 2024k). 817 million items costing £673m were defective; some were counterfeit; some PPE was so bad it couldn't even be given away. The government had so much PPE it had to burn £4 billion of unused items; two commercial waste companies were appointed to burn 15,000 pallets monthly. Also in the UK, BBC News (2024) reported that about £1.4bn worth of personal protective equipment (PPE) had been destroyed or written off in what was understood to be the most wasteful government deal of the pandemic. At least 1.57 billion items of PPE provided by the NHS supplier Full Support Healthcare will never be used, despite being manufactured to the proper standard. The figure includes some 749 million items that have already been burned or destroyed, 'including by energy from waste', and a further 825 million that are classified as excess stock 'where disposal and recycling are possible outcomes'.

3.6 Cost–Benefit Analysis

Russell Blaylock, a retired US neurosurgeon, warned that not only do face masks fail to protect the healthy from getting sick, but claims that they also create serious health risks to the wearer (R. Blaylock, 2020). The bottom line, he says, is that if you are not sick, you should not wear a face mask. Whilst a study published in the *Physics of Fluids* found that wearing a used mask could be more dangerous than not wearing one at all (Eustachewich, 2020). For an article published by the Brownstone Institute, Paul Alexander reviewed 167 studies and pieces of evidence on face masks and concluded that masks do not work to control the virus, and they can be harmful, especially to children (P. E. Alexander, 2021c). Steve Kirsch, an American entrepreneur, spoke with Tyson Gabriel, an industrial hygienist, safety & health professional and risk manager, and made the following points: 'All three mask types (cloth, surgical, and N95) are basically worse than no mask since 1) they lower your oxygen levels 2) can make you more likely to get infected with a respiratory virus, and 3) they actually increase the inhalation of virus (big droplets would fall to the floor from unmasked people, but for masked people [...] instead they are aerosolized)' (Kirsch, 2022f). Sidley and Mordue (2022) reviewed the literature on masks, and concluded that they appear to do more harm than good. Sandlund et al. (2024) reviewed the existing evidence for the effectiveness of mask mandates to protect against COVID-19 and other viral respiratory infections and the harms associated with face mask wearing in children. There was a lack of robust evidence of benefit from masking children to reduce transmission of SARS-CoV-2 or other respiratory viruses. Whilst identified harms of masking include negative effects on communication and components of speech and language, ability to learn and comprehend, emotional and trust development, physical discomfort, and reduction in time and intensity of exercise. The authors concluded that recommendations for masking children fail basic harm–benefit analyses. I. Miller (2024g) reviewed the paper, and added that thanks to masks the growth and development of children has been harmed and stunted for years. My conclusion is clear: in terms of mitigating COVID-19, masks fail a cost–benefit analysis for anyone and everyone.

3.7 Making Masks Mandatory

What are the costs of making masks mandatory in the community? If masks are mandatory, the government have imposed a negative externality on everyone. Although an individual wearing a mask may feel safer, universal masking can instil fear within a community. This is problematic when the fear is disproportionate, as has been the case with COVID-19 (see Section 6.1.4.1). As with lockdowns generally, a vicious circle develops: masks sustain fear, and fear sustains masks. Masks took on the role of a religious talisman, adopted by the virtue signalling political left (Justice, 2022). Humans have evolved to be effective cheater detectors (also discussed in Section 6.1.7). Those not wearing masks may be identified and scolded as cheaters, creating a divided society. Whilst the issue of mandatory masks has directly led to violence with sometimes fatal consequences in the US (Mascia, 2020). The cost to society of requesting that everyone wears a face covering in indoor public spaces is greater than the cost of simply publicising the risks (and in the UK the ONS have provided more data than most countries make available) and letting the old, vulnerable and/or paranoid wear masks if they so desire.

Royo-Bordonada, García-López, Cortés, and Zaragoza (2021) argued that the paternalistic policy of making masks mandatory in public open spaces did not appear to be justified on the basis of the available scientific evidence. Dingwall (2023) argued, reasonably, that making masks mandatory with so little evidence to support their use undermined trust in science. Such a policy was authoritarian, undemocratic and potentially dangerous—vulnerable people may have wrongly believed that masks would keep them safe. In his book *Unmasked: The Global Failure of COVID Mask Mandates*, Ian Miller makes the case that making masks mandatory failed to mitigate COVID-19 (I. Miller, 2022d). Making masks mandatory is one thing, but getting the

public to comply is another. R. Watson (2023c) reviewed *The Face Mask Cult* and *Unmasked: The Global Failure of the Covid Mask Mandates*, which he described as 'excellent books'. He finishes with 'the most remarkable aspect of the COVID-19 pandemic for which I have yet to see an adequate explanation is that people complied'. The compliance was my biggest surprise, too. Even China did not make face masks mandatory (R. Watson, 2023b).

3.8 Why Don't Face Masks Mitigate COVID-19?

We showed that making face masks mandatory in enclosed public places in England failed to mitigate the COVID-19 epidemic. It had no beneficial effect on the rate of COVID-19 infections/cases/deaths (they actually increased). How can we reconcile the fact that masks work as a filter, yet fail to mitigate COVID-19?

3.8.1 A Viable COVID-19 Virus Is Small

As a sanity check, consider the size of a viable COVID-19 virus. A viable virus (0.25 µm–0.50 µm (Lednicky et al., 2021)) is the same size as a cigarette smoke particle 0.1–1.0 µm (Keith & Derrick, 1960)), and we might expect 38% of these particles to penetrate a mask (Oberg & Brosseau, 2008).

3.8.2 Masks Leak

Masks leak, see Section 3.3.2. If a surgical mask has a filtration efficiency of 100%, with a leak of just 2% of the area the filtration efficiency is reduced to 50% for particles of size 0.03–2.5 µm (Drewnick et al., 2021).

3.8.3 Masks Become Moist

In 2003 during SARS, Professor Yvonne Cossart of the Department of Infectious Diseases at the University of Sydney stated that masks are only effective so long as they are dry, which could be for as little as 15 or 20 minutes (Herald, 2003).

3.8.4 Masks Worn Incorrectly

Masks are often worn incorrectly. Oberg and Brosseau (2008) found that out of 20 subjects, all of them failed an unassisted qualitative fit test on the first exercise (normal breathing), whilst 18 failed an assisted qualitative fit test.

3.8.5 The Vulnerable Become More Susceptible

In practice, as discussed earlier, the rate of COVID-19 cases is dominated by the herd immunity threshold (which is a function of the infectiousness of the dominant variant and the season) and the proportion of the population that are susceptible. For the vast majority who didn't have COVID-19, the effect of wearing a mask would be marginal at best. Whilst for those with asymptomatic or pre-symptomatic COVID-19, wearing a mask in public meant that they were (again, marginally) less likely to infect those they met, which would have (marginally) delayed herd immunity among the more mobile, leaving the less mobile (the elderly and vulnerable) more susceptible.

3.8.6 Most Transmission Occurs in Unmasked Environments

Heald, Stedman, Tian, Wu, and Fryer (2021) showed that only 7.3% of all community-based infection risk is associated with environments requiring mandatory mask-wearing in the UK (essentially retail outlets and public transport). So even using the idealised scenario above with

masks leading to a 70% reduction in infections, the mandatory mask policy would only reduce the overall number of infections by 5%.

3.8.7 Limited Time Window of Effectiveness

In the laboratory experiment using two manikin heads referenced above (Ueki et al., 2020), if both the infected and the uninfected wore cotton/surgical masks for twenty minutes, compared to no masks, $\log_{10}$(viral loads) received by the uninfected were reduced by around 70%. In other words, it would take 3.3 times as long to receive the same viral load. The median minimum amount of time that one needs to be exposed to an infected person in order to become infected is of the order of a cumulative time of 15 minutes in a day (Mack et al., 2021). So with both parties masked, this would be extended to about 50 minutes. On this basis, it could be argued that masks should effectively mitigate infections only for those who are susceptible and spending between 15 minutes and 50 minutes with one or more infected persons in an unventilated enclosed space. This does not happen frequently, the time interval is generally too long for passing someone in a shop, and too short for a home or work environment. Commuting by public transport may be the best candidate. Whilst infection rates on public transport turned out to be surprisingly low, partly due to due to good ventilation (Culbertson & Aguilar-Garcia, 2020; Dai & Zhao, 2020; Joselow, 2020; D. Miller et al., 2022; Network Rail, 2021; O'Hare, 2021). Also, Prasad (2024g) notes that prolonged exposure time can thwart a marginal change in particle exposure.

3.8.8 Long-Term Dynamics

If we assume that on a given day, in an unmasked population a susceptible person has a 1% chance of being infected, and in a masked population they will have a 0.95% chance on being infected. At the end of the year, the chances of a susceptible person having been infected are now 97.4% for the unmasked and 96.9% for the masked. So masks have reduced the number of infected by 0.5%. In other words, the true positive impact of masks would likely be immeasurably small.

3.8.9 Merely Slows Onset of COVID-19

If COVID-19 is likely to be transmitted without a mask, and an effective mask is worn properly, less viral load is transmitted. This means a slightly slower onset of disease, rather than the difference between being infected and not being infected.

3.8.10 Cannot Thwart a High Viral Load in the Air

In an enlightened article in *The Daily Sceptic*, Will Jones hypothesised that COVID-19 outbreaks can be explained via aerosol transmission susceptibility thresholds (W. Jones, 2021a). The primary means of infection is through relatively prolonged exposure to air contaminated with a sufficiently high viral load from the aerosols produced by infectious people. An outbreak is triggered when the viral load of infectious aerosols in the air in most indoor communal spaces reaches a certain threshold such that anyone who enters those spaces and spends more than a trivial amount of time in them is exposed to an infective dose of the virus, some of whom will be susceptible. Hypothetically, if masks half the viral load, but the viral load in the air is ten times greater than the threshold required for an infective dose of the virus, then it would be unsurprising that masks are futile.

3.8.11 Immune Response Rather Than Viral Load Matters

When L. H. Fisher et al. (2024) analysed SARS-CoV-2 viral load in the nasopharynx at time of first infection among unvaccinated individuals, perhaps surprisingly, no associations were found between viral load and disease severity. The findings contradict those of earlier studies that found that patients with severe COVID-19 presentations tended to have a high viral load (M. Zhang, 2024b). William Schaffner, a professor of preventive medicine at Vanderbilt University Medical Center who was not involved in the study, said he was not too surprised at the findings. He added that COVID-19 pneumonia, a complication associated with severe COVID-19, is known to be determined by the body's immune response and less so by viral load. If masks reduce viral load, but disease severity is a function of immune response rather than viral load, then this suggests that masks may not be effective.

3.8.12 The Virus Could Evolve to Become More Infectiousness

Livermore (2023a) pointed out that non-pharmaceutical interventions (NPIs) created bottlenecks, not walls, against COVID-19. This is problematic. For example, masks could select for variants with increased infectiousness. If masks filtered out most of the particles of a virus, the virus could evolve such that the minimum infective dose is lowered.

3.9 If Face Masks Don't Mitigate COVID-19, Why Were They Used?

Masks make intuitive sense. If COVID-19 is spread by droplets (as originally assumed), and a large number of those infected are asymptomatic, using face masks (which are cheap) as a source control, *prima facie*, seems like an effective means of mitigation. Swiss Policy Research (2021c) give twelve reasons why, despite the fact that it has been known for decades that face masks don't work against respiratory virus epidemics, the world nonetheless fell for the face mask folly: 1) the droplet model; 2) the Asian paradox (during the first year of the pandemic, several East Asian countries had a high masking rate and a very low COVID-19 infection rate (correlation but not causality)); 3) the Czech mirage (in the spring of 2020, the Czech Republic was one of the first European countries that introduced face masks and the Czech infection rate initially stayed low (correlation but not causality)); 4) fake science; 5) asymptomatic transmission; 6) political pressure; 7) the media; 8) 'surgeons wear masks'; 9) 'masks suppressed the flu'; 10) misleading memes; 11) doubling down; and 12) Sweden: the exception that proved the rule. Below, I shall consider the advantages of face masks, academia's contribution to the unnecessary masking of society, the invocation of the precautionary principle, the political reasons for the introduction of masks, masks' appeal due to their use in healthcare, the responsibility of the media and the reception by the general public.

3.9.1 Advantages of Face Masks

What are the *advantages* of wearing masks? Masks can protect both the wearer and others in close proximity from splashes and droplets. Although in a community setting normal etiquette (don't sneeze in someone's face) does the same, so masks add nothing. Plus, wearing a mask makes one appear a virtuous person (albeit one not *au fait* with the science).

3.9.2 Academia

We knew from the start that masks wouldn't work, but randomised controlled trials (RCTs) on influenza were dismissed, and low-quality observational studies took their place (Jefferson & Heneghan, 2023d). People believed that masks worked due to weak retrospective observational studies and confused public health authorities lying about the benefits and completely ignoring the risks of medical masks (Meehan, 2020). UK policy on masks was informed by a UK Health

Security Agency (UKHSA) review, which included poor-quality evidence (Jefferson & Heneghan, 2023e). E. Brown, Haslam, and Prasad (2023) examined primary research on mask usage as a means of source control to protect others by reducing the spread of respiratory diseases and contrasted the literature published before the onset of the COVID-19 pandemic with that published afterwards. The quality of evidence in the published literature on masks as source control is lower after the start of the COVID-19 pandemic, with notable shifts in methodologies, research subjects, setting and author tone. Study authors were significantly more supportive of masks as source control in the post-pandemic literature. In 2020, drawing from the theory of post-normal science, G. P. Martin, Hanna, McCartney, and Dingwall (2020) argued that the science–policy interface in the case of face coverings had taken a surprisingly traditional form, falling short of interdisciplinary integration and failing to incorporate insights from the full range of relevant experts and affected stakeholders.

3.9.3 Precautionary Principle

The *precautionary principle* is an approach to situations that have the potential for causing harm when scientific knowledge on the matter is lacking. It emphasises caution, pausing and review before potentially dangerous action. Greenhalgh, Schmid, Czypionka, Bassler, and Gruer (2020) invoked the precautionary principle to justify recommending face masks. The correct approach, of course, would have been to follow existing guidelines for pandemics set out by the WHO: masks were not recommended (WHO, 2019). G. P. Martin, Hanna, and Dingwall (2020) responded to Greenhalgh et al. (2020) and wisely pointed out in May 2020 that 'unequivocal advocacy for face masks risks overstepping current knowledge and promoting policy change based more on eminence than evidence.'

3.9.4 Government

Sidley (2024d) wisely suggests that face masks were introduced for political reasons:

> … forcing the public to wear masks was a highly visible way to be seen to be 'doing something' that came with at least a couple of attractive bonuses to politicians and bureaucrats. One, the practice had superficial 'gut feel' appeal to the layperson – if you didn't think about it very much, and never looked at the evidence, masking felt like it should work. Two, as with most of the non-pharmaceutical interventions (NPIs) it shifted blame for Covid impacts away from the state and health service and onto individuals. 'Rule breakers' among the public – now easily identifiable by sight – made for convenient folk devils and scapegoats.

3.9.4.1 United Kingdom

In the UK face masks were made mandatory in secondary schools for political reasons. In Scotland, Nicola Sturgeon's decision to force secondary school children to wear face masks was purely political and not based on medical advice (S. Johnson & Johnston, 2024). Masks were not expected to be introduced in classrooms in England and Wales until Nicola Sturgeon announced that they were to be introduced in classrooms in Scotland, and the UK Government then felt the need to follow, forcing a U-turn (Garton-Crosbie, 2022; Skinner, 2022). In other words, the decision for England and Wales was totally political, too, rather than based on science or a cost–benefit analysis. Again, this was the wrong decision for the wrong reasons, and an absolute disgrace. Then children were forced back into face masks during the pandemic because teaching unions threatened that teachers would not show up to work otherwise (Turner, 2023). The unions thus displaying both their ignorance of the science and their contempt for the children. For more on the poor behaviour of teaching unions during COVID-19, see Section 6.8.9.

3.9.4.2 United States

An article published in *Tablet* (the online magazine focused on Jewish news and culture) reported that mask mandates became political, rather than based on science (J. H. Russell & Patterson, 2022). Shullenberger (2022) insightfully explained why, despite the evidence that they are ineffective, governments encouraged the use of face masks:

> It is not difficult to see why mask mandates proved irresistible to politicians. Masks are the perfect form of hygiene theatre, conveying an intuitive sense of safety regardless of demonstrable efficacy at scale. They also offload responsibility for controlling the pandemic to ordinary people. The overcrowding of ICUs can be blamed on the bad behavior of "anti-maskers", rather than on the allocation of resources by governments and hospital CEOs. When cases and deaths spike, it is the fault of the citizenry, not the leadership.

Burns and Stevenson (2022a) summarise nicely: 'We jettisoned 100 years of science that showed us that masks did not stop respiratory viruses, and the mechanisms for why that was the case. The only reason we did so, was because Asian nations which masked up quickly early on had lower rates of COVID. All other possibilities for those outcomes were precluded, including the much more logical possibility of some kind of broader pre-existing cross-immunity.' Absurdly, the CDC director even endorsed the idea of *permanent* masking to prevent the spread of seasonal viruses in general (S. L. Miller, 2021).

3.9.5 Healthcare

In the UK, the NHS just made up their mask policies, which stemmed from an over-reliance on models, non-existent data and the need to be seen to do something (another case of politician's syllogism) (P. Stevens, 2024). On his blog, eugyppius (2023a) suggested that masks owe their mass appeal to their associations with hospitals, and especially their use by surgical teams in operating theatres. However, he explains, despite 125 years of surgical masking, nobody has ever shown that the practice improves patient outcomes or prevents infections among hospital staff. He concludes that 'Wearing diapers on your face serves no demonstrable health purpose in any context' and 'In a rational world, we would discontinue the use of face masks altogether, in every context'. If masks don't work, then why do surgeons wear them? Meehan (2020) answers this. Surgeons work in sterile surgical suites equipped with air exchange systems that increase the oxygen content of the room, and this mitigates the negative effects of masks. Furthermore, surgeons are well trained, only wear fresh sterile masks, wear them for short periods of time, change them at the first signs of excessive moisture, never re-use surgical masks and never wear cloth masks. However, as we have seen, even in healthcare, surgical masks are only effective for splash and droplet protection.

3.9.6 Media

Even in November 2022 an article in a Canadian newspaper stated that we need to normalise wearing masks (Lederman, 2022). Whilst Bienen, Noble, and Smelkinson (2023) pointed out that when the media promote masks, contradicting the scientific evidence, the public can lose trust in the media.

3.9.7 Public

The public was surprisingly compliant. Presumably, most of the population assume that masks mitigate COVID-19. Not unreasonably, they likely assumed that if masks didn't work, they wouldn't exist, and surely the government would not have made them mandatory. Face masks

facilitate highly visual virtue signalling, which is why populations complied so readily. Unfortunately, virtue signalling doesn't protect anyone in the real world.

When polled on 9–10 October 2020, 86% of British adults were concerned about the risk of COVID-19 to the country as a whole (Ipsos MORI, 2020b). 81% supported making it compulsory to wear face masks when in shops or on public transport. In the UK, in September/October 2021, under the hypothetical scenario of high cases but low hospitalisations, 55% of the public wanted mandatory masks indoors, and 16% wanted mandatory masks outdoors (Kekst CNC, 2021). Also in the UK, a YouGov poll conducted in October 2022 found that 61% of those polled supported the Government re-introducing wearing masks on public transport, 49% supported the Government re-introducing wearing masks in indoor public spaces, and 42% supported the Government re-introducing social distancing (Conner, 2022). Again in the UK, in March 2023, incredibly, 41% of those polled had worn a mask in the past month (E. Craig, 2023a). Even as late as November/December 2023, in the UK, 45% supported, with 16% saying they strongly supported, having to wear face masks on public transport. 51% of those asked who voted for Labour in the 2019 General Election supported the reintroduction of masks being worn on public transport. 41% opposed it. That is, a majority of Labour supporters in a liberal democracy support people being forced to wear a useless bacteria-ridden rag on their face on public transport. In contrast, among Conservatives 45% supported masks on public transport being brought in, 52% were opposed to it. However, my estimate in the UK in 2023 was that revealed preferences show that closer to 1% of people wear a mask on public transport. Presumably, then, the virtue-signalling pro-maskers want *other people* to wear masks.

Walkos (2023) pointed out that there is no mask debate, only blind faith. Masking to stop viral spread has long been known to be futile. Despite this fact, a religious-like belief took hold in the minds of the faithful who ironically insist that we 'follow the science'. Rainmaking is an irrational weather modification ritual performed by historical tribes that attempts to invoke rain. If a rain dance is followed by rain, it was assumed that the rain dance worked. On his blog, eugyppius (2023g) explained that the West used similar faulty logic when adopting mask policies. Despite their ineffectiveness, some people became addicted to masks (Tierney, 2022).

3.10 Air Filters

If face masks are ineffective at mitigating COVID-19, would air filters help? Ventilation, even at relatively low air-change rates, leads to lower aerosol build-up compared to the best-performing masks in an unventilated space (Shah et al., 2021). If we wish to protect workplaces from COVID-19, the way to go is engineering controls (ventilation and air filters), not PPE (Kirsch, 2022a).

3.10.1 High-Efficiency Particulate Air (HEPA) Filters

We have conflicting evidence regarding the effectiveness of high-efficiency particulate air (HEPA) filters. In Addenbrooke's Hospital in Cambridge, UK, Conway Morris et al. (2022) demonstrated that an AC1500 HEPA14/UV steriliser (combining air filtration and UV sterilisation technology) effectively removed airborne SARS-CoV-2 in a hospital environment. In Germany, Falkenberg, Wasser, Zacharias, Mutters, and Kistemann (2023) conducted an observational study to evaluate the effect of HEPA filters on COVID-19 period prevalence in kindergartens. The mean COVID-19 period prevalence rates of the control and intervention groups were 186 and 372 per 1000 children, respectively. In other words, HEPA filters appeared to *increase* the prevalence of COVID-19! The results suggest very strongly that HEPA filtration actually enhances infections, and eugyppius (2023h) gives a couple of potential reasons. It may be because the filters don't filter out all virus particles, but recirculate a small number of them. Or perhaps the filters remove particulates that would normally cause the occasional sneeze and sniffle that would have repelled respiratory pathogens, and by removing these ordinary impurities, we give the

COVID-19 virus a clearer path into our noses and throats.

3.11 Cloth Masks

If even N95 respirators fail to mitigate COVID-19, surely no one would recommend using a cloth mask, would they? The UK's national academy of sciences would. In April 2020, absurdly, the Data Evaluation and Learning for Viral Epidemics (DELVE) group in the Royal Society apparently ignored the existing quality evidence and concluded that face masks, *including homemade cloth masks*, can reduce viral transmission (DELVE, 2020). Embarrassingly, in May 2020 Public Health England provided instructions on how to make a cloth face covering out of an old T-shirt, and how to wear it (Public Health England, 2020). Professor Dame Jenny Harries told the UK's Covid-19 Inquiry that UK government advice on how to make a mask using two pieces of cloth was 'ineffective' as, apparently, studies showed at least three were needed for even a small effect on transmission (E. Craig, 2023c). Also in May 2020, Trisha Greenhalgh, a professor of primary care health sciences in the UK, wrote, wrongly, that 'There is no reason why the public should wear medical-grade masks, since cotton face coverings are more comfortable, recyclable, and sufficiently effective for source control, especially given the evidence on how this particular virus behaves (it sits in the upper respiratory tract and is emitted mostly in droplets)' (Greenhalgh, 2020). In a naive narrative review of face masks against COVID-19 published in *PNAS*, Howard, Huang, Li, and Rimoin (2021) concluded that 'Given the current shortages of medical masks, we recommend the adoption of public cloth mask-wearing, as an effective form of source control'. Also, virtuously, 'We recommend that public officials and governments strongly encourage the use of widespread face masks in public, including the use of appropriate regulation'.

3.12 Silent Eating

If masks don't work, and filtration doesn't work, what about banning people from speaking? In the words of Gin (2023c), 'What Japan's Covid response lacked in authoritarian nastiness, it made up for in innovative stupidity'. Japan introduced mask dining—only removing your mask whilst eating/drinking, but keeping it on whilst speaking—for adults and silent eating—no talking during mealtimes—for children. 'Fortunately, mask dining and silent eating were never widely adopted in restaurants and bars, showing there were limits to the idiocy that most Japanese adults were willing to go along with.' However, Japanese schoolchildren were forced to eat in silence for 2.5 to 3 years. Japan implemented silent eating during school lunchtimes in February 2020, and it remained in effect until November 2022. Unsurprisingly, Takahashi, Igei, Tsugawa, and Nakamuro (2023) found that silent eating during lunchtime had minimal effects in reducing the occurrence of class closures at the classroom level, the class closure rate at the school level, and the number of class closures at the school level. The marginal decrease observed in all estimations was not statistically significant.

3.13 Conclusion

The benefits of wearing a mask in a community setting are marginal at best. Universal masking failed to mitigate COVID-19, yet compromised communication and spread fear within the community, so must be considered a policy failure. One could argue that others have a right to wear masks if they choose to do so. However, they are imposing a negative externality on those around them. Mark Changizi noted many absurdities of wearing masks, including that when communicating with someone, there is an implicit contract that you can see their face (Changizi, 2024c). However, it could be argued that a private commercial entity should have the option of making masks mandatory, allowing customers' revealed preferences to dictate policy. After all, by and large a responsible government in a liberal democracy should seek to enable revealed preferences. Masks can confer a sociological benefit to the wearer. Because masks imply cooperation, they enable the wearer to visibly signal that they are virtuous. Masks remained popular

even after legal restrictions ended, likely because the public overestimated how effective they are, plus masks essentially act as virtue signalling security blankets.

Masks are neither effective nor safe. In a review of the peer-reviewed medical literature, Huber (2020b) examined the impact of masks on human health, both immunological and physiological. She concluded that masks serve more as instruments of obstruction of normal breathing, rather than as effective barriers to pathogens. Therefore, she stated, masks should not be used by the general public, either by adults or children, and their limitations as prophylaxis against pathogens should also be considered in medical settings. In July 2020, The Model Health Show (2020) published a video and references relating to virus transmissibility data and the ineffectiveness of masks in surgery, the ineffectiveness of masks in reducing the spread of infectious disease, the physiological and psychological damage caused by mask usage, and the relationships between health, the immune system and COVID-19 susceptibility.

Neilson (2016) argued that the surgical mask communicates risk, but does not reduce it. Whilst Josh Walkos described masks as filthy bacteria-filled adult pacifiers (Walkos, 2023). Despite the Cochrane review, masks simply would not go away, and linger on either as a performative symbol of social signalling, or naively worn by the more vulnerable members of society. However, in May 2024 the North Carolina Senate voted to ban people from wearing masks in public (Doran, 2024).

The campaign group 'Smile Free' wrote an open letter to NHS Chief Executives signed by over 8,850 co-signatories, including over 2,500 doctors, scientists and healthcare professionals (plus myself), requesting the removal of the mask requirement in healthcare settings (W. Jones, 2023a; Smile Free, 2022). Dr Gary Sidley, a retired NHS Consultant Clinical Psychologist and co-founder of the Smile Free campaign, wrote to Jenny Harries, Chief Executive of UKHSA, requesting that UKHSA update their guidance so as to actively discourage the routine wearing of masks in all clinical areas (Sidley, 2023d). Incredibly, in July 2024, visitors and staff became required to wear masks in clinical areas unless exempt at Royal Stoke University Hospital and County Hospital in Stafford, UK (Headley, 2024). Wisely, Sidley (2024e) encouraged people to complain to the hospital trusts that reimposed masks (Worcestershire Acute Hospitals, University Hospitals of North Midlands and Manx Care). Thankfully, by the end of the month, two of the three (Manx Care and Worcestershire NHS Trust) reversed their mask impositions, leaving just University Hospitals of North Midlands still requiring masks (Sidley, 2024g). However, in the US in August 2024 multiple counties in California started recommending masks, such as the N95 respirator, in public indoor spaces like restaurants and grocers (Joshu, 2024). In October 2024, a number of counties in the San Francisco Bay Area reinstated mask mandates in healthcare settings through to at least March 2025 (I. Miller, 2024b). Even worse, the mandate covers, literally, children over the age of two. In 2025, two and three-year-old kids will be forced to wear masks in certain settings.

Cha, Ku, and Choi (2023) found that, in the post-COVID-19 era in the US (when wearing a mask was optional), for both males and females, perhaps unsurprisingly, those with higher self-perceived attractiveness were less likely to wear a mask. Meanwhile, in the UK using the Chicago Face Database, Hies and Lewis (2022) found that females found male faces more attractive when the male was wearing a mask; whilst medical masks were more attractive than cloth masks.

The film Jackass Forever (2022) involves many genuinely dangerous stunts, some of which resulted in serious injury. Yet due to COVID-19 the crew and cast behind the scenes are wearing face masks, outdoors. Insane. Whilst in 2023 the Tour de France organisers drew up a new COVID-19 protocol, with riders, team staff and officials set to wear face masks at sign-on and in the team paddock, whilst riders were banned from signing autographs (Farrand, 2023). This, of course, is insane. Absurdly, in July 2024 the Tour de France reintroduced rules that required race organisation, media and guests to wear masks wherever they came into contact with riders and team staff on the race. Meanwhile, in a Japanese earthquake refuge centre the elderly were made to sleep in masks (Gin, 2024a). Wearing masks whilst sleeping is incredibly

stupid. Tragically, in Ireland a grandmother was sentenced to six months in prison for not wearing a mask (Southern Star, 2022).

The sad thing is that we've not learnt anything new about masks. Before the COVID-19 pandemic, and with reference to an influenza pandemic, meta-analyses of RCTs on community masking published by the WHO (WHO, 2019) and the Centers for Disease Control and Prevention (CDC) (Xiao et al., 2020) both showed no benefit. During the pandemic there were various low-quality observational studies that appeared to show benefit. Most mask studies are poor, and the literature is biased (eugyppius, 2021g). Prasad (2022b) explained how the US's Centers for Disease Control and Prevention (CDC) pushed weak or flawed studies on face masks and vaccinations in order to support the administration's pandemic policy goals. In other words, science was compromised in order to further political goals and objectives. Then after the pandemic, in 2023, an update to the Cochrane review confirmed that there was no significant evidence that wearing masks in the community reduces the spread of colds, the flu or COVID-19 (Jefferson et al., 2023). So we've gone full circle, and back where we started before the pandemic.

Face masks were not effective at mitigating COVID-19, but can cause dyspnoea, hypoxia, hypoxemia and hypercapnia, harbour pathogens, compromise communication, vision, exercise capacity, cognition and immunity, cause headaches, skin complaints, bad breath and particulate inhalation, facilitate crime and lead to pollution. Masks have no place in healthcare, except for splash and droplet protection, and no place in the community. And masking children is insane.

4 Vaccination Programmes

4.1 Introduction

4.1.1 Vaccinations

Medicine is everywhere and always a cost–benefit decision. Vaccinations are controversial. Anti-vaccine fundamentalists (who dominate social media) highlight the costs, whilst pro-vaccine fundamentalists (who dominate mainstream media) highlight the benefits. In reality, however, not all vaccines are created equal. Vaccines for measles, mumps, polio and smallpox have saved millions of lives. However, there has never been a successful vaccine for an endemic respiratory disease like influenza, coronaviruses or respiratory syncytial virus (RSV) because these viruses mutate too quickly (Bell, 2024a; el gato malo, 2023e; Gøtzsche, 2021). There is no high quality data for influenza vaccines specifically reducing the most important outcomes for those at highest risk of severe illness or death (Barosa, Ioannidis, & Prasad, 2024; I. Miller, 2024f). Whilst opinion is divided over HPV (human papillomavirus) vaccines (Gøtzsche, 2021).

In an insightful article Rubio-Casillas et al. (2023) reviewed the literature from the last 40 years on the non-specific effects (NSEs) of vaccines. They found that live vaccines induce positive NSEs, whereas non-live vaccines induce several negative NSEs, including increased female mortality associated with enhanced susceptibility to other infectious diseases, especially in developing countries. The article is published in *Vaccine*, the official journal of The Japanese Society for Vaccinology, with an impact factor of 5.5. The authors state: 'High IgG4 antibody levels generated in response to repeated inoculation with mRNA COVID-19 vaccines could be associated with a higher mortality rate from unrelated diseases and infections by suppressing the immune system. Since most COVID-19 vaccinated countries are reporting high percentages of excess mortality not directly attributable to deaths from such disease, the NSEs of mRNA vaccines on overall mortality should be studied in depth.' Using an analysis of The Control Group's 2019/2020 nationwide survey of unvaccinated Americans, Garner (2022) argued that vaccines, in general, seriously injure the immune systems of most people who are exposed to them, leading to epidemic levels of lifelong debilitating chronic disorders.

4.1.2 COVID-19 Vaccination Trials

The trials conducted by the pharmaceutical companies on their vaccines showed that the vaccines were highly effective at preventing symptomatic COVID-19, with relative risk reductions of 70.4% (AstraZeneca) (Voysey et al., 2021), 95% (Pfizer) (Polack et al., 2020) and 94.1% (Moderna) (Baden et al., 2021). The vaccine trials were designed to measure symptomatic COVID-19, not the prevention of transmission or serious outcomes such as hospital admissions, use of intensive care or deaths (Doshi, 2020b). Though note that the vaccines were *supposed* to stop the spread of COVID-19 (el gato malo, 2021o).

The trials have been criticised (Canadian COVID Care Alliance, 2021). Ben (2024c) lists eight issues with the COVID-19 vaccine's randomised controlled trials:

1. The trials didn't have a representative study population. The sample was younger/healthier than the general population and excluded participants at high risk of SARS-CoV-2 infection.

2. The investigators were discouraged from testing for COVID-19 up to seven days after each dose.

3. The trials didn't report and record relevant clinical endpoints (such as COVID-19-like illness (CLI), acute respiratory illness (ARI), influenza-like illness (ILI) or severe acute respiratory infections (SARI)) besides all-cause death.

4. The trials were unblinded very early after only an average of three months (rather than three years).

5. The trials had large enough drop-out rates to possibly skew the results.

6. The mRNA vaccinated can be detected via PCR 'tag', thus potentially offering a mechanism of unblinding by the authors.

7. Pfizer admit that they do not know how their vaccine actually provides immunity.

8. Pfizer claims that antibodies are 'neutralising', however the claimed 95% efficacy started way before significant amounts of antibodies were detectable.

Lataster (2024k) argued that claims made about COVID-19 vaccines' effectiveness and safety were exaggerated in the clinical trials and observational studies, which significantly impacts risk–benefit analyses. In April 2021, absurdly, Nebraska Medicine claimed that Moderna, Pfizer and Johnson & Johnson vaccines all had 100% efficacy against hospitalisation (Nebraska Medicine, 2021).

The BMJ called for complete data transparency from the pharmaceutical companies (Doshi, Godlee, & Abbasi, 2022). The documents from the Pfizer COVID-19 vaccine trial that the company were compelled to release revealed that the vaccines were supposed to prevent COVID-19, 23% of the vaccinated suffered from systemic adverse events, the vaccine does not stay at the injection site but travels extensively throughout the body (after 48 hours 0.095% of the injection ends up in the ovaries, 1.03% of the injection ends up in the spleen and 16.2% of the injection ends up in the liver), the efficacy of the vaccine wanes by as much as 50% in a month after the second dose and VAERS was recommended as a means of providing robust adverse event reporting (W. Jones, 2022r). In *The BMJ*, Thacker (2021a) reported that revelations of poor practices at a contract research company helping to carry out Pfizer's pivotal COVID-19 vaccine trial raised questions about data integrity and regulatory oversight. In the original Pfizer clinical trial, there were 25% more total deaths in the vaccinated arm than in the placebo group, including twice as many sudden deaths (W. Jones, 2023k).

There isn't a single randomised controlled trial that shows a benefit to booster doses in relation to severe outcomes (Barosa et al., 2024; I. Miller, 2024f). Note also that even if a vaccine trial appears to show impressive results, the speed of vaccine development will never be able to keep up with the speed of viral mutation (Dong, 2023). The virus will always be one step ahead of the vaccine.

4.1.3 COVID-19 Vaccinations

Authorities must achieve an appropriate balance between rigorous testing and the need for timely approval of drugs that have benefits that outweigh their risks. From 1983 to 2018 the US Food and Drug Administration (FDA) increasingly accepted less data and more surrogate measures, and shortened its review times, reducing the amount of evidence available at the time of approval and increasing uncertainty about the existence or amount of clinical benefit (Darrow, Avorn, & Kesselheim, 2020).

COVID-19 is primarily dangerous to the very old and the already sick. So the majority of the gains to be made from stimulating SARS-2 antibodies are concentrated in around 10–15% of the population (eugyppius, 2021e). We have a law of diminishing returns. If we assume that vaccinations lower hospitalisations and deaths, the difference between vaccinating 40% of the population and 80% of the population is not that great. This is worth bearing in mind when comparing countries with different vaccination rates.

Elinder, Erixson, and Öhman (2023) found a strong positive association between cognitive ability and swift vaccination in Sweden. The authors suggested that 'the complexity of the vacci-

nation decision may make it difficult for individuals with lower cognitive abilities to understand the benefits of vaccination'. Yet they were wise enough to foresee the costs.

Interestingly, vaccinated individuals can transmit antibodies generated through mRNA COVID-19 vaccination to unvaccinated individuals through aerosols (Kedl et al., 2023; Redshaw, 2023a).

4.2 Vaccine Effectiveness

How effective were the COVID-19 vaccination programmes?

4.2.1 Biases

Before reviewing the literature on vaccine effectiveness, let us consider some of the biases that we may encounter in the studies. N. Fenton and Neil (2023b) showed that all observational studies (and many RCTs) of vaccine effectiveness and safety exaggerate vaccine effectiveness claims, due to misclassification, delayed reporting, illegitimate comparisons, different testing protocols between vaccinated and unvaccinated, survivor/selection bias, the study taking place during a period of naturally falling infection rate and/or vaguely defined outcomes. Fung, Jones, and Doshi (2023) identified three sources of bias in observational studies of COVID-19 vaccine effectiveness: case-counting window bias (not counted as vaccinated for the first two weeks after vaccination), age bias and background infection rate bias. The authors claim that these biases could shift COVID-19 vaccine effectiveness estimates from 0% to 50%–70%. Lataster (2024e) reported that a series of articles published in the *Journal of Evaluation in Clinical Practice* (Doshi & Fung, 2023; Fung et al., 2023; Lataster, 2023e, 2024g) (each referenced independently in the current article) showed that the COVID-19 vaccine trials exaggerated COVID-19 vaccine effectiveness and safety claims. In a Lancet journal, B. Liu et al. (2023) claim that COVID-19 vaccination is highly effective against COVID-19 mortality among older adults, although effectiveness wanes with time since the last dose. However, N. Fenton and Neil (2024f) pointed out that there is no comparison of never vaccinated against ever vaccinated, the data are not made available and the authors are claiming that the unvaccinated were generally healthier. Ben (2024b) highlighted the issues with misleading vaccine effectiveness charts. For charts that display COVID-19 death rate by vaccination status, beware of the use of unreliable data, the exclusion of relevant data and the misclassification of vaccination status. For charts that display correlations of vaccine doses administered vs excess deaths ensure that the observed correlation is not driven by confounding factors, such as extreme poverty and cardiovascular death rates. For charts that display UK ONS all-cause mortality data by vaccination status, beware of confounding factors, such as poverty, preexisting health conditions and socioeconomic disparities.

4.2.1.1 Data

Although in general the UK's ONS has a good reputation for providing better data than other countries, according to N. Fenton, Neil, Craig, and McLachlan (2022) the ONS dataset is so compromised with inaccuracies, anomalies and biases that it cannot be used to reliably determine vaccine efficacy and safety. According to N. Fenton (2023c), the ONS's reputation for high-quality data and analysis has been severely compromised by its shambolic work on the COVID-19 vaccines. Also in the UK, Dee (2023c) found that when he replaced the declared diagnosis of COVID-19 within the electronic patient record with a probabilistic function derived from a sophisticated model designed to predict the presence of a genuine infection from a diagnostic array (true positive), all notion of vaccine benefit evaporated and we are left with results that provide evidence of vaccine harm.

4.2.1.2 Case Identification

On his blog, Lyons-Weiler (2024g) argued that the most important bias is case identification via non-quantitative PCR using no internal negative control and instead relying on arbitrarily high cycle threshold values.

4.2.1.3 Unknown Denominator

Although in theory we know exactly how many people have been vaccinated, we don't generally know how many unvaccinated people there are in the population.

4.2.1.4 Case Counting Window

Vaccines suppress innate immunity in the short term (see Section 4.2.3). After a vaccination, for the first two weeks vaccine effectiveness can be negative, yet those in this recently vaccinated category are often classified as unvaccinated. On his blog in September 2021, el gato malo (2021n) explained that COVID-19 cases/hospitalisations/deaths among the vaccinated are not generally counted correctly, with the first two weeks after vaccination (the period during which vaccine effectiveness is negative) being omitted from the statistics. Similarly, Doshi and Fung (2023) explained how the case counting window affected vaccine efficacy calculations in randomised trials of COVID-19 vaccines. In 2021, the ONS categorised anyone within 20 days of their first vaccine dose as 'unvaccinated' (N. Fenton, Neil, Craig, et al., 2024). Estimates of COVID-19 vaccine effectiveness derived from COVID-19 reports from the Government of New South Wales, Australia, are unreliable up to early 2022, with people who received the vaccination being lumped in together with the unvaccinated (Lataster, 2024c). Lataster (2024b) argued that the effectiveness and safety of the COVID-19 vaccines have been exaggerated, in the clinical trials and observational studies, largely due to inadequate counting windows. Both infections and adverse effects being overlooked in the 'partially vaccinated'. On his blog, el gato malo (2022h) explained how misallocation of cases leads to apparent vaccine efficacy even when there is none. Lataster (2024g) argued that the adverse effect counting window has the potential to single-handedly nullify the claim that the benefits of the vaccines still outweigh the risks in all populations. Even a vaccine that is merely a placebo will appear to have high efficacy if there is a time delay after vaccination during which the participant is classified as 'unvaccinated' (N. Fenton & Neil, 2023f). N. Fenton and Neil (2023c) point out that classifying a person who becomes infected within 14 or 21 days of vaccination as unvaccinated in the calculation of vaccine efficacy is nothing short of a scam. It guarantees that any vaccine which is no different (or even worse) than a placebo will be seen to have high initial efficacy. By using the 21-day period before considering a person vaccinated—as the ONS and others do, for the COVID-19 vaccines—means fraudulently high artificial efficacy rates are guaranteed. In a systematic review, M. Neil, Fenton, and McLachlan (2024) identified thirty-nine studies that suffered from miscategorisation bias, whereby study participants who have been vaccinated are categorised as unvaccinated up to and until some arbitrarily defined time after vaccination occurred. Simulation demonstrated that this miscategorisation bias artificially boosts vaccine efficacy and infection rates even when a vaccine has zero or negative efficacy.

4.2.1.5 Classification

The (mal)practice of miscategorising vaccination status is widespread (M. Neil & Fenton, 2023). The CDC defines an 'unvaccinated' person as someone who 'has not been verified to have received [a] COVID-19 vaccine'. Essentially if a person's vaccination status is unknown they are labelled as 'unvaccinated'. Lataster (2023e) replied to Fung et al. (2023), and noted that their apparent assumption of 'nullified cases' in the vaccinated group overlooks the fact that the symptomatic cases in the vaccinated that occurred before the case-counting window do not

necessarily disappear from the data altogether but rather could be added to the figures for the unvaccinated, a form of definitional bias. The effects of the case-counting window biases are substantially increased when accompanied by definitional biases. N. Fenton and Neil (2023g) showed that excluding (rather than misclassifying) recently vaccinated cases also creates the illusion of efficacy for both a placebo vaccine and a vaccine that increases infectiousness.

4.2.1.6 Healthy Vaccinee Bias

The *healthy vaccinee bias* is due to the fact that, ignoring the effect of the vaccine, those who get vaccinated have a mortality rate significantly lower than those who do not. Efforts to differentiate vaccine effectiveness from selection bias can be problematic (Fireman et al., 2009). A high vaccination uptake can be correlated with lower mortality. But this does not imply causality. Beware of confounding variables. For example, comorbidity, obesity and poverty are all associated with both low vaccine uptake and higher mortality (el gato malo, 2022o). Coddington (2022a) showed that the percentage of a given US county's population that are smokers was more predictive of COVID-19 deaths/100k than the percentage vaccinated. His point is that it could simply be that the more health-conscious (less likely to smoke and more likely to be vaccinated) are less likely to die from COVID-19. In a letter to *NEFM*, Høeg, Duriseti, and Prasad (2023) argue that the 'healthy vaccinee bias' may have led to overestimates of vaccine effectiveness in published studies. The authors point out that the inclusion of mortality not related to COVID-19 in all observational COVID-19 vaccine studies would provide important context. Shahar (2023b) notes that once one takes into account the healthy vaccinee bias, there is little evidence of COVID-19 vaccine effectiveness against mortality.

How large is the healthy vaccinee bias effect? In the UK, Dee (2024j) calculated that in terms of factor ratios based around the median score, the unvaccinated who remained unvaccinated after rollout yielded a factor of $\times 1.03$ for risk of treatment and $\times 1.19$ for risk of hospitalisation when compared to those who would go on to get vaccinated when it became available. Berenson (2023a) analysed Pálinkás and Sándor (2022), which suggested that the healthy vaccinee bias may be 55%. Whilst according to Shahar (2023f), based on data from the US and the UK, the mortality rate of unvaccinated is two to three times the mortality rate of vaccinated. Fürst, Bazalová, Fryčák, and Janošek (2024) analysed the association between COVID-19 vaccination status and all-cause mortality (ACM) using data from two Czech health insurance companies. During periods of low COVID, for those aged 60–69 years the unvaccinated had $\times 5$ higher ACM than the fully vaccinated, for 70–79 years the unvaccinated had $\times 4$ higher ACM than the fully vaccinated, and for 80+ years the unvaccinated had $\times 3$ higher ACM than the fully vaccinated. In other words, the healthy vaccinee bias was huge. Shahar (2024a) argues that the study confirms that COVID-19 vaccines have around zero efficacy against death. M. Neil and Fenton (2024b) reviewed Fürst et al. (2024) and concluded that the authors had demonstrated that observational data on vaccination is so biased that it cannot and should not be used to support any claim that the COVID-19 vaccines are or were effective or safe. The healthy vaccinee bias is very strong in frail elderly residents of nursing homes (Shahar, 2023e).

4.2.1.7 Confounding by Indication

Confounding by indication is likely to be present if patients with underlying chronic diseases are more likely to be vaccinated than healthy study participants. In a systematic review, Remschmidt, Wichmann, and Harder (2015) analysed frequency and impact of confounding by indication and healthy vaccinee bias in observational studies assessing influenza vaccine effectiveness (VE). They found confounding by indication in 74% of studies and healthy vaccinee bias in 22% of studies. Adjustment for confounders increased VE on average by 12% for all-cause mortality, 9% for all-cause hospitalisation and 7% for influenza-like illness. Despite adjustment, 39% of studies showed residual confounding as indicated by significant off-season VE estimates.

4.2.1.8 Collider Bias

Collider bias occurs when an exposure and outcome (or factors causing these) each influence a common third variable and that variable or collider is controlled for by design or analysis. With vaccine case-control studies, collider bias is introduced when we only have data on hospitalised patients (N. Fenton & Neil, 2024a).

4.2.1.9 Previous Infection

Randomised controlled trials (RCTs) typically compare mortality rates amongst those vaccinated with those unvaccinated and who have not previously had COVID-19 (Girma & Paton, 2024). Previous infection is known to reduce very significantly the chance both of subsequent infection and of mortality given subsequent infection.

4.2.2 General

4.2.2.1 Asia

Israel Israel undertook early and aggressive vaccine programmes, and in February 2022 el gato malo (2022b) analysed the data on cases, hospitalisations and deaths and concluded that they were not working.

4.2.2.2 Europe

United Kingdom Livermore (2023c) considered the COVID-19 death/case ratio in England and argued that vaccines were effective up until April 2021. On his blog, el gato malo (2021c) analysed vaccine effectiveness for the Delta variant in August 2021 in the UK. In terms of cases, it was negative, around -16%, for the need for medical care/death it was 23–52% for the under-50s and 52–59% for the over-50s.

4.2.2.3 North America

United States During July 2021, 469 cases of COVID-19 associated with multiple summer events and large public gatherings in a town in Barnstable County, Massachusetts, were identified among Massachusetts residents (C. M. Brown et al., 2021). Testing identified the Delta variant in 90% of specimens. 69% of eligible Massachusetts residents were vaccinated, 74% of COVID-19 cases occurred in persons who were fully vaccinated and 80% (4 out of 5) of COVID-19 patients who were hospitalised were fully vaccinated. Real-time reverse transcription-polymerase chain reaction (RT-PCR) cycle threshold (Ct) values in specimens from vaccinated persons with breakthrough cases were similar to those from persons who were unvaccinated. It appears that vaccinations did nothing to mitigate the spread or severity of the Delta variant. From December 2020 to December 2021 (during the eras of Alpha and Delta variant predominance) in the US, a higher vaccination coverage was associated with lower rates of population-level COVID-19 cases and COVID-19 mortality (Suthar et al., 2022). Counties with high vaccine coverage had a more than 80% reduction in death rates compared with largely unvaccinated counties. For the over 60s, if a vaccinated person becomes infected, their risks of hospitalisation, ICU admission or death are not significantly different from those of an unvaccinated person (Taquet, Dercon, & Harrison, 2022). Although this result is conditional on being infected, given that the average age of those who have died from COVID-19 in England and Wales is 82.4 years old, it is significant and concerning. The implication is that we should endeavour to prevent the elderly from becoming infected, which implies focused protection and facilitating herd immunity.

Canada In Manitoba, Canada, in May 2022 the age-standardised rate of COVID-19 hospital admissions and COVID-19 deaths was lower for the unvaccinated than the (non-boosted) fully vaccinated (Manitoba Government, 2022).

Global In a systematic review and meta-analysis, Q. Liu, Qin, Liu, and Liu (2021) calculated that two vaccine doses were 85% effective at preventing SARSCoV-2 infections, 97% for symptomatic COVID-19, 93% for hospitalisation, 96% for ICU admissions and 95% effective for COVID-19-related death. The pooled VE was 85% for the prevention of Alpha variant of SARS-CoV-2 infections, 75% for the Beta variant, 54% for the Gamma variant and 74% for the Delta variant. In another systematic review, Mohammed et al. (2022) concluded that the COVID-19 vaccines have successfully reduced the rates of infections, severity, hospitalisation and mortality among the different populations. The full-dose regimen of the Pfizer/BioNTech vaccine was the most effective against infections with the B.1.1.7 and B.1.351 variants. However, P. E. Alexander (2021a) summarised 51 studies on the efficacy of vaccines that evidenced that vaccines should not be expected to contribute to eliminating the communal spread of the virus or the reaching of herd immunity. Archibald (2021a) noted that the vaccines provide some protection against death from the virus, whilst at the same time making individuals more susceptible to infection. Radagast (2022b) pointed out that if vaccines increase your risk of infection by 30% but reduce the risk of hospitalisation from infection by 75%, over time hospitalisations can still increase. Swiss Policy Research (2022c) took an honest look at the effectiveness of COVID-19 vaccines. Prior to the Omicron variant, vaccine protection against infection decreases from 95% to 0% within about half a year, whilst protection against severe disease and death in senior citizens decreases from 95% to 50% within about half a year. With Omicron, which is both milder and more infectious, vaccine protection against infection decreases from 60% to 0%, whilst protection against severe disease in senior citizens decreases from at most 80% to less than 50% within a few months. Torjesen (2021) reported that the Omicron variant may be more transmissible than other variants and partly resistant to existing vaccines. Shahar (2023c) estimated that, taking biases into account, the true effectiveness of the first booster was short-lived and somewhere between mediocre and zero.

4.2.3 First Two Weeks

There is evidence of a negative efficacy valley for the first two weeks after vaccination. Radagast (2022a) noted that whenever you're injected with these vaccines in your arm, the white blood cells capable of mopping up the spike protein migrate to the location of the injection, and the rest of your body is left at increased risk of infection. Clare Craig, a diagnostic pathologist, in a letter published in *The BMJ*, considered various strands of evidence that COVID-19 cases increase post vaccination (C. Craig, 2021b). She suggested that the explanation is due to changes in immunity, rather than changes in behaviour. In September 2021, el gato malo (2021f) hypothesised that vaccines produce a 14–21 day window of increased risk post administration. This is evidenced by a rising death date 0–21 days post vaccine adoption and proportional to it. The death rate will also be a function of the seasonal risk level in any given region. HART (2021c) collated the evidence that the vaccination results in a rise in COVID-19 infection rates for the first week or two before there is a fall. Many if not most studies deliberately omit any reference to the first two weeks after vaccination. In summary, the evidence of an increased infection rate in the first two weeks after vaccination is well established. The published literature attribute this phenomenon to engaging in risky behaviour after vaccination, the targeting of vaccination to those most at risk of becoming infected, the vaccination process results in increased exposure risk, or an immunological effect. Only a subpopulation is highly susceptible to each variant and once the susceptible population has been infected there is a reprieve until a new variant arrives. The increased rates after vaccination may have sped up this process. Although Mowrey (2023m) argues that the 'worry window' is not real. To make matters worse, studies on vaccine

effectiveness have sometimes omitted what happens in the first two weeks after vaccination, which leads to incorrect conclusions (HART, 2021e). See the earlier section on the case counting window bias, Section 4.2.1.4.

4.2.3.1 Europe

Denmark Analysing data from 27 December 2020 to 18 February 2021, Moustsen-Helms et al. (2021) found that during the two weeks following the first dose of a COVID-19 vaccination, health care workers (median age 47 years) were 104% more likely to be infected than the unvaccinated, whilst nursing home residents (median age 84 years) were 40% more likely to be infected than the unvaccinated.

France Fournier et al. (2022) conducted a retrospective study in France using data from 18 January 2021 to 13 August 2021, and noted that SARS-CoV-2 infection was significantly more likely to occur in the first 13 days post-vaccine injection in those who received a single dose (48.9%) than those who received their second dose (27.4%).

United Kingdom First, let us consider infections/cases. Shrotri et al. (2021) analysed data between 8 December 2020 and 15 March 2021, and found that for residents of long-term care facilities in England, in terms of infections a first dose of vaccine had no significant effect for the first 27 days. In England from December 2020 to November 2021 (spanning the Alpha and Delta periods) during the two weeks following the first vaccination individuals were three to four times more likely to test positive for COVID-19 than their unvaccinated counterparts (W. Jones, 2022t; Piernas et al., 2022). Using data for the UK, after a vaccination, for the first two weeks vaccine effectiveness is negative, then after two months, vaccine effectiveness again turns negative (Data Matters, 2022b).

Now let us consider deaths/all-cause mortality. Whilst analysing UK ONS data from January 2021 to September 2021, M. Neil et al. (2021) concluded that the vaccines produce genuine spikes in all-cause mortality shortly after vaccination. Using data from 1 January 2021 to 31 March 2022, Jestre (2022a) estimated that in the UK those aged 90+ were nearly 500% more likely to die within the first 21 days after their first vaccine dose than the unvaccinated.

4.2.3.2 North America

Canada Data from Alberta, Canada, was revealing. Jestre (2022d) analysed the data and noted that for all age groups but one, cases peak between day 8 and 16 days after vaccination before sharply declining. Whilst for the 5–11 age group there was no vaccine effectiveness. In fact, the Alberta data appears to show that cases, hospitalisations and deaths all peak about ten days after vaccination (Comeau, 2022; Government of Alberta, 2021). The blogger el gato malo (2022a) suggested that for the first two weeks after vaccination, compared to the prior base rate, there may be 10 times more cases, 5 times more hospitalisations and 3–4 times more deaths. Smalley (2022a) calculated that 40% of cases, 48% of hospitalisations and 56% of deaths occurred within the first 14 days after vaccination. Whilst according to Radagast (2022a), 47.6% of COVID-19 hospital admissions and 55.6% of COVID-19 deaths in Alberta occur from infections in the first fourteen days after the injection.

4.2.4 Transmission

Vaccinations do not prevent transmission of COVID-19 (the vaccinated can both become infected and infect others) (Singanayagam et al., 2021). COVID-19 vaccines cannot prevent infection or transmission because SARS-CoV-2 replicates rapidly in the nasal mucosa and transmits to other people days before it makes it down into the gas exchange region of the lungs and encounters

blood antibodies (Leake, 2024). In fact, none of the predominantly mucosal respiratory viruses have ever been effectively controlled by vaccines. In a letter published in one of *The Lancet*'s journals, Günter Kampf explained that the vaccinated population are a possible and relevant source of transmission (Kampf, 2021).

4.2.4.1 Europe

Norway Data from Norway showed that the Omicron variant is highly transmissible among fully vaccinated people (Brandal et al., 2021).

United Kingdom Using data from 30 January 2021 to 14 November 2021, Derqui, Mishra, Hinsley, Bhatt, and Laydon (2024) found that vaccination had 39.30% effectiveness against transmission for dose 1, negligible effectiveness against transmission for dose 2 (likely attributable to the coincident importation and dominance of the Delta variant in the UK), and 48.69% effectiveness against transmission for dose 3. Lyons-Weiler (2024i) reviewed the paper and concluded that the study's findings should be interpreted cautiously due to the methodological and data-related constraints.

4.2.5 Infections/Cases

Each iteration of variant seems to pose a greater infection risk to the vaccinated relative to the unvaccinated (el gato malo, 2022l). So it is possible that a vaccination programme with a significant positive vaccine effectiveness could still increase the overall number of deaths (el gato malo, 2022j).

4.2.5.1 Asia

India Using data from India, Mlcochova et al. (2021) showed that vaccinations appear to be less effective against the Delta variant.

Israel Inspecting data up to December 2021, Smalley (2021b) noted that COVID-19 vaccinations and COVID-19 cases appear to be correlated in Israel and Palestine.

4.2.5.2 Europe

Vaccination programmes, if anything, appear to have led to an increase in COVID-19 cases (H. Ritchie, Mathieu, et al., 2021).

Denmark In a preprint, nationwide data from Denmark, from 20 November 2021 to 12 December 2021, showed that vaccine effectiveness against Omicron is significantly lower than against Delta (Hansen et al., 2021).

France Fournier et al. (2022) conducted a retrospective study in France on SARS-CoV-2 vaccination and protection against clinical disease. 2.0% of unvaccinated patients died, 1.1% of partially vaccinated patients died and 2.5% of fully vaccinated patients died.

The Netherlands Using data from 1 March 2021 to 31 August 2021 from the Netherlands, Andeweg et al. (2021) found evidence for lower vaccine effectiveness against infection for the Beta, Gamma and Delta variants, compared to the Alpha variant.

Norway Data from November 2021 to December 2021 in Norway published in *Eurosurveillance* showed that vaccination may be less effective at preventing infection for the Omicron variant than for the Delta variant (Brandal et al., 2021).

United Kingdom Data from the UK analysed in October 2021 showed that COVID-19 infection rates among the vaccinated exceeded those of the unvaccinated for every age group over 30 (el gato malo, 2021g). In England from December 2020 to November 2021 (spanning the Alpha and Delta periods) two weeks or more after their second vaccination individuals were 44% more likely to be infected than their unvaccinated counterparts (W. Jones, 2022t; Piernas et al., 2022). An analysis using UK data reported in January 2022 showed that the COVID-19 growth rates were higher in the vaccinated than the unvaccinated in all age groups (el gato malo, 2022q). The highest COVID-19 growth rates included the vaccinated aged over 70. ONS data for England and Scotland can provide a natural experiment. Data reported in July 2022 showed that, despite Scotland having a higher vaccination rate than England, the COVID-19 infection rate in Scotland was 50% higher than it was in England (W. Jones, 2022n). ONS data from May 2022 appears to show that subsequent doses of the vaccine do not decrease the chances of infection (PLC, 2022). In general, looking at UK data, it appears that each iteration of variant poses a yet greater infection risk to the vaccinated relative to the unvaccinated el gato malo (2022l).

4.2.5.3 North America

Canada Using data from Ontario, Canada, Buchan et al. (2022) found that vaccine effectiveness against symptomatic COVID-19 infection was substantially lower for Omicron than for Delta.

United States In the US, J. Sun et al. (2022) found that the breakthrough infection rate tripled after the emergence of the Delta variant. Sikka, Wyllie, Premsrirut, and Berke (2022) analysed COVID-19 testing in the workplace during the Omicron era using a cohort of 76 adults in New York and Los Angeles. From 13 December 2021 to 15 January 2022, 37 individuals (49%) tested positive, and all 37 were vaccinated. Data from Santa Clara County from January 2022 revealed that COVID-19 vaccines *increased* the risk of getting COVID-19 (Kirsch, 2024s). In the US, using data up to 3 June 2022, D.-Y. Lin et al. (2022) conducted a large cohort study on the protection conferred by the BNT162b2 vaccine and by previous SARS-CoV-2 infection against infection on children 5 to 11 years of age over a six-month period when the Omicron variant was dominant. Vaccine effectiveness turned negative within five months of vaccination. Also, disturbingly, among those who had previously been infected, the vaccines destroyed the protection provided by natural immunity, leaving them more vulnerable to reinfection than they were before vaccination (W. Jones, 2022c). In the US, Kumar, Bendavid, and Sood (2023) found that unvaccinated, vaccinated and boosted children aged 7 to 18 years (recruited between April and September 2022) who caught COVID-19 (Omicron variant) were infectious for the same amount of time (three days). Using data from 12 September 2022 to 14 March 2023 in the US, Shrestha, Burke, Nowacki, Simon, et al. (2023) evaluated whether a bivalent COVID-19 vaccine protects against COVID-19. Estimated vaccine effectiveness (VE) was 29%, 20% and 4% during the BA.4/5, BQ and XBB dominant phases, respectively. In the US, using data from July 2022 to May 2023, Tartof, Frankland, et al. (2023) estimated vaccine effectiveness on children aged 6 months through to 4 years by using a test-negative case–control experiment. The risk of a positive test result for SARS-CoV-2, compared to the unvaccinated, during emergency department or urgent care and outpatient encounters, was 0.56 for those who received two doses and 0.88 for those who received three doses. In other words, children who received three doses of COVID-19 vaccine had a higher risk than those who received two doses. Ko, Malet, Chang, Nguyen, and Mayes (2023) analysed COVID-19 surveillance data from January to July 2023 across 33 California state prisons, primarily a male population, of 96,201 individuals. They computed the incidence rate of new COVID-19 infections among COVID-bivalent-vaccinated and entirely unvaccinated groups. The infection rate in the bivalent-vaccinated group was 3.24% and in the entirely unvaccinated group 2.72%. For those aged 50 and above, the respective infection

rates were 4.07% and 3.1%. Among those aged 65 and above, the respective infection rates were 6.45% and 4.5%. In other words, the boosted were more likely than the unvaccinated to become infected. In the US, Shrestha, Burke, Nowacki, and Gordon (2024b) evaluated whether the 2023–2024 formulation of the COVID-19 mRNA vaccine protects against COVID-19. Estimated vaccine effectiveness was 42% before the JN.1 lineage became dominant, and 19% after.

4.2.5.4 Global

Radagast (2022j) noted that whereas Delta broke through the waning vaccine-induced immune response, Omicron benefits from it. That is, with Omicron mass vaccination is causing mass infection with SARS-CoV-2. In countries that have low vaccination rates, such as Algeria, Bulgaria and South Africa, the height of the Omicron wave is comparable to that of the Delta wave. Whilst highly vaccinated nations, like Portugal, Denmark, Israel and the Netherlands, have Omicron waves that are up to ten times higher than their Delta wave, and stay stuck at a high level. J. Paul (2022c) explained that the mRNA vaccine elicits poor immunity in older people for the following reasons. The mRNA vaccine is failing in older people because of their old age, and loss of 'immune power'. The mRNA is failing because it chose a single protein (the spike protein) and the body is fixated on it, and, since the immunity provided is not a sterilizing one, leads to further inflammation. The mRNA itself is setting off inflammaging, the breakthrough infections add to the fire, and since most older people have a decaying immune function, this leads to a form of chronic infection. Using global data (68 countries and 2947 counties in the US), S. V. Subramanian and Kumar (2021) found that the number of new COVID-19 cases per million was unrelated to the proportion of the population that had been fully vaccinated. Whilst, analysing country-by-country data, Switkay (2022) argued that there is a very strong positive association between COVID-19 case rate and vaccination rate. Data up to June 2022 showed that Omicron infections appear to be accelerated by the vaccines (Coddington, 2022c).

4.2.6 Severe COVID-19/Hospitalisations

In a good summary, Brian Mowrey argued that the evidence was clear that COVID-19 vaccinations were very effective against severe COVID-19 in the elderly in 2021 (Mowrey, 2024e). He argued that vaccine effectiveness against severe disease is real, but because even in the most 'high-risk' groups, most people do not progress to severe disease, for most people the costs of vaccination exceed the benefits (Mowrey, 2023j). Matt Ridley believes that the COVID-19 vaccines 'undoubtedly reduced the severity of the virus for vulnerable people and contributed to the defeat of the pandemic – though the evolutionary replacement of harmful variants by the milder Omicron types may have been a bigger factor' (Ridley, 2024e).

4.2.6.1 Europe

Scandinavia N. W. Andersson et al. (2024) found that during autumn and winter 2023–2024 across Denmark, Finland and Sweden for individuals aged $\geq$ 65 years who had previously received at least four COVID-19 vaccine doses the comparative effectiveness of the monovalent XBB.1.5-containing COVID-19 mRNA vaccine was 60.6% against COVID-19 hospital admission at 12 weeks of follow-up.

United Kingdom Amanuensis (2022a) showed that in England, using data from the UK Health Security Agency from 21 March 2022 to 19 June 2022, the unvaccinated had the same hospitalisation rate as those who had three or more doses. Whilst those who had just one or two doses had a higher hospitalisation rate. Using data from the UK, a Lancet study (The HDR UK COALESCE Consortium, 2024)—interpreted by W. Jones (2024b)—inadvertently confirmed that the unvaccinated have less severe COVID-19 outcomes than the under-vaccinated

individuals (The Naked Emperor, 2024d). According to N. Fenton and Neil (2024d), the Lancet paper (which lumped together the unvaccinated with the partially vaccinated) is a joke and should never have been published. By September–October 2022 in the UK, the vaccines did not appear to have any significant impact in reducing hospital admissions (Amanuensis, 2022b). Chudov (2023o) noted that data from UKHSA for January 2023 showed that after the COVID-19 booster is taken, for the first six months there is a reduced hospitalisation risk, from six to nine months there is a dramatically *increased* risk of hospitalisation, then from nine months onwards hospitalisation rates fall again.

4.2.6.2 North America

United States In the US, using data from December 2020 to September 2021, J. Sun et al. (2022) found that if a person with COVID-19 visits a hospital, if they are unvaccinated they have a 23.5% chance of being an inpatient (2.0% chance of a severe outcome), whereas if they were fully vaccinated (at least 14 days previously) they have a 16.2% chance of being an inpatient (0.9% chance of a severe outcome). Using data up to October 2021, Smalley (2022u) found that in the US the COVID-19 hospitalisation rates were *higher* in the post-vaccination period than the pre-vaccination period for the under 65s. Kirsch, Marik, Rogers, Cosgrove, and Mead (2024) analysed data from October 2022 to January 2023 on patients admitted for either COVID-19 or influenza to U.S. Veterans Administration (VA) hospitals (from a paper published in *JAMA* (Xie et al., 2023)), and concluded that COVID and flu vaccines don't reduce hospitalisation at all. In an updated analysis of the VA hospitalisation data, Kirsch (2024r) deduced that if you had just one COVID-19 shot, there was a 10% reduction in hospitalisation, if you had two COVID-19 shots, there was no additional benefit, and if you had the booster, your benefit diminished to just a 3% reduction in hospitalisation risk. Using data from Southern California from the period 11 October 2023 to 10 December 2023, Tartof, Slezak, et al. (2023) found that compared to the unvaccinated, those who had received only older versions of Pfizer's COVID-19 vaccines did not show significantly reduced risk of COVID-19 outcomes, including hospital admissions.

4.2.6.3 Global

Analysis using a longitudinal data set of 90 countries showed that COVID-19 vaccinations reduce the chances of severe COVID-19 outcomes (hospitalisation, ICU admission or death), which leads to a reduction in the case fatality rate (Liang, Kuo, Ho, & Wu, 2021).

4.2.7 Deaths

4.2.7.1 Asia

Using data up to July 2022, Smalley (2022v) considered a natural experiment by comparing Israel with Palestine. He states that the relatively higher COVID-19 deaths in Israel can be explained by the relatively higher vaccination rate.

Israel Shahar (2023g) re-analysed the data from a paper on the effectiveness of the Pfizer-BioNTech BNT162b2 mRNA COVID-19 (Comirnaty) vaccine (in terms of deaths) in elderly patients who live in long-term care facilities in Israel (43,596 residents with a mean age of 83 years, data from December 2020 to May 2021) (Goldin et al., 2022) taking the healthy vaccinee bias into account. The corrected vaccine effectiveness after 30 days was -60%, after 60 days 1%, after 90 days 22% and after 150 days 37%. On this basis, the vaccinations were killing more of the elderly than they saved, and should have been halted. This is a shocking finding.

4.2.7.2 Australasia

Australia In Australia during the Delta and Omicron outbreaks, L. Lin et al. (2024) claimed that unvaccinated individuals had a 7.7-fold greater mortality rate than those who were fully vaccinated among people aged 50+, which rose to 11.2-fold in those who had received a booster dose. Lataster (2024f) delivered a damning critique of the paper. It's centred on a model. The vaccine may have caused the increase in COVID-19 cases (they took off once almost all of Australia was vaccinated). Those aged under 50 are ignored. The authors assumed that any vaccine dose required two weeks to provide protective immunity, which they implemented by shifting vaccination coverage (1st dose, 2nd and 3rd dose) two weeks later. The rates of mortality were estimated. The waning in the effectiveness of the vaccine in reducing death rate was underestimated (they used 0.5% per week). They ignore the healthy vaccinee effect. The IFRs employed seem too high. There is no mention of injuries and deaths caused by the COVID-19 vaccines.

4.2.7.3 Europe

HART (2022a) compared vaccination rates and COVID-19 death rates in Eastern, Central and Western Europe, and concluded that geographical differences are more significant than vaccination rates. In a preprint, The WHO European Respiratory Surveillance Network (2024) estimated that across the WHO European Region vaccines reduced deaths by 57% overall, representing ∼1.4 million lives saved in those aged ≥ 25 years, 96% of lives saved were aged ≥ 60 years and 52% were aged ≥ 80 years, first boosters saved 51% and 67% were saved during the Omicron period. The paper was reported in *The BMJ* (Iacobucci, 2024a). However, Raphael Lataster highlighted various issues with the paper (Lataster, 2024i, 2024o). The authors assumed a waning of vaccine effectiveness of just 0.25% per week, which is far too low. Suspect definitions of 'vaccinated' and 'unvaccinated' used likely lead to highly exaggerated effectiveness and safety estimates. The authors failed to factor in negative vaccine effectiveness. The study considered only the benefits of COVID-19 vaccination, and not the risks. Estimates of expected mortality like IFRs/CFRs were not properly explained or justified.

Isle of Man On his blog, using data up to May 2023, Joel Smalley showed that the Isle of Man's COVID-19 death toll was almost four times higher after the rollout of the vaccine (Smalley, 2023d).

Italy Using data from Italy, Alessandria, Malatesta, Berrino, and Donzelli (2024) found that the all-cause-death hazard ratios in multivariate analysis for vaccinated people with 1, 2 and 3/4 doses versus unvaccinated people were 2.40, 1.98 and 0.99, respectively. In other words, they found all-cause death risks to be higher for those vaccinated with one and two doses compared to the unvaccinated and that the booster doses were ineffective. They also found a slight but statistically significant loss of life expectancy for those vaccinated with 2 or 3/4 doses. M. Neil and Fenton (2024a) state that 'this is clearly the best quality study we have available on Covid-19 vaccination to date'. N. Fenton and Neil (2024e) note that the study avoids immortal time bias and the '(un)healthy vaccinee effect', but suspect that the results may even underestimate the negative effect of the vaccines because of likely vaccination status miscategorisation bias.

Scandinavia N. W. Andersson et al. (2024) found that during autumn and winter 2023–2024 across Denmark, Finland and Sweden for individuals aged ≥ 65 years who had previously received at least four COVID-19 vaccine doses, the comparative effectiveness of the monovalent XBB.1.5-containing COVID-19 mRNA vaccine was 77.9% against COVID-19-related death at 12 weeks of follow-up.

United Kingdom In England between 1 February 2021 and 2 August 2021, if you were recorded as a case with the Delta variant, if you were vaccinated with two doses you were five times more likely to die than if you were unvaccinated (Public Health England, 2021; Waldburger, 2021). Whilst the figure for those under 50 was 1.5 times more likely. Of course, these figures don't take into account the fact that older (and thus more vulnerable) people were more likely to have been vaccinated, but are hardly reassuring. The BBC News claimed that it is estimated that the COVID-19 vaccine programme prevented over 120,000 deaths in the UK up to September 2021 (Walsh, 2024). However, Paton (2024) arrived at a figure of about 12,500 deaths prevented by the end of September 2021. Utilising data from an NHS Trust from January 2021 to September 2021, John Dee concluded that there was no solid evidence of vaccine benefit within a sample of 5,553 in-hospital deaths (Dee, 2023g). His spectral analysis of certified COVID-19 deaths from February 2020 to September 2021 revealed that the vaccines did nothing to alleviate the incidence of symptomatic COVID-19 amongst in-hospital deaths (Dee, 2023k). In fact, he says we may go as far as to infer that the vaccines must be inducing acute symptomatic COVID-19 (Dee, 2023j). He analysed 18,000+ in-hospital deaths in a single NHS Trust from December 2020 to September 2021, and concluded that the vaccinations are ineffective in terms of reducing the risk of acute respiratory conditions, and actually appear to increase the risk of severe COVID-19 leading to acute respiratory conditions. In the UK the vaccination programme began in December 2020, yet COVID-19 death rates were higher in 2021 than 2020 from July to October (UK Government, 2021a). In England, between 1 January 2021 and 31 January 2022, for all age groups under 80, non-COVID-19 deaths were higher for those who had a second dose at least 6 months ago but no further doses, than for the unvaccinated (M. Munro, Bermingham, Nafilyan, Morgan, & Gethings, 2022). Using data up to February 2022 in the UK, Kirsch (2024h) showed that the COVID death / COVID hospitalisation ratio did not change at all after the vaccines were rolled out. In the UK, Rendell (2024a) pointed out that if COVID-19 vaccines really prevented 20 million deaths and the AstraZeneca vaccine really saved six million lives, then you would assume that during the 2021–22 winter spike in COVID-19, deaths of the 'never-vaccinated' would have increased faster than deaths of the vaccinated. However, between December 2021 and February 2022 deaths in the vaccinated fell by 17% whilst deaths in the never-vaccinated fell by 34%, twice the rate of decline of the vaccinated. Observing May 2022 data, Archibald (2022d) noted that in the UK COVID-19 deaths increased after the first vaccine dose, but then tended to decrease. Whilst non-COVID-19 deaths essentially doubled from the first dose until over 21 days after the third dose. For the 50–59 age group, after the first dose the non-COVID-19 death rate increased by around 170%. For the 70–79 age group, less than 21 days after the third dose the non-COVID-19 death rate increased by around 330%. For the 10–14 age group, at least 21 days after the third dose the non-COVID-19 death rate increased by around 4800%. Using data from England, from 1 June 2020 to 3 July 2022, Girma and Paton (2024) used double-debiased machine learning (DDML) to examine the impact of differential COVID-19 vaccination rates on care home mortality and other outcomes. Their results provided some evidence that higher vaccination take-up amongst residents, but not staff, reduced COVID-19 mortality in elderly care homes. However, the effect was relatively small, was not robust to alternative measures of mortality and was restricted to the initial vaccination roll-out period. During the booster roll out period (from September 2021), the authors were unable to identify strong evidence that vaccination rates amongst care home staff reduced mortality or that resident vaccination reduced mortality. Indeed, in the later period, they found some evidence that higher vaccination rates were associated with *higher* COVID-19 mortality. Incredibly, they found that vaccinating the staff *increased* COVID-19 deaths and all-cause deaths on residents (Kirsch, 2024j). Shahar (2023j) used ONS data up to April 2023 and estimated that vaccine effectiveness of the fourth dose against death was around zero. Using data up to May 2023, C. Craig (2023a) showed that in the UK, for the 18–39-year-old group, from November 2022 deaths in the vaccinated were higher than the unvaccinated. Whilst for the over 80 age group

deaths in the vaccinated cohort were 23% higher from January 2022 to May 2023. Using data from June 2021 to June 2023, Smalley (2024c) noted that in England and Wales between 2021 and 2023 there was a surprisingly weak relationship between COVID-19 deaths and deaths of the unvaccinated.

4.2.7.4 North America

United States J. Wallace, Goldsmith-Pinkham, and Schwartz (2022) analysed excess death rates for Republicans and Democrats in Ohio and Florida who died at age 25 or older between January 2018 and December 2021. Between March 2020 and December 2021, the part of the study period that overlaps the COVID-19 pandemic, average excess death rates were 5.4 percentage points (pp) (76%) higher among Republicans than Democrats. However, this gap widened from 1.6 pp between March 2020 and March 2021, to a 10.6 pp, or 153%, difference after 5 April 2021, when all adults were eligible for COVID-19 vaccines in Florida and Ohio. In a quality paper, T. B. Baker et al. (2023) analysed 86,732 adult patients in the US hospitalised with COVID-19 from 1 January 2021 to 31 January 2022. Statistically adjusted mortality rates for unvaccinated and vaccinated patients were 8.3% and 5.1% respectively. Vaccination was associated with especially large reductions in mortality for obese, severely obese and older patients. Using data up to February 2022, Kirsch (2024h) showed that in the US, the case fatality rate (CFR) did not drop consistently below the pre-vaccine CFR (0.012 in December 2020) until the Omicron variant emerged. This means that the vaccines did not reduce the CFR which means they do not prevent deaths. Pre-pandemic, excess deaths were correlated with poor metabolic health (e.g. obesity). During the pandemic, vaccine uptake is correlated with good metabolic health. So, counties with a high vaccine uptake have a lower COVID-19 death rate. Once we take the baseline into account, we find that vaccine uptake in a county had no effect on COVID-19 death rates (Crawford, 2022b; Engler, 2023b; Ethical Skeptic, 2022; HART, 2022c). In June 2022 Smalley (2022d) examined COVID-19 deaths per 100k population before and after mass vaccination campaigns for 3,135 US counties, covering all states. More than 80% of the counties had a *higher* rate of COVID-19 deaths after mass vaccination campaigns. The average change was an increase in the rate by 0.2 deaths per 100k per day. There was no apparent relationship between the counties that vaccinated the most and subsequent better outcomes in terms of lower COVID-19 death rates. Chudov (2023p) analysed A. A. Butt et al. (2023), a study of US veterans (mostly older males) which covered the period 1 January 2022 to 21 August 2022, and concluded that unvaccinated veterans had the lowest rate of hospitalisations and deaths. The more vaccines the veterans received, the worse their outcome. B. Adhikari, Bednash, Horowitz, Rubinstein, and Vlasova (2024) conducted a single-centre study in the US using data from May 2020 to November 2022. 152 adult patients were admitted to Ohio State University hospital with acute respiratory failure (ARF), including 112 COVID-19-positive and 40 COVID-19-negative patients. In the COVID-19 patients the mortality rates were 37% for the unvaccinated and 70% for the vaccinated! This is a significant difference, with $p = 0.002$. In Florida, overall, there were more COVID-19 deaths after the vaccination programme than before (Smalley, 2023e). For the over 65s there was no change, but for the younger age groups there were more after the vaccines. In California, Whites' share of COVID-19 deaths doubled from 30% in 2020 to 60% in 2024 (Chudov, 2024i). The article compares February 2020 to August 2020 with September 2023 to February 2024. It could be because Whites are also more vaccinated and boosted against COVID-19.

4.2.7.5 Global

In a preprint, Beattie (2021) conducted a worldwide Bayesian causal analysis on the effectiveness of vaccination programmes. His results showed that vaccinations led to an increase in total deaths per million in 89.84% of statistically significant countries and an increase in total cases

per million in 86.78% of statistically significant countries. Hampson (2023) analysed the death rate from COVID-19 and the level of vaccinations within 115 countries. He concluded that there is no clear evidence that vaccines have saved lives and they have probably done more to precipitate deaths than to avert them. On his blog el gato malo (2023c) pointed out that if vaccine efficacy against deaths really was anything like 50–90% as claimed, it would manifest unmistakable effects on epidemic curve. However, we are seeing such curves bend in the opposite direction. Verduyn (2023c) estimated that COVID-19 vaccines probably prevented no COVID-19 deaths. Clare Craig considered data from Florida, South Africa, Israel & Palestine, Bahrain & Oman, and concluded that the claim that COVID-19 vaccines saved lives does not stand up to any scrutiny (C. Craig, 2023c).

4.2.8 All-Cause Mortality

The best measure of the effectiveness of vaccinations is all-cause mortality, which takes everything (both effectiveness and harms, plus COVID-19 and non-COVID-19 issues) into account. See also Section 5.6 on excess mortality and vaccinations.

4.2.8.1 Europe

Vaccination programmes have not noticeably led to a reduction in all-cause mortality in Europe (EuroMOMO, 2024).

Hungary In an informative article, Pálinkás and Sándor (2022) calculated vaccine effectiveness in preventing all-cause mortality in Hungary utilising nonepidemic effectiveness measures to adjust for the healthy vaccinee effect (HVE). Each vaccine reduced the HVE-corrected all-cause mortality in the epidemic period, with vaccine effectiveness as follows: Oxford/AstraZeneca 0.592, Janssen 0.754, Moderna 0.573, Pfizer-BioNTech 0.487, Sinopharm 0.530 and Sputnik V = 0.557. This is a promising paper, because the authors analysed the real effectiveness on all-cause mortality controlling for the healthy vaccinee effect. However, there is a serious flaw. The vaccinated only included those who had finished the course at least 7 days ago (meaning the first dose of the Janssen vaccine or the second dose of other vaccines).

The Netherlands Data from the Netherlands showed that vaccine efficacy against all-cause mortality was negative between 7 and 10 months after vaccination for those aged 12 to 49 (Malone, 2022a).

United Kingdom In England, all-cause age-adjusted mortality rate (ASMR) by vaccination status appears to be similar in 2021 for the vaccinated and unvaccinated, but in 2022 was lower for the unvaccinated (Ben, 2023a). No significant vaccine efficacy can be seen from the all-cause mortality data.

4.2.8.2 North America

United States According to Kirsch (2024g), who used ChatGPT to analyse record-level Medicare data from Connecticut, Pfizer has a 10% higher all-cause one-year age-standardised mortality than Moderna ($p = 2.39 \times 10^{-176}$). He argues that this means the vaccines are not safe.

4.2.8.3 Global

In a global study using data up to 13 March 2021, S. J. Thomas et al. (2021) analysed the six-month safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. The all-cause death rate was similar for the vaccinated and control arms.

4.2.9 Vaccination Effectiveness Wanes

In addition to early negative effectiveness, vaccine effectiveness turns negative later on, too. D. C. Nguyen et al. (2024) suggested that the rapid waning of SARS-CoV-2-specific serum antibodies could be accounted for by the absence of BM LLPCs after these mRNA vaccines. The absence of LLPCs explains the waning immunity observed after COVID-19 vaccination. Lyons-Weiler (2024b) stated that the failure of mRNA vaccines to generate long-lived plasma cells should not have come as a surprise, it was a foreseeable outcome based on established immunological principles.

4.2.9.1 Asia

Israel A test-negative design study with a population of 83,057 in Israel published by *The BMJ* using data from May 2021 to September 2021 found that after receiving a second dose of the Pfizer-BioNTech vaccine, 21–89 days since the vaccine 1.3% tested positive for SARS-CoV-2, whilst $\geq$ 180 days since the vaccine 15.5% tested positive for SARS-CoV-2 (Israel et al., 2021).

Qatar Data from Qatar from 1 January 2021 to 5 September 2021 showed that vaccination effectiveness for symptomatic and asymptomatic infection is only positive after two weeks after the first dose and before four months after the second dose, outside this window it is *negative* (Chemaitelly et al., 2021).

4.2.9.2 Europe

Austria In a nationwide retrospective cohort study, Chalupka et al. (2024) aimed to evaluate the effectiveness of SARS-CoV-2 vaccinations in previously SARS-CoV-2-infected adults in the general population of Austria during the Delta wave and with extended follow-up. First and second SARS-CoV-2 vaccine doses appeared effective in the short-term, but with diminishing effectiveness over time.

Denmark A Danish cohort study conducted between 20 November 2021 and 12 December 2021 showed that vaccine effectiveness against the Omicron variant decreases rapidly over time and becomes negative (Hansen et al., 2021).

Sweden Data from Sweden up to 4 October 2021 showed that vaccine effectiveness against symptomatic COVID-19 infection wanes progressively over time and turns negative after 240 days since full vaccination (Nordström, Ballin, & Nordström, 2021). It wanes faster for men and older frail individuals. The effectiveness against severe illness wanes more slowly, but is faster for men, older frail individuals and individuals with comorbidities (the most vulnerable groups). Using data from 1 January 2022 to 27 May 2022, the same authors calculated the vaccine effectiveness (VE) of a fourth dose of mRNA COVID-19 vaccine against all-cause mortality in Sweden (Nordström, Ballin, & Nordström, 2022). In long-term care facility residents, from days 7 to 60, VE was 39%, which declined to 27% during days 61 to 126. In a cohort of all individuals aged $\geq$ 80 years, from days 7 to 60, the VE was 71%, which declined to 54% during days 61 to 143. However, the paper fails to account for the healthy vaccinee bias, so true vaccine effectiveness would have been lower than stated (Shahar, 2023d).

United Kingdom In the UK, Kerr et al. (2022) analysed data for the period 8 December 2020 to 30 June 2021 and found that the effectiveness of COVID-19 vaccines at preventing hospitalisation and death drops to zero after 60–80 days, and then turns negative. The Exposé (2021) analysed data from the UK Health Security Agency (UKHSA) between 16 August 2021 and 7 November 2021 and demonstrated that the real-world effectiveness of the COVID-19

vaccinations wains significantly, but unfortunately for the vaccinated population, rather than the immune system returning to the same state it was prior to vaccination, the immune system performance begins to rapidly decline making it inferior to that of the unvaccinated. They also showed that the fully vaccinated have a much higher hospitalisation-fatality rate. In the UK, Horne et al. (2022) analysed the effectiveness of BNT162b2 and ChAdOx1 COVID-19 vaccines over six months since the second dose, between March 2021 and December 2021. They found that by 23–26 weeks after the second vaccine dose, rates of positive SARS-CoV-2 test in vaccinated people were similar to or higher than in unvaccinated people. The rate at which estimated vaccine effectiveness waned was consistent for COVID-19-related hospital admission, COVID-19-related death and positive SARS-CoV-2 test, and was similar across subgroups defined by age and clinical vulnerability. In summary, vaccinations work at the individual level for a while, but wane, and vaccine effectiveness against infection eventually turns negative for both vaccinations (BNT162b2 and ChAdOx1) across all age groups. Using data from December 2021 to January 2022, Chudov (2022l) reported that UK data showed that booster effectiveness against death dropped by 10% across the board in two weeks. Using data from England from 21 March 2021 to 20 March 2022, Bermingham, Nafilyan, Andrews, and Gethings (2023) found vaccine effectiveness against hospitalisation for COVID-19 was 52.1% for a first dose, 55.6% for a second dose and 77.6% for a third dose, with a decrease in vaccine effectiveness 3+ months after the third dose. Vaccine effectiveness against COVID-19 mortality was 58.7% for a first dose, 88.5% for a second dose and 93.2% for a third dose. In England, C. Andrews et al. (2024) analysed the effectiveness of COVID-19 vaccination in children and adolescents. The study found that initial protection by BNT162b2 vaccination against positive SARS-CoV-2 tests in adolescents aged 12–15 had waned by 14 weeks after vaccination. Rates of COVID-19 hospitalisation and COVID-19 A&E attendance were lower after first and second doses of BNT162b2 vaccination in adolescents. Using data for the UK, after a vaccination, for the first two weeks vaccine effectiveness is negative, then after two months, vaccine effectiveness again turns negative (Data Matters, 2022b).

4.2.9.3 North America

United States With US veterans for the period 1 February 2021 to 1 October 2021, vaccine effectiveness against infection declined over time for all vaccine types, even after adjusting for age, sex and comorbidity (Cohn, Cirillo, Murphy, Krigbaum, & Wallace, 2022). Data from New York during December 2021 and January 2022 showed that the effectiveness of vaccinations against cases of Omicron declined rapidly for children (Dorabawila et al., 2022). In the US, using a test-negative, case–control study conducted from December 2021 to February 2022 during Omicron variant predominance, Fleming-Dutra et al. (2022) determined that, among children and adolescents, estimated vaccine effectiveness for two doses of BNT162b2 against symptomatic infection was modest and decreased rapidly. For adolescents who had (exactly) two doses, 4.5 months after the second dose vaccine effectiveness became negative, but increased after a booster dose. Using data from Southern California, Tseng et al. (2023) conducted a test-negative case–control study between January 2022 and June 2022 to evaluate mRNA1273 vaccine effectiveness (VE) against infection and hospitalisation with Omicron subvariants. The VE after a third dose for BA.2, BA.2.12.1, BA.4 and BA.5 variants turned negative after 150 days. Mowrey (2023e) showed, using data from 29 October 2021 to 6 January 2023, that for children aged 5 to 11 the effectiveness of COVID-19 vaccines against hospitalisation or death reaches zero after six months.

Canada Using data from Ontario, Canada, collected between 6 December 2021 and 26 December 2021, Buchan et al. (2022) found that protection from two doses of COVID-19 vaccines against symptomatic Omicron infection declines with time since a second dose, with no protection beyond 180 days.

4.2.9.4 Global

Pantazatos and Seligmann (2021) analysed COVID-19 vaccinations and age-stratified all-cause mortality risk for Europe and the US up to August 2021. They found that 0 to 5 weeks after vaccination, mortality was elevated, from 6 to 20 weeks it was lower (the window during which the vaccination was effective), then after 20 weeks it was higher again. Menegale et al. (2023) conducted a systematic review and meta-analysis, up to 19 October 2022, of SARS-CoV-2 vaccine-induced immunity. They found that the estimated vaccine effectiveness against both laboratory-confirmed Omicron infection and symptomatic disease was lower than 20% at 6 months from the administration of the primary vaccination cycle and less than 30% at 9 months from the administration of a booster dose.

4.2.10 Negative Vaccination Effectiveness

In addition to early negative effectiveness, vaccine effectiveness turns negative later on, too.

4.2.10.1 Asia

Israel In Israel, around January–February 2021 (first/second doses), when the younger cohorts were vaccinated, their incidence of infection increased, whilst there was less of an effect with older cohorts (see Figure 2 in Haas et al. (2021)).

Qatar Results from Qatar, between 21 December 2020 and 5 September 2021, showed that vaccination effectiveness for symptomatic and asymptomatic infection is only positive after two weeks after the first dose and before four months after the second dose, outside this window it is negative (Chemaitelly et al., 2021).

4.2.10.2 Europe

In a study run by WHO, with the involvement of the CDC, from 1 January 2022 to 20 November 2023, Katz et al. (2024) concluded that during nearly two years of Omicron circulation in the eastern WHO European region, COVID-19 vaccination reduced the risk of hospitalisations by more than half for six months following vaccination. However, Lataster (2024p) pointed out that vaccine effectiveness was almost zero around the six-month mark and was negative around the nine-month mark. Whilst vaccine effectiveness for severe disease is -40% at around nine months.

Austria Chalupka et al. (2023) conducted a retrospective population-based observational study on the effectiveness of a fourth SARS-CoV-2 vaccine dose in previously infected individuals from Austria. The unvaccinated had lower all-cause mortality than those who had one, two or three vaccinations. Relative vaccine effectiveness faded rapidly and turned negative. Age and gender-adjusted hazard ratios showed that in May 2023 those with four doses were 1.56 more likely to be infected than those with three vaccine doses, those with four doses were 2.86 more likely to be infected than those with two vaccine doses, and those with four doses were 7.92 more likely to be infected than those with the unvaccinated. This is shocking.

Denmark A Danish cohort study conducted between 20 November 2021 and 12 December 2021 found that vaccine effectiveness against the Omicron variant decreases rapidly over time and becomes negative (Hansen et al., 2021). Smalley (2022k) presented graphs from Kristoffer Torbjørn Bæk that revealed that the vaccinated in Denmark accounted for more cases, hospitalisations and deaths than the unvaccinated and had done from January to April 2022.

Germany Using data up to April 2021, eugyppius (2021b) reported that the entire third COVID-19 wave in Germany is correlated tightly with vaccine doses. Basically, since the second week of February 2021, case numbers were 3–7% of vaccination doses from 17 days ago. This is disturbing.

Sweden A Swedish study (using data from January 2021 to October 2021 for infection and March 2021 to September 2021 for severe COVID-19) showed that vaccine effectiveness against symptomatic COVID-19 infection wanes progressively over time and turns negative after 240 days since full vaccination (Nordström et al., 2021). It wanes faster for men and older frail individuals. The effectiveness against severe illness wanes more slowly, but is faster for men, older frail individuals and individuals with comorbidities (the most vulnerable groups). Shahar (2023d) analysed Nordström et al. (2022) (which uses data from 1 January 2022 to 27 May 2022) and showed that when accounting for the healthy vaccinee bias, the vaccine effectiveness was negative.

The Netherlands Data from the Netherlands up to July 2022 showed that vaccine efficacy against all-cause mortality was negative between 7 and 10 months after vaccination for those aged 12 to 49 (Malone, 2022a).

United Kingdom In the UK, Kerr et al. (2022) analysed data from the period 8 December 2020 to 30 June 2021 and found that the effectiveness of COVID-19 vaccines at preventing hospitalisation and death drops to zero after 60–80 days, and then turns negative. Dee (2023d) analysed data from March 2021 to September 2021 from an unknown NHS Trust and his results suggested a 60% *increase* in the risk of COVID-associated acute respiratory conditions following the second dose. Using data from December 2021 to January 2022, Chudov (2022l) reported in February 2022 that UK data showed that booster effectiveness was negative. A boosted 40–49-year-old was 2.2 times *more likely* to catch COVID-19 than an unvaccinated person of the same age. In the UK, analysing data from the beginning of the COVID-19 pandemic until 1 May 2022, Emani et al. (2022) observed negative vaccine effectiveness for the third dose since 20 December 2021, with a significantly increased proportion of SARS-CoV2 cases, hospitalisations and deaths among the vaccinated; and a decreased proportion of cases, hospitalisations and deaths among the unvaccinated. There was no discernible optimal vaccine effectiveness among the ≥ 18 years of age and vaccinated third dose population since the beginning of the Omicron variant surge (20 December 2021). Using data for the UK, after a vaccination, for the first two weeks vaccine effectiveness is negative, then after two months, vaccine effectiveness again turns negative (Data Matters, 2022b). Analysing data up to June 2023, Rendell (2023g) pointed out that in the UK hospital admissions were 10% *higher* following the vaccine rollout in the vulnerable groups. The timing shows that the proportion of patients hospitalised due to COVID-19 decreased significantly when Omicron became the prevailing COVID-19 variant, rather than being due to the vaccinations. In the UK, analysing data between September 2022 and March 2023, Kirwan et al. (2024) calculated that compared to a waned third dose, fourth dose VE was 13.1% overall; 24.0% in the first 2 months post-vaccination, reducing to 10.3% for 2–4 months and 1.7% for 4–6 months. So after six months we expect negative effectiveness (Lataster, 2023c).

4.2.10.3 North America

United States In the US, analysing data from December 2021 to February 2022, Fleming-Dutra et al. (2022) determined that, during Omicron dominance, among children and adolescents, estimated vaccine effectiveness for two doses of BNT162b2 against symptomatic infection was modest and decreased rapidly. For adolescents who had (exactly) two doses, 4.5 months after the second dose vaccine effectiveness became negative, but increased after a booster dose.

Using data up to 3 June 2022, D.-Y. Lin et al. (2022) conducted a large cohort study on the protection conferred by the BNT162b2 vaccine and by previous SARS-CoV-2 infection against infection in children 5 to 11 years of age over a six-month period when the Omicron variant was dominant. Vaccine effectiveness turned negative within five months of vaccination. Also, disturbingly, among those who had previously been infected, the vaccines destroyed the protection provided by natural immunity, leaving them more vulnerable to reinfection than they were before vaccination (W. Jones, 2022c). In Southern California, Tseng et al. (2023) conducted a test-negative case–control study between January 2022 and June 2022 to evaluate mRNA1273 vaccine effectiveness (VE) against infection and hospitalisation with Omicron subvariants. The VE after a third dose for BA.2, BA.2.12.1, BA.4 and BA.5 variants turned negative after 150 days. Using data from 12 September 2022 to 14 March 2023, Shrestha, Burke, Nowacki, Simon, et al. (2023) found that the risk of Omicron infection *increased* with the number of bivalent COVID-19 vaccine doses. Those who had three or more doses were around 300% as likely to have a COVID-19 infection than the unvaccinated. This is negative vaccine efficacy of -200% (W. Jones, 2022b).

4.2.11 More Doses Increases Risk of Infection/Hospitalisation/Death

There is evidence that the more vaccine doses that one has (e.g. boosters), the greater the risk of infection, hospitalisation and/or death.

4.2.11.1 Asia

Israel Israeli Health Ministry data shows that in the older population (those over the age of 60), having submitted to more COVID-19 vaccinations often correlates to a greater likelihood of becoming infected with COVID-19 (Rabinovitz, 2022).

4.2.11.2 Australasia

Australia David Archibald noted that in New South Wales, Australia, having had four doses of spike protein makes you nearly three times as likely to be hospitalised than if you had stopped at one (Archibald, 2022c). From that it follows that one way to reduce the burden of COVID-19 on the hospital system is to stop vaccination. He later reported that in New South Wales, Australia, those with three vaccine doses had a greater rate of hospitalisation than those with two doses, whilst those with four doses had a significantly higher hospitalisation rate still (Archibald, 2022b). The pattern for deaths was the same. He explains what is happening: 'The vaccinated have a higher rate of covid infection than the unvaccinated due to original antigenic sin — their immune systems have been trained to fight a now extinct version of the spike protein and thus produce T cells that don't bind properly. Each new covid infection delivers an insult to the immune system and eventually the effects of infection and vaccination will merge with time, and then the deaths will be more from cancers and other infections, due to covid but not attributable to it.' He also noted that in New South Wales, Australia, the death rate is supra-linear to the number of vaccinations given.

New Zealand Bowler (2023b) believes that the leaked New Zealand vaccine data (Nightingale, 2024) suggests a cumulative effect and that excess mortality is spread out for several months after each vaccine.

4.2.11.3 Europe

Iceland In a population-based cohort study, Eythorsson, Runolfsdottir, Ingvarsson, Sigurdsson, and Palsson (2022) analysed the rate of SARS-CoV-2 reinfection during the Omicron wave in Iceland (1 December 2021 to 13 February 2022). They found that after two or more

doses of vaccine a person was 42% *more* likely to be reinfected with COVID-19 than someone who had one or no doses.

United Kingdom The Exposé (2024) analysed data from January 2023 to May 2023 and reported that in the UK people aged 18 to 49 who have received four doses of the COVID-19 vaccine are up to 318% more likely to die of any cause than their unvaccinated counterparts.

4.2.11.4 North America

Canada Data from Statistics Canada from 13 June 2022 to 29 August 2022 suggest that more COVID-19 shots are associated with more death (Rose, 2024d).

United States Chudov (2023p) analysed A. A. Butt et al. (2023), a study of US veterans (mostly older males) which covered the period 1 January 2022 to 21 August 2022, and concluded that unvaccinated veterans had the lowest rate of hospitalisations and deaths. The more vaccines the veterans received, the worse their outcome. Disturbingly, using data from 12 September 2022 to 14 March 2023 in the US, Shrestha, Burke, Nowacki, Simon, et al. (2023) found that the greater the number of vaccine doses previously received, the higher the risk of contracting COVID-19. Shrestha, Burke, Nowacki, and Gordon (2023) followed outcomes until 10 May 2023 and found that, among 48,344 working-aged Cleveland Clinic (Ohio, US) employees, since the XBB lineages became dominant, adults 'not up-to-date' by the CDC definition had a lower risk of COVID-19 than those 'up-to-date' on COVID-19 vaccination. HART (2023c) reported that the Shrestha, Burke, Nowacki, and Gordon (2023) study evidences that more COVID-19 doses lead to more COVID-19 infections, but the authors of the study are less than honest about the reality of the situation. Among 47561 working-aged Cleveland Clinic employees, the 2023–2024 formula COVID-19 vaccine was 23% effective against the JN.1 lineage of SARS-CoV-2, but a higher number of prior COVID-19 vaccine doses was associated with a higher risk of COVID-19 (Shrestha, Burke, Nowacki, & Gordon, 2024a). The study was conducted from 31 December 2023 until 22 April 2024. Compared to 0 or 1 prior vaccine doses, risk of COVID-19 was incrementally higher with 2 prior doses (hazard ratio (HR) 1.46; $p < 0.005$), 3 prior doses (HR 1.95; $p < 0.001$) and more than 3 prior doses (HR 2.51; $p < 0.001$). The paper was published in *Clinical Infectious Diseases* (Shrestha et al., 2024b). According to Harvey Risch, a professor of epidemiology who reviewed the paper, 'Multiple vaccine doses may have the effect of antibody-dependent enhancement or 'original antigenic sin,' which increase the infection response disproportionally to antibodies generated from the first vaccine dose, rather than from the current vaccine or the current infection, making the antibody response less effective' (Stieber, 2024c). Similarly, W. Jones (2024j) argued that a likely cause would be 'original antigenic sin', where a narrow vaccine-based immune response prevents a broader immune response on encountering the virus, plus the development of tolerance towards the spike protein from repeated dosing. Lyons-Weiler (2024c) argued that 'The inadequate effectiveness of the single dose of the vaccine and the increased risk associated with multiple prior doses suggest the COVID-19 vaccination boosting program should be ceased, immediately'. 'Further, no mandates of the vaccine for any group anywhere is justified.' Petrovsky (2024) noted that whilst the mRNA might give a modest short-term protection against infection for a few weeks it then leaves these individuals more vulnerable to infection in the long-term. He suggested that it could be related to the induction of IgG4 switching with repeated mRNA doses.

4.2.12 Vaccinations Fail When We Need Them Most

Vaccinations are least effective on those who need protecting from COVID-19 the most (the elderly and those with comorbidities). People who are the most affected by the COVID-19 disease (the elderly, diabetics, hypertensive, and immunocompromised people like those with

HIV) are also more susceptible to suffering the negative effects of repeated mRNA vaccination (Uversky, Redwan, Makis, & Rubio-Casillas, 2023).

4.2.12.1 Italy

In Lombardy, Italy, from December 2021 to April 2022, Accordino, Canetta, and Blasi (2023) found that comorbidities and immunosuppression represented the most relevant issue related to the higher in-hospital mortality observed in the vaccinated.

4.2.12.2 Norway

In January 2021 the Norwegian Institute of Public Health reported that COVID-19 vaccines may be too risky for the very old and terminally ill (Taraldsen & Kresge, 2021). Norwegian officials stated that 23 people had died in the country a short time after receiving their first dose of the vaccine. Of those deaths, 13 had been autopsied, with the results suggesting that common side effects may have contributed to severe reactions in frail, elderly people.

4.2.12.3 Spain

In a prospective, multicentre, observational study published in the *European Respiratory Journal*, Motos et al. (2022) found that the fully vaccinated who ended up in ICU tended to have comorbidities and/or immunosuppression.

4.2.12.4 Turkey

In Turkey, analysing data between August 2021 and November 2021, Kara et al. (2022) found that patients with severe obesity generated significantly reduced antibody titres against SARS-CoV-2 spike antigen after CoronaVac and BNT162b2 vaccines compared to people with normal weight.

4.2.12.5 United States

Using a case–control study in the US and data from March 2021 to August 2021, N. M. Lewis et al. (2022) found that mRNA vaccine effectiveness against hospitalisation decreased roughly proportionally to the number of chronic medical comorbidities, both overall and stratified by age. J. Sun et al. (2022), using data from December 2020 to September 2021, found that patients with immune dysfunction had a substantially higher risk of contracting a COVID-19 breakthrough infection and had worse outcomes compared with those without immune dysfunction. Also, people with a breakthrough infection after full vaccination were more likely to be older.

4.2.13 Conclusion

Vaccinations offer limited effectiveness against infection. Vaccinations appeared to be effective against severe COVID-19 and death in 2021. But once we take into account the various biases that can compromise studies, the effect is diminished. Vaccine effectiveness can be negative for a couple of weeks before turning positive, then wanes, and, disturbingly, can turn negative again. Also disturbingly, there is evidence that more vaccine doses can lead to an increased risk of infection. Vaccines seem to offer little effectiveness against Omicron, and their longer-term outlook appears bleak. Lyons-Weiler (2024a) explained that the complex adaptive landscape created by SARS-CoV-2 vaccines means that evolution will not allow effective mRNA vaccines against mRNA viruses in the long term. Interaction among multiple selective factors and evolution at multiple levels assures unpredictability.

4.3 Issues with Vaccinations

According to eugyppius (2023c), mass vaccination initiatives to reduce the prevalence of old endemic pathogens like influenza or mild Omicron-era COVID-19 are a very bad idea. Even in the fantasy world where the vaccines are totally safe, the risk is that they'll end up reserving hosts for other, newer pathogens and the unknown risks that these pose. According to Kirsch (2023e), the COVID-19 vaccines are more dangerous than any other vaccine in history. Adverse effects include myocarditis, heavy menstrual bleeding, pulmonary embolism, atrial fibrillation, Guillain–Barré syndrome, Bell's palsy, miscarriage, cardiac arrest, ischaemic stroke, erectile dysfunction, Ramsay Hunt syndrome (herpes zoster oticus), intracranial haemorrhage, aortic aneurysm, Creutzfeldt–Jakob disease (CJD) and stiff person syndrome. Demasi (2023b) argued that serious adverse events from Pfizer's mRNA vaccine are not 'rare'. Data from the UK showed that post-vaccination symptoms *per se* cannot be differentiated from early COVID-19 with clinical robustness, either using symptom profiles or machine-derived models (Canas et al., 2021). In other words, the vaccine can effectively give you the very thing that it is supposed to be protecting you from. Kim (2024) provides an excellent summary of the harms from vaccines:

- Blood clots in the eyes
- Changes in women's menstruation
- Effect on exercise capacity
- Constant boosting could lead to 'immune tolerance'
- Heart injuries
- Subclinical heart injuries
- Long-term outcomes for the heart-injured
- Death from vaccine-induced injuries
- Long COVID-like symptoms from the vaccine
- Thrombosis with thrombocytopenia syndrome (TTS)
- Other blood disorders
- Guillain–Barré syndrome, Bell's palsy
- Seizures in children
- Strokes
- Pulmonary embolisms
- MIS-C
- Multiple sclerosis
- Thyroid issues
- Skin issues
- Alopecia
- Liver issues
- Musculoskeletal disorders

- Inflammatory arthritis
- New-onset type 1 diabetes

How are so many harms possible?

- The vaccine can go into vital organs
- Spike protein is harmful
- Spike protein can remain in the body for a long time

4.3.1 Natural Immunity

Natural immunity in the COVID-recovered performs better than full vaccination alone in the COVID-naive (though there is a small absolute benefit to vaccination in the COVID-recovered). In a convincing article, Radagast (2022g) explained that when you get vaccinated, you lose your natural immunity. The vaccine makes your immune system forget what it had previously learnt about the virus. In an article in *Science*, Wadman (2021) concluded that having SARS-CoV-2 once confers much greater immunity than a vaccine. In a systematic review and pooled analysis Shenai, Rahme, and Noorchashm (2021), found that the incidence of infection in never previously infected and vaccinated trended higher than previously infected and unvaccinated groups (risk ratio (RR) = 1.86). The authors concluded that there was no statistical advantage to vaccination in the COVID-naive compared to natural immunity in the COVID-recovered. Whilst vaccination in COVID-recovered individuals provided modest protection from reinfection (RR = 1.82), but the absolute risk difference was extremely small (AR = 0.004 person-years). In a systematic review and meta-analysis on infection protection against re-infection, COVID-19 Forecasting Team (2023) identified a total of 65 studies from 19 different countries, and the level of protection from past infection by variant and over time is at least equivalent if not greater than that provided by two-dose mRNA vaccines.

4.3.1.1 Asia

Israel In Israel, Gazit et al. (2022) conducted a retrospective observational study of 124,500 persons between 1 June 2021 and 14 August 2021 and compared two groups: (1) SARS-CoV-2-naive individuals who received a 2-dose regimen of the BioNTech/Pfizer mRNA BNT162b2 vaccine, and (2) previously infected individuals who had not been vaccinated. The SARS-CoV-2-naive vaccinees had a 13.06-fold increased risk for breakthrough infection with the Delta variant compared to unvaccinated-previously-infected individuals, when the first event (infection or vaccination) occurred during January and February of 2021. The increased risk was significant for symptomatic disease as well. Goldberg et al. (2022) used the Israeli Ministry of Health database, and a study period from 1 August 2021 to 30 September 2021, and showed that you are less likely to become infected if you were infected before you were vaccinated.

Qatar Abu-Raddad, Chemaitelly, Coyle, et al. (2021) found that, as of December 2020 in Qatar, natural infection appeared to elicit strong protection against reinfection with an effectiveness of ∼95% for at least seven months. Altarawneh, Chemaitelly, Hasan, et al. (2022) found that the effectiveness of previous infection in preventing reinfection was approximately 90% for the Alpha, Beta and Delta variants, and approximately 60% for the Omicron variant. Whilst the protection of previous infection against hospitalisation or death caused by reinfection appeared to be robust, regardless of variant. From 23 December 2021 through to 21 February 2022, Altarawneh, Chemaitelly, Ayoub, et al. (2022) analysed the protection conferred by natural immunity, vaccination (with BNT162b2 (Pfizer-BioNTech) or mRNA-1273 (Moderna)) and

both against symptomatic SARS-CoV-2 infection with the BA.1 or BA.2 sublineages of the Omicron variant. The effectiveness of previous infection alone against symptomatic infection was 46.1%. The effectiveness of vaccination with two doses of vaccine and no previous infection was -1.1%, but nearly all persons had received their second dose more than 6 months earlier. The effectiveness of three doses of vaccine and no previous infection was 52.2%. The effectiveness of previous infection and two doses of vaccine was 55.1%, and the effectiveness of previous infection and three doses of vaccine was 77.3%. Previous infection alone, vaccination alone and hybrid immunity all showed strong effectiveness (>70%) against severe, critical or fatal COVID-19.

4.3.1.2 Europe

Austria In Austria, using data up to 30 June 2023, Chalupka et al. (2024) found that the absolute risk of COVID-19 death for the previously uninfected was 0.043%, and for the previously infected 0.003%. In other words, the primary driver of protection was natural immunity (I. Miller, 2024h).

Belgium Researchers in Belgium found a difference in the dynamic of antibody production after COVID-19 disease and vaccination (Gillot, Favresse, Maloteau, Dogné, & Douxfils, 2021). Six months post COVID-19 symptoms onset, 84.6% of the samples were still positive for neutralising antibodies. Whilst six months after the first vaccination in a cohort of healthcare workers who received the two-dose regimens of BNT162b2, just 56.9% were still positive for neutralising antibodies.

The Netherlands In the Netherlands Andeweg et al. (2021) found evidence for lower vaccine effectiveness against infection for the Beta, Gamma and Delta variants, compared to the Alpha variant. They found no increased risk of reinfection with Beta, Gamma or Delta variants relative to the Alpha variant for individuals with infection-induced immunity.

United Kingdom Djaparidze (2022) analysed UK data in 2022 and concluded that the immunity induced by infections in the vaccinated was *worse* than in the unvaccinated.

4.3.1.3 North America

United States Using anti-spike antibodies in the US, Alejo et al. (2022) found that, between 24 September 2021 and 5 November 2021, of unvaccinated individuals who reported a positive COVID-19 test result, antibodies were detected in 99%. Anti-receptor-binding domain (RBD) levels were observed after a positive COVID-19 test result for up to 20 months. In a study in Indiana, Tu et al. (2023) matched 267,847 pairs of individuals who received at least one dose of the COVID-19 vaccine with individuals with documented SARS-CoV-2 infection between 29 November 2020 and 9 February 2022. They found that six months after the vaccination/infection date, the cumulative infection rate in the vaccinated was 6.7%, more than twice the rate in those with previous infections at 2.9%. Interestingly, Bean et al. (2024) found that prior infection with SARS-CoV-2 protected against symptomatic endemic coronavirus (common cold) infection. Whilst vaccination against SARS-CoV-2 did not.

4.3.2 Bolus Theory

Girardot (2024a), a proponent of 'bolus theory', argues that the accidental injection of vaccines directly into the bloodstream, bypassing natural defense mechanisms, can lead to widespread endothelial damage, initiating a cascade of health problems from cardiovascular diseases to neurodegenerative disorders.

4.3.3 DNA Contamination

Pfizer and Moderna bivalent vaccines were found to be 20–35% contaminated with DNA, which can induce human cells to produce the spike protein over the long-term (W. Jones, 2023h). McKernan, Helbert, Kane, and McLaughlin (2023) deployed several methods to assess the nucleic acid composition of four expired vials of the Moderna and Pfizer bivalent mRNA vaccines. Multiple assays found DNA contamination that exceeded the European Medicines Agency (EMA) limit of 330ng/mg by orders of magnitude. Barnett (2024a) reported that at least four independent labs around the world claimed to have detected excessive levels of plasmid DNA in the mRNA Pfizer and Moderna COVID-19 vaccines. Massive levels of DNA contamination have been found in vials of the BioNTech-Pfizer mRNA vaccine in Germany (Kogon, 2023a). Up to 354 times the 10ng per dose limit recommended by the WHO and applicable in the EU was found. Whilst modified mRNA vaccine batches administered in Australia, when tested for DNA contamination, were found to be heavily contaminated. (Rose, 2024b). Barnett (2024d) reported that synthetic plasmid DNA contamination had been detected in Australian vials of Pfizer and Moderna COVID-19 vaccines at levels of between seven to 145 times the regulatory limit. Barnett (2024g) argued that it appears that DNA contamination in COVID-19 vaccines enters the cell nucleus and integrates with human DNA. Similarly, genomic researcher Kevin McKernan found that the DNA in COVID-19 mRNA vaccines can potentially integrate into human DNA (M. Zhang, 2024c). The COVID-19 vaccine spike sequence was detected in two types of chromosomes in cancer cell lines following exposure to the COVID-19 mRNA vaccine. Syed (2024) reported that all recombinant vaccines contain adjuvants that can act as transfection agents, delivering contaminant plasmid DNA into the cells of the person receiving the product. Transfected plasmids can cause cancer. The pharmaceutical companies knew about the problem and have tried to suppress it.

4.3.4 Viral Immune Escape

Immune escape occurs when the immune system of a host, especially of a human being, is unable to respond to an infectious agent: the host's immune system is no longer able to recognise and eliminate a pathogen, such as a virus.

Geert Vanden Bossche asserted that mass infection prevention measures combined with mass vaccination using leaky prophylactic vaccines in the midst of the pandemic enables the natural selection of immune escape variants which are highly infectious (Vanden Bossche, 2021). This could make it harder for a population to reach herd immunity. In April 2021 in a global study, R. Wang, Chen, Gao, and Wei (2021) analysed a total of 506,768 complete SARS-CoV-2 genome sequences. They determined that the following variants are most likely vaccine escape mutations: S494P, Q493L, K417N, F490S, F486L, R403K, E484K, L452R, K417T, F490L, E484Q and A475S. Whereas the following variants are most likely vaccine-weakening mutations: N501Y, Q493R, R408I, Q493H, P384S, K378N, G496S, L455F, I410V, R346S, V483A, K444N, N501T and P384L. R. Wang, Chen, and Wei (2021) demonstrated that vaccine-breakthrough or antibody-resistant mutations provide a new mechanism of viral evolution. They also found that the occurrence and frequency of vaccine-resistant mutations correlate strongly with the vaccination rates in Europe and America. The authors predict that antibody-resistant mutations will become a major mechanism of transmission once most populations are carrying antibodies either through vaccination or infection. Lyons-Weiler (2021) concluded that this vaccine escape sounds like disease enhancement, and spike-only vaccines are a colossal blunder. In Switzerland, Bekliz et al. (2022) detected substantial immune escape in vaccinated individuals for the Omicron-BA.1 variant. It has been argued that the Omicron variant selected for vaccine immune escape (Just A Guy, 2022). In a systematic review and secondary data analysis up to 21 June 2022, Menegale et al. (2022) found marked immune escape associated with Omicron infection and symptomatic disease, after the administration of both two and three doses. A fast decline of booster vaccine

effectiveness (VE) against Omicron was observed, with less than 20% VE against infection and less than 25% VE against symptomatic disease at 9 months from the booster administration. In the US, Branche et al. (2023) conducted a randomised clinical trial comparing early neutralising antibody responses after boosting with bivalent SARS-CoV-2 mRNA vaccines based on either BA.1 or BA.4/BA.5 Omicron spike protein combined with wildtype spike. Participants were enrolled between 4 and 28 October 2022. There was increasing neutralisation escape with the late 2022 Omicron subvariants (BQ.1.1 and XBB.1). The authors express concern that the breadth of antibody response from current updated vaccines is not optimal for the pace of virus evolution. In January 2023 Spieker (2023d) argued that the recent increase in Germany's COVID-19 CFR was due to the BQ.1.1 lineage which is fully adapted to escape the immunity provided by bivalent boosters.

4.3.5 Original Antigenic Sin

One's first exposure to a virus shapes lifelong immune responses, this is known as *original antigenic sin* (E. L. Brown & Essigmann, 2021; Vatti et al., 2017). If a vaccination targets a particular strain of a virus, and a previously uninfected person receives the vaccination, their natural immunity could be compromised, and it may be less effective against future variants of the virus. We have evidence of this. A UK Health Security Agency COVID-19 Vaccine Surveillance Report showed that N antibody levels appear to be lower in individuals who acquire COVID-19 infection following two doses of vaccination (UK Health Security Agency, 2021). Even European Union regulators warned that frequent COVID-19 booster vaccinations could adversely affect the immune response and may not be feasible (Anghel, 2022). In other words, we have increasing evidence of original antigenic sin. Whilst Spieker (2023d) argued that mass deceptive immune imprinting with leaky vaccines allows new SARS-CoV-2 variants to gain predominance.

4.3.5.1 Letters to Journals

The BMJ In a March 2020 letter to *The BMJ*, it was noted that it is possible that influenza vaccines alter our immune systems non-specifically to increase susceptibility to other infections (Cunningham, 2020). A randomised placebo-controlled trial in children showed that flu vaccinations increased fivefold the risk of acute respiratory infections caused by a group of non-influenza viruses, including coronaviruses.

The New England Journal of Medicine In January 2023 Paul Offit, in a letter to *The New England Journal of Medicine*, warned of the problems he had encountered with bivalent vaccines, known as *imprinting* (P. A. Offit, 2023). The immune systems of people immunised with the bivalent vaccine, all of whom had previously been vaccinated, were primed to respond to the ancestral strain of SARS-CoV-2. They therefore probably responded to epitopes shared by BA.4 and BA.5 and the ancestral strain, rather than to new epitopes on BA.4 and BA.5. He concluded 'I believe we should stop trying to prevent all symptomatic infections in healthy, young people by boosting them with vaccines containing mRNA from strains that might disappear a few months later'.

4.3.5.2 Asia

Japan In Japan, Fujita et al. (2023) found that although natural infection induced effective antiviral immunity, breakthrough infections in hamsters with BQ.1.1 and XBB.1 Omicron subvariants after receiving the 3-dose mRNA-lipid nanoparticle vaccine resulted in only faintly induced humoral immunity, supporting the possibility of imprinted immunity.

Qatar In Qatar, Chemaitelly et al. (2022) conducted matched, retrospective, observational cohort studies to investigate epidemiological evidence for immune imprinting in individuals who had a documented primary Omicron infection, but different prior vaccination histories. The authors found that a history of primary-series (two-dose) vaccination enhanced immune protection against Omicron reinfection, but a history of booster (third dose) vaccination compromised protection against Omicron reinfection. The booster dose, a pre-Omicron immunological event, that occurred several months after the primary-series vaccination, another pre-Omicron immunological event, may have trained the immune response to expect a specific narrow pre-Omicron challenge; thus, the response was inferior when the actual challenge was an immune-evasive Omicron subvariant.

4.3.5.3 Europe

Italy In Italy, Focosi et al. (2021) found that previous humoral immunity to the endemic seasonal alphacoronaviruses NL63 and 229E is associated with worse clinical outcomes in COVID-19.

Spain In Spain, Monge, Pastor-Barriuso, and Hernán (2023) argued that the increased risk of reinfection in individuals vaccinated with a booster compared with no booster is the result of selection bias and is expected to arise even in the absence of immune imprinting. However, Lataster (2023d) pointed out that this hypothesis would not apply to all studies. Also in Spain, Benitez Fuentes et al. (2022) found evidence of exhausted CD8+ T cells after repeated doses of S1 antigen following SARS-CoV-2 vaccination.

The Netherlands In the Netherlands, Föhse et al. (2023) found that the BNT162b2 vaccine induces effects on both the adaptive and innate branches of the immune system. Administration of the BNT162b2 vaccine modulated innate immune responses up to one year after the initial vaccination. Aguilar-Bretones et al. (2021) found that the immune response of those with severe COVID-19, unlike those with mild symptoms, was dominated by IgG antibodies against ordinary seasonal coronaviruses.

4.3.5.4 North America

United States In the US, Follmann et al. (2022) found that among participants in the mRNA-1273 vaccine efficacy trial with PCR-confirmed COVID-19, antinucleocapsid antibody seroconversion at the time of study unblinding (median 53 days post diagnosis and 149 days post enrolment) occurred in 40% of the mRNA-1273 vaccine recipients vs 93% of the placebo recipients. This implies that the vaccine significantly suppresses long-term immunity to COVID-19 after infection (Berenson, 2022b; el gato malo, 2022g). C.-Y. Lin et al. (2022) found that preexisting hCCCoV antibodies may hinder effective immunity against SARS-CoV-2. ris Y. Collier et al. (2023) found that immune imprinting by previous antigenic exposure led to both monovalent and bivalent mRNA boosters not substantially augmenting T-cell responses (though they markedly increased antibody responses). Tortorici et al. (2023) deduced that immune imprinting persists even after multiple exposures to Omicron spikes through vaccination and infection, including post XBB.1.5 spike booster mRNA vaccination. Tortorici et al. (2024) found that repeated vaccinations with the COVID-19 XBB.1.5 mRNA booster (and/or repeated infections) led to persistent immune imprinting.

4.3.5.5 Bloggers

Various bloggers have provided interesting insights on COVID-19 vaccines and original antigenic sin.

Stephen Andrews In an insightful analysis, Stephen Andrews analysed mortality during the pandemic period (S. Andrews, 2023d). In 2020, 2022 and 2023 COVID-19 risk increased with age. Whilst in 2021 there was a decrease in mortality risk with age. The vaccination redirected the immune system towards older variants, due to original antigenic sin. Older age groups are more prone to immunosenescence; consequently, there is an increase in mortality for the younger more vaccine-responsive age groups. In another insightful Substack article, he argued that there is strong evidence that the virus(s) responsible for the COVID-19 pandemic was introduced by gain of function research (S. Andrews, 2023e). Because the virus was novel, the antigenic distance between the immune response from the initial infection and the subsequent mutations was relatively small. This led to original antigenic sin (OAS) being highly influential. As the mutation exposure gradient near the area of origin, Western Pacific Region, was much less steep it resulted in a reduced impact of OAS and less severe illness. Omicron was also introduced by gain of function research, and its emergence was originally suppressed by pathogen interference by the dominant Wuhan variant. The antigenic distance was significant. The rapid emergence of Omicron and mutational rate meant that the Western Pacific Region was significantly exposed to OAS and higher mortality. This would also have been potentially elevated by the use of a vaccine targeting a prior variant. This can be seen if we examine the excess mortality data from China. Sure enough, Omicron activated in December 2021, and excess deaths in China were low in 2020 and 2021, but inflated from 2022 (The Economist, 2023a).

el gato malo On his blog, el gato malo (2022m) interpreted an article that analysed autopsies of those who were vaccinated but died of COVID-19 (Hirschbühl et al., 2022). The vaccinated generated fewer N antibodies (antigenic fixation) than the unvaccinated, which seemed to cause the vaccinated to suffer from far higher rates of organ infection by COVID-19 than the unvaccinated.

eugyppius The Germany-based blogger eugyppius argued that the vaccines may be compromising immunity to SARS-2 via original antigenic sin (eugyppius, 2021f). The vaccinated will have their primary immune response conditioned by the spike protein of SARS-2 in its vintage 2020 configuration. Vaccination campaigns deny populations the opportunity to develop the layered, population-wide resistance against successive SARS-2 strains that is the foundation of our immunity against other respiratory viruses. In particular, children are not at serious risk of COVID-19, and if they are infected by the new forms of SARS-2 that are sure to emerge every winter, they can achieve the layered immunity that would make them better off in the longer term. Vaccinating children would compromise this. He discussed Aguilar-Bretones et al. (2021) and C.-Y. Lin et al. (2022) and concluded that original antigenic sin is a real and very serious reason to stop vaccinating everyone (eugyppius, 2021i).

Brian Mowrey In contrast to the other bloggers, Brian Mowrey argued that original antigenic sin is not real (Mowrey, 2023a).

Radagast Radagast argued that vaccination programmes invoked an immune response in the whole population that worked well against the original variant, but have inevitably put our population at a steadily growing disadvantage against future variants, by homogenising our immune response, both at an individual and a population level. The implication is that through repeat vaccination we have interfered with the development of herd immunity (Radagast, 2022m). He later argued that we have a very nasty strong original antigenic sin mechanism: we have fixated the population's immune response on an extinct version of the virus and now we're left with no clear way to make it 'unstuck' (Radagast, 2022i). He found confirmation that original antigenic sin causes the growing waves (Radagast, 2022c). The people who got boosted had a higher risk of an Omicron reinfection after their first Omicron infection than the

people who only got two vaccinations. In other words, this is evidence that vaccinated people are struggling to learn a new immune response from an Omicron infection. Finally, he argued that the XBB.1* variant has learnt how to abuse our immune system's original antigenic sin mechanism to a maximal extent (Radagast, 2023a).

4.3.6 Marek's Disease

Because COVID-19 vaccines are leaky (they keep the hosts alive, but do not prevent transmission), vaccination programmes could cause more virulent strains of the virus to evolve (as evidenced by the vaccine used for Marek's disease in chickens) (el gato malo, 2021d; Read et al., 2015). It's not obvious to what degree Marek's effect applies. At the same time, eugyppius (2021d) stated in August 2021 that it seemed increasingly plausible that mass vaccination against SARS-2 and the rise of the Delta variant were related. Also in August 2021, el gato malo (2021h) argued that the leaky vaccine function has an effect on viral evolution. The short-term immune activation prevents the vaccinated from getting the mild COVID-19 that would finally give them sterilising immunity. The vaccinated become a carrier but remain unaware of it. It keeps them active as a superspreader and viral amplification vector for longer. This is a massive accelerator of disease spread and possibly/probably of overall fatality rates. The younger (who had nothing to gain from the vaccine) are more likely to experience the auto-immune cascades for which mRNA vaccines have been notorious in animals.

4.3.7 Superspreader Hypothesis

Because those who catch COVID-19 who have been vaccinated exhibit lesser symptoms, but have a similar viral load (the concentration of viral genetic material, as measured by a PCR test) to those of the unvaccinated, they may be more likely to inadvertently asymptomatically spread COVID-19 to others (el gato malo, 2021m). Edwards et al. (2021) observed that 18% of human subjects accounted for 80% of the exhaled bioaerosol of the group, reflecting a superspreader distribution of bioaerosol analogous to a classical 20:80 superspreader of infection distribution. Subbaraman (2021) reported in August 2021 (before Omicron existed) that Delta was more likely than other variants to spread through vaccinated people.

4.3.7.1 Singapore

In Singapore, Chia et al. (2022) analysed SARS-CoV-2 Delta variant vaccine breakthrough infections and found that PCR cycle threshold values were similar between vaccinated and unvaccinated groups at diagnosis, but viral loads decreased faster in vaccinated individuals.

4.3.7.2 United Kingdom

In the UK, Griffin (2021) reported that adults who have been fully vaccinated against SARS-CoV-2 can carry the same viral load of the Delta variant as those who are unvaccinated. Singanayagam et al. (2021) compared viral load trajectories from fully vaccinated individuals with Delta infection with unvaccinated individuals with pre-Alpha, Alpha and Delta infections. Peak viral load did not differ by vaccination status or variant type. Although fully vaccinated individuals with the Delta variant infection had a faster mean rate of viral load decline than did unvaccinated individuals with pre-Alpha, Alpha or Delta variant infections.

4.3.7.3 United States

In the US, interestingly, Yan et al. (2018) found that for those with influenza A, having had an influenza vaccination in the current or prior year was positively associated with generating fine-aerosol viral RNA. This would make the person more infective, and render masks even less

effective. In summer 2021, Acharya et al. (2022) found no significant difference in viral loads as measured by cycle threshold values between vaccinated and unvaccinated persons infected with SARS-CoV-2 Delta, overall or stratified by symptoms. Joel Smalley examined data from US States in summer/autumn 2021 and concluded that mass administration of the leaky COVID-19 vaccine caused unseasonal outbreaks of the virus that causes COVID-19 (Smalley, 2022o). Riemersma et al. (2022) found that RT-PCR cycle threshold (Ct) values were similar for vaccinated and unvaccinated individuals infected with SARS-CoV-2 Delta variants. The authors concluded that vaccinated individuals infected with Delta variants are capable of shedding infectious SARS-CoV-2 and could play a role in spreading COVID-19. Boucau et al. (2022) analysed the duration of shedding of culturable virus in SARS-CoV-2 Omicron (BA.1) infection. They did not find large differences in the median duration of viral shedding among participants who were unvaccinated, those who were vaccinated but not boosted and those who were vaccinated and boosted.

4.3.7.4 Vietnam

Chau et al. (2021) studied the spread of COVID-19 in an infectious diseases hospital in Vietnam. They found that breakthrough Delta variant infections following Oxford-AstraZeneca vaccination may cause asymptomatic or mild disease, but were associated with high viral loads, prolonged PCR positivity and low levels of vaccine-induced neutralising antibodies. Epidemiological and sequence data suggested that ongoing transmission had occurred between fully vaccinated individuals.

4.3.8 Spike Protein

4.3.8.1 mRNA Vaccines

Vaccines generally work by introducing a piece of a virus into your body so you can develop long-lasting immunity to the pathogen (Nebraska Medicine, 2022). Whilst the piece introduced by the vaccine rapidly fades away, your body's immune system remembers what it saw. When it encounters the virus in the real world it mounts a strong immune response preventing or decreasing the severity of infection. A *spike protein* or *S protein* is a protein that forms a large structure known as a spike projecting from the surface of an enveloped virus. The spike protein is located on the outside of a coronavirus and is the means by which SARS-CoV-2 enters human cells. Its location on the outside of the virus makes it easy for the immune system to recognise. Messenger RNA (mRNA) vaccines (like Moderna and Pfizer-BioNTech) work by introducing mRNA (messenger RNA) into your muscle cells. Your cells then have instructions for how to make the S protein (Mayo Clinic, 2024). Your muscle cells begin making the S protein pieces and displaying them on cell surfaces. This causes your body to create antibodies. If you later become infected with the COVID-19 virus, these antibodies will fight the virus. Meanwhile, the mRNA from the vaccine is fragile and your cells break it up within a few days. Whilst your immune system identifies the spike protein as foreign, and attacks and destroys it within a few weeks. The spike protein and mRNA disappear quickly, whereas the immune system's response, including the production of antibodies and the activation of T cells, continues to provide protection.

4.3.8.2 Spike Protein Damage

Joomi (2021a) clearly explains that the spike protein by itself (without the rest of the virus present) can cause harm to the body. The spike protein of SARS-CoV-2 is cytotoxic (toxic to cells). The problems with vaccine-encoded spike are 1) it can persist for much longer than we want, sometimes months, within non-classical monocytes, 2) it can end up in various parts of the body, including the brain, because these monocytes can cross the blood–brain barrier, 3) it can cause prolonged symptoms and/or damage for months after vaccination and 4) it appears that

bits of spike were found in monocytes even in some vaccine recipients that had no symptoms. Loose spike protein, either in the bloodstream or within monocytes or through some other mechanism, seems to be the best working explanation we have now that would explain these wide-ranging effects. It is also possible that vaccine-encoded spike protein can cause lasting harm even in people who don't have any obvious adverse events from the vaccine. Some people will express just a small amount of spike. That spike could be causing subclinical damage, e.g. small amounts of damage to the heart, the brain, the blood vessels, etc., that are barely perceptible, at least in the short term. In an article published in *Circulation Research*, Lei et al. (2021) showed that spike glycoprotein (S protein) alone can damage vascular endothelial cells (ECs) by downregulating angiotensin-converting enzyme 2 (ACE2) and consequently inhibiting mitochondrial function. Whilst an article in *Clinical Science* found that the SARS-CoV-2 spike protein may disrupt human cardiac pericytes function, potentially contributing to microvascular disease (Avolio et al., 2021). On his blog, Kory (2024d) argued that the mRNA induced spike protein is one of the most toxic and lethal pathogens in history. Trying to determine whether someone who is vaccinated will ultimately be exposed to less spike protein, compared to an unvaccinated person, is not a simple thing to do (Joomi, 2021b).

4.3.8.3 Blood–Brain Barrier

The *blood–brain barrier* (*BBB*) is a highly selective semipermeable border of endothelial cells that regulates the transfer of solutes and chemicals between the circulatory system and the central nervous system, thus protecting the brain from harmful or unwanted substances in the blood. Buzhdygan et al. (2020) demonstrated that the S1 subunit of the SARS-CoV-2 spike protein promotes loss of barrier integrity in an in vitro model of the human blood–brain barrier. Rhea et al. (2020) showed that when intravenously injected in mice, the S1 subunit of the SARS-CoV-2 spike protein can cross the murine blood–brain barrier and enter the parenchymal tissue of the brain.

4.3.8.4 Spike Protein Persists

The spike protein is supposed to last just a few weeks because the immune system should identify, attack and destroy it. But how long does the spike protein actually last in the body? Palmer and Bhakdi (2021) discussed the fact that after receiving the Pfizer mRNA vaccine, spike protein is found on exosomes, that is, cell-derived vesicles, for at least four months after the second injection. They claim that this surprisingly long persistence raises the prospect of sustained inflammation within and damage to organs that express the spike protein. In Denmark, Castruita et al. (2023) found full-length or traces of SARS-CoV-2 spike mRNA vaccine sequences up to 28 days post-vaccination in blood from chronic hepatitis C virus (HCV) patients vaccinated with mRNA vaccines from both Pfizer-BioNTech and Moderna. A study found that the mRNA COVID-19 vaccines from Pfizer and Moderna contain billions of particles of self-replicating DNA that may turn human cells into long-term factories for the COVID-19 spike protein (W. Jones, 2023i). This may help explain the persistence of vaccine spike protein and mRNA in the body for months following vaccination. In Italy, Brogna et al. (2023) found that recombinant spike protein was detected in the blood six months after vaccination in half of individuals vaccinated against SARS-CoV-2. Half of vaccinated people may never stop producing spike protein. Chudov (2023g) pointed out that this may explain IgG4 immune tolerance. Also in Italy, Dhuli et al. (2023) analysed the serum of 81 patients with long COVID syndrome. They identified the presence of the viral spike protein in one patient after infection clearance and a negative COVID-19 test, and the vaccine spike protein in two patients two months after vaccination. Both natural and vaccine spike protein may still be present in long COVID patients. The evidence suggests that spike protein may persist in the body much longer than previously predicted and does not remain at the injection site (Redshaw, 2024c). The finding also proves that mRNA COVID-

19 vaccines permanently integrate into the DNA of some COVID-vaccinated people (Chudov, 2023d).

4.3.8.5 Spike and Inflammation

The spike protein has a pro-inflammatory effect on brain endothelial cells (Buzhdygan et al., 2020). Avolio et al. (2021) found that the SARS-CoV-2 spike protein on its own induced the production of pro-inflammatory cytokines in cardiac pericytes. Trougakos et al. (2022) postulated that adverse effects may be related to acute inflammation caused by both the virus and the vaccine, as well as in the common denominator between the virus and the vaccine, namely, the SARS-CoV-2 S protein. The vaccine-encoded antigen (S protein) is stabilised in its prefusion form in the BNT162b2 and mRNA-1273 vaccines; it is therefore plausible that, if entering the circulation and distributing systemically throughout the human body, it can contribute to these adverse effects in susceptible individuals. According to preliminary research presented at the American Heart Association's Basic Cardiovascular Sciences Scientific Sessions 2022, the spike protein from the SARS-CoV-2 virus can lead to heart muscle injury through the inflammatory process (American Heart Association, 2022). In an unpublished manuscript, Seneff, Kyriakopoulos, Nigh, and Mccullough (2022) suggest that mRNA vaccine-induced spike protein production is synonymous with the production of a prion-like protein. The authors claim that the spike protein contributes, via its prion-like properties, to neuroinflammation and neurodegenerative diseases, clotting disorders within the vasculature, suppressed prion protein regulation in the context of widely prevalent insulin resistance and other health complications. In an excellent preprint, Polykretis et al. (2023) explained that solid immuno-histopathological evidence demonstrates that the COVID-19 genetic vaccines can display an off-target distribution in tissues that are terminally differentiated, triggering autoimmune reactions. These include the heart and brain, which may incur *in situ* production of spike protein eliciting a strong autoimmunological inflammatory response. Langridge (2023) explained that the spike protein and encapsulating lipids leads to inflammation of tissues. Autopsies show damaged blood vessels, both the cells that form the inner lining (the epithelium) and the fibrous 'tube' of the vessels, as well as the disintegrated heart muscle fibres suspected to lie behind sudden adult (or arrhythmic) death syndrome (SADS).

4.3.8.6 Spike and Ageing

Chesnut (2023) believes that the spike protein induces a chronic stress response, which leads to accelerated ageing. In a worrying but inciteful piece, Lyons-Weiler (2024j) explained that the vaccinated, with repeated exposures to SARS-CoV-2 spike proteins, should expect a reduced ability to fight off SARS-CoV-2 and other pathogens, more chronic illnesses, potential impacts on other organ systems and an acceleration of immunosenescence, the gradual deterioration of the immune system associated with ageing.

4.3.9 Junk Protein

In the UK, Mulroney et al. (2023) found that a quarter of mRNA vaccinated subjects produced random junk proteins due to vaccine 'read errors' with unknown and unpredictable effects, and even get immunity to them (Chudov, 2023e). No adverse effects were created by the error, but such vaccines were not perfect and sometimes led to nonsense proteins being made instead of the desired COVID-19 'spike', which mimics infection and leads to antibody production (Pinkstone, 2023c). Whilst Vogel (2023) reported that mRNA vaccines may make unintended proteins, but there's no evidence of harm.

4.3.10 Nanoparticles

With mRNA vaccines, the mRNA is delivered by a co-formulation of the RNA encapsulated in lipid nanoparticles that protect the RNA strands and help their absorption into the cells. A December 2020 article in *Science* reported that severe allergy-like reactions in at least eight people who received the COVID-19 vaccine produced by Pfizer and BioNTech over the previous two weeks may have been due to nanoparticles (de Vrieze, 2020). In a paper published in *Food and Chemical Toxicology*, Seneff, Nigh, Kyriakopoulos, and McCullough (2022) presented evidence that vaccination induces a profound impairment in type I interferon signalling, which has diverse adverse consequences to human health. Immune cells that have taken up the vaccine nanoparticles release into circulation large numbers of exosomes containing spike protein along with critical microRNAs that induce a signalling response in recipient cells at distant sites. The authors also identified potential profound disturbances in regulatory control of protein synthesis and cancer surveillance. These disturbances potentially have a causal link to neurodegenerative disease, myocarditis, immune thrombocytopenia, Bell's palsy, liver disease, impaired adaptive immunity, impaired DNA damage response and tumorigenesis. Turni and Lefringhausen (2022) stated that the COVID-19 vaccines cause more side effects than any other vaccine, a fact that is attributed to its interactions with the immune system. Not only does the spike protein produce unwanted side effects, but mRNA and nanoparticles do too. M. T. J. Halma, Rose, and Lawrie (2023) reviewed the potential harms of mRNA vaccines, and considered harms due to lipid nanoparticle (LNP), harms due to exogenous RNA and harms due to in-vitro-transcribed (IVT) RNA. On his blog, Girardot (2024b) argued that some of the billions of nanoparticles injected in a dose of COVID-19 vaccine can be 1) accidentally injected directly into a blood vessel or into the lymphatic system, or 2) progressively transit through the muscle tissue and leak into the bloodstream or the lymphatic system. In blood vessels this will inevitably cause heavy inflammation, bleeding and clotting in the areas it is the densest, downstream necrosis, arterial calcification and thrombosis. Numerous strokes and thrombosis in adverse effects databases have demonstrated that to be true. In organs like the heart, lungs, liver and ovaries, it will likely create a high degree of inflammation, cell death (apoptosis) and calcification (pericardium, for example, causing heart attack). The high number of myo/pericarditis highlights this as a real possibility. In lymph nodes, it could either interfere with the lymph node function itself (B cells) as nanoparticles penetrate lymphatic nodules, or interfere with the immune system by transfecting immune cells contained in the lymph node, with the risks of partial immune deficiency. The reappearance of dormant viruses such as shingles seems to point in that direction. Kent et al. (2024) showed that the lipid nanoparticles used in the Moderna COVID-19 vaccines circulate in the blood for up to one month post-vaccination (Rose, 2024a). The amounts of mRNA lipid nanoparticles that remain the blood (and free of phagocytosis) may influence the polyethylene glycol (PEG) antibody immunogenicity in humans. M. Halma, Rose, and McCullough (2024) argued that exposure to lipid nanoparticles, modified mRNA, adenoviral DNA, and/or spike protein from a COVID-19 vaccination or through secondary exposure via blood transfusion, is a potential source of human physiological harm.

4.3.11 Antibody-Dependent Enhancement (ADE)

Antibody-dependent enhancement (*ADE*) is a phenomenon in which binding of a virus to suboptimal antibodies enhances its entry into host cells, followed by its replication. Sánchez-Zuno et al. (2021) wrote a review paper on *antibody-dependent enhancement* (ADE) in COVID-19. The immune response by the host generates specific neutralising antibodies against the virus. However, in some cases, the presence of specific antibodies can be beneficial for the virus. This activity, ADE, enhances virus entry and in some cases virus replication into host cells through interaction with Fc and/or complement receptors. In France, Yahi, Chahinian, and Fantini (2021) concluded that ADE may occur in people receiving vaccines based on the original Wuhan strain spike se-

quence (either mRNA or viral vectors) and then exposed to a Delta variant. In Japan, Y. Liu et al. (2021) concluded that there is a possibility that the production of infectivity-enhancing antibodies might be boosted by SARS-CoV-2 infection or vaccination. Also in Japan, Shimizu et al. (2022) examined the effect of sera after vaccination against infection with the SARS-CoV-2 Omicron strain. They observed some antibody-dependent enhancement (ADE) of Omicron infection in some sera. These results suggest that the rapid spread of Omicron around the world may in part have been due to the lack of cross-neutralisation against Omicron and some ADE activity of sera after vaccination. Oh his blog in July 2024, Lyons-Weiler (2024h) reported that the evidence for ADE in SARS-CoV-2 infection and vaccination was so clear that researchers were looking for ways to mitigate SARS-CoV-2 mRNA-injected ADE.

4.3.12 Vaccine-Associated Enhanced Disease (VAED)

Vaccine-associated enhanced disease (*VAED*) is a rarely observed phenomenon whereby vaccination promotes immune responses that exacerbate the disease caused by subsequent infection with the associated pathogen.

4.3.12.1 United Kingdom

For England, Smalley (2023f) showed that we see elevated mortality rates for the vaccinated since the start of 2022, when COVID-19 represented less than 10% of deaths. Analysing data for 18–39-year-olds, he also identified immunosuppression in the first few weeks after the first dose causing excess death in the vaccinated, followed by six months of 'protection', followed by antibody-dependent enhancement (ADE) and/or vaccine-associated enhanced disease (VAED), against a perpetual background of elevated non-COVID-19 mortality due to vaccine adverse events.

4.3.12.2 United States

In the US, Spieker (2022b) found evidence of vaccine-enhanced disease (VAED). Spike protein-associated disease (inflammatory and coagulative) features were reported at a significantly higher proportion in double-dosed individuals compared to single-dosed individuals, and at a significantly higher proportion in SARS-CoV-2-exposed individuals compared to individuals not reportedly exposed to the SARS-CoV-2. Also in the US, Kory and Pfeiffer (2024a) found a 300% increase in maternal deaths during the Delta wave. The authors suggest that the campaign to vaccinate pregnant women in the heat of the second COVID-19 wave may have combined to make infections worse in the vaccinated. The phenomenon is VAED, and has been documented in measles, respiratory syncytial virus and dengue fever.

4.3.13 Immunosuppression

Vaccinations can *increase* one's susceptibility to COVID-19 during the first two weeks following vaccination (see Section 4.2.3). Furthermore, more doses can make one *increasingly* susceptible to infection (see Section 4.2.11). This may be because the vaccine causes *immunosuppression*—a reduction of the activation or efficacy of the immune system. In a Substack article, Brian Mowrey reviewed four hypotheses of why vaccination programmes have not effectively mitigated COVID-19: the escape mutant, Marek's effect and vaccinated asymptomatic spread hypotheses covered below, plus his own novel hypothesis, which he termed 'forever spike' (Mowrey, 2021). The idea is that the COVID-19 vaccines are suppressing innate immunity, which leads to negative vaccine infection efficacy. The effect is that the vaccinated see a reduction in severe cases of COVID-19, an increase in mild cases and a decrease in the number who are innately suppressed. Cases increase and herd immunity becomes unobtainable. This scenario would have a negative impact mostly on the younger generations, who have more innate immune competence to lose.

Between December 2020, and September 2021, those who caught COVID-19 and were then vaccinated had a lower risk of breakthrough infection than those who had only been vaccinated (Abu-Raddad, Chemaitelly, Ayoub, et al., 2021). Vaccinated individuals with prior infection 6 months or more before dose 1 had statistically significantly lower risk for breakthrough infection than those infected less than 6 months before dose 1. Berenson (2021a) pointed out this may imply that mRNA COVID-19 vaccines interfere with the development of natural immunity following SARS-CoV-2 infection. We have evidence that mRNA vaccines suppress the immune system for two weeks after vaccination (Moustsen-Helms et al., 2021). But it is also possible that mRNA vaccines elicit profound, broad-based immune suppression over the longer term (el gato malo, 2022f). In an unpublished manuscript, I. Roy (2022) suggested that multiple doses of a COVID-19 vaccine can exhaust the T cells and subsequently weaken the immune response. She also claims that COVID-19 vaccines actively suppress type I interferon (IFN) signalling, which can result in impaired innate immunity. On his blog, el gato malo (2022m) interpreted an article that analysed autopsies of those who were vaccinated but died of COVID-19 (Hirschbühl et al., 2022). There were worrying immune suppression possibilities. Frequent COVID-19 booster shots may decrease immunity. But how? In an article published in *Virology Journal*, Yamamoto (2022) stated that the decrease in immunity can be caused by several factors such as N1-methylpseudouridine, the spike protein, lipid nanoparticles, antibody-dependent enhancement and the original antigenic stimulus. When people have been vaccinated, but have not previously been infected, their immune response is biased towards earlier variants rather than Omicron, which can lead to Omicron infection and reinfections (Berenson, 2022a; Reynolds et al., 2022). Qin, Bouteau, Herbst, and Igyártó (2022) found that, using mice, the mRNA-LNP vaccine platform induces long-term immunological changes that can affect both adaptive immune responses and heterologous protection against infections, some of which can be inherited by the offspring. Syed (2022e) argued that the RNA injected into the original mice was incorporated into the genome in the oocytes of the maternal line of mice. We don't know if the destructive effects of the vaccination were passed on to offspring (Guetzkow, 2022a). For England, analysing 2021–2022 data for 18–39-year-olds, Smalley (2023f) identified immunosuppression in the first few weeks after the first dose causing excess deaths in the vaccinated. There is evidence that the vaccination rewires the immune system. Joung et al. (2023) observed that individuals with post-acute sequelae of COVID (PASC) mounted a higher IgG-S antibody response to vaccination than COVID-recovered individuals; this difference was sustained over time. Verduyn (2023a) stated that, given the fact that mRNA works at a cellular level, invades multiple organs, can integrate into the genome of human cells, affects the immune system, and potentially leads to autoinflammatory and autoimmune conditions, it is conceivable that we have only seen the tip of the iceberg of the harms that will be caused by these experimental products. Lataster (2024n) published a letter in the *Australian Journal of General Practice* (*AJGP*) noting that many data sets have indicated that not only does COVID-19 vaccine effectiveness appear to decline very rapidly (varyingly for infections, hospitalisations and even deaths), it can reach zero (no effectiveness), and beyond (negative effectiveness). It is possible that the vaccines could be causing immunosuppression. Note that *AJGP* is *the* medical journal for general practitioners (family doctors) in Australia (Lataster, 2024h). Mead, Seneff, Wolfinger, et al. (2024a) reported that well-designed studies have shown that repeated mRNA vaccines cause immune dysfunction, thereby potentially contributing to heightened susceptibility to SARS-CoV-2 infections and increased risks of COVID-19. According to Kirsch (2022b), if the vaccines compromise the innate immune response, and this causes an increase in the incidence of cancers, it has been suggested that this could be primarily due to accelerating existing (known or unknown) cancers, rather than creating new cases of cancer. Similarly, N. Hodgkinson (2024) stated that there is evidence to suggest that mRNA vaccinations might impair the immune system's natural ability to suppress the growth of cancerous cells.

4.3.14 Immune Tolerance

Immune tolerance refers to the immune system's state of unresponsiveness to substances or tissues that would otherwise trigger an immune response. It arises from prior exposure to a specific antigen and contrasts the immune system's conventional role in eliminating foreign antigens. In an excellent article, Radagast (2022n) explains how the vaccines suppress the innate immune response. Your immune system learns to become more tolerant of the virus. After the third dose of the vaccine wanes, which happens quite rapidly, the combination of a suppressed innate immune response and an absence of neutralising antibodies leads to a situation where the virus is now capable of overwhelming the body again. Israel had the highest case rate per capita on the planet because they were the first to give everyone the third shot. Reinfections become more common and more severe. Chudov (2022d) analysed booster rates and COVID-19 death rates in European countries. During January–March 2022 more boosters were associated with a reduction in COVID-19 deaths. During March–May 2022 there was no significant effect either way. Whilst during June–July 2022 more boosters were associated with an *increase* in COVID-19 deaths. The data can be explained by tolerance. Tolerance also leads to a milder illness, which means the infected are more likely to spread the disease to others. Also, boosted people remain contagious for much longer than unvaccinated people. F.-X. Gao et al. (2022) gave multiple receptor binding domain (RBD) boosters to mice. Extended immunisations impaired the serum neutralisation activity, suppressed the formation of the germinal centre and inhibited the activation of CD8+T cells. The extended course of boosters overturned the protective immune memories by promoting adaptive immune tolerance. The authors concluded that their findings demonstrate potential risks with the continuous use of SARS-CoV-2 vaccine boosters.

4.3.14.1 IgG4

Immunoglobulin G (*IgG*) is a type of antibody. Representing approximately 75% of serum antibodies in humans, IgG is the most common type of antibody found in blood circulation. IgG molecules are created and released by plasma B cells. Each IgG antibody has two paratopes. There are four IgG subclasses in humans (IgG1, IgG2, IgG3 and IgG4), named in order of their abundance in serum: IgG1 66%, IgG2 23%, IgG3 7% and IgG4 4%.

Radagast (2022o) explained that after repeat exposure to things it needs to tolerate, like bee venom, pollen or peanut proteins, your immune response shifts to IgG4. However, mRNA vaccinations also cause the immune response to shift to IgG4. The problem is that this IgG4 antibody response is homogeneous, it is the same epitopes that everyone is learning to tolerate. Worse, an IgG4 response to a respiratory infection can lead to us tolerating many different respiratory viruses. Horndler et al. (2022) measured the production of antibodies of the IgG1 isotype to the spike protein of SARS-CoV-2 in response to the four different vaccines most frequently used in Spain. They found a relative reduction in the reactivity of the sera with the B.1.1.7 versus the Wuhan-1 variant after the second boosting immunisation. The authors are clear about the problem with boosters: 'Our results showing a loss of relative reactivity with the current VOCs [variants of concern] suggest that third doses of the present vaccines, based on the Wuhan sequence, to the general population might not be the best approach to increase the immunity to the emerging VOCs. In our opinion, a third dose should be limited to the population that has been demonstrated to have been poorly responsive to the first two prime and boost doses and not to the general population.' In July 2022 Mowrey (2022c) was one of the first to highlight evidence that multiple doses of mRNA vaccines can lead to B Cells self-switching to IgG4 class antibodies, associated with tolerance and an anti-inflammatory response. J. Paul (2022b) argued that IgG4 can lead to inflammation, accelerate disease, and lead to long COVID and mortality. With mRNA vaccinations, Irrgang et al. (2023) found that IgG4 antibodies among all spike-specific IgG antibodies rose on average from 0.04% shortly after the second vaccination to 19.27% late after the third vaccination. Chudov (2022c) reviewed

the research on booster-caused IgG4 immune tolerance, and concluded that immune tolerance developing months after booster vaccinations perfectly explains the delayed effect seen in excess mortality, and why vaccination rates explain more and more excess deaths as time passes. On his blog, el gato malo (2022e) explored the idea that mRNA COVID-19 vaccines increase IgG4 antibodies, which create tolerance by preventing the body from attacking whatever it has bound to, which could lead to persistent COVID-19. P. Alexander (2022b) discussed the issue of IgG4 and a vaccinated person's immune system learning to 'tolerate' spike protein, especially with repeated boosting. On his blog, eugyppius (2022h) reported the research that suggests that repeated mRNA vaccination induces partial immune tolerance for the spike protein (Irrgang et al., 2023). Adenovirus vector vaccines don't cause this tolerance. The spike protein on its own doesn't either. Because Sweden seemed unaffected, he suggested that it may be that too much IgG4 is only bad in combination with other negative vaccine effects, like immune imprinting. Rose (2022b) explained how repeated mRNA COVID-19 vaccines can induce a shift away from viral clearing to a tolerance-inducing antibody class, leading to IgG4-related diseases. Syed (2022c) explained that repeated doses of mRNA COVID-19 vaccines lead to a switch to IgG4 and the immune system collapsing. Siglaugsson (2022a) explained that repeated vaccination with mRNA vaccines increases the number of IgG4 subtype antibodies, which means that the immune system no longer sees the COVID-19 spike protein as a threat. In other words, the COVID-19 vaccination gradually weakens our resistance to COVID-19.

In Germany, Buhre et al. (2023) found that repeated immunisation of naïve individuals with the mRNA vaccines increased the proportion of the IgG4 subclass over time. Mowrey (2023l) argued that IgG4 may still limit lung injury via neutralisation, but it will replicate the end result of persistent infections. Mowrey (2023k) interpreted Selva et al. (2023) and noted that versus what is found after earlier doses, there is a sudden surge of IgG4 appearing after the booster. In Poland, Rastawicki, Gierczyński, and Zasada (2023) found that the level of IgG4 and IgG avidity significantly increased seven months after the first two doses of the vaccine and then again after the third dose. IgG4 antibodies are passed to newborns in COVID-19-vaccinated mothers, with unknown consequences (e.g. dampening of cellular immunity during infections with SARS-CoV-2, theoretically resulting in infection enhancement) (E. H. Adhikari et al., 2023; Mowrey, 2023d). Fortunately, they rapidly fade after a few months. Emerging evidence suggests that the reported increase in IgG4 levels detected after repeated vaccination with the mRNA vaccines may not be a protective mechanism; rather, it constitutes an immune tolerance mechanism to the spike protein that could promote unopposed SARS-CoV2 infection and replication by suppressing natural antiviral responses (Uversky et al., 2023). Increased IgG4 synthesis due to repeated mRNA vaccination with high antigen concentrations may also cause autoimmune diseases, and promote cancer growth and autoimmune myocarditis in susceptible individuals. For further discussion, see Stieber (2023a), Mowrey (2023h) and McArdle (2023b). In Australia, Hartley et al. (2023) found that a third mRNA dose generated similarly robust serological and Bmem responses in homologous (mRNA/mRNA) and heterologous (adenoviral vector/mRNA) vaccination groups. They concluded that the expansion of $IgG4^+$ Bmem after mRNA priming might result from the unique vaccine formulation or dosing schedule affecting the Bmem response duration and antibody maturation. Mowrey (2023g) reviewed the preprint and concluded that post-mRNA IgG4 does not raise overall IgG4. He also noted that, alarmingly, 5 out of 19 donors in the Pfizer/mRNA-only group, by their third dose, experienced nearly 10-fold more IgG4 conversion than their peers. Chudov (2023j) reported that repeated injections of mRNA COVID-19 vaccines cause a 'class switch' to IgG4 antibodies. Whilst IgG4 antibodies may promote 'hyperprogressive' cancers. There is no evidence that IgG4 antibodies cause cancer, the evidence only points to them enhancing and speeding up existing cancers. Meanwhile, there has been a 7% increase in cancer deaths reported in Australia, a highly vaccinated country.

Kalkeri et al. (2024) analysed the altered IgG4 antibody response to repeated mRNA versus protein COVID-19 vaccines. They found that only the mRNA groups had high levels of IgG4

antibodies. Thus, the authors showed that mRNA technology is the culprit behind a faulty immune response (Chudov, 2024h). Igor Chudov explained that IgG4 refers to a special rare subclass of antibodies instructing our immune system to ignore a pathogen rather than fight it (Chudov, 2024h). Repeat COVID-19 vaccinations cause immune tolerance in boosted people, which makes them less able to fend off repeat infections. Mowrey (2024a) reviewed S. Jain et al. (2024), which showed that post-XBB.1.5 mRNA booster vaccination IgG4 represents almost a third of antibodies binding to the original-recipe Wuhan spike. Valk et al. (2024) observed a substantial increase in the proportion of RBD-specific IgG4 antibodies (median 21%) in healthy/untreated controls after the third vaccination. Gelderloos et al. (2024) showed that considerable class switching to IgG4 occurs in older adults (as well as younger individuals) upon repeated mRNA vaccination and that IgG4 levels following the fifth vaccine dose even exceed those induced after the third dose. Furthermore, their data show that the increased ratio of IgG4/IgG1 following repeated vaccination associates with a reduced capacity of the virus-specific antibodies to mediate NK cell activation and complement deposition relative to total virus-specific IgG concentrations. Increased IgG4 levels associate with a relative reduction in Fc-mediated effector functionality. In conclusion, older adults produce antibodies with reduced functional capacity upon repeated COVID-19 mRNA vaccination.

4.3.15 VAIDS

Noé et al. (2023) found that BNT162b2 vaccination in children alters cytokine responses to heterologous stimulants for the worse, particularly one month after vaccination. Many specific immune reactions declined by a factor of over ten times. Chudov (2023l) reviewed the paper, and, disturbingly, concluded that this is scientific confirmation that vaccination against COVID-19 causes a marked decrease in immunity to heterologous pathogens such as viruses, bacteria and fungi (a phenomenon colloquially known as 'VAIDS').

4.3.16 Adverse Effects

Vaccinations can cause adverse reactions (Gee et al., 2021). But how frequent and how serious are adverse effects to COVID-19 vaccines?

4.3.16.1 General

In March 2021 Berenson (2021c) noted that countries like Israel and Britain had seen sharp short-term spikes in COVID-19 cases and deaths following the beginning of mass vaccination campaigns, and many people had reported severe side effects after being vaccinated. In a systematic review and meta-analysis, Q. Liu et al. (2021) found that the overall pooled incidence rate was 1.5% for adverse events, 0.4 per 10,000 for severe adverse events and 0.1 per 10,000 for death after vaccination. Heneghan and Jefferson (2024a) argued that it is plausible that the number of suspected adverse reactions could be 10-fold higher than the number reported, and 'as many as 98 out of every 100 ADRs go unreported'. Whilst Lataster (2024m) detailed seven articles in top journals (Benn, Schaltz-Buchholzer, Nielsen, Netea, & Aaby, 2023; Doshi & Fung, 2023; Fraiman et al., 2022; Fung et al., 2023; Lataster, 2023e, 2024g; Thacker, 2021a) that showed vaccine harms.

In Denmark, rates of suspected adverse effects per 1000 BNT162b2 mRNA COVID-19 vaccine doses varied considerably between vaccine batches (Schmeling, Manniche, & Hansen, 2023). A few small batches, distributed early in the campaign, were associated with an unacceptably high number of adverse events (almost one in 10 recipients reported an adverse effect), whereas the later batches showed orders of magnitude fewer adverse effects. Similarly, in the Czech Republic, batches of Pfizer's COVID-19 vaccines that were released in spring 2021 showed a much higher number of adverse events than batches released in 2022 (Fürst, 2024). In a research letter,

Jablonowski and Hooker (2024) showed that in the US there were clear variations in Pfizer-BioNTech's vaccine lots. The highest suspected adverse event (SAE) rates were identified in vaccine batches allocated in the first two months of the vaccination programme, with the highest proportions being sent to government agencies, hospitals, universities and health departments.

Seneff and Nigh (2021) reviewed some of the possible unintended consequences of the mRNA vaccines against COVID-19, which include acute and long-term induced pathologies, such as blood disorders, neurodegenerative diseases and autoimmune diseases. Zana Carver hypothesed that the following list are those who would have an increased risk of adverse reactions following a COVID-19 vaccination (Carver, 2022):

- Those who are recently COVID-19 recovered.
- Those with an inflammatory disease (e.g. diabetes, cardiovascular disease or obesity).
- Those with autoimmune conditions.
- Those with senescent or weakened immune systems.
- Those with mitochondrial and thyroid disease (endothelial repair and regeneration is already impaired).
- Those on certain medications may also have an increased risk, such as those on beta blockers or ACE 2 inhibitors, but there are many confounders, and this needs further research.

In the US, L. L. Li et al. (2022) found that the risk of hospitalisation after a second dose vaccination was elevated for previously-infected patients, but there was no increase among patients without previous infection. The vaccine side effects leading to hospitalisation included fever, constitutional symptoms, weakness and falls. J. Wu (2022) predicted that vaccination with mRNA vaccines may increase the risk of cancer, multiple organ failure and an earlier death, plus increase the speed of genome alteration by one or more mechanisms, alter the normal selection process for viral evolution resulting in more virulent viruses, and aggravate chronic diseases or cause past diseases to relapse. The two root problems are the practical inability to control the expression of mRNA in different parts of the body and severe adverse reactions from repeated vaccination. Gøtzsche and Demasi (2022) conducted a systematic review of the serious harms of the COVID-19 vaccines. The adenovirus vector vaccines increased the risk of venous thrombosis and thrombocytopenia, whilst the mRNA-based vaccines increased the risk of myocarditis. They also found evidence of serious neurological harms, including Bell's palsy, Guillain–Barré syndrome, myasthenic disorder and stroke, which are likely due to an autoimmune reaction. Severe harms, i.e. those that prevent daily activities, were hugely underreported in the randomised trials. These harms were very common in studies of booster doses after a full vaccination and in a study of vaccination of previously infected people. The main categories of adverse events from mRNA COVID-19 vaccines are cardiovascular (atrial fibrillation and irregular heartbeat) and neurological (tinnitus and taste & smell disorders) (Durden, 2023). HART (2023f) identified three categories of vaccine injury: the risk of myocarditis, the risk of unusual brain clots and the risk of Guillain–Barré syndrome (where the immune system attacks the nervous system leading to life-threatening or disabling weakness or paralysis). Mead, Seneff, Wolfinger, et al. (2024a) reported that confidential Pfizer documents revealed 1.6 million adverse events by August 2022. A third were serious injuries to cardiovascular, neurological, thrombotic, immunological and reproductive systems, along with an alarming increase in cancers. Mead, Seneff, Rose, et al. (2024) argued that the COVID-19 mRNA vaccines introduce a unique set of biological challenges to the human body with the potential to induce an extensive range of adverse, crippling and life-threatening effects. They state that since early 2021 excess deaths, cardiac events (notably myocarditis and myocardial infarction), strokes and other serious adverse events have often been wrongly ascribed to COVID-19 infections rather than to the COVID-19 mRNA vaccines.

Asia A study on healthcare workers in Japan found that side effects after the third mRNA COVID-19 vaccine (booster) included general fatigue, headache, joint pain, chills and axillary pain (Mori et al., 2023). Females and young adults in particular were at an increased risk of suffering from side effects. Side effects following the third dose were often distinct from those following the second dose.

Australasia In Victoria, $6.8 million in claims were paid out for COVID-19 vaccination injuries, but this may just be the tip of the iceberg (Barnett, 2024k). In July 2024 COVID-19 vaccine injuries were discussed on a mainstream Australian commercial TV channel, 7NEWS (Barnett, 2024e). In Australia, 43.7% reported at least one adverse event, with 0.9% having to visit a GP or emergency department (AusVaxSafety, 2024).

Europe In Europe, Raethke et al. (2024) analysed the frequency and timing of adverse reactions to COVID-19 vaccines. The percentage of serious adverse drug reactions (ADRs) for first and second vaccinations was 0.24%, and for boosters 0.26%. Lataster (2024d) stated that these figures are not 'very rare', or even 'rare', but common enough to get pretty worried.

BKK ProVita, a German health insurance company, reported that there was highly significant under-reporting of suspected cases of COVID-19 vaccination side-effects (Schöfbeck, 2022). They estimated that around 4–5% of the vaccinated people in Germany were in medical treatment because of vaccination side effects. Also in Germany, Reusch et al. (2023) examined sick leave and intake of *pro re nata* medication after the first, second and third COVID-19 vaccinations in healthcare workers. Among 1704 healthcare workers enrolled, 595 (34.9%) were on sick leave following at least one COVID-19 vaccination, leading to a total number of 1550 sick days. Both the absolute sick days and the rate of healthcare workers on sick leave significantly increased with each subsequent vaccination. Following the first dose, 3.8% took sick leave, following the second dose 21.8% took sick leave and following the third dose 27.9% took sick leave.

Smalley (2022l) noted that, within Europe, Hungary experienced low excess mortality relative to the number of COVID-19 deaths. He hypothesised that it may be because Hungary is the only European country to have administered China's Sinopharm vaccine (inactivated whole virus) and Russia's Sputnik vaccine (non-replicating viral vector like Astra Zeneca) rather than Pfizer and Moderna's mRNA vaccines. Conversely, Lithuania, which had the highest excess mortality to COVID-19 death ratio and the second worst excess mortality overall, was the only country that administered virtually 100% mRNA vaccines.

Larsen et al. (2023) assessed the risks of adverse events following immunisation in adolescents aged 12–19 years following SARS-CoV-2 vaccination with a mRNA vaccine in Norway. Second-dose vaccination was associated with increased risks of anaphylactic reaction (adjusted IRR (aIRR): 10.05), lymphadenopathy (aIRR: 2.33), and myocarditis and pericarditis (aIRR: 5.27). When expanding the risk window to 42 days in a post-hoc analysis, there was an increased incidence of acute appendicitis following both first-dose vaccination (aIRR: 1.39) and second-dose vaccination (aIRR: 1.43).

In the UK, Dee (2024b) found that acute respiratory conditions (odds ratio (OR) = 0.79, $p = 0.001$), other cardiac conditions (OR = 1.26, $p = 0.038$), cancer diagnosis (OR = 0.79, $p = 0.003$) and COVID-19 diagnosis (OR = 4.43, $p < 0.001$) were identified as statistically significant discriminators for the three weeks immediately following vaccine rollout in January 2021. There was a significant increase in ambulance call-outs in England for cardiac and respiratory arrest from May 2021 (HART, 2022b), which correlates with the percentage of the population with a second dose of a COVID-19 vaccination (Bartram, 2021). In the UK, Raw, Kelly, Rees, Wroe, and Chadwick (2021) found that previous COVID-19 infection, but not long COVID, was associated with increased adverse events following BNT162b2/Pfizer vaccination. This lends credence to the argument that vaccinating those who have natural immunity may not be a good

idea. A Personal Independence Payment (PIP) is a welfare benefit in the United Kingdom that is intended to help working age adults with the extra costs of living with a health condition or a disability. Dee (2023l) noted that in England there was a remarkable rise in new claims for PIPs from July 2021 that correlated strongly with accumulated total doses administered. Specifically, an increase in the month-on-month changes in total administered doses is followed three months later by a rise in month-on-month changes in new cleared claims. In Britain, it was reported in August 2024 that nearly 14,000 people had applied for payments from the Government for alleged harm caused by COVID-19 vaccines (Knapton, 2024c). Payments had already been awarded for conditions including stroke, heart attack, dangerous blood clots, inflammation of the spinal cord, excessive swelling of the vaccinated limb and facial paralysis. Around 97% of claims awarded relate to the AstraZeneca vaccine. Then in October 2024, in the UK, Turner (2024a) reported that a COVID-19 vaccine compensation scheme could be set up after thousands claimed they have been left disabled as a result of the AstraZeneca vaccine.

North America In British Columbia, Canada, Bridle (2024a) noted that COVID-19 vaccines were 15.7 times more likely than flu vaccines to lead to adverse events following immunisation (AEFIs). COVID-19 vaccines caused 13.6-fold more hospitalisations and 24-fold more deaths than flu vaccines.

In the US, J. Murphy and Huber (2022) observed twenty high school and middle school athletes retrospectively. Half were vaccinated and half were not, according to their parents' prior choices. The performance of the vaccinated student athletes deteriorated (compared to 2020), whilst the unvaccinated student athletes continued to improve, according to assessments by their coaches. Amanuensis (2022c) analysed Al-Aly, Bowe, and Xie (2022), a US study on long COVID. The data strongly suggested a high level of negative health conditions after vaccination in those not infected with COVID-19, compared with historical norms. On his blog, el gato malo (2022n) noted that in the US, the uptake of COVID-19 vaccines correlated with an increase in disability. Similarly, Phinance Technologies (2022) reported that in the US, there appeared to be clear evidence of a strong relationship between the COVID-19 vaccination rollout and increases in disability rates. Also in the US, M. Hu, Shoaibi, et al. (2023) monitored 21 pre-specified health outcomes following monovalent COVID-19 vaccines, and detected signals for myocarditis/pericarditis after BNT162b2 in the age group 12–17 years, and seizures/convulsions after BNT162b2 in the age group 2–4 years and after mRNA1273 in the age group 2–5 years.

Global In a global analysis, booster rates strongly correlate with increases in COVID-19 case and COVID-19 death rates (Spieker, 2022a). A global study of 99 million vaccinated individuals published in *Vaccine* confirmed pre-established safety signals for myocarditis, pericarditis, Guillain–Barré syndrome and cerebral venous sinus thrombosis (Faksova et al., 2024). Kirsch (2024a) reviewed the study and denied that the benefits outweigh the risks. Whilst Lyons-Weiler (2024e) also reviewed the paper and concluded that the events were not as rare as made out. Prasad (2024b) argued that the paper shows the bare minimum increased risk of harms. For methodological reasons, the truth is likely worse. Firstly, the numerator is weak because many cases of adverse events are likely not to be coded. Secondly, the analysis does not stratify by demographic group. He concluded that low-risk populations were harmed by mandatory vaccination.

4.3.16.2 Pharmacovigilance Databases

Many adverse reactions to COVID-19 vaccinations have been recorded on the Database of Adverse Event Notifications (DAEN) for Australia, EudraVigilance for the European Economic Area (EEA), the Vaccine Adverse Event Reporting System (VAERS) for the United States and the Yellow Card Scheme for the United Kingdom. Whilst the World Health Organization has its own database, called VigiBase.

EudraVigilance Smalley (2022q) estimated that the under-reporting factor (URF) of the European ADR database for COVID-19 vaccines, EudraVigilance, is at least 7.2.

Vaccine Adverse Event Reporting System (VAERS) In 2012, for the U.S. Food and Drug Administration's (FDA) Adverse Event Reporting System (AERS), T. J. Moore and Bennett (2012) estimated reporting rates of 1.07% for emergency hospitalisations of patients older than 65 years associated with warfarin, 0.9% for hospitalisations of clopidogrel and ticlopidine, 1.02% for haemorrhage cases associated with warfarin and 2.3% for venous thromboembolism (VTE) associated with thalidomide. In 2017 Alatawi and Hansen (2017) examined how closely reporting rates in the FDA Adverse Event Reporting System (FAERS) reflected expected rates of known adverse drug events (ADEs). The majority of drug-ADE pairs showed significant under-reporting. Crawford (2021) estimated that the underreporting rate for serious adverse events (SAEs) in VAERS is 30:1, and that potentially 1 in 1000 vaccinated Americans suffered from a post-vaccination death. Whilst Kirsch, Rose, and Crawford (2021) estimated that the VAERS under-reporting factor was 41×. According to W. Jones (2022v), mortality data are compatible with the assumption that the true number of vaccine deaths is around ten times the number reported to the adverse event reporting systems.

The data provided by VAERS is more useful than the data provided by the Yellow Card Scheme or DAEN (McLachlan et al., 2021). McLachlan et al. (2021) analysed the first 250 COVID-19 vaccine-related reported deaths in VAERS. 67% were reported by health service employees, 5% by pharmaceutical employees and 28% by laypersons. In 5% of deaths the vaccine was the most likely cause of death, in 81% of deaths the vaccine may have been a factor in the death, whilst in 14% of the deaths a vaccine reaction could be ruled out as a contributing factor. Fraiman et al. (2022) used a prespecified list of adverse events of special interest (AESI) identified by the Brighton Collaboration, and a higher risk of serious AESI was observed in the mRNA COVID-19 vaccine group relative to placebo in both the Pfizer and Moderna adult phase III trials, from 10.1 (Pfizer) to 15.1 (Moderna) additional events for every 10,000 individuals vaccinated. Kulldorff (2022a) pointed out that there is one additional AESI for every 800 people vaccinated, and stated 'That is very high for a vaccine. No other vaccine on the market comes close.' McLachlan et al. (2023) analysed reported deaths associated with COVID-19 using data from VAERS. Almost half of all death reports in the 2022 cohort included evidence of the individual having been diagnosed with a breakthrough COVID-19 infection.

Western Australian Vaccine Safety Surveillance (WAVSS) Western Australia's vaccine safety data showed that adverse events reported for COVID-19 vaccines are 24× higher than for non-COVID-19 vaccines (Nass, 2023).

Yellow Card Scheme Heneghan and Jefferson (2024m) argued that up to 98% of adverse effects go unreported and that the Yellow Card Scheme, devised 60 years ago, is not fit for purpose.

4.3.16.3 Hospitalisations

Asia Disturbingly, C. L. F. Sun, Jaffe, and Levi (2022) identified an increase of over 25% in the volume of both cardiac arrest and acute coronary syndrome emergency medical services calls in the 16–39-year-old population in Israel during January–May 2021, compared with the same time period in 2019–2020. Using negative binomial regression models, the weekly emergency call counts were significantly associated with the rates of first and second vaccine doses administered to this age group, but not with COVID-19 infection rates.

Australasia Chudov (2023n) reported that in New South Wales in Australia, the more doses a person had, the more likely they were to be hospitalised. Whilst data from the New Zealand Ministry of Health revealed a massive 103% increase in hospitalisations among 12 disease categories measured in 2021 (compared with 2019) following the mRNA rollout. Acute kidney injury, Guillain–Barré syndrome, myo/pericarditis and thrombocytopenia all increased by over 100%. New Zealand had very few cases of COVID-19 in 2021, and Hatchard (2023) concluded that the cause of the disease increase was mRNA vaccination.

Europe In England, an analysis by Joel Smalley using data from the Gloucestershire Hospitals NHS Foundation Trust from 6 September 2020 to 12 December 2021 suggested that vaccines cause more hospitalisations than they mitigate (Smalley, 2022s). HART (2022d) analysed a preprint version of Stowe, Andrews, Kirsebom, Ramsay, and Bernal (2022), which used data from England, and noted that, among those testing negative for COVID-19, the A&E admission rate for those who had received at least one COVID-19 vaccination was *five* times greater than the admission rate for the unvaccinated. In the UK, Amanuensis (2022d) analysed the raw data on hospitalisation rates by vaccine status, for those infected with COVID-19 as well as those that were not, published by UKHSA (Stowe et al., 2022). The results, worryingly, showed significantly higher A&E admission rates in the vaccinated than the unvaccinated for reasons other than COVID-19.

North America In 2021 Emergency Medical Services in Westchester County, New York received a shocking number of vaccine emergency calls as well as requests for ambulances to be 'on standby' before vaccines were administered (Kory, 2023c). Smalley (2022n) analysed data for 3,095 US counties from 24 February to 19 May 2022, and found a statistically significant *positive* correlation between full vaccination and hospitalisation, plus a *positive* correlation between rate of booster vaccination and hospitalisation.

4.3.16.4 Deaths

Asia In February 2022, Oehler (2022) noted that in Israel COVID-19 vaccine doses and COVID-19 deaths appeared to have followed the same three waves.

On 15 October 2021 it was reported that in Taiwan, the number of people who died after receiving the COVID-19 vaccine had exceeded the number of deaths from the virus itself (The Testimonies Project, 2021).

In Japan in 2021 the number of deaths due to COVID-19 among people in their 20s was 15 in 2021 (13 men, 2 women) and 35 in 2022 (22 men, 13 women) (Gin, 2023d). Whilst the number of reported deaths after vaccination was 30 (22 men, 7 women, 1 unknown) in 2021 and 10 (8 men, 2 women) in 2022. So, among Japanese in their 20s in 2021, the number of post-vaccination deaths was twice the number of COVID-19 deaths. Also using data from Japan, from February 2021 to March 2023, Suzumura (2023) investigated the association between BNT162b2 mRNA vaccinations and deaths after vaccination using sex ratios of reported deaths compared by period. He concluded that the vaccination may influence the occurrence of death during the risk period and might be associated with death. The paper is explained in Gin (2023e).

Australasia The COVID-19 data for New South Wales in Australia is extraordinary (Smalley, 2021c). The state had very few cases of COVID-19 before the vaccination programme began. The vaccine rollout didn't merely fail to mitigate spread, but appeared to trigger an outbreak, presumably because the vaccine weakens the immune system for the first two weeks (Moustsen-Helms et al., 2021). The first to be vaccinated would have been the most vulnerable. Vaccinations and COVID-19 deaths follow the same pattern, except that deaths peak 28 days after vaccinations. Recall that S. N. Wood (2021) estimated that the average time between infection

and death was 26.8 days. The Australian Bureau of Statistics (ABS) officially acknowledged 21 COVID-19 vaccine deaths, despite there being more than 1,000 reported deaths to the Database of Adverse Event Notifications (DAEN) (Barnett, 2024l).

Barry Young, an IT worker for Health New Zealand - Te Whatu Ora leaked record-level public health data (Nightingale, 2024). Kirsch (2023c) analysed the data and claimed that the data showed that the COVID-19 vaccines have killed over 10 million worldwide. He estimated that the vaccines have killed, on average, around 1 person per 1,000 doses. The data shows a mortality hump that peaks around six months after a dose is given. Norman Fenton analysed the New Zealand vaccine data, and concluded that it provides evidence of lack of safety of the vaccine (N. Fenton, 2023b). William M. Briggs analysed the New Zealand data, and concluded that perhaps the vaccine killed a few, probably younger, people, though we cannot tell for sure (W. M. Briggs, 2023b). On his blog, eugyppius (2023e) agreed that there does appear to be some unusual clustering of deaths in the early days after the first and second vaccinations, particularly in people under thirty years of age. He thinks it's very plausible that this is a real signal of direct vaccine-induced death. The New Zealand data shows that for a given number of doses, the number of male and number of female deaths are significantly different, which should not arise with a safe vaccine (Kirsch, 2023d). Males had up to 20% higher mortality, which decreased after each shot (Kirsch, 2023g). Also, one's death rate increased with each additional shot. Bowler (2024b) stated that the whistleblower data release in New Zealand provided the strongest evidence to date of a temporal association between vaccination status and increased excess mortality. Kirsch (2024k) concluded that the vaccines increased mortality. When COVID-19 deaths peaked in July 2022, the vaccinated were disproportionately affected. He also rightly pointed out that mainstream epidemiologists avoided the New Zealand data. Perhaps because the results would be embarrassing for the health authorities, medical community, politicians and mainstream press. Smalley (2024i) analysed the New Zealand data and concluded that it doesn't tell us anything useful. Although he noted that there were spikes in mortality rate in sharp coincidence with the booster campaigns.

Europe Billing data from public German insurers seems to show a dramatic increase in deaths from unknown causes coinciding exactly with the vaccination campaign of 2021 (eugyppius, 2022g). Since bivalent boosters are advertised for protection from symptomatic disease, analysing data from Germany Spieker (2023d) proposed that those variants well-adapted to the immunity provided by bivalent boosters can rapidly induce sudden death in bivalently boosted individuals, after a short asymptomatic disease course with a tendency to go undiagnosed.

In an unpublished paper, Meester, Aukema, and Schetters (2021) performed a Bayesian analysis to determine the relationship between vaccination against COVID-19 and the mortality rates in the three weeks after vaccination in the Netherlands. In the age group 12–65, there was a slight increase in mortality. In the age group 65–80, there was a significant increase in mortality. In the age group 80+, for men there was a significant increase in mortality, but for women there was no increase in mortality.

Joel Smalley analysed QALY losses for England and Wales (Smalley, 2022z, 2023q). The most significant mortality event occurs a few weeks after the start of the mass vaccination campaign. He noted that in England the second wave of daily deaths explodes on 8 December 2020, the exact date that the mass vaccination programme began (Smalley, 2022f). He also points out that more than 3,000 more people aged between 40 and 64 have died in each full year since the mRNA vaccinations were administered when we would naturally expect fewer deaths. The virus naturally favours less virulent mutations. So, he hypothesises, if a weaker virus is killing more people, the host must have been weakened. Smalley (2022g) showed that in England for 5–24-year-olds the COVID-19 death rate was 65% higher after COVID-19 vaccinations began. Dee (2022b) also found evidence of an increase in COVID-19 deaths in England during the early stages of the vaccination programme. Official data on deaths by vaccination status in England

released by the ONS showed that the vaccinated were over-represented in all-cause mortality in all age groups for most of 2021 and all of 2022 (W. Jones, 2023n). Dee (2024i) used survival analysis techniques to investigate delays between vaccination and death. He found that whatever is driving post-vaccine survival is not disease-related, and may be indicative of vaccine harm. Using data from England, Smalley (2023a) noted that ethnicities that were less vaccinated (e.g. Blacks) were dying less relative to their wave one (pre-vaccine) death rate than ethnicities that were highly vaccinated (e.g. South Asians and Whites).

Will Jones noted that with the data publicly available it's not possible to quantify precisely how many people COVID-19 vaccinations have sent to an early grave, but it may be in the tens of thousands in the UK alone (W. Jones, 2022k). He estimated that there were an estimated 20,000 deaths in the UK due to short-term vaccine injury (W. Jones, 2022v). This would represent just 3% of total deaths, so it would be hard to identify the signal in excess mortality data. Using UK Government data, The Exposé (2022a) calculated that 1 in every 73 people who received at least one dose of the COVID-19 vaccine in England had died by the end of May 2022. Whilst age-standardised mortality rates for non-COVID-19 deaths were lowest among the unvaccinated. In the UK, Pearson (2023) reported the sad story of Lisa Shaw, the 44-year-old BBC Radio Newcastle presenter who died due to rare complications from the Oxford AstraZeneca vaccine. She noted that the young and healthy, who were at minimal risk from COVID-19, should not have been told they had to take the vaccine.

North America Smalley (2021e) noted that in the US deaths in 2021 after mass vaccinations are substantially higher than in 2020 before vaccinations, in every age group, especially the younger ones. CDC officials found evidence that the Pfizer-BioNTech and Moderna COVID-19 vaccines caused multiple deaths before claiming that there was no evidence linking the vaccines to any deaths (Stieber, 2024b). In the US, Kirsch (2024i) argued that Medicare data showed that the COVID-19 vaccination increased the baseline risk of death in the elderly by over 10%. Also, since April 2022 (or possibly earlier), the unvaccinated fared better than the COVID-19-vaccinated from a mortality perspective. In a study of vaccinated Florida residents aged 18 years or older, Florida Department of Health (2022a) determined that mRNA COVID-19 vaccination was associated with a modestly increased risk for cardiac-related mortality 28 days following vaccination, especially among males aged 18–39. Petek et al. (2023) analysed sudden cardiac death in National Collegiate Athletic Association athletes during a 20-year time frame (1 July 2002 to 30 June 2022). In this population there did *not* appear to be any sort of spike in sudden death related to either COVID-19 or the vaccine. However, C. Craig (2023e) noted that there was a 50% rise in mortality between 2016 and 2023 among staff, but this was ignored. Furthermore, the authors had a conflict-of-interest bias (one of them is a consultant for Pfizer, plus the research was supported by organisations that mandated the vaccine as a condition of entry or continuing membership). As of January 2024, 53% of American adults believe it is likely that side effects of COVID-19 vaccines have caused a significant number of unexplained deaths (Rasmussen Reports, 2024). Rose (2024c) found that the number of autopsy reports in VAERS domestic data following COVID-19 vaccines spanning 2021–2023 was 18 times higher than the average of influenza vaccines for the timeframe spanning 2018–2020. Using a simple survey of his readers, in May 2022 Kirsch (2022h) estimated that over 500,000 Americans had been killed by the COVID-19 vaccines. Using a randomised nation-wide, online survey of COVID-19 health experiences ($n = 2,840$), Skidmore (2022) estimated that in the US 290,000 people may have died from the COVID-19 inoculation in the first year of the vaccine rollout.

Global Steve Kirsch explained that if you do a simple plot of the absolute number of deaths per day after a vaccine shot is given vs the number of days that have elapsed since the shot, other than for a brief 21-day period after the shot, the number of deaths per day will always monotonically decline over time in a safe vaccine (Kirsch, 2023f). But for the COVID-

19 vaccine, it monotonically *increases* over time for up to 365 days straight. This happens in every country, after every dose, that he has data on. He claims that it means the COVID-19 vaccine is killing people. Chudov (2022i) speculated that the relative risk of death for vaccinated people is 40% greater than for the unvaccinated. In an unpublished preprint, in a country-by-country analysis using data from August 2021 to September 2022, Thorp, Thorp, Thorp, Scott-Emuakpor, and Thorp (2022) found that high rates of COVID-19 vaccination were associated with high COVID-19 death rates per country population. Other variables associated with high COVID-19 death rates included healthcare costs per capita, income per capita, COVID-19 tests per 1000 population and stringency index. Radagast (2022d) hypothesised that sudden deaths have genuinely increased, and that the cause is a product of an interaction between the vaccine and subsequent exposures to SARS-CoV-2. 'If people are then eventually reinfected, the antibody response is effectively entirely IgG4 dominated, which doesn't trigger inflammation and so the infection becomes effectively silent, you don't really notice common cold-like symptoms. IgG4, as an anti-inflammatory antibody that doesn't activate complement and poorly binds to the Fcr receptor fails to bring the viral load down to zero. The virus eventually damages the cardiovascular system, resulting in a sudden unexpected death.' Smalley (2023w) argues that COVID-19 vaccines increase overall mortality primarily by exacerbating COVID-19 mortality (or respiratory mortality in general).

Smalley (2023k) estimated that globally just over 10 million people have been killed by the vaccines, and 6.9 million killed by COVID-19. Verduyn (2023a) gives a ballpark estimate of the vaccine fatality rate of 0.02%, leading to a fatality rate likely close to 0.1% of the population. To put this into perspective, the global average IFR of COVID-19 for everyone under 70 had been determined to be about 0.07%. This implies that the vaccines were more lethal than COVID-19 itself. Hulscher, Alexander, et al. (2024) conducted a systematic review of autopsy and necropsy reports relating to COVID-19 vaccination up until 18 May 2023. They identified 325 autopsy cases and one necropsy case. The most implicated organ system among cases was the cardiovascular (49%), followed by haematological (17%), respiratory (11%) and multiple organ systems (7%). Three or more organ systems were affected in 21 cases. The mean time from vaccination to death was 14.3 days. Most deaths occurred within a week of last vaccine administration. A total of 240 deaths (73.9%) were independently adjudicated as directly due to or significantly contributed to by COVID-19 vaccination, of which the primary causes of death include sudden cardiac death (35%), pulmonary embolism (12.5%), myocardial infarction (12%), VITT (7.9%), myocarditis (7.1%), multisystem inflammatory syndrome (4.6%) and cerebral haemorrhage (3.8%). Perhaps tellingly, the article was withdrawn at the request of the Editors-in-Chief, whilst the original preprint with *The Lancet* was removed within 24 hours. In a systematic review, Hulscher, Hodkinson, Makis, and McCullough (2024) investigated potential causal links between COVID-19 vaccines and death from myocarditis using post-mortem analysis. They initially identified 1691 studies and, after screening for their inclusion criteria, included 14 papers that contained 28 autopsy cases. They established that all 28 deaths were most likely causally linked to COVID-19 vaccination by independent review of the clinical information presented in each paper. Fatality after an influenza vaccination is around one death per five million, whilst short-term fatality after a COVID-19 vaccination is dozens of deaths per one million (Shahar, 2023i). Rafael Bornstein, a Senior Consultant in Hematology at Hospital Central de Cruz Roja in Madrid, reported in December 2022 that the evidence of vaccine deaths was ever stronger, and concluded that the COVID-19 mRNA vaccination should be paused whilst a comprehensive safety investigation is carried out (Bornstein, 2023).

See also Section 5.6, excess mortality due to vaccinations.

4.3.16.5 Audiological

Hearing Loss Thai-Van et al. (2023) found that the COVID-19 vaccine can be linked to sudden hearing loss (M. Zhang, 2024a). An autoimmune reaction induced by the spike protein

may be to blame.

Vertigo and Tinnitus A study in Australia found an increase in general practice presentations of vertigo following mRNA vaccines (relative incidence (RI) = 1.40, $p < 0.001$), and tinnitus following both the Vaxzevria® adenovirus vector and mRNA vaccines (RI = 2.25, $p < 0.001$ and 1.53, $p < 0.001$ respectively) (Shetty et al., 2024).

Tinnitus In an article published in *Frontiers in Pharmacology*, W. Wang, Yellamsetty, Edmonds, Barcavage, and Bao (2024) analysed a survey on 398 cases of COVID-19 vaccination-related tinnitus, and 699,839 COVID-19 vaccine-related reports in the VAERS database that was retrieved on 4 December 2021. They determined that COVID-19 vaccination increases the risk of tinnitus.

4.3.16.6 Cancer

On his blog, el gato malo (2022m) interpreted an article that analysed autopsies of those who were vaccinated but died of COVID-19 (Hirschbühl et al., 2022). There were worrying cancer possibilities. According to MagsPress (2023), the top seven cancers that have increased since COVID-19 vaccination programmes began are turbo cancer (existing tumours grow exponentially faster, plus multiple tumours in multiple organs); breast cancer; recurrence (and metastases) after complete remission prior to COVID-19 injection(s); lung and bronchus cancer; prostate cancer; colon and rectal cancer; and stomach and oesophageal cancer. In contrast to much of the evidence presented here, in December 2023, Swiss Policy Research stated that there was *not* yet any evidence that vaccines increased cancer rates (Swiss Policy Research, 2023b). In April 2024 Ethical Skeptic (2024a) showed that in the US for those aged 0 to 54, malignant neoplasms without COVID-19 or long COVID have been on a linear upward trend ever since vaccines were introduced. In the same month, Makis (2024) lists 15 papers on turbo cancer and 11 case reports. Ethical Skeptic (2024d) showed that in the US, malignant neoplasm deaths started to increase when vaccines were introduced, and have continued to increase ever since, with a linear trend. Barnett (2024i) reported that the retraction of a study showing that COVID-19 vaccines may increase cancer risk (Jiang & Mei, 2021) was forced. Coquin de Chien (2024b) investigated the reality of 'turbo cancer'. Incidence rates of cancers, benign tumours and granulomas increased since COVID-19 vaccinations. Growth rates of two granulomas at COVID-19 vaccination sites were evidence beyond reasonable doubt that the COVID-19 vaccination played a part in the formation of the granuloma. The speed of growth was anomalously 'turbo'.

Now let us consider *how* COVID-19 vaccines could increase the incidence of cancer. According to Angus Dalgleish, mRNA vaccines can theoretically induce cancer in at least ten different ways. The mRNA vaccines do not, as promised, disappear in days but can integrate into cells and induce cancer (Dalgleish, 2024c). He reported mounting evidence that the mRNA-based COVID-19 vaccines not only cause cancer progression but also inhibit current treatments in controlling so-called 'turbo cancers', sudden and aggressive either first-time or relapsed cancers, which are on the rise (Dalgleish, 2024b, 2024d). The following mechanisms set off by the mRNA-based COVID-19 vaccines could induce cancer, especially after the totally unnecessary boosters:

- T cell suppression/exhaustion, especially documented in cancer patients after the first booster.
- Immunoglobulin class switching from protective IgG1 and IgG3 to tolerising IgG4.
- Increase in PD-L1 expression on cells giving protection from immune surveillance.
- DNA plasmid contamination and inclusion of known oncogenic sequences such as SV40.

- The ability of the spike protein to induce clotting, both microclots and intravascular clots, both of which can enhance cancer spread and metastases.
- The inclusion of the mRNA stabiliser N1 methyl pseudouridine (m1Ψ) in 100% of samples, leading to melanoma spread in mouse models.
- The spike protein can bind tumour-suppressive genes including p53 which is the king of cancer control genes.

Palacios-Castrillo (2024) described seven mechanisms that can explain how mRNA vaccines against COVID-19 may be related to an increase in cancer deaths:

- mRNA vaccines and oestrogen sensitivity.
- Biodistribution of lipid nanoparticles.
- Modification with N1-methyl-pseudouridine.
- Antibody-dependent enhancement.
- Thrombogenic effects of spike protein and LNPs.
- Suppression of cancer immunovigilance.
- Reverse transcription of RNA to DNA.

HART (2024a) pointed out that there are good reasons to fear a cancer surge as a consequence of the mRNA vaccines. The vaccines can hypothetically contribute to cancer in multiple ways:

- Constant production of a mixture of foreign proteins will lead to chronic inflammation and potentially immune exhaustion.
- Modified nucleotides increase risk of cancer.
- Spike protein damaging genes that protect cells from cancer.
- Contaminant DNA that can integrate into the recipient's DNA and damage protective genes or else enhance growth promoting genes.

Those with long haul vaccine injury symptoms are likely most at risk because of continuing exposure. Dalgleish (2024a) argued that there is an association between booster vaccines and a relapse or new cancer, particularly in those below 50 years old. He also offers several plausible scientific causal explanations:

- T cell responses are suppressed after the boosters (though not after the first two injections) and this is especially marked in some cancer patients.
- The antibody repertoire switches after the first booster from a protective IgG1 and IgG3 dominant B cell response to a tolerising IgG4 one, made worse by further boosters.
- mRNA vaccines increase PD-L1 on granulocytes and monocytes, which means they effect the very opposite of what the immunotherapy agents do against these tumours, and which in turn explains why many of these tumours appear to be resistant to this otherwise effective therapy.
- More controversially, reports document the presence of DNA plasmids and SV40 (a known cancer-inducing gene) sequences, as well as the ability of mRNA to bind to important suppressor genes.

On his blog, el gato malo (2022k) argued that it is possible that the mRNA vaccines are CG (cytosine-guanine) enriched, which can increase the risk of cancer. Arizti et al. (2000) showed that the tumour suppressor protein gene p53 is required to modulate expression of the breast cancer type 1 susceptibility protein (BRCA1) gene. Renz (2024b) argued that there are a lot of very compelling reasons to ask if the COVID-19 vaccines are causing or exacerbating cancer. Some vials were contaminated with SV40, which can integrate into the host genome. And integration of the genetic material from the vaccines into the host's genome (their DNA) raises the risk of cancer. Rubio-Casillas, Cowley, Raszek, Uversky, and Redwan (2024) showed that adding 100% of N1-methyl-pseudouridine (m1Ψ) to the mRNA vaccine in a melanoma model stimulated cancer growth and metastasis, whereas non-modified mRNA vaccines induced opposite results, thus suggesting that COVID-19 mRNA vaccines could aid cancer development. Wafik El-Deiry, an American physician and cancer researcher at Brown University, provided evidence that the spike protein of both SARS-CoV-2 and mRNA vaccinations inhibits an important tumour suppressor protein, which may lead to an increased incidence of cancer (Demasi, 2024b; S. Zhang & El-Deiry, 2024). Professor Ian Brighthope, a retired medical practitioner in Australia, declared that mRNA vaccines are class one carcinogens (Brighthope, 2024b). He added that mRNA is also a broad-spectrum mutagen.

4.3.16.7 Cardiovascular

Kirsch (2023b) conducted a survey and estimated that for those aged 10 to 25 the vaccinated experience severe cardiac events at a rate 18 times higher than the unvaccinated. Marchand, Masoud, and Medi (2023) performed a meta-analysis on all self-controlled case series assessing mortality associated with COVID-19 vaccination in the immediate post-vaccination period. The pooled hazard ratio (HR) revealed no significant association of COVID-19 vaccination with all-cause mortality (HR=0.89, $p = 0.28$), but found that COVID-19 vaccination was associated with an increased risk of cardiac-related mortality (HR=1.06, $p = 0.007$), especially in males. Perhaps unsurprisingly, the paper caused controversy (E. Craig, 2023e). In a systematic review, Singh et al. (2023) revealed a potential link between COVID-19 vaccines and Takotsubo cardiomyopathy (TCM), a heart condition mimicking a heart attack. They identified 16 patients who developed TCM following the COVID-19 vaccine, two of whom died. In Spain, using a single-centre retrospective cohort study conducted between 1 March 2020 and 1 March 2023, Blasco et al. (2024) found that over a six-month period after a heart attack, COVID-19-vaccinated patients had nearly double the risk of dying or suffering from heart failure compared to unvaccinated patients (Berenson, 2024a). The risk appeared concentrated in patients who were both vaccinated and had had COVID-19 before their heart attacks. Whilst it has been reported that in the era of COVID-19 vaccinations many mainly young athletes have suffered from cardiac arrests or died whilst playing their sport (Real Science, 2023). The monthly rate in the two years to July 2022 was higher than the annual rate for prior years (Smalley, 2022b). Mowrey (2023j) argued that COVID-19 vaccines may doom children to a lifetime of persistent infections with potential downstream cardiac risks. In contrast to the above, in December 2023, Swiss Policy Research stated that there was *not* yet any evidence that vaccines increased overall heart deaths (Swiss Policy Research, 2023b).

Australasia In Victoria, Australia, cardiac episode emergency department presentations for 10- to 29-year-olds almost doubled over the period March 2021 to February 2022 (Smalley, 2023b; The Nobody Who Knows EveryBody, 2023c). The timing and magnitude of the increased cardiac episodes was very closely correlated with the Victorian COVID-19 mRNA vaccination programme. Also in Victoria, from April 2019 to March 2022, for those aged 1–50, there was no association between out-of-hospital cardiac arrest and COVID-19 vaccination (Paratz, Nehme, Stub, & Gerche, 2023).

In New Zealand, Walton, Pletzer, Teunissen, Lumley, and Hanlon (2023) identified a statistically significant association between BNT162b2 and myo/pericarditis in the 21 days following both doses of the vaccine. The association was found to be highest in the youngest recipients, i.e. under 39 years of age, and following the second dose, with an estimated five additional myo/pericarditis cases per 100,000 persons vaccinated.

Asia Gin (2023g) showed that spikes in heart deaths among Japan's working-age men support the 'hot lot hypothesis'. That is, in terms of causing cardiovascular deaths, some COVID-19 vaccine batches are much worse than others.

Mansanguan et al. (2022) conducted a prospective cohort study that enrolled students in Thailand aged 13–18 years who received the second dose of the BNT162b2 mRNA COVID-19 vaccine. Cardiovascular effects were found in 29.24% of patients. The most common cardiovascular effects were tachycardia (7.64%), shortness of breath (6.64%), palpitation (4.32%), chest pain (4.32%) and hypertension (3.99%). These figures are disturbingly high, though in this cohort symptoms were mild with full recovery within 14 days.

Europe Arora (2022) concluded that data from the US, France, Germany and Israel suggest that mRNA vaccines have damaged the hearts of a significant number of people, and that it's highly likely there's a causal relationship between mass vaccination and cardiac arrests. A Pfizer Post Authorisation Safety Study (PASS) report (Weibel & Arana, 2024), dated 12 March 2024, and using data from six electronic healthcare data sources in Europe, showed that the vaccinated cohort had at least 23–40% higher risk of some heart-related conditions; and the risk was higher than in Pfizer's previous report (i.e. it was increasing over time since vaccination) (Hunt, 2024).

In Germany, Schreckenberg et al. (2023), observing rat and human heart cells, showed that within 48 hours of vaccination, the COVID-19 mRNA vaccines form spike proteins (M. Zhang, 2023a). Pfizer and Moderna vaccines caused different cell abnormalities. The authors concluded that, at the cellular level, the effects of the COVID-19 vaccines seemed to align closer with cardiomyopathy than with myocarditis. The authors make a strong anti-vaccine conclusion and say that we must re-evaluate giving people mRNA vaccines due to their cardiotoxic effects (Chudov, 2023k).

In May 2024 a Guernsey cardiologist called for an investigation into the safety of the COVID-19 vaccine after reportedly seeing a rise in the number of people with heart issues. In 2020 there were 5 cases of myocarditis in Guernsey, in 2021 25, in 2022 22 and in 2023 11.

In a study on adults in Sweden, using data from from 27 December 2020 (start date of vaccinations in Sweden) to 31 December 2022, Y. Xu et al. (2024) claimed that after COVID-19 vaccination the risk of myopericarditis (mRNA vaccines only), extrasystoles and transient ischaemic attack transiently increased, but full vaccination substantially reduced the risk of several more severe COVID-19-associated cardiovascular outcomes. Mowrey (2024b) reviewed the article, and argued that the recently vaccinated have lower rates of cardiac events than expected for their age because the cardiac events were merely prevented (postponed) by short-term immunity to infection with SARS-CoV-2. Consequently, the study failed to demonstrate that COVID-19 vaccines did not cause more cardiac disease in the vaccinated.

Using active surveillance in Switzerland, Buergin et al. (2023) found that mRNA-1273 vaccine-associated mild transient myocardial injury was much more common than previously thought. It occurred in 2.8% of participants, was mild and transient, and more common in women than in men.

In the UK, using data from January 2021 to September 2021, Dee (2023f) found evidence that vaccination is linked with an increased risk of COVID-associated hypertension prior to death, which likely implies inflammation. His guess is that the vaccines are inducing a situation that increases the likelihood of COVID-19 infection with concomitant hypertension in some

people. Ip et al. (2024) used longitudinal health records from 45.7 million adults in England between December 2020 and January 2022. Their study compared the incidence of thrombotic and cardiovascular complications up to 26 weeks after first, second and booster doses of brands and combinations of COVID-19 vaccines used during the UK vaccination programme with the incidence before or without the corresponding vaccination. The incidence of common arterial thrombotic events (mainly acute myocardial infarction and ischaemic stroke) was generally lower after each vaccine dose, brand and combination. Similarly, the incidence of common venous thrombotic events (mainly pulmonary embolism and lower limb deep venous thrombosis) was lower after vaccination. However, Prasad (2024f) pointed out that the paper is flawed. There is likely residual confounding and residual time-zero problems/immortal time. In the UK, using data to March 2022, O.S. (2022b) identified a noticeable correlation between vaccinations and heart-related emergency calls in the West Midlands in the under 30s.

North America In the US, using data from autopsies performed at Massachusetts General Hospital between January 2021 and February 2022, Krauson, Casimero, Siddiquee, and Stone (2023) found that SARS-CoV-2 vaccine mRNA routinely persists up to 30 days after vaccination and can be detected in the heart. In October 2022, Florida Department of Health (2022b) reported that there was an 84% increase in the relative incidence of cardiac-related deaths among males 18–39 years old within 28 days of an mRNA vaccination. They concluded that mRNA COVID-19 vaccines failed to pass a cost–benefit analysis among men in this age group. As such, the State Surgeon General recommended against males aged 18 to 39 from receiving mRNA COVID-19 vaccines. In July 2024, using VAERS data, Rose (2024c) found that 69% of all COVID-19 vaccine autopsy-linked reports were associated with cardiovascular adverse events, more specifically 11% myocarditis, 12% cardiac arrest and 16% pulmonary embolism (PE).

Myocarditis Using mice, C. Li et al. (2021) provided in vivo evidence that inadvertent intravenous injection of COVID-19 mRNA vaccines may induce myopericarditis. In a systematic review of 46 studies, Pillay et al. (2022) concluded that adolescent and young adult males are at the highest risk of myocarditis after mRNA vaccination, and the incidence may be as high as 140 cases per million. In another systematic review, of 41 case reports and case series, Fatima et al. (2022) concluded that myocarditis and pericarditis after the COVID-19 vaccine occur most commonly in young adult males after the second dose of mRNA vaccines. The pooled incidence of myocarditis and pericarditis extrapolated from original studies was 0.001% and 0.0004%, respectively. W. Jones (2022o) reviewed some of the literature on mRNA vaccines and myocarditis, and found considerable evidence that mRNA vaccines are routinely injuring the heart, with raised troponin levels across the board and 2.8% showing levels associated with subclinical myocarditis. Jessica Rose hypothesises that it's not myocarditis, but injection-induced cardiac amyloidosis (Rose, 2022a). C. Andrews et al. (2024) found that among both adolescents and children, myocarditis and pericarditis were documented only in the vaccinated groups (there were none in the unvaccinated group), with rates of 27 and 10 cases/million after the first and second doses respectively. Warren et al. (2024) found that among patients with COVID-19 vaccine-associated myocarditis, myocardial fibrosis was seen in almost a third of patients at least 12 months after diagnosis. Huber (2021b) examined the possible mechanisms of the mRNA COVID-19 vaccine association with myocarditis. She asked whether the human recipient of a spike protein-generating mRNA vaccine should be expected to continue to generate spike proteins for an indefinite amount of time, or even permanently. She stated that vaccines of this type must be avoided until these questions are thoroughly resolved, in order to prevent further harm to human health.

A study in Hong Kong found that there is an increased risk of carditis associated with BNT162b2 vaccination (F. T. T. Lai et al., 2022). Also in Hong Kong, Yu et al. (2023) evaluated the cardiovascular outcomes of adolescent patients diagnosed with COVID-19 vaccine-associated

myocarditis up to one year later. 67% had abnormal findings. These included features of myocarditis (56%), abnormal T1 values (54%), abnormal T2 values (62%), late gadolinium enhancement (LGE) (signs of scarring on their hearts) (49%) and reduced LVEF (18%).

Using data from Japan, Nakahara et al. (2023) found that when compared with nonvaccinated patients, asymptomatic patients who received their second vaccination 1–180 days prior to imaging showed increased myocardial ^{18}F-FDG uptake on PET/CT scans. Chudov (2023b) interpreted the paper, concluding that COVID-19 vaccines damage *all* hearts. Vaccinated individuals show higher levels of cardiac, lymph node, liver and spleen inflammation compared to unvaccinated individuals (D. Corrigan, 2024). Takada et al. (2024) analysed data from the Japanese Adverse Drug Event Report database (April 2004 to December 2023). SARS-CoV-2 mRNA vaccination was significantly associated with the onset of myocarditis/pericarditis. The influencing factors included age of ≤ 30 years and male. Their results showed an incredible 11% death rate for mRNA COVID-19 vaccine-related myocarditis (13% specifically for the Pfizer vaccine) (Lataster, 2024a). Only 47% had recovered. Whilst the death rate for pericarditis was 5% (6% for the Pfizer vaccine). Only 50% had recovered. Kirsch (2024o) reviewed the paper, and concluded that the Pfizer vaccine isn't safe, and the Moderna vaccine is 3.6× worse. Suzuki, Ro, Takada, Saito, and Hayashi (2022) conducted autopsies on post-COVID-19 vaccine deaths in Japan. 14.8% showed a causal relationship to vaccination, with myocarditis being the most common cause of death. HART (2024c) reported on an autopsy report from Japan (Minato et al., 2024) that showed that even mild myocarditis can result in fatal arrhythmias. Whilst vaccine damage to the heart's electrical system is undetectable with a standard autopsy.

In South Korea, Cho et al. (2023) found that vaccination-related myocarditis (VRM) was confirmed in 1.08 cases per 100,000 persons and showed relatively favourable clinical courses, but severe VRM was found in 19.8% of all VRM cases. VRM incidence was highest in males between the ages of 12 and 17 years (5.29 cases per 100,000 persons) and lowest in females over 70 years (0.16 cases per 100,000 persons). Again in South Korea, S. Choi et al. (2021) presented autopsy findings of a 22-year-old man who developed chest pain five days after the first dose of the BNT162b2 mRNA vaccine and died seven hours later. The primary cause of death was determined to be myocarditis, causally associated with the BNT162b2 vaccine. Also in South Korea, autopsies revealed that mRNA COVID-19 vaccines were responsible for sudden cardiac deaths due to myocarditis in eight people (Stieber, 2023b). All were aged 45 or younger.

Chiu et al. (2023) conducted a study of school-aged students (aged 12 to 18) in Taiwan following the second dose of the BNT162b2 vaccine. 17.1% had at least one cardiac symptom (mostly chest pain and palpitations), 1.0% had abnormal electrocardiograms (ECGs) and 0.1% had significant arrhythmias and myocarditis.

Using data from Israel from 20 December 2020 to 24 May 2021, Witberg et al. (2021) estimated that the incidence of myocarditis for those who had received at least one dose of vaccine was 2.13 cases per 100,000 persons. The highest incidence was reported in male patients between the ages of 16 and 29 years, 10.69 cases per 100,000 persons. Using data from Israel up to 24 May 2021, Barda et al. (2021) found that the BNT162b2 mRNA COVID-19 vaccine increased the risk of myocarditis by a factor of 3 (3 excess events per 100,000 persons), whilst a SARS-CoV-2 infection increased the risk of myocarditis by a factor of 11. Tuvali et al. (2022) conducted a retrospective cohort study of 196,992 adults after COVID-19 infection in Israel between March 2020 and January 2021, and concluded that there was no increase in the incidence of myocarditis and pericarditis in COVID-19-recovered patients compared to uninfected matched controls.

In a cohort study of 23.1 million residents across four Nordic countries (Denmark, Finland, Norway and Sweden), the risk of myocarditis after the first and second doses of SARS-CoV-2 mRNA vaccines was highest in young males aged 16 to 24 years after the second dose (Karlstad et al., 2022). For young males receiving two doses of the same vaccine, data were compatible with between 4 and 7 excess events in 28 days per 100,000 vaccinees after second-dose BNT162b2, and between 9 and 28 per 100,000 vaccinees after second-dose mRNA-1273. Using data from

the same four Nordic countries, Husby et al. (2023) found that myocarditis associated with SARS-CoV-2 mRNA vaccination was less severe than for other types of myocarditis.

Using nationwide hospital discharge and vaccine data from France, Le Vu et al. (2022) performed matched case–control studies and found increased risks of myocarditis and pericarditis during the first week following vaccination, and particularly after the second dose, with adjusted odds ratios of myocarditis of 8.1 for the BNT162b2 and 30 for the mRNA-1273 vaccine. The largest associations were observed for myocarditis following mRNA-1273 vaccination in persons aged 18 to 24 years.

In Germany, Schwab et al. (2022) looked at autopsies of those who suffered from myocarditis following a COVID-19 vaccination. The autopsy findings indicated death due to acute arrhythmogenic cardiac failure. Thus, myocarditis can be a potentially lethal complication following an mRNA-based COVID-19 vaccination.

Using data from England, from 1 December 2020 to 15 December 2021, Patone et al. (2022) confirmed that the risk of myocarditis following vaccination is consistently higher in younger males, particularly following a second dose of RNA mRNA-1273 vaccine. In total, and not necessarily anything to do with vaccinations, 15 newborn babies in Wales and south-west England were struck down with severe myocarditis between June 2022 and May 2023, and one died (E. Craig, 2023d). In February 2024, Dean Patterson, a leading consultant cardiologist in Guernsey and Fellow of the Royal College of Physicians, wrote to the UK medical professional regulator, the General Medical Council (GMC), calling for an investigation into harms from the COVID-19 vaccines (The Daily Sceptic, 2024). He reported an astonishing 47-fold increase in serious post-COVID-19 vaccination myocarditis.

In Canada, Talib et al. (2024) found that among patients with clinically suspected myocarditis after COVID-19 vaccination, after a median of 214 days minimal late gadolinium enhancement (LGE) persisted in 48%.

Using data from the US, G. A. Diaz et al. (2021) found that myocarditis developed rapidly in younger patients, mostly after the second vaccination. Whilst pericarditis affected older patients later, after either the first or second dose. The mean monthly number of cases of myocarditis or myopericarditis during the vaccination period was 61.5% higher than during the prevaccination period. Whilst the mean monthly number of cases of pericarditis during the vaccination period was 60.5% higher than during the prevaccination period. Based on passive surveillance reporting in the US, Oster et al. (2022) found that the risk of myocarditis after receiving mRNA-based COVID-19 vaccines was increased across multiple age and sex strata and was highest after the second vaccination dose in adolescent males and young men. Another study, from the US, concluded that mRNA COVID-19 vaccines increase the markers IL-16, Fas, and HGF, all markers denoting inflammation on the endothelium and T cell infiltration of cardiac muscle (although there was no control group or statistical tests performed) (Gundry, 2021). Data from the US showed that the rate of myocarditis after a COVID-19 infection is higher for the vaccinated than the unvaccinated (C. Craig, 2022; Xie, Xu, Bowe, & Al-Aly, 2022). Clinical and autopsy investigations in the US of two adolescent boys who died following the administration of the second dose of the Pfizer-BioNTech COVID-19 vaccine revealed features resembling a catecholamine-induced injury, rather than typical myocarditis pathology (Gill, Tashjian, & Duncanson, 2022). In a longitudinal retrospective observational cohort multicentre study across 38 hospitals in the US, using data from April 2021 to November 2022, S. S. Jain et al. (2024) found that myocardial injury, as evidenced by late gadolinium enhancement (LGE) on cardiac magnetic resonance (CMR) imaging, was common in patients with myocarditis after mRNA COVID-19 vaccination who present to the hospital, especially in adolescent males. D. Lai et al. (2024) modelled the temporal association between myocarditis onset and COVID-19 vaccination by explicitly modelling the case reporting process in VAERS data. Following the second dose, the relative incidence (RI) was 4.89 for the BNT162b2 vaccine and 2.86 for the mRNA-1273 vaccine. Following the third dose, the RI was 9.04 for the BNT162b2 vaccine and 4.71 for the mRNA-1273

vaccine. Among those vaccinated with BNT162b2 and aged under 30, the risk of myocarditis was increased at 1–3 days following the second dose (RI 5.74) and the third dose (RI 13.90). Among those vaccinated with mRNA-1273 and aged under 30, the risk of myocarditis was increased at 1–3 days following the second dose (RI 3.78) and the third dose (RI 7.22). Rose, Hulscher, and McCullough (2024) found the number of myocarditis reports in VAERS after COVID-19 vaccination in 2021 was 223 times higher than the average of all vaccines combined for the past 30 years. This represented a 2500% increase in the absolute number of reports in the first year of the campaign when comparing historical values prior to 2021. Demographic data revealed that myocarditis occurred most in youths (50%) and males (69%). A total of 76% of cases resulted in emergency care and hospitalisation. Of the total myocarditis reports, 92 individuals died (3%). Myocarditis was more likely after dose 2 and individuals less than 30 years of age were more likely than individuals older than 30 to acquire myocarditis.

4.3.16.8 Haematological

Using data from England, Hippisley-Cox et al. (2021) found that there were increased risks of haematological and vascular events that led to hospital admission or death for short time intervals after first doses of the ChAdOx1 nCoV-19 and BNT162b2 mRNA vaccines. Though the authors note that the risks of most of these events were substantially higher and more prolonged after SARS-CoV-2 infection than after vaccination in the same population. However, I would add that the vaccination does not prevent infection anyway. In South Korea, H. S. Choi, Kim, Choi, Park, and Chun (2023) investigated whether haematologic abnormalities develop after COVID-19 vaccination. Incidence rates of haematologic abnormalities in the vaccination group three months after vaccination were significantly higher than those in the nonvaccinated group: 14.79 vs 9.59 for nutritional anaemia, 7.83 vs 5.00 for aplastic anaemia and 4.85 vs 1.85 for coagulation defects. COVID-19 mRNA vaccine was associated with higher development of nutritional anaemia (odds ratio (OR), 1.230) and aplastic anaemia (OR, 1.242) than the viral vector vaccine. The risk of coagulation defects was increased (OR, 1.986) after vaccination, and there was no risk difference between mRNA vaccine and viral vector vaccine (OR, 1.075). In conclusion, COVID-19 vaccination increased the risk of haematologic abnormalities.

4.3.16.9 Coagulation

Coagulation, also known as *clotting*, is the process by which blood changes from a liquid to a gel, forming a blood clot. According to an article published in *Science*, COVID-19 vaccines may sometimes trigger subtle clotting issues, such as microclots (Couzin-Frankel & Vogel, 2022). Meanwhile, numerous funeral directors have reported struggling to embalm bodies because of finding white 'calamari-like' clots blocking the veins (HART, 2024d). They could be caused by the virus, the vaccine or something else. We just don't know.

United Kingdom In the UK, since the widespread administration of the COVID-19 vaccines some funeral directors and embalmers have reported discovering strange white rubbery clots in the blood vessels of the deceased (J. Smith, 2024). The authorities have refused to investigate. Jack Last, 27, from the UK, died of a blood clot to the brain, caused as a direct result of his body's reaction to the AstraZeneca COVID-19 vaccination, according to the coroner (BBC News, 2022a).

United States In the US, Kirsch (2024e) reported that embalmers were finding novel white fibrous clots in 30% of corpses in 2022 and in 20% of cases in 2023. These clots were never seen before COVID-19 and the COVID-19 vaccines. Richard Hirschman, an embalmer in Alabama, persistently discovered terrifying white fibrous clots, yet the authorities seem uninterested in investigating (B. Rice Jr., 2024c).

4.3.16.10 Immunological

A December 2020 article in *Science* reported that severe allergy-like reactions in at least eight people (six in the US, two in the UK) who received the COVID-19 vaccine produced by Pfizer and BioNTech over the previous two weeks may have been due to a compound in the packaging of the mRNA, polyethylene glycol (PEG) (de Vrieze, 2020). In South Korea, Suh, Kim, Kim, Choi, and Chun (2023) examined the incidence rate and risk of non-fatal immune-related adverse events (irAEs), including gynaecological, haematological, dermatological, ophthalmological, otologic and dental problems following the COVID-19 vaccination. The cumulative incidence rates (cIR) of non-fatal irAEs for three months was significantly higher in vaccinated subjects than in non-vaccinated subjects. Engler (2023a), Kirsch (2023c), H. S. Choi et al. (2023), Y. H. Park, Kim, Choi, and Chun (2023) and Suh et al. (2023) strongly support the contention that the vaccinations significantly increase the incidence of a wide variety of harms across many body systems, especially those of an inflammatory or autoimmune nature (Engler, 2023c). In an informative article, Jonathan Engler pointed out that it is not possible to say whether we are at the beginning or near the end of the manifestation of vaccine harms (Engler, 2023a). Much of the harm observed appears to be inflammatory or autoimmune in nature, and both these processes are usually chronic, rather than acute, problems. It is possible that once started they could persist for months or even years. Chronic inflammation is thought to have a central role in many of the chronic pathologies increasingly suffered by Westerners over the past few decades.

4.3.16.11 Neurological

Neurological conditions involve the nervous system, which comprises the brain, the spinal cord and the peripheral nerves. In a narrative review, Finsterer (2022) found that the most frequent neurological side effects of SARS-CoV-2 vaccines are headache, Guillain–Barré syndrome (GBS), venous sinus thrombosis (VST) and transverse myelitis. In Italy, Salsone et al. (2023) evaluated the neurological complications after the first and/or second dose of COVID-19 vaccines and factors potentially associated with these adverse effects. The NEURO-COVAX cohort included 19,108 vaccinated people. Approximately 31.2% of the sample developed post-vaccination neurological complications, particularly with ChAdOx1nCov-19. This is worrying. They found an increased risk for ChAdOx1nCov-19 of tremors (vs BNT162b2, odds ratio (OR): 5.12), insomnia (vs mRNA-1273, OR: 1.87), muscle spasms (vs BNT162b2, OR: 1.62) and headaches (vs BNT162b2, OR: 1.49). For mRNA-1273, there were increased risks of parethesia (vs ChAdOx1nCov-19, OR: 2.37), vertigo (vs ChAdOx1nCov-19, OR: 1.68), diplopia (vs ChAdOx1nCov-19, OR: 1.55) and sleepiness (vs ChAdOx1nCov-19, OR: 1.28). The authors also found an increased risk of neurological complications in females (OR: 1.97), whereas there was no risk association with age (OR: 0.98). In the US, Khayat-Khoei et al. (2022) reported the clinical and MRI features of seven individuals who received SARS-CoV-2 mRNA vaccines and, within a few weeks of either the first or second dose, developed new neurologic symptoms and MRI findings consistent with active CNS (optic nerve, brain and/or spinal cord) demyelination. In a preprint, Safavi et al. (2022) found that a variety of neuropathic symptoms may manifest after SARS-CoV-2 vaccinations, and in some patients might be an immune-mediated process. By October 2024, even the BBC was reporting vaccine harm (Moynagh, 2024). Larry Lowe, from Omagh in Northern Ireland, after taking the Pfizer COVID-19 booster, suffered from painful trigeminal neuropathy and a small fibre sensory neuropathy. 'I'm in so much pain, my life is barely worth living,' he said.

Alzheimer's Disease (AD) *Alzheimer's disease* (*AD*) is a neurodegenerative disease that usually starts slowly and progressively worsens, and is the cause of 60–70% of cases of dementia. Roh, Jung, Suh, and Kim (2024) found an increased incidence of mild cognitive impairment and Alzheimer's disease in vaccinated individuals, particularly those receiving mRNA vaccines,

within three months post-vaccination.

Cerebral Venous Thrombosis (CVT) *Cerebral venous thrombosis* (*CVT*) is the presence of a blood clot in the dural venous sinuses (which drain blood from the brain), the cerebral veins, or both. J. Park, Park, Kim, and Song (2022) found that mRNA-based vaccinations (Pfizer-BioNTech and Moderna), in addition to ChAdOx1 (AstraZeneca) vaccinations, were associated with cerebral venous thrombosis (CVT). Relative to a baseline, the risk was around 3.53 times greater for the mRNA vaccines and 7.23 times greater for the AstraZeneca vaccine. Whilst C. Rogers, Thorp, Cosgrove, and McCullough (2024) found that COVID-19 vaccines are a risk factor for cerebral thrombotic syndromes (blood clots to the brain).

Creutzfeldt–Jakob Disease (CJD) *Creutzfeldt–Jakob disease* (*CJD*) is a fatal neurodegenerative disease. In an unpublished manuscript Perez, Moret-Chalmin, and Montagnier (2022) reported that, in a few weeks, more than 50 cases of almost spontaneous emergence of CJD appeared in Europe very soon after the injection of the first or second dose of Pfizer, Moderna or AstraZeneca vaccines. Of the 26 cases analysed, the first symptoms of CJD appeared on average 11.4 days after the COVID-19 vaccination. Of these 26 cases, 20 had died at the time the article was written. The 20 deaths occurred, on average, just 4.8 months after vaccination (death from classical CJD normally takes several decades).

Multiple Sclerosis (MS) *Multiple sclerosis* (*MS*) is an autoimmune disease in which the insulating covers of nerve cells in the brain and spinal cord are damaged. COVID-19 vaccination can induce multiple sclerosis via cross-reactive CD4+ T cells recognising SARS-CoV-2 spike protein and myelin peptides (Qiu et al., 2022).

Ramsay Hunt Syndrome (RHS) *Ramsay Hunt syndrome* (*RHS*), also known as *herpes zoster oticus*, is inflammation of the geniculate ganglion of the facial nerve as a late consequence of varicella zoster virus (VZV). There have been cases of Ramsay Hunt syndrome following COVID-19 vaccination (Woo, Chou, & Cheung, 2022).

Stroke A *stroke* is a medical condition in which poor blood flow to the brain causes cell death. In the UK stroke consultations increased 25% since the vaccine rollout (Amanuensis, 2023). Whilst Nahab et al. (2023) found that in Georgia, US, there was a 57% higher risk of ischemic stroke within 21 days of vaccination associated with the Ad26.COV2.S vaccine compared to the BNT162b2 vaccine. R. Watson (2023g) reported that mRNA COVID-19 vaccines can cause stroke, for example via blood clotting.

4.3.16.12 Respiratory

John Dee examined the impact of vaccination rollout on respiratory illness using A&E admissions data for 2017–2021 from an unknown NHS Trust (Dee, 2023h). He concluded that not only do the vaccines not stop transmission, but they don't prevent people from ending up in A&E with respiratory conditions either; in fact, they seemed to be making things worse. He later utilised the data from the NHS Trust to develop a staged multivariate logistic regression model to predict acute respiratory conditions (Dee, 2023e). COVID-19 cases were 151 times more likely to suffer an acute respiratory condition if they were vaccinated. In-patients suffering from an existing chronic respiratory disease were more likely to suffer an acute respiratory condition if they were vaccinated (odds ratio (OR) = 1.32, $p = 0.016$). Whilst in-patients suffering from non-respiratory comorbidities were more likely to suffer an acute respiratory condition if they were vaccinated (OR = 2.04, $p < 0.001$).

4.3.16.13 Men

Sperm quality after COVID-19 infection can be suboptimal (Donders et al., 2022). Mean progressive motility was reduced in 60% of men tested shortly (< 1 month) after COVID-19 infection, 37% of men tested 1 to 2 months after COVID-19 infection, and 28% of men tested > 2 months after COVID-19 infection. Mean sperm count was reduced in 37% of men tested shortly (< 1 month) after COVID-19 infection, 29% of men tested 1 to 2 months after COVID-19 infection, and 6% of men tested > 2 months after COVID-19 infection. High levels of antisperm antibodies developed in three men (2.5%). It is possible that permanent damage occurred in a minority of men. Gat et al. (2022) found that systemic immune response after the COVID-19 BNT162b2 (Pfizer) vaccine temporarily impaired semen concentration and total motile count among semen donors. Similarly, Kriel (2024c) reported a very significant 30%-plus decrease in motile sperm concentration between 2019 and 2022. He stated that there is every reason to imagine that vaccinations (and lockdowns) were to blame. Meanwhile, Chudov (2024f) noted that male human infants and male rat pups are disproportionally affected by mRNA COVID-19 vaccines given to pregnant mothers.

4.3.16.14 Women and Babies

Pregnancy In an article in *iScience*, Gonzalez et al. (2023) found that COVID-19 mRNA vaccines are minimally active in the human placenta. X. Lin et al. (2024) found that the COVID-19 vaccine mRNA is not localised to the injection site and can spread systemically to the placenta and umbilical cord blood. The detection of the spike protein in the placental tissue indicated that the bioactivity of the vaccine mRNA reached the placenta. Notably, the vaccine mRNA was largely fragmented in the cord blood and, to a lesser extent, in the placenta. In short, the COVID-19 vaccine mRNA can penetrate the foetal-placental barrier and reach the intrauterine environment (Redshaw, 2024a). mRNA COVID-19 vaccines in pregnancy provoke an IgG response for the mother-infant dyad for six months after birth (Cassidy et al., 2023), which can increase the likelihood of adverse outcomes for infants, such as preterm births, congenital anomalies and trips to the neonatal intensive care unit (Chudov, 2023c). In contrast, in a population-based study examining outcomes among more than 140,000 live births in Ontario, Canada, maternal mRNA COVID-19 vaccination during pregnancy was *not* associated with adverse newborn outcomes and instead was associated with lower risks of severe neonatal morbidity, neonatal death and neonatal intensive care unit admission (Jorgensen et al., 2023). In addition, neonatal and six-month readmissions were not increased in infants of mothers vaccinated during pregnancy. Meanwhile, data for Scotland appears to show cases of COVID-19 in pregnant women following vaccinations (Scottish Unity - Edinburgh Group, 2022).

Foetal Development Chudov (2024b) analysed Norman et al. (2024) and concluded that COVID-19 vaccines given to pregnant women during the first trimester may somehow interfere with foetal development and make thrombocytopenia (and a host of other outcomes) more likely to happen. Fell et al. (2022) found that children born to mothers vaccinated during the first trimester have a 28% greater chance of a low Apgar score (worse developmental outcomes) than those vaccinated in the third trimester (Chudov, 2024e).

Menstruation COVID-19 vaccinations can cause menstrual changes (Male, 2021), such as increased bleeding (K. M. N. Lee et al., 2022) and a small change in menstrual cycle length (Edelman et al., 2022). Blix et al. (2023) found that among post-, peri- and premenopausal women, 3.3%, 14.1% and 13.1% respectively reported having one or several unexpected vaginal bleeding episodes during the last 8 to 9 months, of which approximately 50% were reported to have happened within 28 days of vaccination. In postmenopausal women, the risk of vaginal

bleeding increased two to threefold in the 4 weeks after vaccination, as compared to the prevaccination period. Ljung et al. (2023) found that for postmenopausal women, after the third dose of Pfizer, compared to the unvaccinated there was an increased risk of bleeding of 41% for 1–7 days then 23% for 8–90 days. The results are more concerning than the authors' conclusion admits (Siglaugsson, 2023c). Bar-Joseph et al. (2024) explained how the Pfizer-BioNTech mRNA vaccine causes menstrual irregularities (Elijah, 2024a). The authors hypothesised that the menstrual changes in post-vaccinated women may result from a direct effect of the vaccine on the granulosa cells, leading to modifications in the expression and secretion of follicular hormonal regulators and thus affecting the cycle.

Miscarriages Data from Rambam Hospital in Haifa, Israel revealed a stillbirth, miscarriage and abortion (SBMA) rate of 6% among women who never received a COVID-19 vaccine, compared to 8% among women who were vaccinated with at least one dose (and never had a SARS-Cov-2 infection) (Guetzkow, 2022c). This was a statistically significant odds ratio of 1.36. Velez, Fell, Shellenberger, Kwong, and Ray (2023) analysed miscarriage after SARS-CoV-2 vaccination. Miscarriage occurred at a rate of 3.6 per 10,000 person-days among remotely vaccinated (vaccinated more than 28 days before estimated conception) women and 3.2 per 10,000 person-days among those recently vaccinated (vaccinated within 28 days before conception up to 120 days after conception), in contrast to a rate of 1.9 per 10,000 person-days among unvaccinated women, with corresponding adjusted hazard ratios (aHR) of 0.98 and 1.00. The results also showed that induced abortion rates for remotely vaccinated women were 7.7 per 10,000 person-days, 7.4 per 10,000 person-days for recently vaccinated women and 4.2 for unvaccinated women. The study appears to show an 89% increase in miscarriages for remotely vaccinated women and a 76% increase in abortions (The Naked Emperor, 2023c). However, the study concludes 'SARS-CoV-2 vaccination was not associated with miscarriage while accounting for the competing risk of induced abortion. This study reiterates the importance of including pregnant women in new vaccine clinical trials and registries, and the rapid dissemination of vaccine safety data'. Rose (2023) reported that, according to VAERS domestic data, 31% of women who were exposed to COVID-19 products prior to pregnancy experienced a miscarriage. Whereas the background rate for miscarriages, as calculated by the CDC using v-safe data, is between 11% and 16%. W. Jones (2023e) reported that the evidence suggests that getting vaccinated during pregnancy almost doubles the risk of a miscarriage, at least after the sixth week. Kirsch (2023a) determined that the absolute number of stillbirths and miscarriages reports associated with the COVID-19 vaccines is four times higher than for all other vaccines combined.

Breast Milk In an article published in *JAMA Pediatrics*, Hanna et al. (2022) investigated whether the COVID-19 vaccine mRNA can be detected in the expressed breast milk of lactating individuals receiving the vaccination within 6 months after delivery. Of 11 lactating individuals enrolled, trace amounts of BNT162b2 and mRNA-1273 COVID-19 mRNA vaccines were detected in 7 samples from 5 different participants at various times up to 45 hours post-vaccination. In an article published in *EBioMedicine*, Hanna et al. (2023) found that of 13 breastfeeding women receiving the mRNA vaccine, trace mRNA amounts were detected in the breast milk of 10 of the mothers up to 45 hours post-vaccination. Elijah (2023a) reported adverse events for breast-fed babies, indirectly exposed to the Pfizer-BioNTech mRNA vaccine, by their vaccinated mothers.

Baby Deaths Mensah et al. (2023) set out to show that COVID-19 vaccines are safe in pregnancy, but also showed that 15% of vaccinated pregnant women had COVID-19, whereas only 12% of unvaccinated pregnant women had it (Chudov, 2023i). Their data also suggested that neonatal deaths for vaccinated mothers are 27–32% higher than those for unvaccinated mothers. C. Craig (2023d) reported on baby deaths in Scotland. During the vaccination period (March 2021 to May 2022) Scotland had a 27% increase in babies dying in the neonatal period.

From July 2021 onwards there was a 30% increase in post-neonatal deaths (deaths in the first year of life). If the extra deaths were all due to the COVID-19 vaccines that would equate to a risk of one death for every 690 doses administered. In the post-vaccine era the number of deaths at age 0 increased by 16%. The NRS aged-standardised mortality rate data for deaths at age 0 increased by 19%. The Scottish Government refused to investigate the potential role of the vaccines in the increase in baby deaths.

Maternal Deaths Kory and Pfeiffer (2024a) found a 300% increase in maternal deaths during the Delta wave. The authors suggest that the campaign to vaccinate pregnant women in the heat of the second COVID-19 wave may have combined to make infections worse in the vaccinated. Disturbingly, The Naked Emperor (2024e) reported that the maternal mortality rate due to blood clots jumped by 36% in 2022, compared to 2019–2021 (MBRRACE-UK, 2024). Whilst there was a shocking 139% increase in early pregnancy deaths when compared to 2016–2019.

Birth Rates Chudov (2023a) reported that in Australia, January–March 2023 birth rates dropped 15% compared to 2021. Whilst birth rates in Sweden had also decreased. In the first four months of the year, from 2021 to 2022 they dropped by 7%, and from 2022 to 2023 they dropped by 6%. In 2022 birth rates declined in Canada (Jestre, 2022b). On his blog, el gato malo (2022p) analysed Swedish birth rate data and found that the birth rate declined from January 2022 to April 2022. The date range corresponds with babies conceived between April 2021 and July 2021, which is aligned with when the majority of the population received their first dose of the vaccine. Similarly, Kogon (2023b) noted that Swedish birth rates began to decline after COVID-19 vaccinations were rolled out to women of childbearing age. KanekoaTheGreat (2022) observed that data from around the world (United Kingdom, Germany, Sweden, Netherlands, Switzerland, Hungary and Taiwan) showed a substantial monthly decrease in birth rates from January 2022 to April 2022 compared to previous years. Many countries have seen markedly lower birth rates since 2022. According to Swiss Policy Research (2023b), the main cause almost certainly is the collapse in marriage rates in 2020 and 2021 due to lockdowns and other restrictions.

Autism Erdogan, Gurbuz, Bozkurt, and Erbas (2024) found that when pregnant rats were given the Pfizer mRNA COVID-19 vaccination, male offspring exhibited pronounced autism-like behaviour, characterised by a marked reduction in social interaction and repetitive patterns of behaviour. Bridle (2024b) pointed out that given that mRNA vaccines potentially cause neurological harm to developing babies, eventually manifesting itself as autism or other disorders, it was not a good idea to vaccinate pregnant women until we know they are safe.

4.3.16.15 Aircraft Pilots

There is plenty of anecdotal evidence of a surge in pilot deaths since the vaccine rollout (Le Sueur, 2022). A pilot, Captain Shane Murdock, warned of a potential airline industry disaster due to COVID-19 vaccines. The data backs up his concerns. A squawk 7700 code indicates an emergency onboard an aircraft. The number of squawk 7700 calls, compared to the 2018–2019 average, was 272% higher in 2022, and 386% higher in the first three months of 2023. There was an instant, steep increase when the vaccines were mandated for pilots.

4.3.16.16 Shedding

Incredibly, it is possible that vaccinated people can cause disease in unvaccinated people in close proximity, via vaccine shedding (Chudov, 2022m). 'A Midwestern Doctor' argued that mRNA COVID-19 vaccines exhibit shedding (A Midwestern Doctor, 2024b, 2024c). He references stories

of unvaccinated people becoming ill after being in proximity to recently vaccinated people. Kory (2024c) compiled a document detailing the scientific and clinical evidence that spike protein shedding causes side effects in a cohort of people exposed to the vaccinated. The most common symptoms are menstrual abnormalities (by far), decidual cast shedding, headaches, tinnitus, nosebleeds, painless, inexplicable bruising, dizziness, brain fog/malaise and skin rashes.

4.3.16.17 Other

Diabetes *Diabetes* is a group of common endocrine diseases characterised by sustained high blood sugar levels. In Hong Kong, Zhai et al. (2024) showed that 61.1% of patients with type 2 diabetes, but not healthy controls, exhibited aggravated insulin resistance towards the booster shots of the COVID-19 vaccine. Both COVID-19 vaccines and COVID-19 make diabetes worse (Chudov, 2024g).

Hepatitis *Hepatitis* is inflammation of the liver tissue. In Germany, Boettler et al. (2022) found that COVID-19 vaccination can elicit a CD8 T-Cell dominant hepatitis.

Inflammatory Musculoskeletal Disorders In South Korea, Y. H. Park et al. (2023) investigated the incidence rates of inflammatory musculoskeletal disorders following COVID-19 vaccination compared to unvaccinated individuals. At 12 weeks after vaccination, the incidences of plantar fasciitis, rotator cuff syndrome, adhesive capsulitis, HIVD, spondylosis, bursitis, Achilles tendinitis and De Quervain tenosynovitis were higher in all three vaccinated groups (mRNA, cDNA and mixing and matching vaccines) when compared to the unvaccinated group. In conclusion, individuals who received any COVID-19 vaccine were more likely to be diagnosed with inflammatory musculoskeletal disorders than those who did not.

Lymphopenia *Lymphocytopenia* is the condition of having an abnormally low level of lymphocytes in the blood. After a COVID-19 infection or a COVID-19 vaccination, some people develop reactivated and recurrent infections, including herpes, Epstein-Barr virus (EBV), urinary tract infections (UTIs) and even COVID-19 (M. Zhang, 2023b). This phenomenon could be linked to lymphopenia, or low numbers of lymphocytes. Persistent lymphopenia is a hallmark of immune deficiency, which can put people at risk of opportunistic infections.

Pathological Syncytia According to an article published in the *International Journal of Pathology and Clinical Research*, mRNA vaccines may inadvertently facilitate the formation of pathological syncytia (fusion between immune cells) (Sfera et al., 2022).

Postural Orthostatic Tachycardia Syndrome (POTS) *Postural orthostatic tachycardia syndrome* (*POTS*) is a condition characterised by an abnormally large increase in heart rate upon sitting up or standing. Kwan et al. (2022) identified a possible association between COVID-19 vaccination and incidence of postural orthostatic tachycardia syndrome (POTS). In fact, all of the following diagnoses increased after vaccination (in order of decreasing odds) myocarditis, dysautonomia, POTS, mast cell disorders, urinary tract infection (UTI), dizziness, lumbago, fatigue, edema, hyperlipidemia, iron deficiency anaemia (IDA), hypertension, anxiety, depression, gastroesophageal reflux disease (GERD), cellulitis, eczema, diabetes mellitus, Ehlers–Danlos syndrome (EDS) and headache.

Retinal Vascular Occlusion *Retinal vascular occlusion* occurs when small veins in the back of the eye become blocked, and blood cannot flow through them. In Taiwan, J.-X. Li et al. (2023) investigated the risk of retinal vascular occlusion after COVID-19 vaccination using a retrospective cohort study. Individuals who had received a COVID-19 vaccination had a higher

risk of all forms of retinal vascular occlusion within two years after vaccination, with an overall hazard ratio of 2.19. This is shocking, really.

Single Organ Cutaneous Vasculitis (SOCV) *Cutaneous vasculitis* is a group of disorders in which there are inflamed blood vessels in the skin. Walton et al. (2023) identified a statistically significant increased standardised incidence ratio (SIR = 3.7) of single organ cutaneous vasculitis (SOCV) following the first dose of BNT162b2 in the 20–39 years age group.

Skin Diseases In a meta-analysis Hinterseher, Hertl, and Didona (2023) highlighted the association between SARS-CoV-2 vaccination and *de novo* induction or aggravation of inflammatory and autoimmune skin diseases. Furer et al. (2021) found that when patients with autoimmune inflammatory rheumatic diseases were given the BNT162b2 mRNA COVID-19 vaccination, there was an increased prevalence of herpes zoster (shingles). Whilst Stanley, Zhang, O'Hara, Haertsch, and Maitz (2023) identified a seven-fold increase in Stevens–Johnson syndrome (SJS) (a rare and potentially fatal skin disorder) since the COVID-19 pandemic, which may be triggered by COVID-19, COVID-19 vaccinations or a lowered threshold caused by vaccines or previous infection.

Thyroid Dysfunction The *thyroid* is an endocrine gland in the neck and consists of two connected lobes. In an article from Greece published in *Frontiers in Endocrinology*, Paschou et al. (2022) reported that the COVID-19 vaccination can lead to thyroid dysfunction, namely decrease TSH and T3 levels.

VEXAS Syndrome *VEXAS syndrome*, discovered in 2020, is an adult-onset autoinflammatory disease primarily affecting males, caused by a somatic mutation of the *UBA1* gene in hematopoietic progenitor cells. *The Epoch Times* reported that some vaccinated and COVID-19-infected people have been diagnosed with VEXAS syndrome (M. Zhang, 2024d).

VO_2 max *VO_2 max* is the maximum rate of oxygen consumption attainable during physical exertion. Miljoen et al. (2022) found that among 42 recreational endurance athletes, booster vaccination with the BNT162b2 mRNA vaccine resulted in a statistically significant 2.7% decrease in VO_2 max 7 days after vaccination, with a potentially clinically relevant decrease of 8.6% or more in 19% of the athletes.

4.3.17 Long Vax

An article published in *Science* conceded that vaccines may, rarely, cause long COVID-like symptoms, such as fatigue, severe headaches, nerve pain, blood pressure swings and short-term memory problems (Couzin-Frankel & Vogel, 2022). Arjun et al. (2022) analysed the characteristics and predictors of long COVID among diagnosed cases of COVID-19. The most significant variables that predict long COVID are those related to the severity of COVID-19 and, shockingly, having completed two doses of the vaccination (adjusted odds ratio 2.32, p-value 0.01)! The odds ratio of long COVID for acute COVID-19 severity remained similar for subgroups based on COVID-19 vaccination status, ruling out the possibility of interaction between COVID-19 vaccination and acute COVID-19 severity. Another article in *Science* conceded that there is a link between COVID-19 vaccines and long COVID-like illness, such as neurologic complications, blood pressure swings and other side effects, which they term 'Long Vax' (Vogel & Couzin-Frankel, 2023a). A third article in *Science* discussed so-called 'long vax', symptoms following a COVID-19 vaccination that resembles long COVID (Vogel & Couzin-Frankel, 2023b). There are 'uncommon' cases of neurologic complications, blood pressure swings and other side effects following the COVID-19 vaccination. Chudov (2023m) noted that the article tries to give the

impression that the condition is rarer than it actually is. SARS-CoV-2 mRNA vaccination can entail chronic fatigue/dysautonomia, tentatively termed post-acute COVID-19 vaccination syndrome (PACVS). Semmler et al. (2023) provided evidence of PACVS as a somatic disease by linking a clinical phenotype with specific pathognomonic alterations in serological markers. They thus suggested diagnostic criteria for an objective discrimination of PACVS from the healthy post-vaccination condition. In an article published in *PLOS ONE*, Asadi-Pooya et al. (2024) found that for people who had already contracted COVID-19 and now suffer from long COVID, among the unvaccinated 29.4% had long COVID symptoms, whilst among those who received at least one dose of any vaccine 44.6% had long COVID symptoms. The authors concluded that in people who have already contracted COVID-19 and now suffer from long COVID, receiving a COVID-19 vaccination has a significant association with prolonged symptoms of long COVID for more than one year after the initial infection. In the *Australian Journal for General Practitioners*, Robert Tindle noted that there is concern that COVID-19 vaccination per se might contribute to long COVID, giving rise to the colloquial term 'Long Vax(x)'.

Some research suggests the condition may be caused by an immune overreaction to the SARS-CoV-2 spike protein that COVID-19 vaccines use to induce antibodies (Redshaw, 2023b). One theory is that vaccination may cause some people to generate a second round of antibodies that target the first. These antibodies could function like spike protein, which targets the angiotensin-converting enzyme 2 (ACE2) receptor—a cell surface protein—and enables the virus to enter cells. Like spike protein, these 'rogue antibodies' might also bind to the ACE2 receptor and disrupt ACE2 signalling, which can cause conditions associated with long COVID.

Kory (2024b) found that 'long vax' was far more common than long COVID. 70% in his practice are long vax, not long COVID. Furthermore, on average his long vax patients are sicker than his long COVID patients (due to much higher spike protein counts) and tend to have more frequent small fibre neuropathy and dysautonomia. According to Brien commenting on The Naked Emperor (2023e), long vaccine is a much, much bigger problem than long COVID. The problem is that the pathogen is the same in both, the spike protein.

4.3.18 Herd Immunity

Chudov (2022j) argued in April 2022 that if the West had not had lockdowns and vaccinations, herd immunity would have been reached, and COVID-19 would be in the past (just like the Spanish Flu of 1918 became a thing of the past without any vaccines). Unfortunately, after the majority of people were vaccinated, herd immunity is no longer possible in most countries. The following countries, which had low vaccination rates, reached herd immunity: Romania, Bulgaria, Palestine, South Africa and India. (As of 2024, Igor Chudov turned out to be correct, all five countries continued to have lower COVID-19 case rates than Europe.)

4.4 Boosters

A *booster dose* is an extra administration of a vaccine after an earlier (primer) dose. How effective have COVID-19 boosters been?

4.4.1 Asia

4.4.1.1 Israel

In September 2021, el gato malo (2021b) noted that booster shots appeared to be increasing COVID-19 spread and COVID-19 deaths in Israel. Zioni (2021) noted that in Israel in 2021, the booster shot appeared to increase the death rate among those with severe COVID-19. Whilst Shahar (2022c) estimated that the booster fatality rate in Israel in August 2021 was 8–17 deaths per 100,000 vaccinees.

4.4.1.2 Japan

Frequent COVID-19 booster shots may decrease immunity. In a Comment in *Virology Journal*, Yamamoto (2022), from Okamura Memorial Hospital, Shizuoka, Japan, stated that the decrease in immunity can be caused by several factors such as N1-methylpseudouridine, the spike protein, lipid nanoparticles, antibody-dependent enhancement and original antigenic stimulus.

4.4.1.3 Qatar

In Qatar, Chemaitelly et al. (2022) found that from the seventh month and thereafter, coincident with BA.4/BA.5 and BA.2.75* subvariant incidence, booster effectiveness was progressively negative reaching -20.3% after one year of follow-up.

4.4.2 Europe

In December 2021 Radagast (2021) warned of a pandemic for the boosted, because of the virus's high selective pressure to evade the vaccinated's immune response.

4.4.2.1 Gibralta

In Gibraltar, the dates of the day with the highest daily cases for each boosted age group follow the order in which they were boosted (Dr.Simon, 2021). In other words, boosters cause cases among the boosted to rise. The blogger eugyppius (2021a) also reported that boosters increased cases in Gibraltar. Only the second dose does not enhance infections, presumably, he suggests, because it is administered in the protective shadow of the first one.

4.4.2.2 United Kingdom

Chudov (2022l) reported in February 2022 that UK data showed that booster effectiveness against cases was negative and falling. Whilst boosters were still protective against death. However, in April 2022 el gato malo (2022i) reported that in England boosters were associated with higher death rates. In January 2022 Livermore (2022) recommended the booster for (only) the over-50s and anyone with specific risk factors. However, in the UK, a YouGov poll conducted in October 2022 found that 48% of 18–24-year-olds said they would take a COVID-19 vaccine booster if offered in the winter (Conner, 2022). Professor Angus Dalgleish, a professor of oncology at St George's, University of London, argued in April 2023 that vaccine boosters do more harm than good (Dalgleish, 2023a).

4.4.3 North America

Bardosh, Krug, et al. (2022b) performed a cost–benefit assessment of SARS-CoV-2 boosters for young previously uninfected adults under 40 years old. They found that booster mandates may cause a net expected harm: per COVID-19 hospitalisation prevented in previously-uninfected young adults, they anticipated 18 to 98 serious adverse events, including 1.7 to 3.0 booster-associated myocarditis cases in males, and 1,373 to 3,234 cases of grade ≥ 3 reactogenicity which interferes with daily activities. The authors argue that university booster mandates are unethical because 1) no formal risk–benefit assessment exists for this age group; 2) vaccine mandates may result in a net expected harm to young people; 3) mandates are not proportionate: expected harms are not outweighed by public health benefits given the modest and transient effectiveness of vaccines against transmission; 4) US mandates violate the reciprocity principle because rare serious vaccine-related harms will not be reliably compensated due to gaps in current vaccine injury schemes; and 5) mandates create wider social harms.

4.4.3.1 United States

In May 2022, el gato malo (2022c) analysed historical VAERS, and concluded that COVID-19 boosters were causing more severe adverse events than previous doses. As of March 2023, the US had not authorised another round of booster shots for older and immunocompromised citizens (Mandavilli, 2023).

4.5 Vaccinations Cost–Benefit Analysis

4.5.1 Introduction

Vaccinations should pass a cost–benefit analysis, but this can be done at the individual or population level (George & Mildred, 2023a, 2023b). For example, an individual may not benefit from being vaccinated, but the vaccination could reduce transmission to others. Such a scenario could lead to coercive policies, encouraging people to get vaccinated for the greater good. Note that even if the risk of a serious adverse reaction to a COVID-19 vaccination is small, for most people (especially those most at risk of myocarditis, young males) so is the risk of severe COVID-19. In the UK, vaccinating the under 50s, at an estimated cost of £30 per dose, costs around £1 billion, a fifth of the cancer budget (Ellse, 2022). By June 2023 Britain's COVID-19 vaccine injury bill had surpassed £12 million (Stearn, 2023a).

4.5.2 Risk–Benefit Ratio

In the US, Trial Site News (2024) reported a benefit–risk assessment of the Moderna mRNA-1273 COVID-19 vaccine for males, based on information available by the third week of January 2022. The vaccination of 18–25-year-old males generated between 16% and 63% more hospitalisations from vaccine-attributable myocarditis/pericarditis alone compared to COVID-19 hospitalisations prevented. Using data from Israel and the Netherlands, Walach, Klement, and Aukema (2021) calculated that for every six deaths prevented by COVID-19 vaccination, there were approximately four deaths after vaccination, yielding a potential risk/benefit ratio of 2:3. Siglaugsson (2023a) estimated that in Iceland the COVID-19 vaccination saved just 20 lives, whilst 60–70 may have been lost from it. In a narrative review in *Cureus*, Mead, Seneff, Wolfinger, et al. (2024b) estimated that harms of the COVID-19 mRNA vaccines greatly outweigh the rewards: for every life saved, there were nearly 14 times more deaths caused by the modified mRNA injections. The Editors-in-Chief retracted this article, stating that 'the conclusions of this narrative review are considered to be unreliable due to the concerns with the validity of some of the cited references that support the conclusions and a misrepresentation of the cited references and available data'. The authors disagreed with the retraction. In an article published in the *International Journal of Vaccine Theory, Practice, and Research*, Mead, Seneff, Wolfinger, et al. (2024a) estimated that for mRNA vaccines, for every life saved, there would have been nearly 14 times more deaths.

4.5.3 Which Age Groups Benefit?

For which age groups do the vaccinations pass a cost–benefit analysis? Using a decision tree model, Kitano, Thompson, Engineer, Dudley, and Salmon (2023) calculated the benefit–risk ratio and the benefit–risk difference of receiving monovalent messenger RNA (mRNA) COVID-19 vaccine (primary 2 doses, a third dose, and a fourth dose) in the 4–5 months after vaccination, during the Omicron era, using quality-adjusted life years. The authors concluded that the benefits of mRNA COVID-19 vaccines in protecting against the Omicron variant outweighed the risks, irrespective of age, sex and comorbidity. However, Lataster (2024j) pointed out that the data in the study are subject to counting window issues. Furthermore, the authors only consider

vaccine effectiveness and safety up to around 5 months after the last injection. Finally, the potential benefits of the vaccines are minimal at best, at least in the young and healthy. Using data from the ONS, The Exposé (2022d) pointed out in no uncertain terms that vaccinations for children do not pass a cost–benefit analysis in terms of all-cause mortality. In the US, Arora (2024) discovered that the Food and Drug Administration (FDA) recommended COVID-19 vaccination in children despite the risks, due to an improper cost–benefit analysis. On his blog, el gato malo (2021k) estimated that the costs of vaccinating 5–11-year-olds with the Pfizer vaccine are an order of magnitude greater than the benefits. Krug, Stevenson, and Høeg (2022) conducted a cost–benefit analysis of first and second doses of mRNA vaccination in adolescent boys. Among 12–17-year-olds, two-dose vaccination was uniformly favourable only in nonimmune girls with a comorbidity. In boys with prior infection and no comorbidities, even one dose carried a greater cost than benefit. In Denmark, the government announced in August 2022 that people under the age of 18 were no longer allowed to get the COVID-19 vaccine (M. Campbell, 2022). In 2022, students at North American universities with third-dose COVID-19 vaccine mandates risked disenrollment if unvaccinated. Bardosh, Krug, et al. (2022a) calculated that in the Omicron era for adults under 30 years old, a booster (third) mRNA vaccine does not pass a risk–benefit analysis. Thus university COVID-19 vaccine booster mandates are likely to cause net expected harm to young healthy adults, and are clearly unethical. According to (Swiss Policy Research, 2021a), for healthy and lean adults below 40 years of age, as well as for healthy children and adolescents, the risk/benefit ratio of COVID-19 vaccination does not appear to be favourable. Swiss Policy Research (2022a) concluded that the vaccination of people at significant risk of severe COVID-19 was a major medical success in 2021, despite timing issues and rapidly declining protection. Whilst the mass vaccination of young and healthy people up to about 40-years-old was clearly a mistake (or even medical misconduct). In the Omicron era, vaccination still seems to provide a mortality benefit to people at high risk of severe COVID-19, but the long-term mortality impact of COVID-19 vaccination remains rather uncertain. In Denmark, as of September 2022, the Danish Health Authority (2022) only recommended the vaccination of people aged 50 years and over plus selected at-risk groups. In the retracted narrative review referenced above (Section 4.5.2) (Mead, Seneff, Wolfinger, et al., 2024b), the authors concluded that for the vast majority of adults under the age of 50, the perceived benefits of the mRNA boosters are profoundly outweighed by their potential disabling and life-threatening harms. In a preprint, using publicly available UK and US data, Dopp and Seneff (2022) calculated that for those aged under 60, the risk of death from the COVID-19 vaccination was greater than the risk of death from COVID-19. Whilst those aged 60 and above benefited from the vaccination. Steve Kirsch collected survey data on deaths, which showed that vaccinations were, on average, harmful to those under 60, but beneficial to those over 60 (Kirsch, 2022g). Laderoute (2022) argued that in England for the 60+ age group, from January 2022 to May 2022, the third dose of the mRNA vaccine appeared to increase the risk of death. In October 2021, el gato malo (2021l) suggested that the vaccines only passed a cost–benefit analysis for those over 60 (or with comorbidities) who were COVID-19 naive. Carl (2023e) argued that vaccinating the elderly (over 60/65, i.e. focused protection) saved lives. In England and Wales, those older than 76 at the start of the pandemic were the only cohort to show a lower excess mortality rate post-vaccinations (Smalley, 2023h). Ben (2023b) analysed data from England, and concluded that the vaccine has never significantly protected those aged over 80 from death. Whilst it appeared that the vaccine led to more deaths for all age groups in 2022. In an informative preprint article, R. P. Jones and Ponomarenko (2023) consider all-cause mortality data for England between January 2021 and May 2022 compiled by the ONS. COVID-19 vaccination of the elderly had generally been a success. Whilst mRNA vaccines for children aged 10–19 had adverse all-cause mortality. They state that it may have been better not to vaccinate against Omicron, except perhaps in those over 80 years. Whilst from the beginning of 2023 the cost and risk of further mRNA vaccination could be counterproductive in terms of the net mortality benefit. Using official, national

data Smalley (2024a) estimated the impact of vaccinations on mortality in 2021. For the over 80s, vaccinations saved around 13,000 lives, the majority of those lives saved were in February and March. However, for the under-80s, the vaccinated died at higher rates than expected. There were at least 2,500 more deaths in the 65 to 79 age group. At least 600 more deaths than expected in the 50- to 64-year-olds. At least 1,500 more deaths in the 30- to 49-year-olds, starting from March 2021. And finally, at least 300 more deaths in the 20- to 29-year-olds. In short, in 2021 vaccinations saved lives, but only in the over 80s. On the basis of cost–benefit analysis, Swiss Policy Research (2022c) recommended the vaccines for senior citizens, but not for healthy young adults and children. Martin Kulldorff and Jay Bhattacharya point out in *The Hill* that it is not clear that vaccinating young people passes a cost–benefit analysis (Kulldorff & Bhattacharya, 2021). Later, Kulldorff (2022a) analysed Fraiman et al. (2022) and a preprint of Benn et al. (2023), and considered risks and benefits across different age groups. He concluded that the COVID-19 recovered and children should not take mRNA vaccines, but older people who have never had COVID-19 and have yet to be vaccinated may benefit. Whilst for working-age adults who have not had COVID-19 and have not been vaccinated it was unclear whether the benefits exceeded the costs. Sir David Spiegelhalter said that for the AstraZeneca vaccine the harms could very well outweigh the benefits for younger people who did tend to get blood clots more (*The Telegraph*, 2023a). In an insightful but unpublished paper, Pantazatos and Seligmann (2021) analysed COVID-19 vaccinations and age-stratified all-cause mortality risk and concluded that the risks of COVID-19 vaccines and boosters exceeded the benefits for children, young adults and older adults with low occupational risk or previous coronavirus exposure. In an unpublished but novel paper using data from Israel and Australia, D. G. Rancourt, Baudin, Hickey, and Mercier (2023a) calculated that the vaccine-dose fatality rate (the ratio of vaccine-induced deaths to vaccine doses delivered in a population) from the COVID-19 vaccines increases exponentially with age, with a doubling time of approximately 5.2 years, and is close to 1% for the oldest age group. Because the risk of death from COVID-19 also increases exponentially with age, this is an interesting result.

4.5.4 Conclusion

In September 2021, el gato malo (2021a) estimated that the vaccine failed a cost–benefit analysis (in terms of all-cause mortality) for 2/3 or maybe even 3/4 of those vaccinated. Kirsch et al. (2021) concluded that the COVID-19 vaccines have killed more people than they have saved, and estimated that, as of 28 August 2021, the COVID-19 vaccines had killed over 150,000 Americans. Vaccine manufacturers and government officials promote the vaccines using a surrogate measure of health, severe infections with COVID-19. However, a better, all-inclusive, measure of health would be to use all-cause severe morbidity. Classen (2021) reanalysed the pivotal Moderna, Pfizer and Janssen clinical trials using all-cause morbidity as the primary endpoint. Results showed that none of the vaccines provided a health benefit, and all of the trials showed a statistically significant increase in all-cause severe morbidity in the vaccinated group compared to the placebo group. Radagast (2022j) argued that all of the mRNA injections with the Wuhan spike protein are a mistake, even in the elderly. However, they do succeed at kicking the can down the road by a few months, at the cost of greater pain once the antibody response wanes. Seen through that light, all of the numbers we observe in different countries start to make sense. In August 2022 Will Jones estimated that in the UK vaccines saved around 35,000 lives during the Delta wave and around 20,000 during the early Omicron waves, giving a total of 55,000 lives saved (W. Jones, 2022j). Whilst he estimated that 62,500 over-60s were fatally injured by the vaccine programme. In other words, it is likely that the vaccine programme failed to save any lives overall and was a very costly mistake. In an interesting analysis of deaths by vaccination status data from England up to May 2022, W. M. Briggs (2022) found that the vaccine had a positive effect early on (in terms of both COVID-19 and non-COVID-19 deaths), but by May 2022 the vaccinated and unvaccinated death rates (both COVID-19 and non-COVID-19) had

converged.

4.6 Experiment 4: Analysis of Vaccination Programmes

If vaccination programmes have delivered a net benefit to society, they should reduce the age-standardised mortality rate. After a vaccine programme has been rolled out, what are the long-term effects on COVID-19 deaths and excess mortality? Australia and New Zealand had almost no COVID-19 when vaccines were introduced, making them a useful control group. Figure 14 shows COVID-19 vaccination doses and COVID-19 deaths in Australia and New Zealand. Figure 15 shows COVID-19 vaccination doses and excess mortality in Australia and

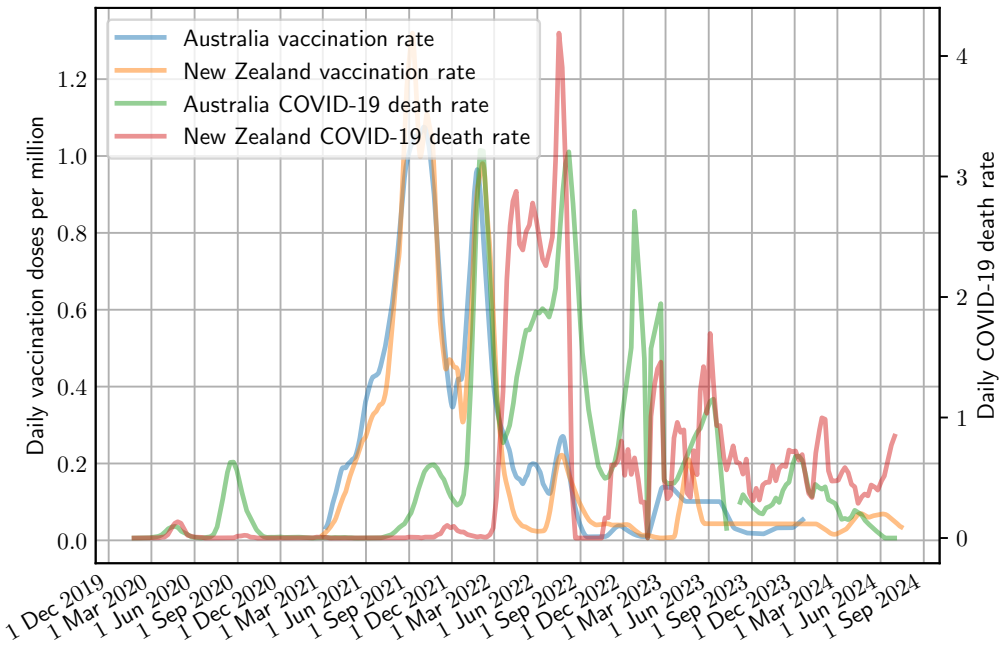

Figure 14: COVID-19 vaccination doses and COVID-19 deaths for Australia and New Zealand

New Zealand. COVID-19 deaths in Australia and New Zealand only really took off after the vaccination programmes began. Whilst in Australia and New Zealand excess mortality has been elevated ever since vaccination programmes began. Of course, no causality can be inferred with certainty, but in light of the data the vaccination programmes appear to do more harm than good.

Now consider data from all countries. From January 2022, highly vaccinated countries had more COVID-19 deaths than low-vaccinated countries. Medium-vaccinated countries were intermediate (see Figure 16). From March 2022, highly vaccinated countries had significantly greater excess mortality than low-vaccinated countries. Medium-vaccinated countries are intermediate (see Figure 17).

However, there will be many confounding variables. In an attempt to ameliorate this as best we can, we first cluster countries according to pre-vaccination COVID-19 deaths and pre-vaccination excess mortality, using k-means clustering with two clusters.[10]

[10]Figures for up to 20 clusters are available from `https://github.com/MartinSewell/COVID-19/tree/main/figures`.

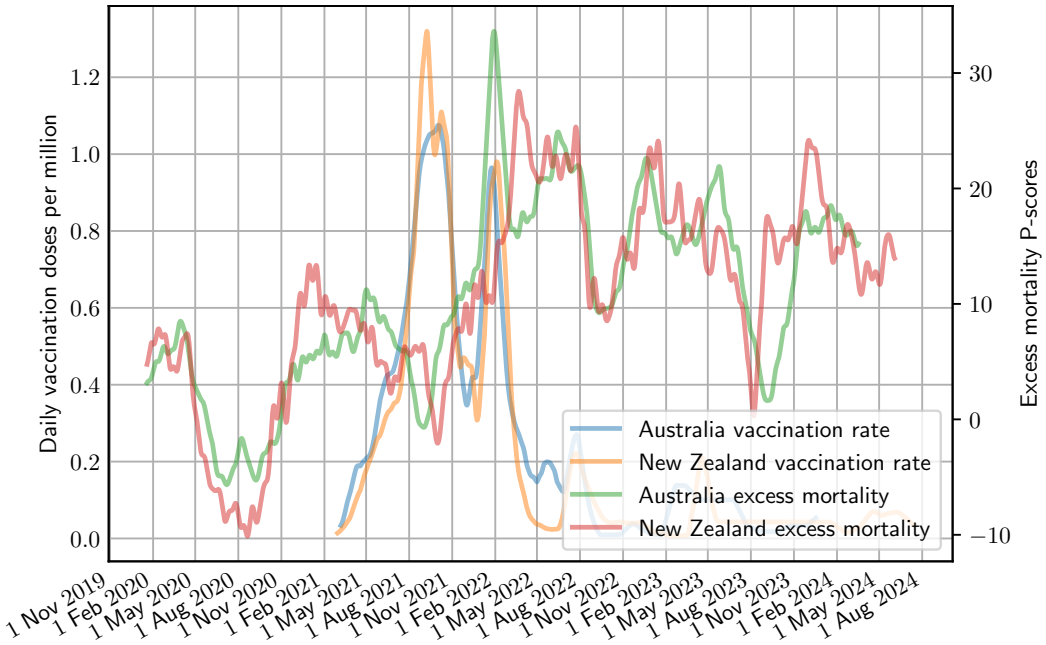

Figure 15: COVID-19 vaccination doses and excess mortality for Australia and New Zealand

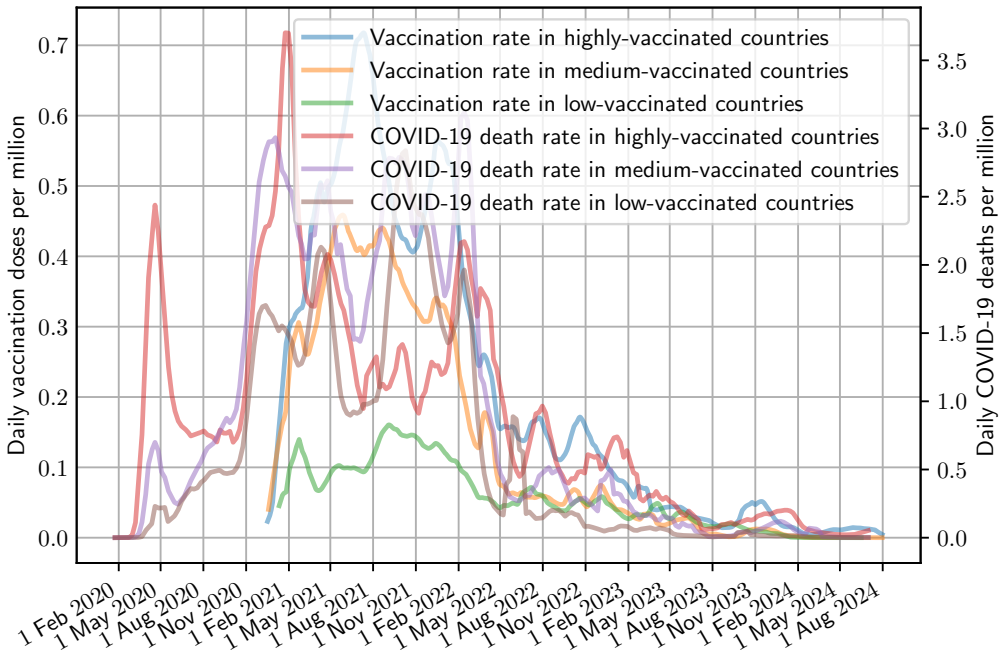

Figure 16: Vaccinations and COVID-19 deaths

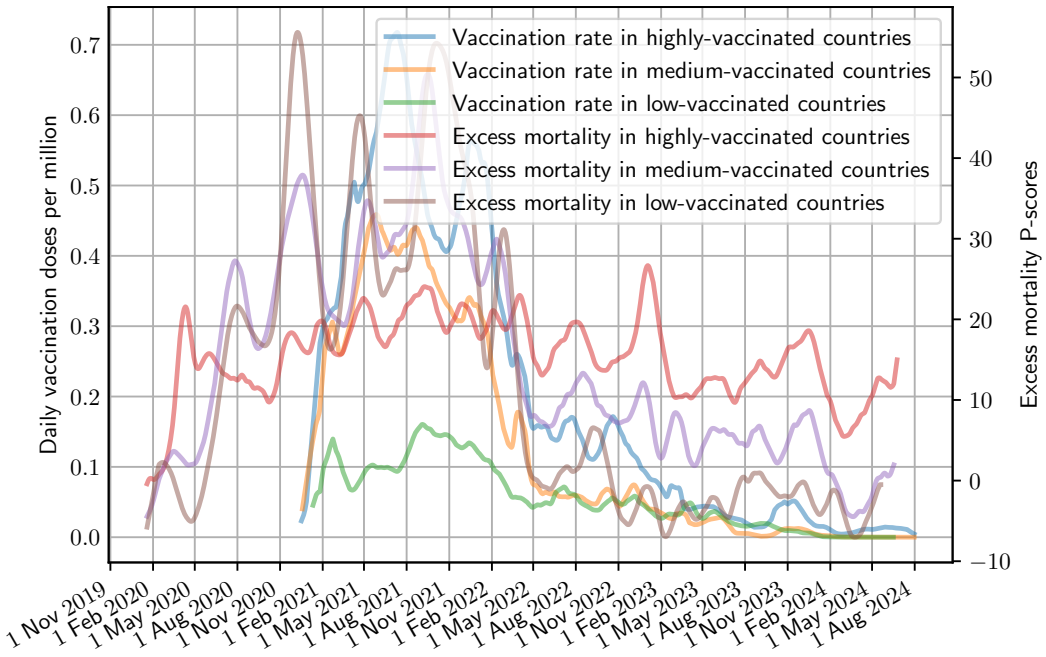

Figure 17: Vaccinations and excess mortality

Let us consider cluster 1. Figure 18 shows vaccinations and COVID-19 deaths for countries in cluster 1. Up until around 1 April 2022 (when most COVID-19 deaths occurred), low-vaccinated countries experienced the highest COVID-19 deaths, highly vaccinated countries experienced the lowest COVID-19 deaths. Medium-vaccinated countries were intermediate. After 1 April 2022 (a period with far fewer COVID-19 deaths), the highly vaccinated countries had the highest COVID-19 death rate, low-vaccinated countries the lowest COVID-19 death rate, with medium-vaccinated countries intermediate. Figure 19 shows vaccinations and excess mortality for countries in cluster 1. Up until the end of 2021, there is no clear pattern. From 2022 onwards, highly vaccinated countries had the highest excess mortality, low-vaccinated countries had the lowest excess mortality, and medium-vaccinated countries were intermediate.

Let us now consider cluster 2. Figure 20 shows vaccinations and COVID-19 deaths for countries in cluster 2. Up until the end of 2021, the medium-vaccinated countries had the highest COVID-19 death rate. From 2022 onwards, highly vaccinated countries had the most COVID-19 deaths, low-vaccinated countries had the lowest COVID-19 death rate and medium-vaccinated countries had an intermediate COVID-19 death rate. Figure 21 shows vaccinations and excess mortality for countries in cluster 2. Before around 1 April 2022, low-vaccinated countries had the highest excess mortality, highly vaccinated countries the lowest excess mortality and medium-vaccinated countries an intermediate excess mortality. After around 1 April 2022, this reversed, with highly vaccinated countries having the highest excess mortality, and low vaccinated countries having the lowest excess mortality.

Now, what conclusions can be drawn from our cluster analysis? In all cases, from either January 2022 or April 2022 onwards, the highly vaccinated countries had the most COVID-19 deaths and the most excess deaths. This lends evidence to the hypothesis that vaccination programmes, on average across all ages, lead to an increase in both COVID-19 deaths and excess deaths over the longer term (post-pandemic).

When a vaccine programme commences, what is the short-term effect across the popula-

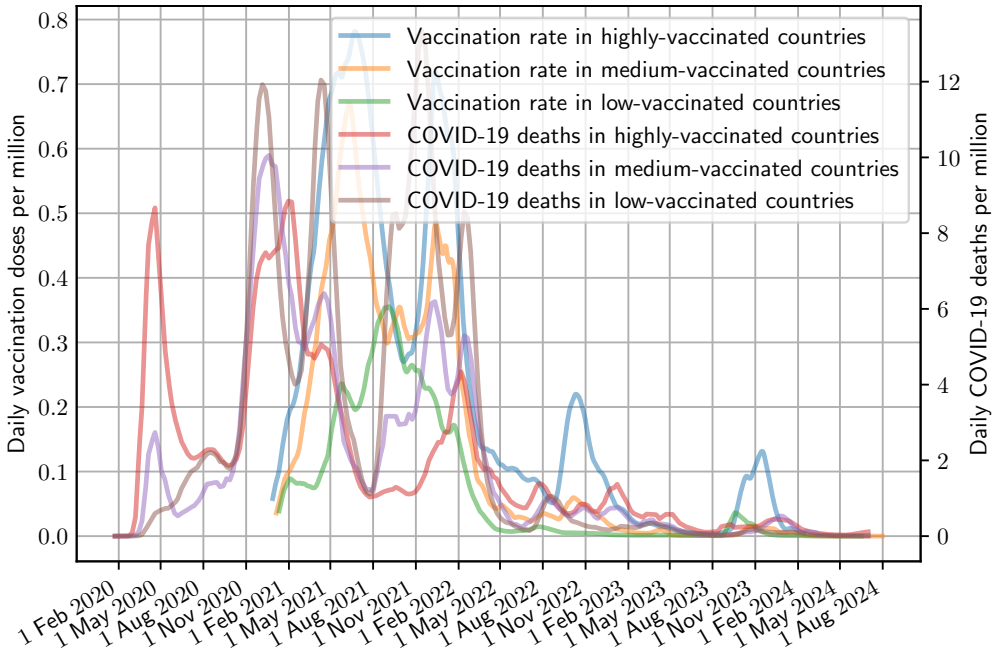

Figure 18: Vaccinations and COVID-19 deaths for countries in cluster 1

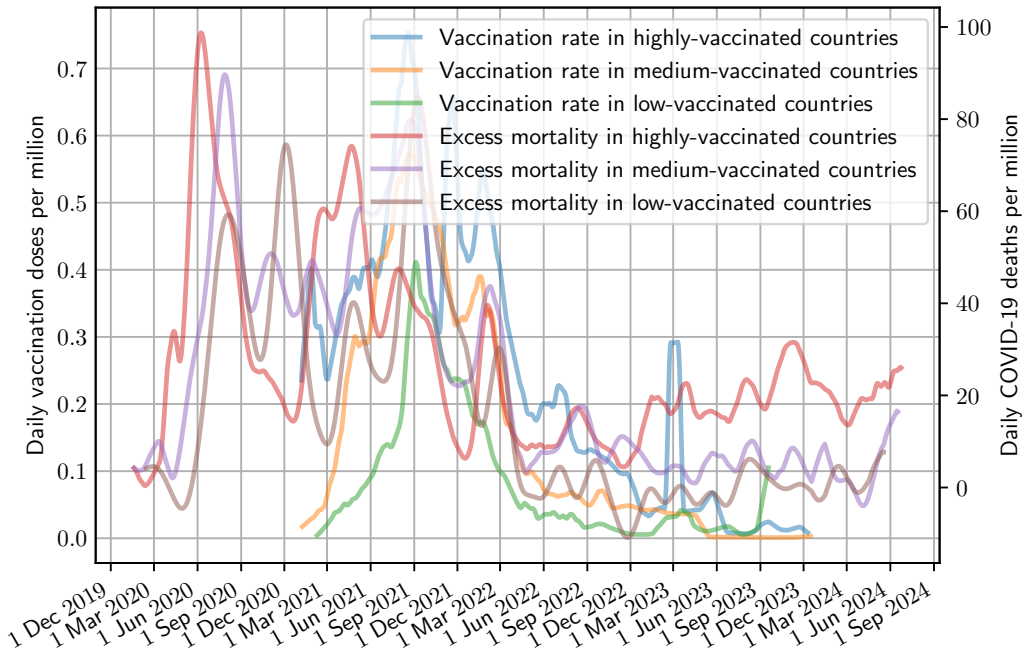

Figure 19: Vaccinations and excess mortality for countries in cluster 1

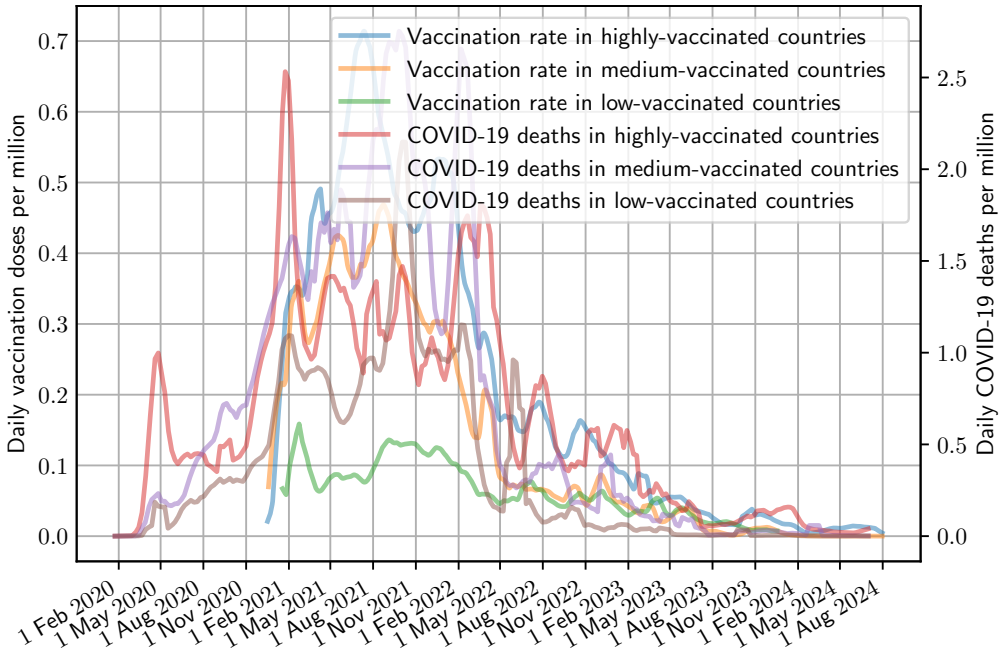

Figure 20: Vaccinations and COVID-19 deaths for countries in cluster 2

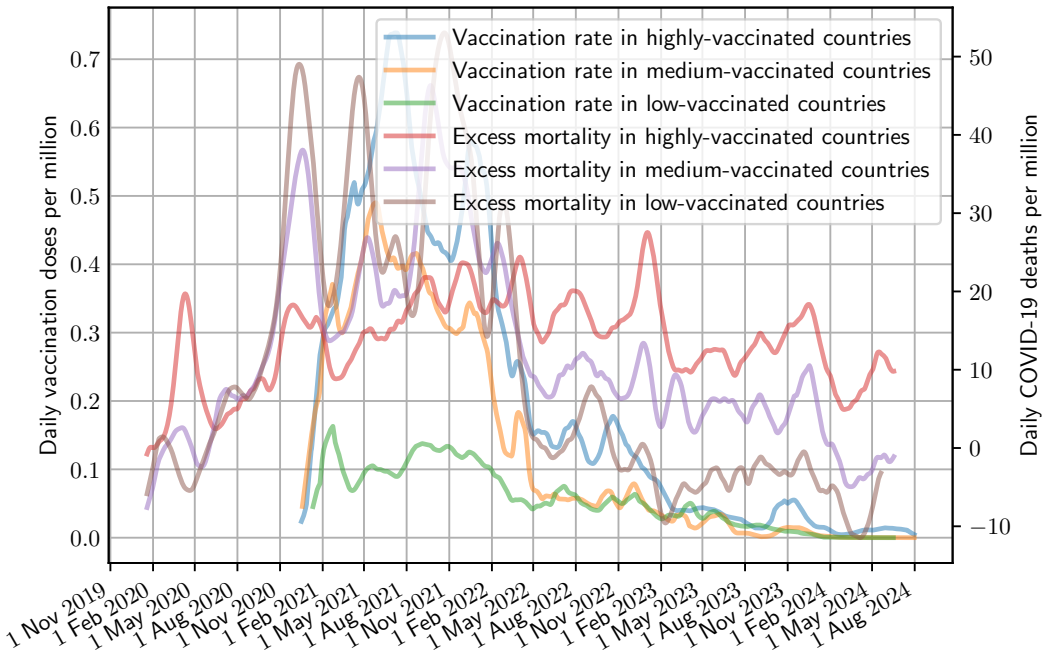

Figure 21: Vaccinations and excess mortality for countries in cluster 2

tion on COVID-19 deaths and excess mortality? To answer the question, we need to select two neighbouring populations with good data, that had similar COVID-19 deaths and similar age-standardised all-cause mortality before vaccination programmes were rolled out, but with significantly different timing of vaccination rates. The best pair that I could find was Croatia and Hungary. Hungary rolled out its vaccination programme more rapidly. Figure 22 shows COVID-19 vaccination doses and COVID-19 deaths for Croatia and Hungary.

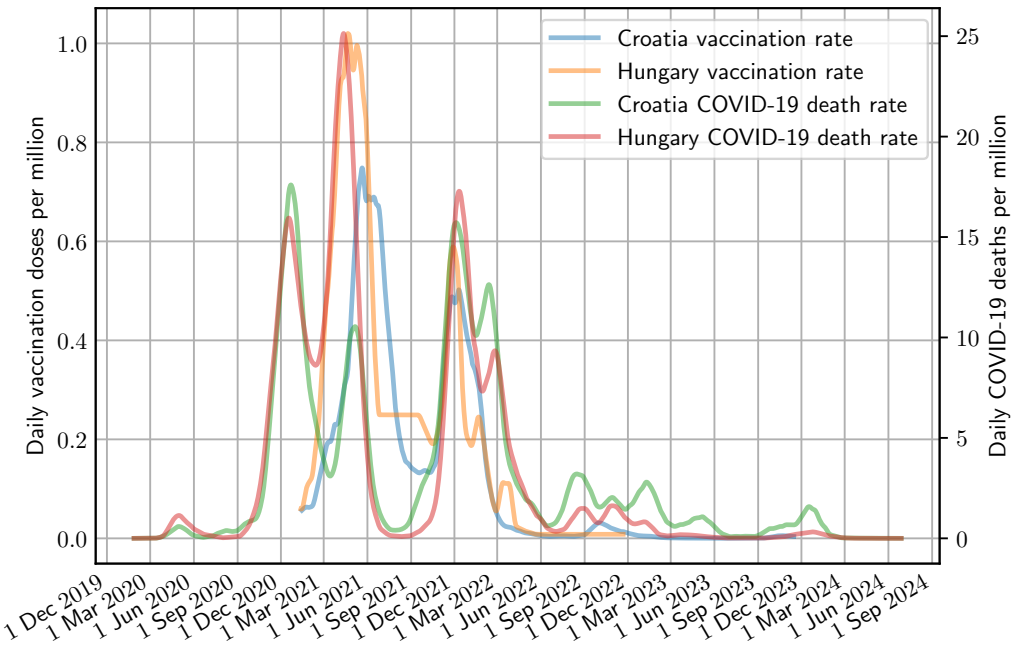

Figure 22: COVID-19 vaccination doses and COVID-19 deaths for Croatia and Hungary

To better enable comparisons across countries, we can measure age-standardised excess mortality as the percentage difference between the reported and projected number of deaths. Our World in Data term this the P-score, and it is calculated as follows:

$$\text{P-score} = \frac{\text{Reported Deaths} - \text{Projected Deaths}}{\text{Projected Deaths}} \times 100.$$

New daily COVID-19 vaccination doses per million and excess mortality P-scores averaged across all ages for Croatia and Hungary were downloaded from Our World in Data, and plotted.[11] Figure 23 shows COVID-19 vaccination doses and excess mortality for Croatia and Hungary.

If something causes an increase in mortality in the elderly for a period of time, excess mortality will increase in the short term, but, *ceteris paribus*, we would actually expect a *decrease* in excess mortality later on, as there are fewer frail elderly people. For this reason, we need to limit our analysis to the near term. So let us consider the period during which Hungary had a greater number of vaccines per day than Croatia, which takes us to 5 June 2021. Let's zoom in on the two previous graphs. Figure 24 shows COVID-19 vaccination doses and COVID-19 deaths for Croatia and Hungary up to 5 June 2021. Figure 25 shows COVID-19 vaccination

[11]The vaccination doses data was downloaded from `https://ourworldindata.org/grapher/covid-vaccination-doses-per-capita` and the excess mortality data was downloaded from `https://ourworldindata.org/grapher/excess-mortality-p-scores-average-baseline-by-age`. The excess mortality data was converted from weekly to daily using barycentric rational interpolation from the Boost C++ Libraries.

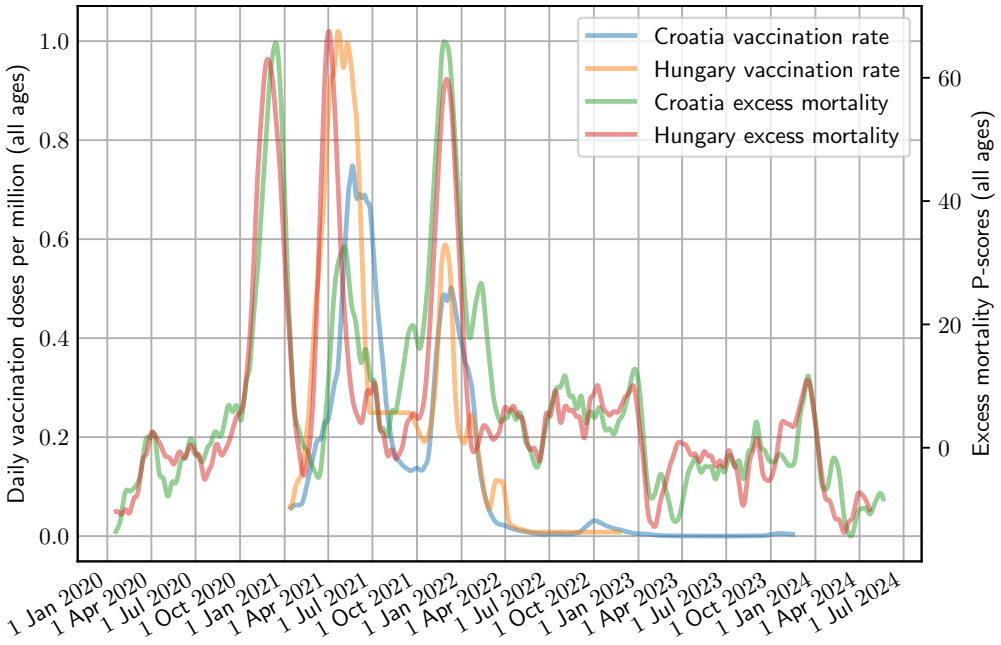

Figure 23: COVID-19 vaccination doses and excess mortality for Croatia and Hungary

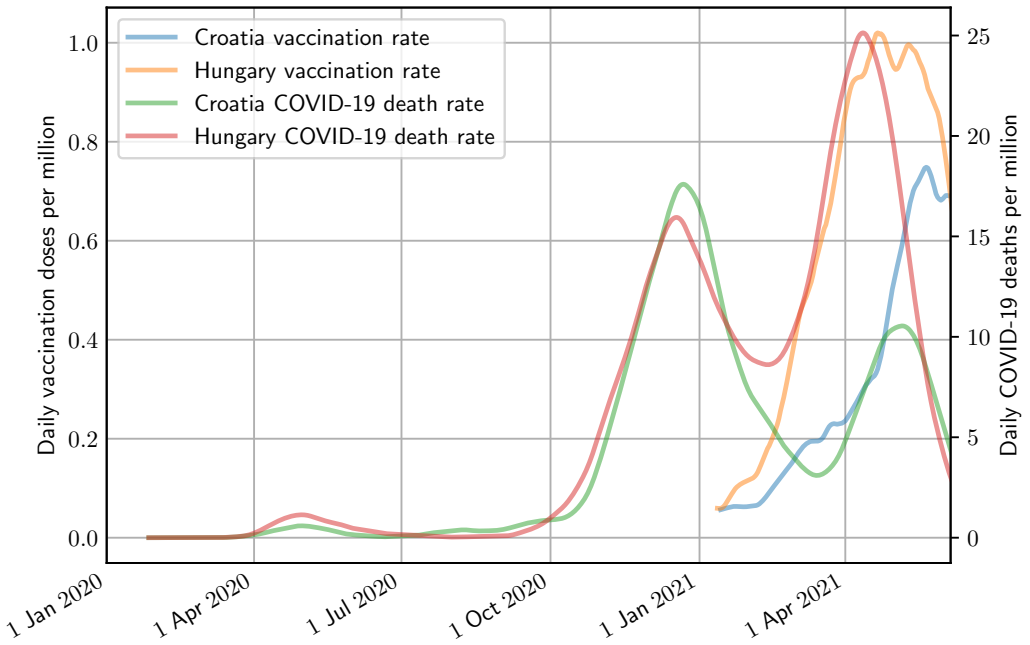

Figure 24: Vaccinations and COVID-19 deaths for Croatia and Hungary

doses and excess mortality for Croatia and Hungary up to 5 June 2021.

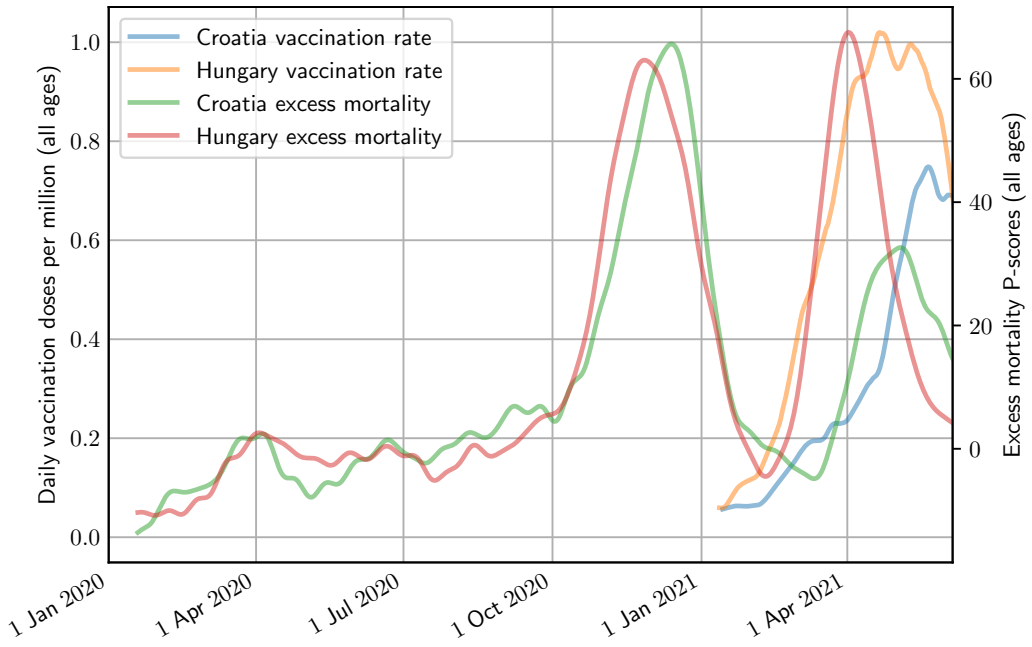

Figure 25: Vaccinations and excess mortality for Croatia and Hungary

Let's explicitly look at the *differences* between the two countries. Figure 26 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary COVID-19 death rate minus the Croatia COVID-19 death rate up to 5 June 2021. Figure 27 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary excess mortality minus the Croatia excess mortality up to 5 June 2021.

Finally, let us consider the same graph for excess mortality for various age groups. Figure 28 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary excess mortality for ages 0–14 minus the Croatia excess mortality for ages 0–14 up to 5 June 2021. Figure 29 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary excess mortality for ages 15–64 minus the Croatia excess mortality for ages 15–64 up to 5 June 2021. Figure 30 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary excess mortality for ages 65–74 minus the Croatia excess mortality for ages 65–74 up to 5 June 2021. Figure 31 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary excess mortality for ages 75–84 minus the Croatia excess mortality for ages 75–84 up to 5 June 2021. Figure 32 shows the Hungary vaccination rate minus the Croatia vaccination rate and the Hungary excess mortality for ages 85+ minus the Croatia excess mortality for ages 85+ up to 5 June 2021.

Hungary rolled out its vaccination programme more rapidly, and COVID-19 deaths started increasing. Whilst Croatia rolled out its vaccination programme more slowly, and COVID-19 deaths started increasing later and to a lesser degree. The best pairs experiment we have evidences that COVID-19 vaccination programmes increase both the incidence of COVID-19 deaths and excess mortality in the population in the short term for those aged over 15, and especially for those aged 15–74.

Of course, it is not a perfect experiment. There could been confounding variables. Also, different countries used different proportions of different types of vaccinations. By 4 June 2021,

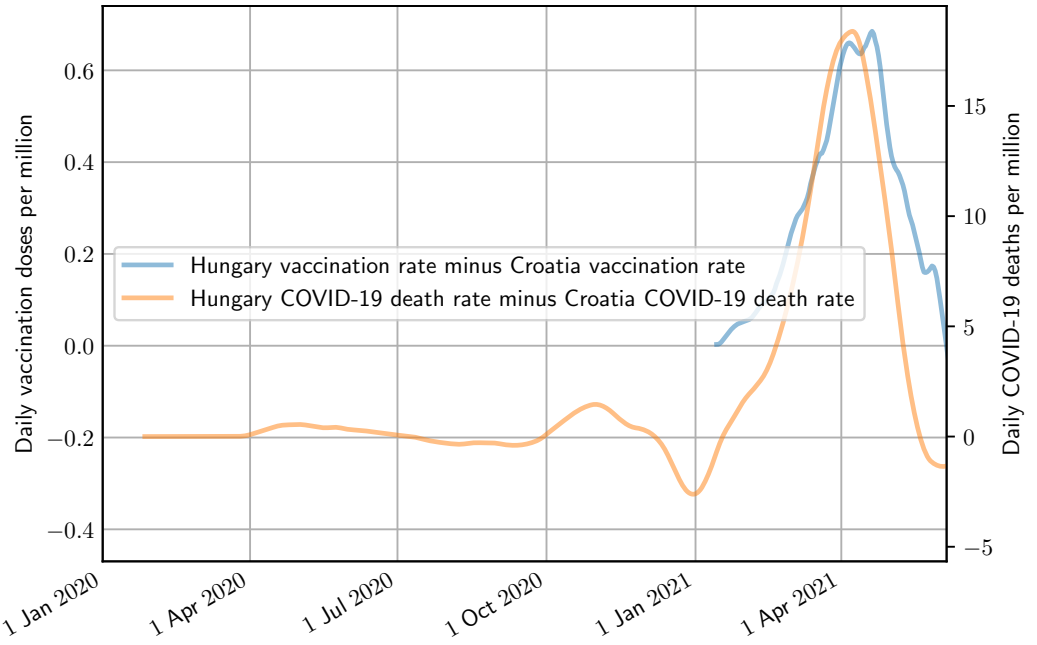

Figure 26: Vaccinations and COVID-19 deaths for Croatia and Hungary (differences)

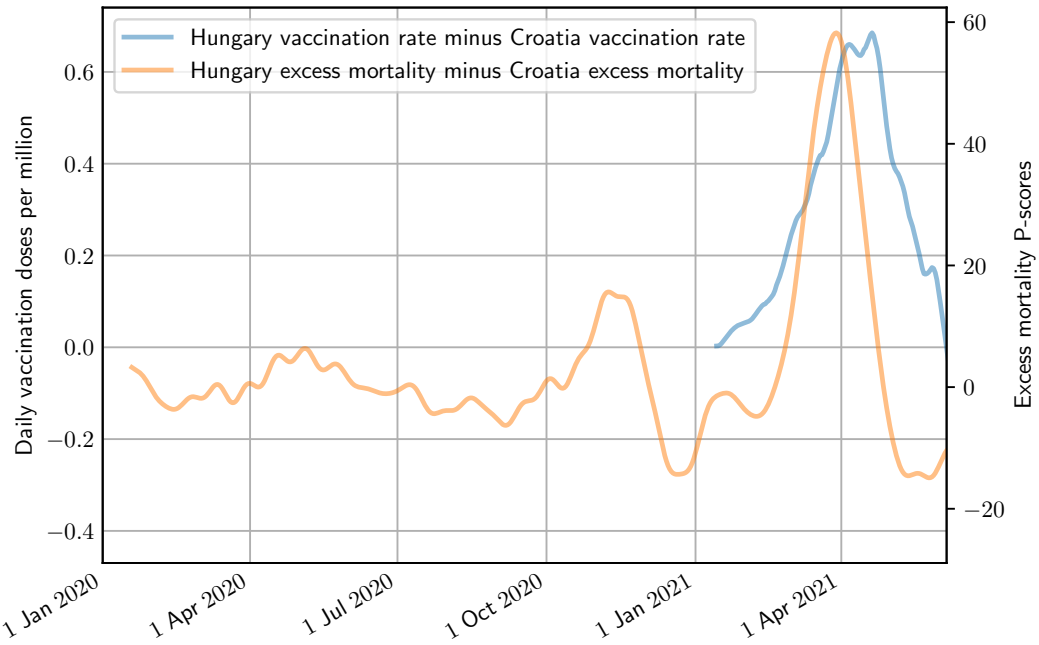

Figure 27: Vaccinations and excess mortality for Croatia and Hungary (differences)

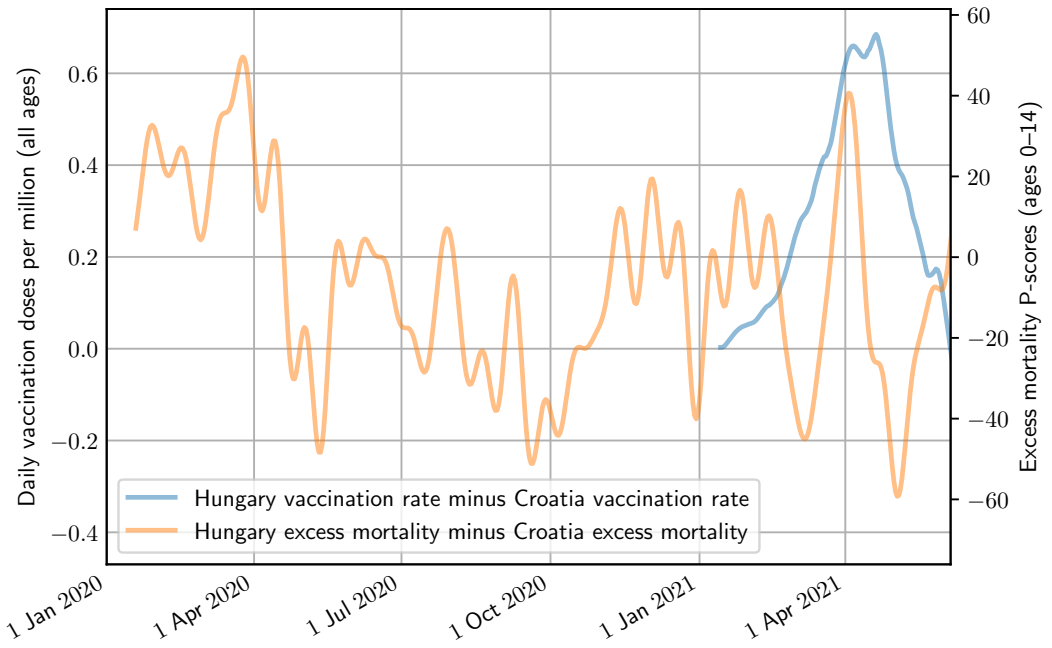

Figure 28: Vaccinations and excess mortality for ages 0–14 for Croatia and Hungary

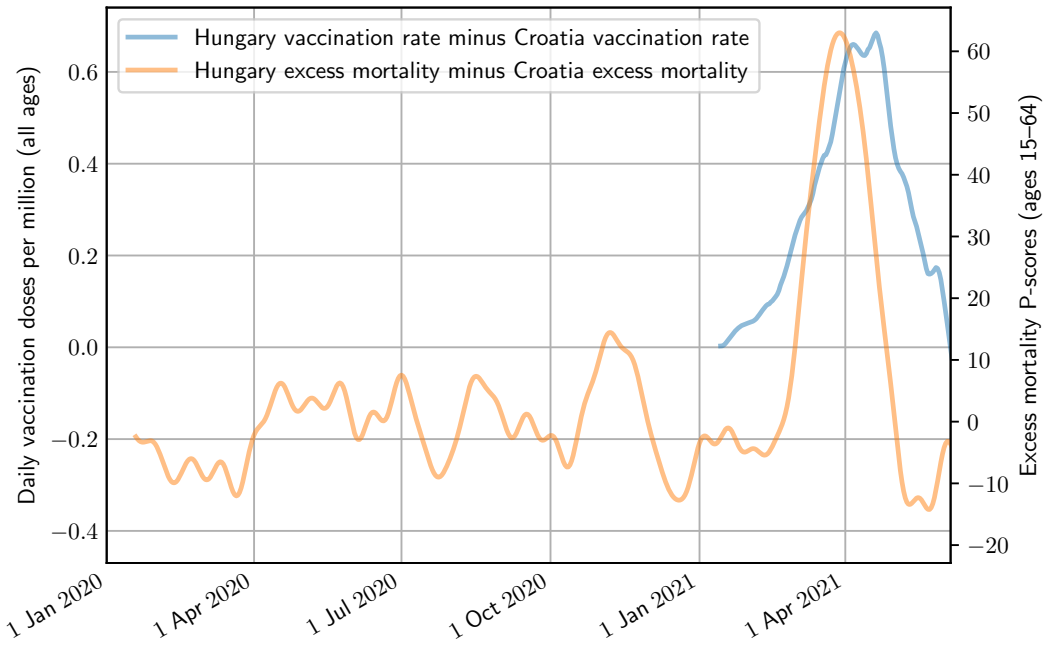

Figure 29: Vaccinations and excess mortality for ages 15–64 for Croatia and Hungary

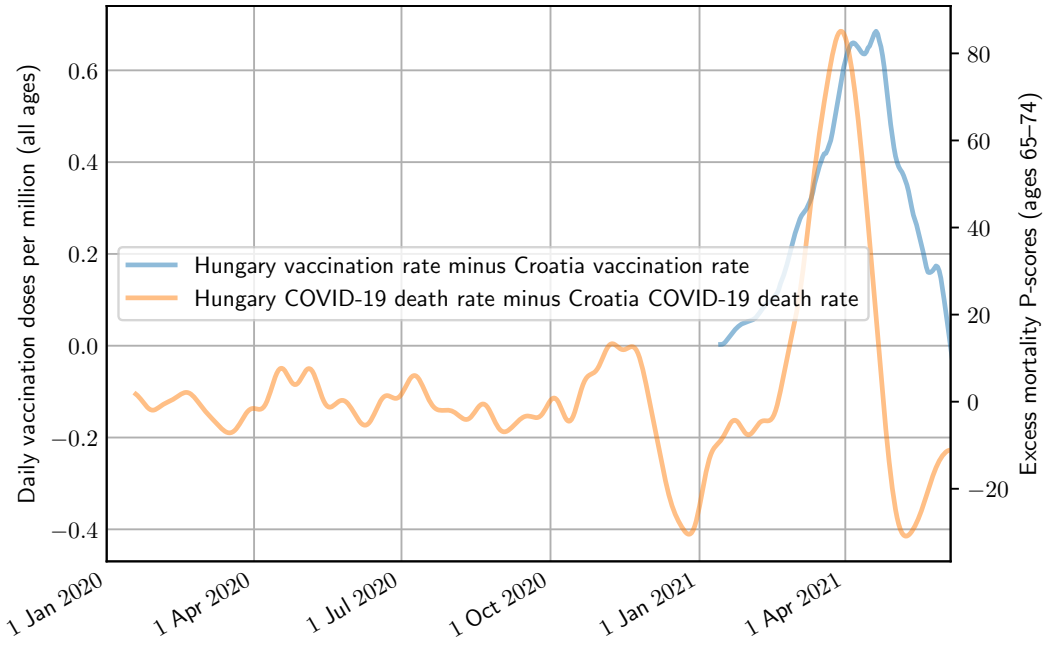

Figure 30: Vaccinations and excess mortality for ages 65–74 for Croatia and Hungary

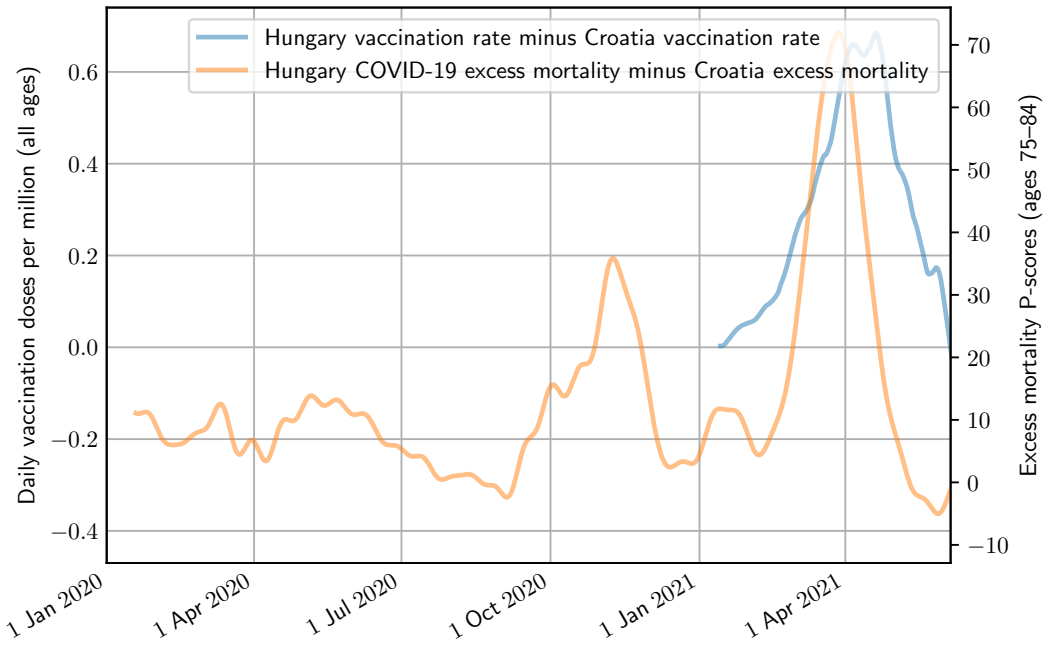

Figure 31: Vaccinations and excess mortality for ages 75–84 for Croatia and Hungary

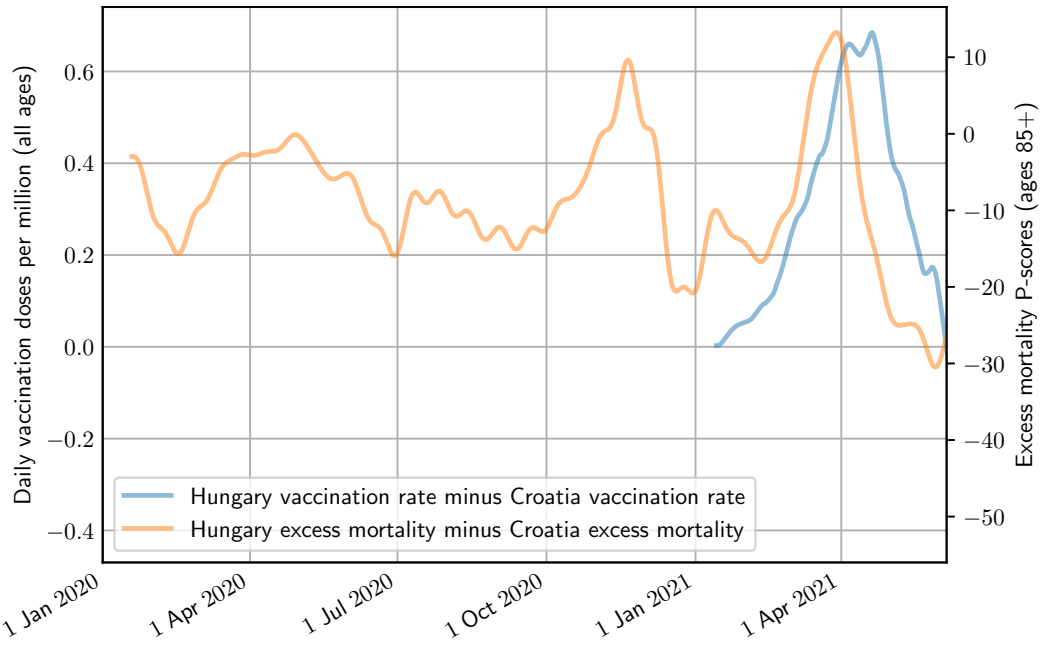

Figure 32: Vaccinations and excess mortality for ages 85+ for Croatia and Hungary

Croatia's vaccine doses were 66% Pfizer/BioNTech, 22% Oxford/AstraZeneca, 11% Moderna and 1% Johnson&Johnson (Our World in Data, 2024b). Whilst by the same date Hungary's doses were made up of 43% Pfizer/BioNTech, 21% Sinopharm/Beijing, 19% Sputnik V, 10% Oxford/AstraZeneca, 6% Moderna and 1% Johnson&Johnson. So Croatia had more Pfizer/BioNTech (mRNA) and Oxford/AstraZeneca (viral vector) doses, whilst Hungary had more Sinopharm/Beijing (inactivated) and Sputnik V (viral vector) doses. However, Pfizer/BioNTech was the most common vaccine in Croatia, Hungary and globally, and the Moderna/Pfizer ratio was similar in Croatia and Hungary (Kirsch (2024m) reported that the Moderna vaccine increased all-cause mortality by at least 30% above the Pfizer vaccine).

4.7 Children

In the UK, the Medicines and Healthcare products Regulatory Agency (MHRA) authorised Pfizer's COVID-19 vaccine for infants aged six months to four-years-old (W. Jones, 2022s). Did it make sense to vaccinate children?

4.7.1 Pre-COVID-19

Prior to COVID-19, in the US, Mawson, Ray, Bhuiyan, and Jacob (2017) found that vaccinated homeschooled children were found to have a higher rate of allergies and neurodevelopmental disorders (NDD) than unvaccinated homeschooled children. Again, prior to COVID-19, also in the US, for vaccinated and unvaccinated children during their first year of life, Hooker and Miller (2020) analysed the incidence of developmental delays, asthma, ear infections and gastrointestinal disorders. Vaccination before one year of age was associated with increased odds of developmental delays, asthma and ear infections. In a quartile analysis, subjects were grouped by number of vaccine doses received in the first year of life. Higher odds ratios were observed

in quartiles 3 and 4 (where more vaccine doses were received) for all four health conditions considered, as compared to quartile 1. N. Z. Miller and Goldman (2023) found statistically significant positive correlations between mortality rates of developed nations and the number of early childhood vaccine doses that are routinely given. Linear regression analyses of neonatal vaccine doses required by nations in a 2021 dataset yielded statistically significant positive correlations to rates of neonatal mortality ($r = 0.34$, $p = 0.017$), infant mortality ($r = 0.46$, $p = 0.0008$) and under age five mortality ($r = 0.48$, $p = 0.0004$). Whilst Mowrey (2023c) argued that since 1953 the only vaccinations that significantly reduced childhood mortality were for polio.

4.7.2 Vaccination Effectiveness

4.7.2.1 Italy

Vaccination against COVID-19 in children aged 5–11 years in Italy showed lower effectiveness in preventing SARS-CoV-2 infection and severe COVID-19 than in individuals aged 12 years and older (during the dominance of the Omicron variant) (Sacco et al., 2022). Furthermore, effectiveness against infection appeared to decrease after completion of the current primary vaccination cycle.

4.7.2.2 United States

Dorabawila et al. (2022) found that in New York the effectiveness of vaccinations against cases of Omicron declined rapidly for children. Fleming-Dutra et al. (2022) determined that, during Omicron dominance, among children and adolescents, estimated vaccine effectiveness for two doses of BNT162b2 against symptomatic infection was modest and decreased rapidly. For adolescents who had (exactly) two doses, 4.5 months after the second dose vaccine effectiveness became negative, but increased after a booster dose. D.-Y. Lin et al. (2022) conducted a large cohort study on the protection conferred by the BNT162b2 vaccine and by previous SARS-CoV-2 infection against infection on children 5 to 11 years of age over a six-month period when the Omicron variant was dominant. Vaccine effectiveness turned negative within five months of vaccination. Also, disturbingly, among those who had previously been infected, the vaccines destroyed the protection provided by natural immunity, leaving them more vulnerable to reinfection than they were before vaccination (W. Jones, 2022c). Kumar et al. (2023) found that unvaccinated, vaccinated and boosted children aged 7 to 18 years (recruited between April and September 2022) who caught COVID-19 (Omicron variant) were infectious for the same amount of time (three days). Mowrey (2023e) showed, using data from 29 October 2021 to 6 January 2023, that for children aged 5 to 11 the efficacy of COVID-19 vaccines against hospitalisation or death reaches zero after six months. In the US, using data from July 2022 to May 2023, Tartof, Frankland, et al. (2023) estimated vaccine effectiveness on children aged 6 months through to 4 years by using a test-negative case–control experiment. The risk of a positive test result for SARS-CoV-2, compared to the unvaccinated, during emergency department or urgent care and outpatient encounters was 0.56 for those who received two doses and 0.88 for those who received three doses. In other words, children who received three doses of COVID-19 vaccine had a higher risk than those who received two doses.

4.7.3 Adverse Effects

4.7.3.1 Vaccinations in General

A Midwestern Doctor (2024a) argued that there is over a century of evidence that vaccines cause sudden infant deaths (known as 'sudden infant death syndrome' or 'SIDS').

4.7.3.2 Influenza Vaccinations

In Hong Kong, Cowling et al. (2012) showed that children in receipt of a trivalent inactivated influenza vaccine, over the following nine months, had an increased risk of virologically-confirmed non-influenza infections. The influenza vaccine caused the children to lack temporary non-specific immunity that protected against other respiratory viruses.

4.7.3.3 Asia

In Vietnam 120 children were hospitalised and three died following their Pfizer COVID-19 vaccination (Hoang, 2021).

4.7.3.4 Australasia

In Australia, among children aged between 5 and 11, 25% reported at least one adverse event after Pfizer dose 1, and 28% after Pfizer dose 2 (AusVaxSafety, 2022).

4.7.3.5 Europe

Among children under five years old who received the BNT162b2 (Pfizer) vaccine in Germany, 0.5% suffered from symptoms, 0.03% had symptoms that lasted longer than 90 days and 0.1% were hospitalised for serious adverse events (Toepfner et al., 2022). Official data from Iceland showed that eleven children reported serious injury from the vaccines versus zero serious cases of COVID-19 (Siglaugsson, 2022b).

4.7.3.6 North America

In an evaluation of the mRNA-1273 vaccine on young children in the United States and Canada, E. J. Anderson et al. (2022) found that 8 out of 1911 (0.42%) of those aged 6–23 months suffered from serious adverse events, and none from the placebo arm. Also in the US, an analysis of VAERS reports showed that at least 58 infants aged under 3 years old who received mRNA COVID-19 vaccines suffered life-threatening adverse events (Feinberg & Shir-Raz, 2022).

4.7.3.7 Asthma

C.-Y. Yang, Shih, and Lung (2024) employed a retrospective cohort study, using electronic medical records from the TriNetX database (global data), covering 1 January 2021 to 31 December 2022. The study identified a significant link between COVID-19 infection and an increased incidence of new-onset asthma in children, with higher risk in vaccinated individuals. Berenson (2024c) reported that the authors ran a parallel version of the study that directly compared outcomes by vaccination status. For children without a COVID-19 diagnosis, vaccinated individuals had a 12.7% higher incidence of new-onset asthma compared to their unvacciantd counterparts. For children who were diagnosed with COVID-19, those vaccinated had a 20.2% higher chance of developing new-onset asthma compared to those who were not vaccinated.

4.7.3.8 Myocarditis

Using data from VAERS in the US, the editor of *Health Impact News* calculated that when one considers the monthly averages for cases of carditis following vaccines, we see a 17,495% increase of reported cases of heart disease in children following COVID-19 vaccines (Shilhavy, 2022). In a cohort study of more than 3 million children (aged 5–17 years) in the US who received BNT162b2 COVID-19 vaccination through mid-2022 using data from 3 US commercial claims databases, only myocarditis or pericarditis met the statistical threshold for a signal after BNT162b2 COVID-19 vaccination via near-real-time monitoring (M. Hu, Wong, et al., 2023).

No safety signals were observed for the 12 other outcomes assessed using sequential testing. In contrast to most of the literature for adolescents, an analysis of safety surveillance data for mRNA COVID-19 vaccines administered to children aged 5 years and younger between 18 June 2022 and 18 March 2023 in the US did *not* detect a safety signal for any outcome during the 21 days after vaccination (Goddard et al., 2023). Importantly, no cases of myocarditis or pericarditis occurred after vaccination. M. Hu et al. (2024) analysed the safety of ancestral monovalent BNT162b2, mRNA-1273 and NVX-CoV2373 COVID-19 vaccines in US children aged 6 months to 17 years. Statistical signals were detected for myocarditis or pericarditis after BNT162b2 vaccination in children aged 12 to 17 years and seizure after vaccination with BNT162b2 and mRNA-1273 in children aged 2 to 4 or 5 years.

4.7.3.9 Deaths

In the US, there were 45 reports of children dying after receiving the COVID-19 vaccine up to July 2022 (Smalley, 2022h). 27 of these children (60%) were perfectly healthy beforehand.

4.7.4 Cost–Benefit Analysis

Does vaccinating children pass a cost–benefit analysis? An editorial in *The BMJ* argued that it is hard to justify vaccinating children against SARS-CoV-2 for most children in most countries (Lavine, Bjornstad, & Antia, 2021). They give three reasons: 1) the limited benefits of protection in age groups that experience only mild disease, 2) the limited effects on transmission because of the range of antigenic types and waning vaccine-induced immunity, and 3) the possibility of unintended consequences related to differences in vaccine-induced and infection-induced immunity. Whilst T. Rogers (2021) estimated that for every one child saved by the vaccine, another 117 would be killed by the vaccine. Will Jones reviewed the evidence for and against vaccinating children, and concluded that it was unnecessary and risky, and brought no clear benefit whatsoever (W. Jones, 2022a). In an insightful preprint, Hoffmann, Nielsen, Thysen, Duriseti, and Benn (2024) conducted a systematic review and meta-analysis on the overall health effects of mRNA COVID-19 vaccines in children and adolescents. From the RCTs in children aged 6 months to 15(17) years, neither of the mRNA vaccines (BNT162b2 and mRNA-1237) had a beneficial effect on overall health, assessed as the incidence of serious adverse events, severe adverse events, respiratory tract infections and other organ-specific diseases. In the older children the risk of severe adverse events was more than 3.5-fold higher. In younger children, mRNA vaccines were associated with a nearly 3-fold increased risk of lower respiratory tract infection, including a nearly 3-fold increase in the risk of RSV. Both mRNA vaccines were associated with reductions in the risk of COVID-19. C. Andrews et al. (2024) conducted an observational study using the OpenSAFELY-TPP database on over one million children aged 5–15. Rendell (2024b) reviewed the paper. After 20 weeks just as many vaccinated as unvaccinated adolescents had tested positive for COVID-19. Vaccination did nothing to prevent infection. The benefits of the vaccine were that it prevented one COVID-19-related hospital visit per 20,000 children. The costs of the vaccine were that it caused one myocarditis/pericarditis-related hospital visit per 25,000 children. In other words, broadly speaking, for each child that was spared a visit to the hospital due to COVID-19, another sought treatment for heart damage. Heart damage is surely the worse outcome. According to a National Audit Office (NAO) report, on average each vaccine dose delivered cost £64. This means that to prevent one additional visit to A&E we had to spend £1,280,000 of taxpayer's money. It was clearly a terrible decision to vaccinate children against COVID-19. In September 2024 in the US, Vinay Prasad argued that doctors who advise a healthy child to get a 2024 autumn booster are committing malpractice (Prasad, 2024c).

4.8 Mandatory Vaccinations

Some institutions made vaccinations mandatory. For example, in the UK it was a legal requirement for health and social care staff to be double vaccinated. Some colleges in the US made vaccinations mandatory, too. Were such a policies justified?

In *BMJ Global Health*, Bardosh, de Figueiredo, et al. (2022) argued that mandatory vaccine policies are scientifically questionable and are likely to cause more societal harm than good. Restricting people's access to work, education, public transport and social life based on COVID-19 vaccination status impinges on human rights, promotes stigma and social polarisation and adversely affects health and well-being. Such policies may lead to a widening of health and economic inequalities, detrimental long-term impacts on trust in government and scientific institutions, and reduce the uptake of future public health measures, including COVID-19 vaccines as well as routine immunisations. The conviction of many governments that the best long-term strategy is to vaccinate almost the entire population felt like it was based on a religious mania rather than a cost–benefit analysis rooted in science (W. Jones, 2021d). P. E. Alexander (2021a) summarised 51 studies on the efficacy of vaccines that evidenced that vaccines should not be expected to contribute to eliminating the communal spread of the virus or the reaching of herd immunity. This, he rightly says, unravels the rationale for making vaccines mandatory. Swiss Policy Research (2022c) argued that vaccine mandates, even for healthcare workers, have no medical or epidemiological justification and should be abandoned. In an unpublished paper on global self-reported data among self-selected individuals from the Control Group Cooperative, who are all unvaccinated, Verkerk et al. (2022) concluded that the cohort prioritised self-care and placed very little burden on healthcare systems. In the UK, Rendell (2023k) analysed ONS data and concluded that the 'pandemic of the unvaccinated' was always a myth. For example, just 4% of all-cause deaths in May 2023 were of unvaccinated people. In Canada, after a vaccine mandate for federal public service employees was implemented there was a tenfold increase in the number of COVID-19 cases (Chartier, 2023). Which is wonderfully tragicomic. In the US, I. Miller (2024e) argued that college vaccine booster mandates were unnecessary, unethical and harmful, with vanishingly small benefits and massive increases in risk. In the UK, Bird (2024) reported that a man in his thirties with Down's syndrome had his drinks spiked with sedatives by his local NHS integrated care board (ICB) so that he could be vaccinated against his (and his mother's) will.

Contrary to the received wisdom, many of the hypotheses put forward in this section are consistent with the vaccinated compromising the unvaccinated, rather than vice versa. For example, the hypothesis that the vaccinated can unwittingly asymptomatically spread COVID-19, and the hypothesis that vaccination programmes put herd immunity out of reach. On this basis, there is no scientific justification for making vaccinations mandatory. Although it was true that the elderly in 2021 who chose not to vaccinate, like those who smoke, were obese or ride a motorbike, had an increased risk of hospitalisation. Under universal health care, this can lead to resentment. However, activities that reduce life expectancy among the elderly can actually save the government billions of pounds in pension, benefit and healthcare payments. To conclude, making vaccinations mandatory was never justified.

4.9 Vaccination Passports

A *vaccine passport* is an immunity passport employed as a credential in countries and jurisdictions as part of efforts to control the COVID-19 pandemic via vaccination. Were they justified? There was some demand for them, which made them politically tenable. In the UK, in September/October 2021, under the hypothetical scenario of high cases but low hospitalisations, 53% of the public wanted proof of vaccination for big events and 28% wanted proof of vaccination for shops/bars (Kekst CNC, 2021). Whilst Andrew Neil, the Scottish journalist and broadcaster, called for the unvaccinated to be banned from nightclubs, large venues, restaurants,

pubs, bars and non-essential shops (A. Neil, 2021). However, the science was not on his side. The summary of 51 studies referenced above (P. E. Alexander, 2021a) also unravels the rationale for introducing vaccine passports. Fisman, Amoako, and Tuite (2022) assumed a vaccine effectiveness of 0.4–0.8, ignored all of the issues with vaccinations, and modelled the impact of population mixing between the vaccinated and the unvaccinated. Their model implied that if like-with-like mixing (as opposed to random mixing) increased (i.e. the vaccinated and unvaccinated become more segregated), the vaccinated are better off and the unvaccinated worse off. However, they noted that such like-with-like mixing increased the degree to which risk among vaccinated people could be attributed to unvaccinated people. On this basis the authors, one of whom has served on advisory boards related to COVID-19 for Pfizer and AstraZeneca vaccines, believe that reducing mixing between the vaccinated and unvaccinated does not go far enough, and conclude that 'this excess contribution to risk cannot be mitigated by high like-with-like mixing undermines the assertion that vaccine choice is best left to the individual and supports strong public actions aimed at enhancing vaccine uptake and limiting access to public spaces for unvaccinated people'. Bridle (2023c) described the article as the worst piece of trash that he had ever seen. Swiss Policy Research (2022c) argued that vaccine passports, even for healthcare workers, have no medical or epidemiological justification and should be abandoned. In April 2024, testifying in a lawsuit, Dr Hanna Nohynek, the WHO's leading vaccine expert, said that she advised her Finnish Government against COVID-19 vaccine passports as the vaccines did not stop transmission and the passports gave a false sense of security (Thacker, 2024j, 2024k). Given that we have evidence that vaccines can *increase* spread, vaccine passports are, of course, insane. Such policies compromised the career of Novak Djokovic, arguably the greatest tennis player of all time.

4.10 Politics

Naturally, vaccination programmes rolled out by national governments are not immune from politics. Australia's drug regulator hid vaccine deaths from the public, concerned that 'disclosure could undermine public confidence' (Barnett, 2023b). The hidden deaths included two children, aged seven and nine years old, who both suffered fatal cardiac arrests which the Therapeutic Goods Administration (TGA) assessed as causally linked to COVID-19 vaccination. In the UK in June 2024, Livermore (2024b) noted that although vaccines were originally touted as great achievements by Boris Johnson, Matt Hancock, Rishi Sunak, the BMJ and the press at large, during the election campaigns they were quietly forgotten. The vaccines' mediocre efficacy was evident by the summer of 2021.

4.11 Public Opinion

Vaccines can polarise public opinion. What do the public, in various countries, think of vaccines? And has this changed over time?

4.11.1 Canada

Incredibly, in January 2022, 27% of Canadians supported jailing unvaccinated individuals for five days (C. E. Park, 2022). In my mind, the fascist tendencies displayed by a significant proportion of the general public during the pandemic are both deeply disturbing and the most surprising. By January 2022 we knew that the vaccines failed to prevent transmission.

4.11.2 France

A large online survey of adults in France reported in 2024 found that only 15% of survey respondents strongly agreed with the view that 'In the event of a new epidemic, mRNA vaccines will be useful' with 31% agreeing, 35% don't know, 10% disagreeing and 9% strongly disagreeing.

Similarly, there was no strong consensus that it was 'Thanks to the mRNA vaccines that the COVID-19 epidemic was brought under control', with 11% strongly agreeing with this statement whilst 14% strongly disagreed with the statement; the 'don't knows' were the largest group (32%) (Cooper, 2024).

4.11.3 United Kingdom

In December 2020, (RSPH, 2020) polled a representative sample of 2,000 UK adults to assess the public's confidence in the COVID-19 vaccine. 76% of the UK public would take a COVID-19 vaccine if advised to do so by their GP or health professional. 84% of people in managerial and professional occupations said they would take the vaccine compared to 70% of those in unskilled/semi-skilled manual occupations or unemployed. 79% of White respondents said they would get the COVID-19 vaccine compared to 57% of Black, Asian and minority ethnic (BAME) respondents.

4.11.4 United States

In May 2024 *The New York Times* published an article stating that thousands of Americans believe COVID-19 vaccines harmed them. Jeffrey Tucker described the article as a 'limited hangout' (admitting only some of the truth) (Tucker, 2024b). In a national survey of 1,223 American adults conducted in June 2024, the Rasmussen Report found that 33% of Americans agree that the COVID-19 vaccine is 'killing large numbers of people'. Whilst 25% of those who took the COVID-19 vaccines stated that they regretted it.

4.12 Vaccine Hesitancy

Siri (2024) reported in July 2024 that less than 23% of the adult population in the US had received an updated COVID-19 vaccine despite a relentless multi-billion-dollar national promotion campaign. Technically, the majority of Americans are 'anti-vaxxers'. E. Paul, Brown, Ridde, and Sturmberg (2024) noted that the 'anti-science' mantra has been used to refer to those people 'hesitant' of vaccines, and particularly COVID-19 vaccines. Yet there is plenty of science that questions the safety and effectiveness of COVID-19 vaccines. Maggie Cooper, a pharmacist and research scientist, pointed out that vaccine scepticism doesn't inherently reject science, but reflects public unease navigating science's intersection with politics and economics (Cooper, 2024).

4.13 Prejudice

Vaccination programmes are divisive and can lead to prejudice. Using conjoint experimental data from 21 countries, Bor, Jørgensen, and Petersen (2023) demonstrated that vaccinated people tend to feel antipathy towards the unvaccinated. The vaccinated feared becoming infected by the unvaccinated, and also considered them to be untrustworthy and unintelligent. In contrast, the authors found little evidence that unvaccinated respondents displayed antipathy towards vaccinated people. A 15-year-old boy in Chicago who was initially targeted by a false rumour that he was unvaccinated was bullied relentlessly until he took his own life (J. R. Miller, 2022). Pirlot and Berg (2022) of the Oxford University Centre for Business Taxation argued that there is a serious case for taxing the unvaccinated. Note that the centre is funded by, among others, two companies that sell COVID-19 vaccines: AstraZeneca and GSK. Graso, Aquino, Chen, and Bardosh (2023) observed that the animosity that people showed towards the unvaccinated during the COVID-19 pandemic could be partly understood as scapegoating (as opposed to a reasonable response to a person's culpability) due to a miscalibration of risk. Liberals were more likely than conservatives to blame the unvaccinated (vs vaccinated).

4.14 The Fall of Vaccinations

COVID-19 vaccinations were developed in record time amongst great fanfare, and introduced as a success story. However, they failed to prevent infections or stop transmission, the public became increasingly vaccine hesitant, and some vaccines were eventually withdrawn.

4.14.1 Vaccinations Becoming Less Popular

X. Zhou, Song, Zhang, and Hou (2023) collected 5,257,385 English-language tweets regarding COVID-19 vaccination between 1 January 2020 and 30 June 2022, in six countries—the United States, the United Kingdom, Australia, New Zealand, Canada and Ireland. Transformer-based deep learning models were developed to classify each tweet as intent to accept or reject COVID-19 vaccination and the belief that COVID-19 vaccine is effective or unsafe. The six countries experienced similar evolving trends of COVID-19 vaccine hesitancy and confidence. On average, the prevalence of intent to accept COVID-19 vaccination decreased from 71.38% of tweets in March 2020 to 34.85% of tweets in June 2022. The prevalence of believing COVID-19 vaccines to be unsafe continuously rose from 2.84% in March 2020 to 21.27% in June 2022. In Canada the uptake of routine childhood vaccinations declined since the pandemic (EKOS Research Associates, 2023). The proportion of parents who agreed with 'I accept all recommended vaccines and have no doubts or concerns' in 2017 was 48%, but by October 2022 had dropped to 39%. Because the vaccines were not as effective or as safe as we were led to believe, the pandemic's legacy now seems to include greater public mistrust of vaccines in general (Ridley, 2024e). More people are refusing the MMR vaccine and measles is on the rise. A UNICEF survey found that vaccine confidence had fallen in 52 out of 55 countries. In September 2024 it was reported that in England childhood vaccination rates had fallen. Nationally a sixth of children were not fully protected, the poorest result in over a decade (Calman & Ely, 2024). By October 2024, even the BBC was reporting vaccine harm. They ran an article entitled 'Is the system letting down people who were harmed by Covid vaccines?' (Walsh, 2024).

4.14.2 Calls to Withdraw Vaccinations

17,000 doctors and medical scientists signed a declaration (International Alliance of Physicians and Medical Scientists, 2021). Among other things, they declared that 'the COVID-19 experimental genetic therapy injections must end'. Angus Dalgleish, an expert in immunology and Professor of Oncology at St George's Hospital Medical School, London, gave a damning review of mRNA vaccines in *The Conservative Woman* (Dalgleish, 2023b). He concluded with 'No ifs or buts any longer. All mRNA vaccines must be halted and banned now.' In January 2024 Florida Surgeon General Joe Ladapo called for a halt on the use of mRNA vaccines (W. Jones, 2024d). In July 2024 hundreds of doctors and scientists from around the world signed The Hope Accord[12] calling for the suspension and investigation of mRNA COVID-19 vaccines due to serious concerns about their safety and efficacy (W. Jones, 2024e). In September 2024, a letter (Broadbent, 2024) co-signed by 52 scientists and academics sent to Anthony Albanese, prime minister of Australia, requested that the Australian Government should immediately suspend the use of Pfizer and Moderna COVID-19 vaccines due to evidence of synthetic DNA contamination in the vaccines at levels up to 145× above the legal limit, which present a 'substantial risk' of genomic integration and long-term health impacts, including cancers (Barnett, 2024h). In October 2024, the local government of Port Hedland, a mining town in Western Australia, voted to call for the immediate suspension of the Moderna and Pfizer COVID-19 vaccines pending an investigation into evidence of excessive levels of synthetic DNA contamination in the shots.

[12] `https://thehopeaccord.org/`

4.14.3 Vaccinations Withdrawn

In the autumn/winter of 2023, Iceland, among other countries, elected to recommend vaccinations only to high-risk groups, such as the elderly, the immunocompromised and healthcare workers (Dmitry, 2023). Livermore (2024a) argued in February 2024 that pharmaceutical companies are abandoning mRNA vaccines, leaving governments holding the white elephant. In May 2024, AstraZeneca announced that they were withdrawing the Oxford-AstraZeneca COVID-19 vaccine worldwide (Mendick & Sawer, 2024). The pharmaceutical giant admitted that the vaccine can cause thrombosis with thrombocytopenia syndrome (TTS), but claimed that it was being removed from markets for commercial reasons. In September 2024, Kory (2024e) reported that The Ohio State University Wexner Medical Center was no longer offering the COVID-19 vaccine to any of their employees. In October 2024 is was reported that the Food and Drug Administration (FDA) stopped research on Novavax's experimental combination COVID-19 and flu vaccine and standalone flu vaccine following a report of nerve damage in one patient who took the combination injection (McColl, 2024). Novavax shares plummeted nearly 20%. At the end of October 2024, in the US, Idaho's Southwest District health department board voted four to three to stop making the vaccines available to residents in six counties across the state, over claims that the risks now outweigh the benefits (Burdick, 2024; Mendick, 2024). This is the first time that COVID-19 vaccines have been banned by a US public health board.

4.15 Conclusion

Steve Kirsch collated plenty of evidence that the COVID-19 vaccines are not 'safe and effective' (Kirsch, 2022d). Lataster (2023b) reviewed the evidence against COVID-19 vaccines in medical journals. Vaccine effectiveness and safety have been exaggerated, there is evidence of vaccine-induced myocarditis in young males and evidence of negative effectiveness. Whilst Citizen Free Press (2024) tweeted an amusing 90-second video showing the fast-declining claims made for the COVID-19 vaccines.

Countries that had high pre-vaccination COVID-19 deaths tended to have lower COVID-19 deaths after their vaccination campaigns, suggesting that the more vulnerable had already died, leaving a healthier population and lower mortality from the vaccines. Whilst many countries with low pre-vaccination COVID-19 deaths had very high deaths post-vaccination, which suggests that they had high levels of natural immunity, which was bypassed or compromised by the vaccinations. The vaccination programmes were a disaster in high-natural-immunity countries. Prasad and Haslam (2024) argued that a vaccine can be lifesaving and miraculous in high-risk populations, but that does not necessarily mean that giving more of it, giving it to younger populations, and giving it indefinitely is better.

Radagast (2022k) explained that Omicron was a vaccine-induced self-inflicted wound. The vaccines generate a response to an identical version of the spike protein in every single person who receives them. It is much easier for evolutionary processes to overcome homogeneous spike-directed immunity, than for evolution to overcome the diverse natural immunity developed through infection from multiple variants. Unlike in the West, in South Africa Omicron was a nothingburger due to its low vaccination rate. In an excellent blog post, Radagast (2022f) explained why COVID-19 became chronic. After being vaccinated, you're left with an immune response that targets an old version of the virus. The quantity of the immune response induced by the vaccines is high, but the quality is low. Also, after the vaccination programme, everyone ended up with a highly similar immune response. The virus evolved to use the similar immune response to its advantage (the overwhelming clustering of mutations in the receptor binding domain of the spike protein is clearly evidence of vaccine-driven selection). The virus mutated to allow it to suppress interferon, meaning it continues to hide in your cells without alerting the innate immune system. New variants then emerged. With Delta there was a Marek's disease type effect. Breakthrough infections were encouraged by viral replication at a pace that

overwhelms the adaptive immune response. The side effect this had was more severe infections in the unvaccinated. With Delta, cases and deaths rose together. With Omicron there was immune escape. Omicron generally doesn't directly kill you, but every time it infects you it ages and exhausts your immune system. With Omicron, there is a delay between cases and deaths of about a month. When you vaccinate people, you make them more susceptible to infection with the Omicron variant. In highly vaccinated populations like Israel and Denmark, you start to see positive feedback loop effects, as all the vaccinated people who get infected also have the ability to spread the virus. Radagast (2022j) wrote:

> A vaccine against a novel coronavirus with high potential for variability, that generates non-sterilizing immunity for around six months, erodes natural immunity and is given indiscriminately to ∼80% of the Western world's population will lead to a longer and deadlier pandemic.

In October 2022, PANDA concluded that mass COVID-19 vaccination had been a failed experiment. Then in November 2023, they argued that there was no need or justification for the rollout of the vaccines (PANDA, 2023).

In a good summary, Archibald (2022a) showed that in the UK for those aged 40–70 vaccination increases the risk of contracting COVID-19 and transmitting it to other people. Vaccination increases the chances of catching COVID-19 (due to original antigenic sin), reduces the risk of dying in the short term, but increases the risk of dying in the longer term due to 'long COVID'. Vaccination leads to a higher overall death rate. Swiss Policy Research have published three 'reality check' review articles on COVID-19 issues (Swiss Policy Research, 2021a). The first, published in December 2021, drew the following conclusions. 1) In 2021, COVID-19 vaccines likely saved several hundred thousand lives, but they may also have caused or triggered about 100,000 deaths and many more injuries globally. 2) COVID-19 vaccine protection, initially very high, decreases substantially within about half a year and it collapsed against the immune-evasive, but apparently milder Omicron variant. 3) The risk of COVID-19 vaccine injuries increases with additional booster doses, and several countries have already suspended various COVID-19 vaccines partially or completely. 4) For healthy and lean adults below 40 years of age, as well as for healthy children and adolescents, the risk/benefit ratio of COVID-19 vaccination does not appear to be favourable. 5) 'Vaccination passports' and COVID-19 vaccination mandates have no medical or epidemio-logical justification. Coercing people into getting vaccinated must be seen as a crime against humanity. 6) Ultimately, the COVID-19 pandemic will be ended not by vaccination, which cannot prevent transmission, but by widespread natural immunity, already achieved in several parts of the world. The second publication, published in December 2022, concluded that only people at significant risk of COVID-19 hospitalisation or COVID-19 death should have been vaccinated (Swiss Policy Research, 2022b). In addition to vaccination, early outpatient treatment should always have been a priority. Vaccinating young and healthy people was likely medical misconduct, and pressuring people into vaccination by cutting off their access to leisure activities, education or work was likely a serious human rights violation that should be met with legal action wherever possible. The overall conclusion of the third publication, published in January 2023, remained unchanged: vaccinating senior citizens was right; vaccinating young and healthy people was wrong; pressuring people into vaccination was criminal; Omicron degraded vaccine protection after just one year; the value of additional 'boosters' remains questionable; and potential long-term health effects of vaccination need to be monitored closely (Swiss Policy Research, 2023a).

In a letter to the editor of *Polish Annals of Medicine* on the scientific views around mRNA-based COVID-19 vaccines, Lataster (2024l) drew the following conclusions. 1) Numerous issues have been found with the clinical trials for COVID-19 vaccines, including the potential for fraudulent activity, an excess risk of serious adverse events of special interest, and a lack of evidence of a COVID-19 or overall mortality benefit. 2) Counting window issues have been found in the clinical trials and major observational studies, likely leading to large exaggerations

of COVID-19 vaccine effectiveness and safety estimates. 3) There is also evidence that the vaccines may have negative effectiveness. 4) Numerous post-licensure studies indicate that there are far more serious adverse effects caused by the vaccines than initially understood, even leading to the conclusion that the risks outweigh the benefits, at least in the young and healthy. 5) Particularly given the previous point, there have been many legal actions initiated on behalf of both the pointlessly persecuted unvaccinated and the vaccine injured, and he expected a spate of further legal action in the near future.

The trials significantly overstated the efficacy of vaccinations as the virus evolved. The vaccines were leaky, so failed to provide sterilizing immunity, which ultimately accentuated spread. The vaccine can penetrate heart tissue and elicit an immune response to attack the heart cells. Some people with heart damage will die during each round of vaccinations. Whilst it is possible that the mRNA vaccines are CG (cytosine-guanine) enriched, which can increase the risk of cancer. mRNA vaccines look to be suppressing not only innate immune function, but also the mechanisms by which pathogens and cancers are detected. These vaccines generated strong antigenic fixation teaching one antibody response that immune systems are exhibiting preferentially and preventing them from adapting to changing pathogens. We have ended up with 'herd original antigenic sin'. COVID-19 deaths avoided (primarily the elderly in 2021) were offset by deaths from other causes, often heart-related. The vaccination programmes were particularly disastrous in high-natural-immunity countries.

5 Excess Mortality

5.1 Introduction

When evaluating the effectiveness of vaccination programmes, what ultimately matters is age-standardised all-cause mortality (excess deaths that accounts for population ageing). Though Smalley (2024e) argued that the mortality probability distribution is the only reliable model of excess mortality.

Firstly, should we expect elevated excess mortality following an epidemic? With the Spanish flu in the US there were recurring outbreaks in the following years with periods of deficit deaths in-between (Witzbold, 2023c). Whilst in the UK all-cause mortality during the two years after the pandemic had lower lows and lower highs than during the two years before the pandemic (D. He et al., 2020). So no, we should not expect elevated mortality between the waves. However, with COVID-19 we have recurring outbreaks in the years following the pandemic, but with an elevated baseline of deaths.

For dashboards showing excess mortality, see the Office for Health Improvement & Disparities' online Power BI presentation of Excess Mortality in England (OHID, 2024), the Institute and Faculty of Actuaries' England and Wales population mortality updates (Institute and Faculty of Actuaries, 2018), EuroMOMO (EuroMOMO, 2024), US Mortality (Ben, 2022), The Human Mortality Database (HMD, 2024), National Center for Health Statistics Mortality Data on CDC WONDER (CDC, 2024), Mortality Watch (Mortality Watch, 2023) and T. Coddington's Tableau vizzes (Coddington, 2024).

5.2 Deaths

5.2.1 Asia

Livermore (2024c) reported in September 2024 that Taiwan and South Korea had seen excess mortality bounce around 20% for two years; whilst in Singapore it was running between 20% and 40%.

5.2.1.1 India

In India in 2021, non-COVID-19 deaths increased, and the life insurance industry experienced a 200–300% increase in claims (Kaur, 2021).

5.2.2 Australasia

By May 2022, rates of COVID-19 cases and deaths in Australia and New Zealand had overtaken the US (Data Matters, 2022d).

5.2.2.1 Australia

In Australia more people died in the March quarter of 2022 than in any of the past 41 years (Daniel, 2022). The overall deaths in 2022 (up to week 34) represented a nine-sigma increase (nine standard deviations), and the Australian Bureau of Statistics tried to hide it (Syed, 2022b). During the first eight months of 2022, there were an incredible 13% more deaths than expected (W. Jones, 2022l). Total excess mortality for 2022 was about 12% (COVID-19 Mortality Working Group, 2023b). Most of the excess deaths were in older age groups (i.e. 65+ years), but excess mortality was a significant percentage in all age groups. Just over half of the excess mortality was due to COVID-19. Other significant causes of death were post-COVID-19 sequelae or interactions with other causes of death, plus deaths due to delays in emergency care. According to Heneghan and Jefferson (2022a), in 2022 Australia suffered from significant excess deaths, two-thirds of which were not due to COVID-19. Deaths due to dementia were 20.5% above

the average for the year to May; cancer was 6% above, and diabetes was 20% higher. In 2022, according to the Actuaries Institute, the excess death rate was 13%, with around one-third of those having no link to COVID-19 (Chung, 2022). Chudov (2023n) reported that in 2022 deaths were about 20% higher than average.

5.2.2.2 New Zealand

New Zealand suffered an increase in all-cause mortality from 2021 to 2022 of over 10%, the largest single-year increase in New Zealand since the 1918 flu (I. Miller, 2023c). From 2020 to 2022 there was an over 17% increase. Cat (2024) produced graphs that show that New Zealand's excess mortality has been higher since their vaccination programmes began. Whilst McGoo (2024) produced graphs that appear to show that in New Zealand, vaccines increase excess deaths. Ben (2024h) presented a graph of all-cause deaths by COVID-19 vaccination status in New Zealand, and concluded that the vaccinated are the driver of all-cause excess mortality.

5.2.3 Europe

On his blog, el gato malo (2022r) observed that in northern European countries (except for Sweden) all-cause deaths were up in 2021 relative to 2020. In late summer 2022, EuroMOMO data continued to show an elevated level of excess mortality, especially among the elderly (65 years or older) (EuroMOMO, 2022). In Europe there has been excess mortality in children aged 0 to 14 since June 2021 (Oke, Jefferson, & Heneghan, 2022). Rendell (2023a) pointed out that across much of Europe excess deaths were higher in 2022–2023 than they were in the 'pandemic years' of 2020–2021. In March 2024, Heneghan and Jefferson (2024b) reported that since March 2020, there had been more than 100,000 extra circulatory disease deaths in England. In the summer of 2022 deaths were 18% above the average. At the same time, several European countries have also experienced similar increases in excess deaths. In Germany, in the first year of the pandemic there was hardly any excess mortality, then in spring 2021 there was a sustained increase in mortality.

5.2.3.1 Denmark

Bowler (2024c) calculated excess mortality for Denmark as 2020 3.99%, 2021 7.17%, 2022 11.70% and 2023 10.42%.

5.2.3.2 Finland

Per capita excess deaths in Finland in 2022 were higher than excess deaths in the UK in 2020 (Rendell, 2023c).

5.2.3.3 Germany

In Germany, instead of following the typical U-shaped pattern attributed to seasonal respiratory infectious disease, excess mortality increased steadily throughout 2022 (Spieker, 2023a). All-cause excess deaths per million in 2022 were only 3% lower than the UK rate in 2020 (Rendell, 2023c). Kuhbandner and Reitzner (2023) estimated excess mortality in Germany during 2020–2022. The observed number of deaths in 2020 was close to the expected number. In contrast, in 2021 the observed number of deaths was two empirical standard deviations above the expected number. Even worse, in 2022 it was more than four times the empirical standard deviation. The high excess mortality in 2021 and 2022 was mainly due to an increase in deaths in the age groups between 15 and 79 years and started to accumulate from April 2021 onwards. A similar mortality pattern was observed for stillbirths with an increase of about 9.4%

in the second quarter and 19.4% in the fourth quarter of the year 2021 compared to previous years. Kuhbandner and Reitzner (2024) analysed differential increases in excess mortality in the German federal states during the COVID-19 pandemic In the first two years of the pandemic, but not in the third, there was a strong correlation between excess mortality and the number of reported COVID-19 deaths. For the second and third pandemic years a significant positive correlation between the increase in excess mortality and COVID-19 vaccinations was observed (in the third pandemic year the correlation reached a value of $r = 0.85$). An analysis of still-births showed exactly the same pattern. No other systematic correlation pattern was observed. Smalley (2024f) reviewed and summarised Kuhbandner and Reitzner (2024): 1) 'COVID-19 deaths' were exaggerated; 2) non-pharmaceutical interventions were ineffective; 3) COVID-19 vaccines were associated with higher excess mortality than COVID-19 itself; and 4) COVID-19 vaccination adversely affected fertility.

Stillbirths The number of stillbirths per 1000 births increased in Germany from Spring 2021 (Guetzkow, 2022b). There was an increase in stillbirths of about 9.4% in the second quarter and 19.4% in the fourth quarter of the year 2021 compared to previous years (Kuhbandner & Reitzner, 2023).

5.2.3.4 Ireland

Ireland had one of the highest rates of excess deaths in 2023: January 15.4%, February 0.8%, March 9.2%, April 12.2%, May 13.3%, June 14.0%, July 13.7%, August 21.3%, September 12.7% and October 17.8% (Bhriain, 2024).

5.2.3.5 Norway

Raknes, Fagerås, Sveen, Júlíusson, and Strøm (2024) found that there was considerable excess non-COVID-19 mortality in Norway from March 2020 until December 2022, mainly due to excess cardiovascular deaths. The number of cancer deaths was significantly but marginally higher than predicted in 2022. For respiratory diseases and dementia, mortality was lower than predicted. Of the total net cumulative excess mortality, COVID-19 comprised the largest cause.

5.2.3.6 Sweden

Orwell2024 (2022) analysed age-standardised mortality rates from August 2018 to July 2021, and showed that Sweden did better than the UK, Germany, Austria, USA and Canada. In terms of excess mortality from 1 January 2020 to 31 December 2021, Sweden ranked 25th out of the 30 countries in Europe (I. Miller, 2022c). Figures from the WHO confirmed that Sweden's excess death rate was among the lowest in Europe, despite avoiding strict lockdowns (Newey, 2022b). The ONS published estimates of age-adjusted excess mortality up to July of 2022, which showed that Sweden's excess mortality was lower than Finland's, Denmark's and Iceland's; only Norway did better (Carl, 2023d). Using an average of excess mortality estimates for Europe for 2020–22 places Sweden second from bottom, with only Denmark lower (Paul C, 2023). Sweden saw excess mortality among the 65+ age group below the OECD average in 2020 and negative in 2021 and 2022 (Morgan, Lukong, Haywood, & Paolantonio, 2023). A BBC analysis confirmed that Sweden had the lowest excess death rates in Europe from March 2020 to February 2023 (Cuffe & Rogers, 2023; W. Jones, 2023l). The ONS methodology for excess deaths (compared with the 2015–2019 average) places Sweden as having the lowest excess deaths of the OECD countries (Simmons, 2023b). Whilst the World Mortality Dataset methodology places Sweden seventh from bottom. Nations with better cardiovascular health at the outset of the pandemic lag behind those with poorer cardiovascular health in terms of excess deaths. Bowler (2024a) argued that Sweden had lower excess deaths than the average for the EU during 2021–2023 partly

on account of its mortality deficit after the initial COVID-19 waves and its better-than-average initial cardiovascular health status. However, Sweden did experience significant excess deaths during 2021–2023, but they were 'submerged' behind the deficits. Gøtzsche (2023a) pointed out that Sweden did exceptionally well during the COVID-19 pandemic. Swiss Policy Research (2023d) argued that Sweden experienced pandemic excess mortality comparable to other Western European countries—it didn't experience a 'mortality miracle' with record low excess deaths. Ben (2023f) calculated Sweden's excess mortality by four different methods. No statistically significant excess mortality was detected by any method. Swiss Policy Research (2023b) argued that COVID-19 not only caused a similar level of age-adjusted excess mortality in Sweden as in other Western European countries, but even broke the previous Swedish downward mortality trend that 'swallowed' true excess mortality and misled many modellers.

5.2.3.7 United Kingdom

Heneghan and Jefferson (2024l) analysed deaths in England from 2017 to 2023. For those aged under one year there were no discernible changes. For those aged 1 to 14, 2020–2021 was low, 2022–2023 was high. For those aged 15 to 44, 2021–2023 was high. For those aged 45 to 64, 2020–2021 was high, 2022–2023 was moderately high. For those aged 65 to 74, 2020–2021 was high. For those aged 75 to 84, 2020–2023 was high. For those aged 85+, 2020 was high, 2021–2023 was moderately high.

2020 In England and Wales, from 28 December 2019 to 10 July 2020, before vaccination programmes began, deaths involving diabetes, hypertensive diseases and several heart-related conditions such as cardiac arrhythmias and cardiomyopathy were above five-year average levels (Office for National Statistics, 2020a). Heneghan and Jefferson (2023j) noted that in the UK there was a steep unprecedented rise in deaths from the end of March to mid-April 2020. The increase was synchronous, suggesting either the virus struck at precisely the same time across England or other factors were at play. By the end of 2020, deaths were asynchronous.

2021 In England, from January to September 2021, if people dying from COVID-19 were typical of their age, around 9% would have died from another cause in the following 12 months—around 8,500 people (Tallack & Krelle, 2021). In England, from January to September 2021, the only cause for which deaths were significantly higher was 'symptoms, signs and ill-defined conditions'—a broad category used where doctors are unclear on the exact cause of death (Tallack & Krelle, 2021). In September 2021 *The Telegraph* reported that, according to the ONS, since 2 July 2021 there had been 9,619 excess deaths in England and Wales, of which 48% (4,635) were not caused by COVID-19 (Knapton, 2021). Data from Public Health England (PHE) showed that during that period there were 2,103 extra death registrations with ischaemic heart disease, 1,552 with heart failure, as well as an extra 760 deaths with cerebrovascular diseases such as stroke and aneurysm, and 3,915 with other circulatory diseases. Acute and chronic respiratory infections were also up with 3,416 more mentions on death certificates than expected, whilst there had been 1,234 extra urinary system disease deaths, 324 with cirrhosis and liver disease and 1,905 with diabetes. In England and Wales, all-cause deaths were inflated for the second half of 2021 (Dee, 2022a). According to official figures from the ONS, in England and Wales, when deaths due to COVID-19 were removed from the total, the number of deaths remained above the five-year average from July 2021 to December 2021 (Rushton, Barton, & Owen-Williams, 2022). For females the leading cause of excess mortality were symptoms, signs and ill-defined conditions. For males the leading cause of excess mortality was ischaemic heart diseases, spread across ages 35 to 79 years. Deaths due to chronic lower respiratory diseases also saw notable excesses. Smalley (2023v) noted that in England, during the seven months between June 2021 and December 2021, seasonal excess mortality was 143% higher than the lowest comparable period since 2014. Smalley (2023o) showed that in England and Wales, in absolute terms, annual

mortality for those aged 30 to 75 years was higher in 2021 than in 2020. Whilst in relative terms, mortality outcomes for 30- to 60-year-olds was worse in 2021 than in 2020.

2022 In England and Wales, for the ten-week period ending on 1 July 2022, there were around 9000 excess deaths (W. Jones, 2022f). Cardiovascular deaths were running high, but also diabetes, diseases of the urinary system and diseases of the liver. Whilst cancers and respiratory deaths were fairly normal. J. Jenkins (2022) reported on 22 August 2022 that in the UK in 2022 there were more deaths among 30–59-year-olds than we would expect, especially in recent months. The data suggested that heart issues and diabetes were likely factors. In England and Wales during the summer of 2022, excess deaths continued to be above average (Heneghan & Jefferson, 2022b). In the week ending 23 December 2022, in England deaths were 20.2% above the five-year average, and in Wales 27.3% above the five-year average (The Naked Emperor, 2023b). Only about 3% of the total was attributed to COVID-19. In the UK, the number of registered deaths in 2022 was 9% greater than in 2019 (BBC News, 2023a). This was one of the largest excess death levels outside the pandemic in 50 years. W. Jones (2023p) argued that UK deaths were worryingly high in 2022, particularly from the spring. In the UK, Jefferson and Heneghan (2024g) reported that there was a statistically non-significant increase in the overall maternal death rate in the UK between 2019–21 and 2020–22. A statistically non-significant increase also occurred when deaths due to COVID-19 were excluded. However, compared to 2017–19, the last complete triennium, there was a statistically significant increase in the overall maternal death rate in the UK in 2020–22. This increase remained statistically significant when deaths due to COVID-19 were excluded. In England and Wales there were more people dying 'unexpectedly' in 2022 than there were in 2020 (the year of the pandemic) (Smalley, 2024d).

2023 On 29 September 2023 Smalley (2023g) reported that by January 2023 in England and Wales there had been around 132,000 excess deaths, with, surprisingly, no reversion to baseline. Only 36% of the excess deaths occurred prior to the start of the mass vaccination campaign. In England and Wales excess deaths were sustained into March 2023 (W. Jones, 2023c). In the last week of March 2023, excess deaths in the UK were at 21%, and in Germany 11% (Chudov, 2023f). Yet the health authorities refuse to investigate. In May 2023, The Naked Emperor (2023a) reported that in the last 12 months, there had been 56,285 excess deaths in England and Wales. This was almost as many as the first year of the pandemic. Pearson-Stuttard, Caul, McDonald, Whamond, and Newton (2024) reported in a Lancet publication that the UK's ONS calculated that there were 7.2% more deaths registered in the UK in 2022 based on comparison with the five-year average (excluding 2020). This persisted into 2023 with 8.6% more deaths registered in the first six months of the year than expected. From 28 May 2022 to 30 June 2023, excess deaths for all causes were highest for 50–64-year-olds (15% higher than expected), 11% higher for under 25-year-olds and 25–49-year-olds, and about 9% higher for over 65-year-olds. The authors state that the causes of these excess deaths are likely to be multiple and could include the direct effects of COVID-19 infection, acute pressures on NHS acute services resulting in poorer outcomes from episodes of acute illness, and disruption to chronic disease detection and management. Several causes, including cardiovascular diseases, showed a relative excess greater than that seen in deaths from all causes (9%) over the same period (28 May 2022–30 June 2023), namely all cardiovascular diseases (12%), heart failure (20%), ischaemic heart diseases (15%), liver diseases (19%), acute respiratory infections (14%) and diabetes (13%). In the UK the mortality rate for 40- to 44-year-olds worsened the most in the first half of 2023, the number of age-standardised deaths per 100,000 rose 6% (Anghel, 2024). This is significant enough to be impacting the profits of UK life insurance companies Aviva Plc and Legal & General Group Plc. Cat in the Hat (2023) noted the high excess deaths in England for the non-elderly for the period 6 January 2023 to 29 September 2023: 0–24 yrs: 11%, 25–49 yrs: 10% and 50–64 yrs: 14%. Heneghan and Jefferson (2024e) reported that in England and Wales

in the week ending 22 December 2023 deaths were 4.7% above their estimated 5-year average. The Office for Health Improvement and Disparities (OHID) analysis of the place of death showed that deaths in own homes remained excessively high for 2023. Heneghan and Jefferson (2023b) noted that in England and Wales excess deaths in 2023 continued to trend higher than average. Britain experienced a record number of excess deaths in 2023 amid repeated NHS strikes and the continued cost of the COVID-19 pandemic (Searles & Butcher, 2024). Nearly 53,000 more people died in 2023 than normal—the highest figure recorded in a non-pandemic year since the Second World War. In an excellent article, Bowler (2024b) showed that in the UK deaths in 2023 were 20% above the expected level. Since the spring of 2021 non-respiratory mortality has been elevated. 2023 had higher non-respiratory mortality than any of the three preceding years, at 9.5% above the 2015–2019 average. In 2020 COVID-19 disproportionately increased respiratory mortality and thus, due to their synergy, pushed non-respiratory mortality downwards (part of the mortality displacement effect). Something then happened in 2021 that increased the size of the pool of vulnerable people over the following two years. The normal relationship between the two mortality types re-established itself in 2023 (the proportion between them was restored), but at a level around 10% above pre-COVID-19 mortality. In February 2024, the ONS revised the figure for excess deaths in Britain in 2023 from 31,442 to 10,994—a 65% drop—having taken into account an ageing population (Knapton, 2024b). If nothing else, this reminds us that excess death calculations rely on assumptions and are subject to a significant degree of uncertainty. W. Jones (2024m) is suspicious of the changes.

2024 In the UK, by June 2024, a small number of politicians had expressed concern about excess deaths, but the government had refused to look into the issue.

Life Expectancy In the UK, the Continuous Mortality Investigation (CMI) (actuaries) believe that mortality in 2022 may be indicative of future mortality to some extent (Lane Clark & Peacock, 2023). A proposed model meant that life expectancy assumptions at age 65 would likely fall by around 6 months, equivalent to 2%. After analysing data up to 2023, the ONS announced that life expectancy had gone back to 2010 levels (Bowler, 2024b).

Non-COVID-19 Deaths In England, from January to September 2021, there were 9% fewer non-COVID-19 deaths than expected, due to displaced mortality (Tallack & Krelle, 2021). Tatalović (2022) reported that by late January 2022 the UK had recorded more than 10,000 extra non-COVID-19 deaths since July 2021, and interviewed various experts. Between March 2020 and October 2021, only 13 deaths were registered with the data code U12.9 for 'death involved adverse reactions to the Covid-19 vaccine'. The excess deaths were primarily cardiovascular, and many of them were happening at home. They could be due to people with heart attacks and strokes not being able to get to hospital in time, due to those reluctant to seek help during the pandemic, due to late complications of COVID-19 itself, due to COVID-19 but recorded as other causes, or due to heatwaves. Another explanation was that there were no excess deaths, because the excess death calculations rely on numbers with significant uncertainty. In England and Wales, for the twelve-week period ending in mid-July in 2022, excess non-COVID-19 deaths exceeded 10,000, but the government refused to investigate why (W. Jones, 2022h). In England and Wales, from April to September 2022, non-COVID-19 deaths were 9.5% higher than expected (based on an average of the previous five years) (W. Jones, 2022u). Much of the increase in deaths was due to cardiac arrhythmias, predominantly among those aged 80 and above. This could be due to missed operations and procedures during 2020 and 2021, problems with accessing healthcare, mortality displacement, the spike protein from infection causing immune inflammation or the spike protein from vaccination causing immune inflammation. Unfortunately, as of September 2022, no government had released all-cause mortality data by vaccination status. In England and Wales from April 2022 to October 2022 excess non-COVID-19 deaths were 9%

higher than expected (based on an average of the previous five years) (W. Jones, 2022i). In Scotland NHS Highland reported that by the end of 2022 there were significantly more cremations than normal driven by non-COVID-19 causes of death.

Avoidable Deaths Heneghan and Jefferson (2023d) analysed excess deaths in England and Wales for those aged 15 to 44. If we take the average excess deaths of 2017, 2018 and 2019 as a baseline, 2020 is 5% higher, 2021 14% higher and 2022 10% higher. The authors conclude that the data suggest that there are preventable deaths in the age group 15 to 44. These include avoidable harms from alcohol, heart disease, self-harm, accidents and homicides.

Non-respiratory Deaths Non-respiratory mortality ('core' mortality) typically varies little from year to year, changing by a maximum of just 1.3% in the UK in each of the six years from 2015 to 2020 (Bowler, 2022a). Because non-respiratory mortality is usually stable, rather than seasonal, is a useful statistic for investigating excess mortality. However, in the UK, 2021 registered a 3.72% increase and 2022 was projected to show a catastrophic 10.0% increase. Bowler (2023c) updated his analysis of non-respiratory mortality trends. From 2020 to 2023 each year appears to be worse than the previous one, and but for the still unexplained spike in non-respiratory deaths at the very beginning of the pandemic, 2020 would have been broadly similar to the 2015–2019 average. Something therefore happened in 2021 that changed the picture radically.

Cardiac-Related Deaths As of February 2022, in the West Midlands ambulance calls coded 'arrest' or 'peri-arrest' for males had been inflated since April 2021 (Bass, 2023). For females they were inflated from July 2020, and got even worse from May 2021. Whilst, as of March 2022, ambulance call-outs for conditions/illnesses relating to the heart among those aged under 30 were inflated from April 2021 onwards. Alegria (2023a) found that in the UK, for cardiovascular diseases for those aged 15–44, relative to the 2015–2019 average, deaths for 2020 were up 13%, for 2021 up 30% and for 2022 up 44%. He concluded that from 2021 a novel phenomenon leading to increased cardiovascular deaths and disabilities appears to be present in individuals aged 15 to 44 in the UK. In England, analysis by the British Heart Foundation (BHF) found that deaths from heart disease in 2022 had risen almost 13% since the pandemic, rising for three consecutive years (Searles, 2024a). Experts said that since 2020 it was the 'first time there has been a clear reversal in the trend for almost 60 years'. In April 2023 Heneghan, Jefferson, and Oke (2023) noted that excess deaths in England are across all ages and seem to be driven by the mention of cardiovascular disease on the death certificate. In England excess deaths from heart failure increased significantly since the vaccine rollout (Rendell, 2023l). Deaths from heart failure in a six-week period in 2023 were 23% higher than the expected level for the comparable six-week period in 2020. In contrast, if cancer diagnoses are increasing this increase had not shown up in the mortality figures as of May 2023. In England during the week ending 26 May 2023, recorded deaths from heart failure were 44% higher than the 'expected' number of deaths for the same week in 2020 (Rendell, 2023f). In June 2023 the British Heart Foundation reported that in England nearly 100,000 more people with cardiovascular disease than expected had died since the start of the pandemic (BHF Press Office, 2023). That is, on average, over 500 additional deaths per week. In England, in June 2023, it was reported that heart deaths had surged by more than 500 a week since the pandemic (Donnelly, 2023a). The reasons given were NHS disruptions in care and increasing ambulance delays. In England deaths from heart failure from 24 March 2023 to 1 September 2023 were 26% higher than the expected level in 2020 (Rendell, 2023e). In the UK L. Johnston (2024) reported that 2023 was the most deadly non-pandemic year for excess deaths (those above the five-year average) since the Second World War. Deaths from heart and circulatory problems, including deaths from heart disease, heart attacks, strokes and lung clots, were spiralling. Whilst deaths from cancer and dementia

had fallen. In January 2024 Heneghan and Jefferson (2024i) noted that the Office for Health Income and Disparities reported an excess of 102,715 deaths due to circulatory diseases since 1 March 2020.

Cancer Deaths Alegria (2023b) investigated death rates for malignant neoplasms for individuals aged 15 to 44 in the UK by computing excess death rates. The Z-score in 2020 was around 0, indicating that prior to the start of the vaccinations there was no signal pointing to an increase in malignant neoplasm deaths. The trend accelerated substantially in 2021 and 2022 where we observe Z-scores of around 5 and 16, respectively. The increase in excess deaths in 2022 was highly statistically significant. In the UK in November 2023, Harrity (2023) reported that young people were dying of cancer at 'explosive' rates. There was a 28% rise in fatal breast cancer rates in women, an 80% increase in pancreatic cancer deaths among women and a 60% increase among men, a 55% increase among men in colon cancer deaths and a 41% increase in women, a 120% increase in fatal melanomas among men and a 35% increase in women, a 35% increase in brain cancer deaths among men and a 12% rise in women, and a 60% increase in cancer death rates among men in cancers 'without site specification' and a 55% increase among women.

5.2.4 North America

5.2.4.1 Canada

The number of deaths with unknown causes in Alberta, Canada, was elevated in 2021, but only for those aged over ten (Jestre, 2022c). In Canada, there were significantly more ambulance calls in 2021 and 2022 than in 2019 or 2020 (Bridle, 2023a). It was reported in August 2023 that excess mortality in Canada was 15–20% higher than it was in 2020 and 2021, but lower than in 2022 (W. Leung, 2023).

5.2.4.2 Mexico

Silverio-Murillo, de la Miyar, and Martínez-Alfaro (2023) analysed monthly administrative data on 15 different non-COVID-19 causes of death in Mexico from 2017 to 2020. There was an increase in six causes of death: diabetes (36.8%), hypertension (25.8%), heart attacks (40.9%), bronchitis- asthma (24.2%), anaemia (28.6%) and prostate cancer (21.4%). There was a decrease in two causes of death: traffic accidents (8.8%) and HIV (13.8%). There were null effects for seven causes of death: breast cancer, cerebrovascular disease, malnutrition, alcohol-related liver disease, renal insufficiency, homicides and suicides.

5.2.4.3 United States

2021 In the US, in the second half of 2021, all-cause deaths among people aged 18–64 were up 40% (Data Matters, 2023). In the US, in the third quarter of 2021, life insurers incurred claims counts that were 37.7% higher than a pre-pandemic baseline, with a nearly 50-50 split between claims directly tied to COVID-19 and those that weren't (Scism, 2022). A survey report by the Society of Actuaries Research Institute showed a significant increase in excess mortality in the US in the third quarter of 2021 among those aged 25–64 (Britt et al., 2022). This is perhaps the most important unexplained anomaly. Kory (2023a) reported that there was an unprecedented rise in life insurance claims in the third quarter of 2021 among the healthiest sector of society–working-age, white-collar Americans with group life insurance policies (i.e. largely Fortune 500 corporate employees). White collar deaths reached 39% above normal. Deaths for all employees were 34% higher than baseline. Whilst mortality among 35–44-year-olds reached a stunning 101% above (double) the three-year pre-pandemic baseline. In a balanced article, *The Epoch Times* summarised excess US COVID-19 and non-COVID-19 deaths by age group in 2020 and 2021

(Svab, 2022). See Table 4. The fifth largest insurance company in the US, Lincoln National Life

Table 4: An analysis of excess US deaths in 2020 and 2021, compared to 2019. Source: Svab (2022).

Age	Deaths
0–17	Virtually unchanged.
18–49	Significant non-COVID-19 excess deaths due to drugs, alcohol, murder, misclassified COVID-19, an overwhelmed health service, vaccines and post-COVID-19 deaths.
50–64	A mixture of the above and below age groups.
65+	Significant COVID-19 deaths in 2020, dropped in the first half of 2021, coinciding with the proliferation of the COVID-19 vaccines, and increased in the third quarter of 2021, coinciding with the emergence of the Delta variant, which appears more resistant to the vaccines.

Insurance Company, paid out the following in death benefits under group life insurance policies: 2019 $500,888,808; 2020 $547,940,260; and 2021 $1,445,350,949 (Menge, 2022). In other words, the amount paid out in 2021 was 164% higher than the amount paid out in the year of the pandemic (2020). Mulligan and Arnott (2022) found that from April 2020 through to at least the end of 2021, Americans died from non-COVID-19 causes at an average annual rate of 97,000 in excess of previous trends. Circulatory diseases were 4% in excess of the baseline, diabetes or obesity 10%, drug-induced causes 13%, alcohol-induced causes 28%, homicide 27% and traffic accidents 11%. Mortality from all causes during the pandemic was elevated 26% for adults aged 18–64, as compared to 'only' 18% for those aged 65+. This is surprising and disturbing, given that COVID-19 itself mostly kills the elderly, and more life-years are lost when the younger die. At the monetary value of a statistical life used in US government cost–benefit analyses, $10,000,000, the non-COVID-19 excess deaths through to the end of 2021 amounted to a loss of $1.7 trillion. Smalley (2022j) explained that, for Americans aged under 25, during the epidemic wave of March to May 2020 excess deaths were about 300 lower than usual. But, as the year progressed, deaths rose steadily, accounting for almost 2,400 excess deaths between June and December 2020. Deaths continued to rise in 2021 and actually accelerated in the summer, ending up at almost 6,000 excess for the full year, a staggering 185% increase on the 2020 excess. In the US, for people aged 15–64, deaths were up 19% in 2020 compared to the average of the previous five years (Mitteldorf, 2023). In 2021, deaths were even higher, up 30% compared to the same baseline. Excluding COVID-19 deaths, there was an excess of 17% in 2020 and 23% in 2021. In the US for 2020–2021, for those aged 55–64 years unexplained deaths were actually greater than the COVID-19 deaths.

2022 In an excellent Substack article, Coquin de Chien (2022a) analysed the official Massachusetts database of death certificates as of February 2022:

1. There was a pandemic from mid-March 2020 to mid-June 2020, perfectly resembling a high R_0 Gompertz model, with those aged 85+ the hardest hit.

2. During the 2020–2021 winter there was another wave, a Gompertz model with a much lower R_0, mostly affecting those aged 65+.

3. During most of 2021 and continuing into 2022 there was a non-Gompertz anomalous increase in excess deaths of 10%–20%, mostly affecting those aged 60–84 (this anomaly manifests itself visually only from July 2021, because so many aged 85+ died of COVID-19 during the pandemic and the winter resurgence, due to mortality displacement, there were fewer deaths of those aged 85+ than usual from February 2021 to July 2021, which offset the anomaly).

The average age of death was lower in 2021 than in any of the prior six years. In fact, the life-years lost from the cause of the anomaly are significantly greater than the life years lost from COVID-19 itself, which is shocking. Using data from the US up to 31 March 2022 and with reference to the pandemic (but no mention of vaccinations), Yeo et al. (2023) found that excess mortality due to acute myocardial infarction mortality increased during the COVID-19 pandemic by 23%–34% for those aged 25–44 years, by 17%–21% for those aged 45–64 years and by 13%–18% for those aged $\geq$ 65 years. In his book *"Cause Unknown": The Epidemic of Sudden Deaths in 2021 & 2022*, Ed Dowd reported that the CEO of the OneAmerica insurance company publicly disclosed that during the third and fourth quarters of 2021, deaths of people of working age (18–64) were 40% higher than it was before the pandemic (Dowd, 2022). Significantly, the majority of the deaths were not attributed to COVID-19. Coddington (2023b) analysed all-cause mortality in the US. Very large increases in all-cause mortality started in all groups in 2020. Surprisingly, whilst COVID-19 hit older groups the worst in 2020, younger groups actually had larger increases in all-cause mortality. All groups showed increased total deaths from 2019 to 2020 and 2020 to 2021 (except 75–84 yr olds, who were flat) and decreases in total deaths from 2021 to 2022. Despite reductions in 2021 to 2022, all groups' 2022 death rates remained well above 2018–19 levels. Surprisingly, the increase from 2018–19 to 2022 was worst for 25–34 and 35–44-year-old groups. In the US, obituaries show that many more people died suddenly or unexpectedly in 2021 and 2022 (Coquin de Chien, 2023c). The figures were 37374 in 2019, 49068 in 2020, 79858 in 2021 and 74596 in 2022. They died in excess from clotting, bleeding, stroke, myocarditis, heart attack, pulmonary embolism, cardiac arrhythmia, lymph and marrow cancers and blood cancers. According to the author, 'It's all about the blood'.

2023 Smalley (2023p) analysed US mortality up to May 2023. In the COVID era, under-45-year-old Americans suffered more life years lost due to non-COVID causes than COVID. In every age group under 85, there have been more life years lost in the post-vaccination period than before. Mortality returned to pre-pandemic levels, coinciding with a substantial drop in administration of the vaccine. For the 12 months ending in June 2023, age-standardised excess mortality in the US was estimated at +9.7% (Ben, 2023d). An article in *The Hill* asked why so many Americans are dying early (Kory & Pfeiffer, 2023a). Excess deaths claimed 158,000 more Americans in the first nine months of 2023 than in the same period in 2019. That exceeded America's combined losses from every war since Vietnam. Actuarial reports showed deaths occurring disproportionately among young working-age people, with mortality increases in liver, kidney and cardiovascular diseases, and diabetes. Drug overdoses also soared nationwide, but not primarily in the young working class. In the US in October 2023, Insurance Collaboration to Save Lives reported that excess deaths were 7% higher than expected (Bailey, 2023). Whilst CDC reported that younger adult mortality rates were up more than 20% in 2023. Excess deaths were expected to reach about 0% by 2030. The following causes of death increased: cardiac, stroke, diabetes, kidney and liver diseases. In Minnesota, Massachusetts and Connecticut in the US, deaths from acute renal failure (sudden kidney failure) increased by 100% from November 2020 through to 2023 (Coquin de Chien, 2024a).

2024 In April 2024, Ethical Skeptic (2024c) reported that in the US, all-cause excess mortality was holding at 6.7% elevated. Non-natural cause excess mortality was holding at around 720 young person deaths per week from drug overdose, both detected drug and assumed drug (37% of total excess). The Ethical Skeptic (2024) calculated excess deaths for the period 2018 to 6 October 2024 as follows: (real) excess all cause mortality 12.7%, nominal excess all cause mortality 3.7%, excess non-COVID-19 natural cause mortality 12.7% and excess non-natural mortality 7.1%.

Cancer Deaths In October 2022, Chudov (2022e) reported that cancer deaths began to increase in late 2021, with an unprecedented 9-sigma increase in cancer deaths in the US. Excess deaths in Massachusetts involving lymph node cancer were, for the first quarter of each year, 122% in 2021, 105% in 2022 and 193% in 2023 (Coquin de Chien, 2023a). Coquin de Chien (2023b) reported that in Massachusetts in 2023 secondary lymph node cancer-involved deaths were higher than 400% of normal. In April 2024, Ethical Skeptic (2024c) reported that in the US, cancer hit a new high excess at 6.8%, and a new high rate of growth at 2.8%. In May 2024 for the US, Ethical Skeptic (2024e) pointed out that cancer was up 25% in younger ages, but fewer older people were dying of cancer, because they had already died from COVID-19. These two effects cancel each other out due to an 'age bracket Simpson effect' and overall the graph appears flat. In reality, it is likely that all ages were up in rate as well, but the excess is just temporarily hidden by the Simpson effect.

5.2.5 Global

A global analysis from 1 January 2020 to 31 December 2021 estimated that excess mortality was three times greater than the reported number of COVID-19-related deaths (COVID-19 Excess Mortality Collaborators, 2022). Australia, New Zealand and South Korea had few excess deaths in 2020–2021, but considerable excess deaths in 2022 (Levitt et al., 2023). The USA and Greece did poorly in both periods. Whilst Sweden had limited deaths in both periods. Taking into account population change, Mexico and Colombia saw the highest increase in mortality of +30.5% and +23.5%, respectively, over the three-year period 2020 to 2022 (Morgan et al., 2023).

In an article published in *BMJ Public Health*, Mostert, Hoogland, Huibers, and Kaspers (2024) concluded that excess mortality had remained high in the Western World for three consecutive years (2020, 2021 and 2022, the linear excess mortality trendline is almost horizontal), despite the implementation of COVID-19 containment measures and COVID-19 vaccines. The authors state that this is unprecedented and raises serious concerns. Three out of four of the authors are affiliated with Princess Máxima Center for Pediatric Oncology, Utrecht, the Netherlands. Absurdly, the Princess Máxima Center distanced itself from the publication (Prinses Máxima Centrum, 2024): 'The Princess Máxima Center deeply regrets that this publication may give the impression that the importance of vaccinations is being questioned'. There is a blatant conflict of interest. The Princess Máxima Center receives funding to conduct clinical trials. Specifically, two of the products they are funded for are Bosutinib and Inotuzumab, both cancer treatments developed by Pfizer (Aussie17, 2024). The BMJ published an expression of concern, which pointed out that the paper does not show a causal link between vaccinations and excess mortality (BMJ Publishing Group Ltd., 2024). This is true, but the expression of concern was completely unnecessary. The paper was not misleading. Meanwhile, Ariel Karlinsky, an economist at the Hebrew University of Jerusalem in Israel whose work the study cited, and a few colleagues, submitted a commentary and request for retraction to *BMJ Public Health* (Kincaid, 2024). The authors have also been accused of plagiarism (van Erp, 2024). Simonsen and Pedersen (2024) attempted to make the case for the retraction of the paper. In doing so, they claim that vaccines prevented about 90% of severe COVID-19 outcomes, and that the IFR in Western countries may be above 0.8%. Both numbers are far too high. The paper fails to consider what N. Fenton and Neil (2024b) believe were the major factors that explain the excess deaths in 2020, especially in the spring: cause of death misattribution, deaths resulting from an inappropriate medical response to COVID-19, such as the use of ventilators, DNR (do-not-resuscitate order), midazolam and lack of antibiotics for bacterial pneumonia. Elijah (2024b) reported that the study on excess deaths faced retraction.

5.3 Injuries

This subsection addresses potential excess mortality.

5.3.1 Europe

5.3.1.1 Switzerland

Binder (2023) calculated increases of severe diagnoses in 2021 compared to the mean of the years 2016–2020 in Switzerland, based on the diagnostic codes in hospitalisations. For 0–14-year-olds, various malignant tumours +249%; and pulmonary embolism, cardiac arrest & stroke +125%. For 15–39-year-olds, myocarditis: +99%; intracerebral haemorrhage +64%; and various types of cancer +48%. For all ages, autoimmune diseases: +40% and damage to the nervous system +29%.

5.3.1.2 United Kingdom

Beck (2023a) reported that between 2021 and 2022, the UK Civil Aviation Authority's (CAA) 'unfit to fly' numbers showed a 75% increase, whilst the RAF said that 27% of their pilots were medically downgraded. Apparently, Brexit is partly to blame for the former. A *cataract* is a cloudy area in the lens of the eye that leads to a decrease in vision of the eye. In the UK, the number of cataracts and other disorders of the lens jumped from 921 in 2021 to 15,528 in 2022 (Kirsch, 2024f). A 1586% increase!

Cardiovascular In response to a freedom of information request, the Blackpool Teaching Hospitals NHS Foundation Trust in the UK disclosed that the annual total number of patients that had been referred to the Heart Failure Diagnostic Clinic within the trust over the last few years was 2018: 213, 2019: 172, 2020: 63, 2021: 603 and 2022 up to the end February: 104 (Mcghee, 2022). Smalley (2022w) analysed data from the West Midlands Ambulance Trust. Cardiac/respiratory arrest emergency calls, relative to 2019, were up 23% in 2020, 56% in 2021 and 74% in 2022. Alegria (2023a) found that in the UK, for cardiovascular diseases for those aged 15–44, relative to the 2015–2019 average, disabilities for 2020 were up 10%, for 2021 up 64% and for 2022 up 135%. He concluded that from 2021 a novel phenomenon leading to increased cardiovascular deaths and disabilities appears to be present in individuals aged 15 to 44 in the UK.

Cancer In the UK in March 2024 leading doctors warned of a mysterious new 'epidemic' of abdominal cancers in younger people, with notable increases seen in under-45s, including the Princess of Wales (Bodkin, 2024a). Ely (2024) reported that scientists were scrambling to find the cause of a mystery cancer 'epidemic' which is striking under-50s.

5.3.2 North America

5.3.2.1 United States

Compared with 2019, mortality due to Alzheimer's disease and related dementias (ADRD) in the US in 2020 was 25.7% higher (Gilstrap, Zhou, Alsan, Nanda, & Skinner, 2022).

Cardiovascular Using the national healthcare databases from the US Department of Veterans Affairs, and data from 1 March 2020 to 31 October 2021, Xie et al. (2022) showed that, beyond the first 30 days after infection, individuals with COVID-19 were at increased risk of incident cardiovascular disease spanning several categories, including cerebrovascular disorders, dysrhythmias, ischemic and non-ischemic heart disease, pericarditis, myocarditis, heart failure and thromboembolic disease. In the US, heart attacks in those aged 18–44 rose by 66% between 2020 and 2021 (Focht, 2024). Experts blamed the rise on myocarditis (heart inflammation) during the pandemic.

Cancer The number of cancer diagnoses in the US military's DMED system went from a 5-year average (2016–2020) of 38,700 per year to 114,645 in the first 11 months of 2021 (Huff, 2022). This was a predominantly young population. Whilst malignant neoplasms (cancerous tumours) for those aged 0 to 54 were on an upward trend from the start of 2020 to, at least, the end of 2022 (Ethical Skeptic, 2023). Medicaid data showed that in New York cancer cases increased by 2.5× in 2023 over the 2017–2019 baseline (Kirsch, 2024p).

5.3.3 Global

Globally, for people under 50 years old, since the pandemic began both cancer rates and cancer deaths have trended upwards (Ledford, 2024; Zhao et al., 2023).

5.4 Excess Mortality and COVID-19

To what extent is the excess mortality due to COVID-19? Mowrey (2024d) stated that it is really difficult to determine exactly why people are dying, but he still thinks it is clear that the persistent excess deaths are predominantly driven by the virus.

5.4.1 Asia

5.4.1.1 Japan

Using a three-dimensional human heart tissue model, Murata, Makino, Tomonaga, and Masumoto (2024) demonstrated that SARS-CoV-2 persistently infects the heart opportunistically causing cardiac dysfunction triggered by detrimental stimuli such as ischemia, potentially predicting a post-COVID-19 era heart failure pandemic.

5.4.2 Australasia

5.4.2.1 Australia

In Australia total excess mortality for the first eight months of 2023 was 6% (COVID-19 Mortality Working Group, 2023a). Slightly more than half of the excess mortality was due to deaths from COVID-19 (+3,500 deaths), with another +1,000 COVID-19-related deaths, and the remaining excess of +2,000 deaths had no mention of COVID-19 on the death certificate. Whilst the Australian Senate's Excess Mortality Inquiry concluded that COVID-19 was the key driver of Australian excess mortality, both directly and indirectly (Barnett, 2024c). However, two-thirds of submissions made were suppressed and key evidence was omitted.

5.4.2.2 New Zealand

1News (2023) in New Zealand reported that COVID-19 may have permanently damaged people's immunity.

5.4.3 Europe

5.4.3.1 Estonia

Using data from Estonia, Uusküla et al. (2022) found that SARS-CoV-2 infection carries a substantially increased mortality in the following 12 months. This excess death mainly occurred in older people and was driven by a broad array of causes of death.

5.4.3.2 Scandinavia

Nilsson et al. (2024) found that Denmark, Finland, Norway and Sweden during the COVID-19 pandemic (2020–2022) experienced deaths due to COVID-19 (a total of 32,491 during 2020–2022), excess deaths due to cardiovascular diseases (in total 11,610 excess deaths), and under-mortality due to respiratory diseases other than COVID-19 (in total 9878) and dementia (in total 8721). The excess mortality due to cardiovascular diseases was particularly pronounced in Finland and Norway in 2022, and the under-mortality due to dementia was particularly pronounced in Sweden in 2021–2022.

5.4.3.3 United Kingdom

Using data from 2020, Heneghan and Jefferson (2023j) estimated that in the UK in the early phase of the pandemic roughly two-thirds of the excess deaths were caused by COVID-19. Similarly, using data up to 9 April 2022, Joel Smalley estimated that in the UK two-thirds of all excess deaths were due to COVID-19 (Smalley, 2022r). Analysing data from the UK Biobank from between 1 February 2020 and 31 December 2020, Hilser et al. (2024) found that hospitalisation for COVID-19 represented a coronary artery disease risk equivalent, with post-acute myocardial infarction and stroke risk particularly heightened in non-O blood types. However, for those who caught COVID-19 but were not hospitalised (98% of all adults and 90–95% of adults over 60), there was essentially no increase in the risk in heart attacks, strokes or deaths (Berenson, 2024b). Wan et al. (2023) analysed the association of COVID-19 with cardiovascular disease (CVD) and all-cause mortality before vaccines became available. A prospective cohort of patients with COVID-19 infection between 16 March 2020 and 30 November 2020 was identified from UK Biobank, and followed for up to 18 months, until 31 August 2021. There was an acute phase (within 21 days of diagnosis) and a post-acute phase (after 21 days). They used a historical control (between 16 March 2018 and 30 November 2018) and a contemporary control (between 16 March 2020 and 30 November 2020). Hazard ratios are shown in Table 5. The data suggests that COVID-19 infection, including long COVID, is associated with increased short- and long-term risks of CVD and mortality. The UK Government stated that the majority of

Table 5: Hazard ratios for the association of COVID-19 with short- and long-term risk of cardiovascular disease and mortality. Source: Wan et al. (2023).

		Historical control	Contemporary control
CVD	Acute	5.0	4.3
	Post-acute	1.3	1.4
All-cause mortality	Acute	67.5	81.1
	Post-acute	4.5	5.0

excess deaths appear to be from circulatory issues and diabetes—long-term, chronic conditions that can be fatal without adequate care. J. Paul (2022a) argued that this increase in diabetes and circulatory problems is either caused or further accelerated by the virus. Analysing data up to 26 August 2022, W. Jones (2022g) hypothesised that either a delayed effect of the virus or the vaccine is covertly killing thousands more than we think by attacking the cardiovascular system. The explanations are not mutually exclusive; the impact of vaccination could exacerbate or be exacerbated by the effects of the virus. Analysing UK data, J. Ferguson (2023) estimated that the official COVID-19 death toll (230,000) was overestimated by more than a factor of 2. Adjusted for dry tinder effects, the true figure was likely 95–105,000. Whilst there have been 80,000–90,000 excess deaths in the eighteen months from February 2022 to August 2023. If only 10,000–15,000 of them can reasonably be blamed on COVID-19, something unidentified, but clearly not COVID-19, seems to have killed upwards of 65,000 Brits over the last 18 months;

and at a monthly rate (∼4,000) wholly in line with the severity of COVID-19 itself. Swiss Policy Research (2023b) reported that England had seen substantial excess mortality in working-age people (15–64), but this increase is linked to COVID-19, not vaccination. Possible causes are high obesity rates and a high proportion of dark-skinned South Asian immigrants.

5.4.4 North America

5.4.4.1 Canada

In May 2022 Statistics Canada reported that excess mortality among Canadians under the age of 45 had been observed almost continuously from May 2020 onwards, with 19.0% more deaths than expected if there was no pandemic, and it was *not* COVID-19-driven (Statistics Canada, 2022). Whilst the number of deaths among Canadians younger than 45 due to accidental poisonings, including overdoses, rose 30.7% in 2020 (compared to 2019).

5.4.4.2 United States

Using data from May 2020 and May 2021, Eberhardt et al. (2023), publishing in *Nature Cardiovascular Research*, found that SARS-CoV-2 can directly infect the arteries of the heart and cause the fatty plaque inside arteries to become highly inflamed, increasing the risk of heart attack and stroke. Using data from 1 January 2020 to 30 June 2021, Mainous, Rooks, Wu, and Orlando (2021) found that patients with COVID-19 hospitalisation, relative to those who were COVID-19 negative, had a substantially higher risk of (all-cause) death over the subsequent 12 months. Among adults under 65, the risk was 233% higher; among adults 65 or older, the risk was 117% higher. Nearly 80% of these downstream deaths were for causes other than respiratory or cardiovascular. A life insurance company in Indiana reported that death rates among 18 to 64-years-olds in the second half of 2021 were 40% higher than pre-pandemic levels (Beane, 2022). This was a 12-sigma event (Crawford, 2022d), and likely *not* due to COVID-19 directly (Kirsch, 2022i). Paglino et al. (2022) produced county-level estimates of excess mortality for 3,127 counties in the US between March 2020 and December 2021. During 2020 and 2021, 18.3% of excess deaths were not assigned to COVID-19 on death certificates as an underlying cause of death. The proportion of excess deaths assigned to COVID-19 was lower in 2020 (76.3%) than in 2021 (87.0%). Excess deaths exceeded deaths assigned to COVID-19 in rural areas across many regions, especially in 2021. In the US, the younger the cohort, the higher the increase in the number of COVID syndrome deaths from 2020 to 2021 (Spieker, 2023e). In the US from 2018–19 to 2020–21 there was a 25% increase in deaths for those aged 15–24. Less than 1 in 15 of those deaths were labelled as due to COVID-19 (Coddington, 2023d). In an article published in *Nature Medicine*, using data from 1 March 2020 to 25 June 2022 from the US Department of Veterans Affairs' national healthcare database, Bowe, Xie, and Al-Aly (2022) showed that compared to no reinfection, SARS-CoV-2 reinfection contributed additional risks of death (hazard ratio (HR) = 2.17), hospitalisation (HR = 3.32) and sequelae including pulmonary, cardiovascular, haematological, diabetes, gastrointestinal, kidney, mental health, musculoskeletal and neurological disorders. The risks were most pronounced in the acute phase but persisted in the post-acute phase at 6 months. Compared to noninfected controls, cumulative risks and burdens of repeat infection increased according to the number of infections. Using a Bayesian hierarchical model with US data from March 2020 to August 2022, Paglino, Lundberg, Wrigley-Field, and Stokes (2024) found that COVID-19 deaths correlated temporally with increases in excess deaths reported as non-COVID-19 natural causes in the same and/or prior month. The authors state that this suggests that many excess deaths reported as non-COVID-19 natural causes during the first 30 months of the pandemic in the United States were unrecognised COVID-19 deaths. Verduyn, Kenyon, and Engler (2023) analysed COVID-19 mortality in the US up to 30 June 2023. Any effectiveness of the NPIs was completely dwarfed by the correlation with pre-existing mortality rates. The effectiveness of the COVID-19 vaccinations, if any, was also dwarfed by

pre-existing mortality rates. 2019 mortality rates determined COVID-19 mortality in 2020 and beyond. Surprisingly, any excess deaths in the USA after 2019 were likely caused by things other than COVID-19.

5.4.5 Global

An analysis of data from 1 January 2020 to 31 December 2021 revealed that estimated excess mortality exceeded reported COVID-19 deaths to a greater extent in South Asia and sub-Saharan Africa than in other regions (COVID-19 Excess Mortality Collaborators, 2022). In December 2023, Swiss Policy Research reported that global excess mortality continued to be driven by COVID-19 infections in elderly people (Swiss Policy Research, 2023b). Whilst respiratory infections are also a leading cause of heart deaths in elderly people.

Figure 33 shows COVID-19 death rate and excess mortality. In 2023 and early 2024 countries

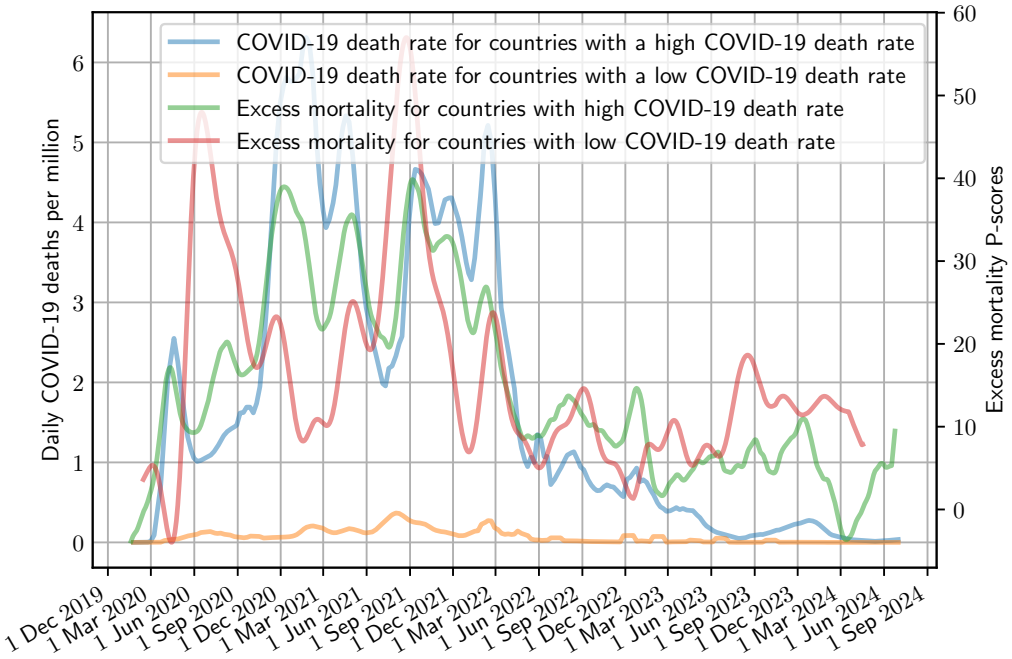

Figure 33: COVID-19 death rate and excess mortality

that had experienced a low COVID-19 death rate (January 2020 to July 2024), had greater excess deaths than countries that had experienced a high COVID-19 death rate (January 2020 to July 2024).

5.5 Excess Mortality and Lockdowns

To what extent is the excess mortality due to lockdowns?

5.5.1 Australasia

5.5.1.1 Australia

ManDownUnder (2022) argued that the data for Australia showed clearly that lockdowns increased chronic and overall mortality.

5.5.2 Europe

5.5.2.1 Sweden

Smalley (2022y) noted that, of all the countries analysed by the OECD, from 2020 to June 2022, Sweden had the lowest overall cumulative excess deaths tally.

5.5.2.2 United Kingdom

In July 2020 the UK Government estimated that, using total figures for the UK including the past and the future, changes in care would result in 65,770 excess deaths and the impacts of the recession would result in 17,300 excess deaths (UK Government, 2020). Dee (2023b) estimated that in England there were around 55,000 excessive excess deaths in 2020 that could be attributed to misguided policies over this period rather than anything genuinely viral. Using data up to 9 April 2022, Joel Smalley estimated that in the UK one-third of all excess deaths were caused by the government's response to the pandemic (deaths due to inappropriate medical treatment, denial of healthcare or fatal adverse events to the vaccinations) (Smalley, 2022r). Analysing data up to 15 July 2022, W. Jones (2022h) reported that cancer deaths were, perhaps surprisingly given the withdrawal of healthcare access during the pandemic, broadly at normal levels, suggesting there is something other than lack of access to healthcare going on. Analysing data from 30 December 2019 to 13 November 2022, Dee (2022c) calculated that in England and Wales lockdown harm, in terms of excess deaths, crops up for persons aged 25 years and over, but doesn't apply to younger generations. Using data from the Department of Health Improvement and Disparities (DHID) website, Rendell (2023m) compared the expected number of deaths from the end of March to the end of September 2020, with the registered number of deaths for the commensurate 28 weeks in 2023. Overall, deaths in 2023 were 26% up on those expected in 2020. Excess deaths included the following: heart failure 26%, cirrhosis and other liver diseases 22%, diabetes 19% and cancer 2.3%. Heart failure, cirrhosis and diabetes are linked to lifestyle choices, so may be due to the unintended consequences of lockdowns. Smalley (2024g) analysed life expectancy in England and Wales from 1974 to the present, and concluded that the extraordinary mortality events of 2020 to 2024 in England and Wales were associated with public health intervention and not with the emergence of a novel respiratory pathogen.

5.5.3 North America

5.5.3.1 United States

Michael Betrus, in his book *COVID-19: Lockdowns on Trial* published in August 2021, hands down the verdict that lockdowns were guilty of causing over 100,000 of the 350,000 excess deaths in 2020 in America (M. Betrus, 2020). Analysing data from April 2020 to September 2021, Shahar (2022b) estimated that interventions were responsible for around 21% of excess deaths in the US. In an insightful paper, D. G. Rancourt, Baudin, and Mercier (2022) analysed all-cause mortality data up to 5 February 2022 in the US. The highest percentage increase in all-cause mortality was for the 25–44 age group, at 41%. Excess all-cause mortality was strongly correlated with poverty, and also correlated with obesity and disability. Whilst COVID-19 was not a dominant cause of excess mortality. The authors hypothesise that lockdowns caused psychological stress and social isolation, which led to severely suppressed immune systems in the most vulnerable, which led to mortality from untreated bacterial pneumonia. Smalley (2023c) argued that analysis of Minnesota death certificate data from January 2015 to May 2023 revealed that, collectively, COVID-19 interventions caused at least four times more excess mortality than COVID-19 itself. One of the theories of pandemic-induced cancer deaths is that patients miss screening, which delays detection and treatment, but not necessarily causing death until two or more years after the pandemic (Mulligan & Arnott, 2022).

5.5.4 Global

States that did not implement lockdowns achieved a perfectly average or even below-average pandemic excess mortality compared to their regional peers, as shown by Sweden in Western Europe, Belarus in Eastern Europe, Florida in the United States, Brazil and Nicaragua in Latin America, Japan in East Asia, or Tanzania in Black Africa (Swiss Policy Research, 2023c). Ben (2024d) analysed global data for the period 2020–2023, and concluded that stringent lockdowns, rising poverty and pre-existing health issues were the main drivers of increased excess deaths.

5.6 Excess Mortality and Vaccinations

To what extent is the excess mortality due to vaccinations? See also Section 4.2.8 on vaccine effectiveness and all-cause mortality. Professor Christine Stabell Benn, a vaccine researcher with almost thirty years of experience in the field, is an expert on non-specific vaccine effects, and has found that non-live vaccines tend to increase overall mortality (Rushworth, 2022). The COVID-19 vaccines are best described as non-live.

From April 2022, among countries with a high COVID-19 death rate (January 2020 to July 2024), highly vaccinated countries had greater excess mortality than low-vaccinated countries. Medium-vaccinated countries were intermediate. Figure 34 shows excess mortality for countries with a high COVID-19 death rate. From January 2022, among countries with a low COVID-19

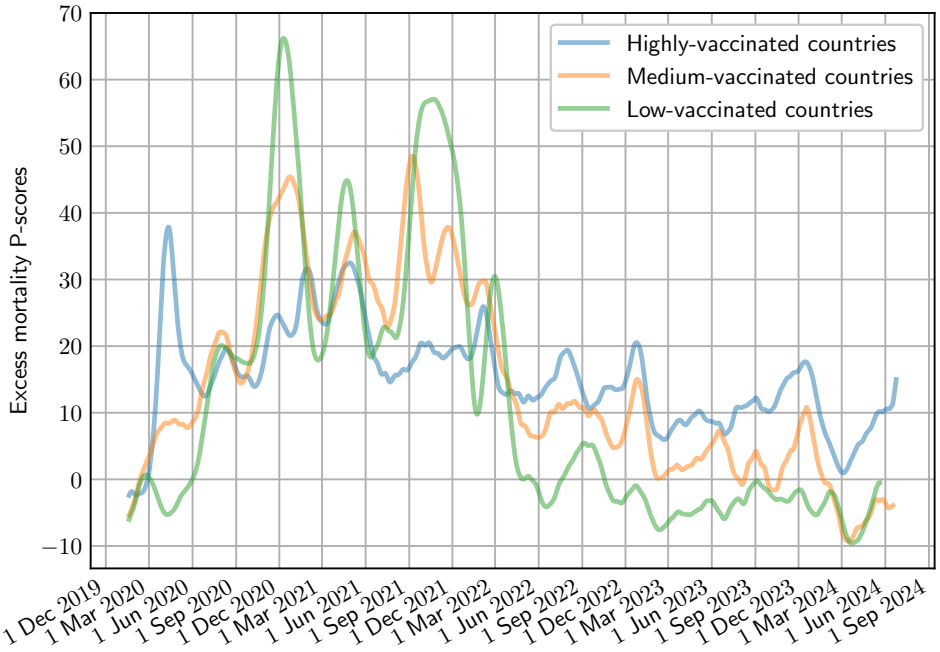

Figure 34: Excess mortality for countries with a high COVID-19 death rate

death rate (over the entire period), highly vaccinated countries had greater excess mortality than low-vaccinated countries. Figure 35 shows excess mortality for countries with a low COVID-19 death rate. From April 2022, among countries with a medium COVID-19 death rate (over the entire period), highly vaccinated countries had greater excess mortality than low-vaccinated countries. Medium-vaccinated countries were intermediate. Figure 36 shows excess mortality for countries with a medium COVID-19 death rate.

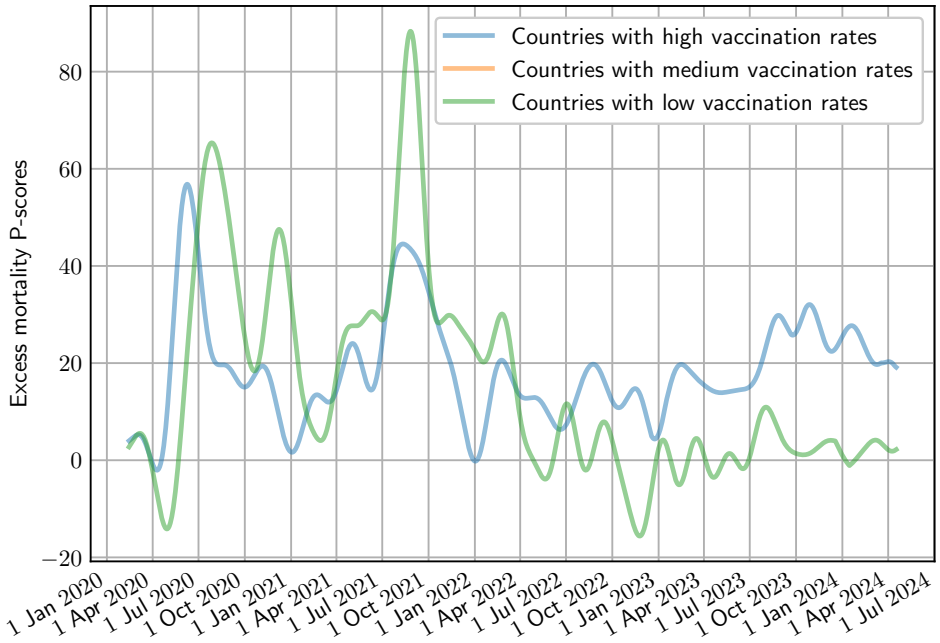

Figure 35: Excess mortality for countries with a low COVID-19 death rate

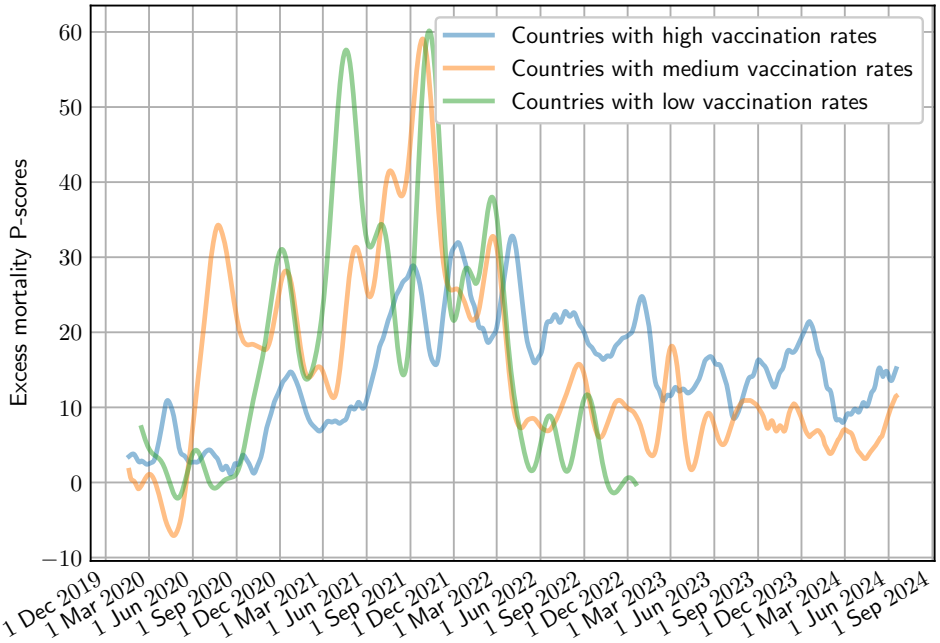

Figure 36: Excess mortality for countries with a medium COVID-19 death rate

See also Section 4.3.16.4, deaths caused by adverse reactions to vaccinations.

5.6.1 Asia

5.6.1.1 Cyprus

Avraam, Economidou, Kountouras, Doulberis, and Soteriades (2022) analysed daily reported COVID-19 cases, daily COVID-19-related deaths and weekly all-cause mortality in Cyprus over the period 2016–2021. They observed a substantial increase of 9.7% in all-cause mortality in Cyprus in 2021 compared to 2020, with an overall mortality increase of 16.5% in 2021 compared to the mean mortality of the previous five years. In particular, they documented a sharp increase over the third and fourth quarters of 2021. When excluding the deaths reported to be caused by COVID-19, from 2020 to 2021 there was a 3.3% increase in mortality; again, the increase was concentrated in the third and fourth quarters of 2021. This phenomenon, the authors note, coincided chronologically with the vaccination campaign. Also in Cyprus, Economidou, Markou, Prokopi, Avraam, and Soteriades (2024) found that the third and fourth quarters of 2021 saw excess mortality of 34.1% and 11.8%, respectively. Whilst the first quarter of 2022 showed a staggering 30.7% excess mortality. The increases in mortality during 2021 and 2022 coincided with the island's COVID-19 vaccination campaign.

5.6.1.2 Israel

In an unpublished paper using data up to May 2021, Ohana and Henrion-Caude (2021) analysed excess mortality in Israel during the COVID-19 pandemic. The authors observed an unexpected rise of excess mortality among 20- to 49-year-olds in February–March 2021, which coincided with the rollout of the Israeli vaccination campaign for the 20- to 49-year-olds. They noted that this unexpected rise in excess mortality among young adults was also found in the United Kingdom and Hungary, which, in common with Israel, had highly vaccinated populations.

5.6.1.3 Japan

In Japan, in 2021 after mass vaccination (with the mRNA-LNP vaccine) with the first and second doses there was some excess age-adjusted cancer mortality (Gibo, Kojima, Fujisawa, Kikuchi, & Fukushima, 2024). Then in 2022 after mass vaccination with the third dose there was significant excess age-adjusted cancer mortality. The age-adjusted mortality rates of ovarian cancer, leukaemia, prostate, lip/oral/pharyngeal, pancreatic and breast cancers increased significantly beyond the predicted rates, especially in 2022. All of these cancers are known as oestrogen and oestrogen receptor alpha (ERα)-sensitive cancers. The authors concluded that these particularly marked increases in mortality rates of these ERα-sensitive cancers may be attributable to several mechanisms of the mRNA-LNP vaccination rather than COVID-19 infection itself or reduced cancer care due to the lockdown. Only five out of 20 cancers showed any excess deaths in 2020–2022. But the three that showed significant excess deaths in 2021 (pancreatic, prostate and ovarian cancers) showed significant excess deaths in 2022 too (Gin, 2024c). Lip/oral/pharyngeal cancers and leukaemia also showed significant excess deaths in 2022. It could be that the vaccine is causing impairment of the innate immune response, which leads to an increased susceptibility to any infection, increased autoimmune disease and accelerated cancer progression (Redshaw, 2024d). There are various mechanisms by which mRNA COVID-19 vaccines could link to cancer:

- oestrogen-sensitivity;
- biodistribution of lipid nanoparticles;
- modification with N1-methyl-pseudouridine;

- antibody-dependent enhancement;
- thrombogenic effects of spike protein and LNPs;
- suppression of cancer immunosurveillance; and
- reverse transcription of RNA into DNA.

The Editors-in-Chief retracted Gibo et al. (2024): 'Upon post-publication review, it has been determined that the correlation between mortality rates and vaccination status cannot be proven with the data presented in this article. As this invalidates the conclusions of the article, the decision has been made to retract.' The authors disagree with the retraction. Smalley (2023n) noted that in the year of the pandemic, 2020, Japan had no excess mortality; in 2021, when vaccination programmes began, excess mortality increased; then in 2022 excess mortality jumped to around four times higher than in recent years. Disturbingly, with data up to 26 March 2023, waves of excess mortality appear to follow waves of boosters (Smalley, 2023i). In what makes for a disturbing graph, using data from November 2021 to March 2023, COVID-19 boosters are consistently followed by excess deaths (Smalley, 2023l).

5.6.1.4 Singapore

Singapore, which is 94% vaccinated against COVID-19, has seen massive excess mortality, but it only started in 2021 when vaccinations were rolled out. Overall, Singapore has observed an excess mortality rate within the range 12%–20%. In the 65–69 age group excess mortality exceeded 30% in 2023.

5.6.1.5 South Korea

South Korea had essentially no excess deaths until 80% were vaccinated and boosters were administered (Smalley, 2022x). The country experienced no unexpected or unusual deaths for the first 18 months of the global pandemic, then all-cause mortality rocketed just after the country was 80% vaccinated and boosters began (Smalley, 2023k).

5.6.2 Australasia

5.6.2.1 Australia

Australia is an important control group because they had minimal COVID-19 prior to Omicron. Therefore the effects of the vaccine alone can be deduced by what happened there in 2021 (HART, 2023b). In Queensland, Australia, all-cause mortality among those aged 60 and older started trending upwards around March 2021, when the vaccine rollout began (Barnett, 2023a). Deaths in Australia exceeded expected levels from 2021, well in excess of what could be attributed to COVID-19. The excess was part circulatory disease but many such deaths did not fall into the main categories of deaths (HART, 2023b). Smalley (2022c) analysed all-cause mortality data for Australia from January 2020 to February 2022, and concluded that all-cause mortality became significantly excessive in April 2021, a few weeks after vaccinations began. In an unpublished but thorough article, using data up to 28 August 2022, D. G. Rancourt, Baudin, and Mercie (2022) argued that Australia's excess mortality is causally associated with the COVID-19 vaccine. They estimated that the vaccine injection fatality ratio (vIFR) is approximately 0.05%. Using ordinary least squares regression analysis, by state and territory in Australia up to March 2023, D. E. Allen (2024) found that there was a very strong correlation between COVID-19 booster vaccinations and excess deaths.

5.6.2.2 New Zealand

Smalley (2022p) analysed mortality in New Zealand up to February 2022. There were few COVID-19 deaths, and they did not coincide with spikes in overall mortality. He suggested that the vaccine should be investigated as the potential cause of all the excess death in 2021. Gibson (2022) used aggregate weekly data on excess mortality from April 2021 to March 2022 in New Zealand to study the impact of booster doses. He estimated that there were 16 excess deaths per 100,000 booster doses. The value of a statistical life (VSL) of these excess deaths is over $1.6 billion. The age groups most likely to use boosters had 7–10 percentage point rises in excess mortality rates as boosters were rolled out, whilst the age group that is mostly too young for boosters saw no rise in excess mortality. The relationship with excess mortality was not seen with the rollout of the original protocol vaccine doses. Using data up to 2023, Ben (2024g) found no statistically significant effect on all-cause mortality by COVID-19 vaccination status. During times of high COVID-19-attributed excess mortality, rates were higher in vaccinated groups. Kirsch (2024l) claimed that data from a New Zealand Official Information Act (OIA) request (from January 2022 to April 2023) showed that the vaccines increased all-cause mortality significantly since the vaccinated age-standardised mortality rate (ASMR) was slightly above the unvaccinated ASMR.

5.6.3 Europe

Mercadé-Besora et al. (2024) conducted a staggered cohort study from January 2021 to July 2021 based on national vaccination campaigns using electronic health records from the UK, Spain and Estonia. The authors concluded that COVID-19 vaccination *reduced* the risk of post-COVID-19 cardiac and thromboembolic outcomes. The graphs on (EuroMOMO, 2024) show that in Europe (all-cause) excess deaths were elevated after vaccination programmes began (throughout the summer in 2021, but not in 2020), for the middle-aged, but not for the elderly. This is consistent with the notion that vaccinations suppress innate immunity—the early spike and forever spike hypotheses. Witzbold (2023a) noted that, based on country-by-country data in Europe, up until March 2022, higher vaccination uptake correlated with fewer excess deaths, but from April 2022 onwards, higher vaccination uptake correlated with higher excess death rates. In Europe, excess deaths were almost 13% higher after the vaccinations began, compared with before (Smalley, 2022i). Aarstad and Kvitastein (2023) analysed vaccine uptake and all-cause mortality for 31 countries weighted by population size. Vaccines may have been beneficial in 2021. However, the higher the 2021 vaccination uptake, the higher all-cause mortality from January to September 2022. Chudov (2024c) analysed COVID-19 vaccination rates and excess mortality in 25 European countries from 2 January 2023 to 8 October 2023. COVID-19 vaccination rates are associated with an increased mortality of 25%, and the association is highly statistically significant. It continued the patterns seen in 2022. In Europe, Igor Chudov found a strong positive correlation between excess mortality and COVID-19 vaccination rates for 2 January 2023 to 8 October 2023 (Chudov, 2024a) and December 2023 (Chudov, 2024d). Lataster (2023a) analysed excess death data from March 2023 to January 2024 and COVID-19 vaccination rates and the number of COVID-19 vaccine doses administered in up to 31 European countries. A positive correlation was found between COVID-19 vaccination rates and excess mortality for every month examined ($r = 0.25$–0.65). Whilst a slightly stronger correlation was found between COVID-19 vaccine doses administered and excess mortality ($r = 0.33$–0.67). Using data from 8 April 2024 to 14 April 2024, Ethical Skeptic (2024d) showed that in Europe, countries that had a high percentage of the population vaccinated had a high most recent 12-month excess mortality.

5.6.3.1 Children

In Europe, an analysis of data up to 12 June 2022 showed that cumulative vaccine doses for 10–14-year-olds followed excess deaths for 0–14-year-olds (O.S., 2022a). Analysing data up to

August 2022, Smalley (2022i) found a correlation between cumulative COVID-19 mRNA doses administered and excess deaths for 0- to 14-year-olds in Europe. In a letter to the *Scandinavian Journal of Immunology*, Polykretis and McCullough (2022) discuss the fact that since the end of 2021 and throughout 2022, young age excess mortality has substantially increased in many European countries, in concert with the vaccine programme. Elijah (2023b) reported on the tragedy of child deaths in the EU, some of which were likely vaccine-related.

5.6.3.2 Czech Republic

Official government record-level data obtained through a Freedom of Information request from the Czech Republic showed that the Moderna COVID-19 vaccine increased all-cause-mortality (ACM) as measured over a 12-month period from the time of vaccination for every age as compared to the Pfizer vaccine (Kirsch, 2024b). For ages 46–69, the risk of death was over 50% higher. The Moderna vaccine increased all-cause mortality by at least 30% above the Pfizer vaccine (Kirsch, 2024m). Batch analysis of Czech Republic data comparing one-year post-vaccine all-cause mortality rates showed some batches are 3× deadlier than other batches from the same manufacturer when given at the same time to the same age 5-year age group (Kirsch, 2024c). A Moderna batch can be 8× deadlier, or more, than a Pfizer batch given at the same time to the same age group.

5.6.3.3 Germany

In Germany, both at the national level and in every one of the 16 federal states, during the time between 22 February 2021 and 11 July 2021, non-COVID-19 excess deaths correlated very strongly with newly administered vaccine doses (Spieker, 2023c). The correlation is strong enough to suggest a causal link. Data based on the insurance records of 72 million Germans from the Association of Statutory Health Insurance Physicians (KBV) showed that the number of sudden deaths more than doubled since the vaccine was introduced at the end of 2020, jumping from about 6,000 per quarter to 14,000 (W. Jones, 2022q). In 2022, using data for German states, Chudov (2022g) reported a positive relationship between booster rate and excess mortality. Spieker (2022c) looked at German booster rates and German excess mortality by state. He concluded that boosters are causing excess mortality by making people more susceptible to severe COVID-19. In Germany, during times of high COVID-19 mortality (during waves), states with the highest booster rates saw the lowest rates of excess deaths, but during times of low COVID-19 mortality (outside waves), states with the highest booster rates saw the highest rates of excess deaths (Spieker, 2023b). The correlation between excess mortality and booster rates became stronger over time, because vaccine efficacy decreased with every new variant that gained predominance, whilst the vaccine's negative impact on health remained unchanged. The net impact of vaccinations on mortality was negative in 2021 (they prevented more deaths then they caused), but positive in 2022 (they caused more deaths than they prevented).

5.6.3.4 Norway

Smalley (2023t) noted that Norway had no excess mortality during the pandemic in spring 2020, commenced their vaccination programme in December 2020, and then from August 2021 to July 2022 experienced a monstrous increase in mortality (an 8-sigma deviation from expectation).

5.6.3.5 Scandinavia

After analysing the data for Scandinavia, el gato malo (2022d) hypothesised that excess mortality is likely driven by vaccines creating later susceptibility, but this risk can be mitigated if most of those getting vaccinated had previously had COVID-19 and thus have some form of sterilising immunity already.

5.6.3.6 Sweden

Smalley (2023j) had the following hypothesis as to why heavily-vaccinated Sweden was not, as of July 2023, suffering the same magnitude of excess death as other comparable countries (e.g. Australia and New Zealand):

1. The vaccination makes people more susceptible to COVID (first, in the two-week window of immunosuppression when your body is totally pre-occupied with dealing with the trillions of spike proteins you've just programmed to produce for itself; second, later on, if you managed to survive the first window, when challenged with the whole natural virus, your body naively produces a whole load of antibodies against a single part of an old strain which is no longer circulating—in other words, immunocompromised in both cases).
2. COVID (and most notably the way it is 'treated') results in a whole load of death.
3. If there is a good level of natural immunity (e.g. Sweden) then the impact of 1 and 2 are mitigated.

5.6.3.7 The Netherlands

In an unpublished paper, Redert (2022) analysed the relationship between COVID-19 vaccinations and all-cause mortality in the Netherlands. During the Delta and milder Omicron waves, the correlation was significantly positive (4 sigma), coinciding exactly with the two periods of excess mortality peaking in November 2021 and March/April 2022. Theo Schetters, a vaccinologist, analysed official data from the Netherlands, which shows a very close correlation between when fourth vaccine doses were administered and the number of excess deaths (W. Jones, 2022d). He estimated that COVID-19 vaccines are killing one in every 800 over-60s. Whilst Ben (2024a) found that data on all-cause mortality by vaccination status from the Netherlands showed likely no vaccine efficacy, and possible harm. Steigstra, Theunissen, Kriek, and Meester (2023) proposed a different way of determining excess mortality. Their approach takes into account age and gender, but also the under-mortality that you would expect after a period of excess mortality. They found that excess mortality in the Netherlands remained consistently high during 2020–2022 and shifted from the elderly (median age 81.5) to a lower age (median age 5 years lower) and towards men. There was more excess mortality in all the years in which vaccination was carried out (2021–2023) than in the year without vaccination (2020). In the Netherlands, there is a strong correlation between vaccination campaigns and excess death (Kirsch, 2024h).

5.6.3.8 United Kingdom

Smalley (2023r) noted that there were more life-years lost in England in the mortality season spanning July 2020 to June 2021, the year of the vaccine, than there were the prior year when COVID-19 first emerged. Analysing data to September 2021, Archibald (2021b) reported that in the UK the vaccinated were dying at a much higher rate than the unvaccinated, though not due to COVID-19. It appears that the increase in the death rate of the vaccinated was not due to the first dose. The death rate started rising about one month after the beginning of significant application of the second dose. He concluded that COVID-19 vaccination in the UK has been a major disaster. It looks like it will kill about 700,000 people in the first year, mostly from heart problems. It has also set up most of the population for a higher risk of long COVID, due to a higher COVID-19 infection rate. In Scotland an analysis of data to September 2021, disturbingly, showed that excess mortality for each age group apparently rose in synch with the vaccine rollout for each age group (McTavish, 2021a). Analysing UK ONS data from January 2021 to September 2021, M. Neil et al. (2021) stated that vaccines do not reduce all-cause mortality. Disturbingly, Gulbrandsen (2023) analysed data from the National Immunisation Management System (NIMS), EuroMOMO and the ONS, and concluded that the

increase in deaths from July to October in 2021 happened exclusively among the vaccinated. Data from 1 January 2021 to 31 January 2022 showed that those who have been vaccinated just once or twice, but received their vaccination(s) several months ago, have significantly higher all-cause mortality than the unvaccinated (The Exposé, 2022c). Data from the ONS showed that the proportion of total deaths in England among unvaccinated people dropped sharply in early 2022, even as excess deaths soared (W. Jones, 2024c). The proportion then remained low throughout the following two years, indicating that the additional deaths since early 2022, just as Omicron appeared, were primarily in the vaccinated. This was the case for all age groups over 40. On his blog, el gato malo calculated that, in the UK, from May 2022, having ever taken a COVID-19 vaccination was associated with 22–74% greater all-cause mortality compared to being unvaccinated, and this was true for all age stratifications (el gato malo, 2023a, 2023d). With reference to data from England and Wales, W. Jones (2022g) hypothesised that either a delayed effect of the virus or the vaccine is covertly killing thousands more than we think by attacking the cardiovascular system. The explanations are not mutually exclusive; the impact of vaccination could exacerbate or be exacerbated by the effects of the virus. Analysing data to October 2022, W. Jones (2022p) noted the striking correlation between autumn 2022 vaccine boosters and excess deaths in England. Deaths registered in England and Wales were a massive 20.7% above the five-year average in the week ending 23 December 2022, according to data from the ONS (W. Jones, 2023d). In 2021, excess deaths were higher in the more deprived groups, whilst from February 2022, excess deaths were higher in the less deprived groups. In 2021, excess deaths were higher among non-Whites, whilst from April 2022, excess deaths were higher in Whites. The less deprived groups and Whites tend to have higher vaccination rates. So the data is consistent with the highly vaccinated and boosted suffering from greater excess deaths. In Dumfries and Galloway, Scotland, the overall death rate increased after the rollout of COVID-19 vaccinations in 2021 amongst the two main hospitals (GCH/DGRI) (Biologyphenom, 2024a). And this trend disturbingly continued well into 2022 with historical highs for that year.

Bowler (2023a) reanalysed non-respiratory mortality, and concluded that something extraordinary has been occurring in the trends in core mortality since spring 2021, notably around the time of the COVID-19 vaccination rollout. C. Craig (2023f) noted that something was killing the vaccinated at a much higher rate during winter 2022–2023 than winter 2021–2022 and whatever it was did not affect the unvaccinated. She explains that there are explanations for why this has happened, including issues of immune modulation such that repeated dosing has led to the type of antibody produced switching from being protective to being of a type that the body ignores (as it does with pollen or food). In April 2023 N. Fenton (2023a) estimated that deaths caused directly or indirectly by the vaccines account for about half the excess deaths in the UK since January 2021. Scottish Ambulance Service data (up to May 2023) showed that in 2021 (the year of vaccinations) heart-related incidents were 15% above average (the highest reported rate since records began) (Biologyphenom, 2024c). There was a 47% rise among younger age groups from March to June 2021. Significant spikes were observed in December 2020 and May 2021, coinciding with vaccination phases. Cardiovascular issues in the 15–44 age group remained elevated through to 2023. In a July 2023 review of ONS vaccination data, N. Fenton (2023d) concluded that with reasonable adjustments to take account of the biases in the ONS data, there is strong evidence that the vaccines are increasing all-cause mortality in most age groups (although no firm conclusions could be made because none of the public health statistics from the ONS could be trusted). Whilst the ONS reports have concluded that all-cause mortality is lower in the vaccinated, detailed analyses conducted by N. Fenton and Neil (2023e) have shown that these conclusions are fundamentally flawed because of a range of systemic biases and flaws that work in favour of the 'safe and effective' vaccine hypothesis. Their findings show that the ONS's reputation for high-quality data and analysis has been severely compromised by its shambolic work on the COVID-19 vaccines. Using official government data for England, in September 2023, The Nobody Who Knows EveryBody (2023b) showed that mRNA vaccines in-

crease all-cause mortality, and the more doses the worse the outcome. Which is rather shocking. In the UK, the Department of Health & Social Care released a briefing paper 'Trends in excess deaths and Covid-19 vaccines' that stated that there is no evidence linking excess deaths to the COVID-19 vaccine (DHSC, 2023). However, the data and analysis used is unclear (Jefferson & Heneghan, 2023b). Smalley (2024h) analysed data for England and Wales from 2013 to 2023, and found that relative excess deaths are worse across all ages under 75 in years 2021 and 2022 (the post-vaccine era, rather than the pandemic year). In the UK, some medical professionals were concerned that the government were not investigating the high excess deaths in 2023, not because they were worried about excess deaths per se, but because they were concerned that people may conclude that the vaccinations were to blame (L. Johnston, 2023). The Office for Health Improvement & Disparities maintain an online Power BI presentation of Excess Mortality in England (OHID, 2024). The data may be able to help us determine whether vaccinations contributed to mortality. For example, Whites and the least deprived have higher vaccination rates than Blacks and the most deprived. Excess mortality from the second half of 2022 was higher for Whites and the least deprived than for Blacks and the most deprived. These observations are consistent with a greater number of vaccinations leading to greater excess mortality.

Let us now consider different age groups. In England, between 1 January 2021 and 31 January 2022, all-cause mortality was higher for the vaccinated than the unvaccinated for those aged under 25 (M. Munro et al., 2022). Again, the Office for Health Improvement & Disparities' online Power BI presentation of Excess Mortality in England (OHID, 2024) may be able to help us determine whether vaccinations contributed to mortality. 0–24-year-olds were unaffected by COVID-19, but were first vaccinated through 2021. Excess mortality for 0–24-year-olds in 2020 was negative, in 2021 was mixed and through 2022–2024 was positive. These observations are consistent with a greater number of vaccinations leading to greater excess mortality. In November 2021, Berenson (2021d), using data from the ONS, reported that in England for those aged 10–59, for the past six months, incredibly, the death rate from all causes was twice as high in the vaccinated than in the unvaccinated. Note that on average the vaccinated group would be older than the unvaccinated group. In England and Wales, excess mortality increased for the older then the younger generations, progressively; in most cases peaking in March 2021 (Smalley, 2023h). In relative terms, the cohort worst affected were those born between 2004 and 2008 (aged between 12 and 19 over the course of the pandemic), with a 330% increase in excess mortality rate after the start of the mass vaccination campaign, compared to the rate established between spring and December 2020. Those older than 76 at the start of the pandemic were the only cohort to show a lower excess mortality rate post-vaccinations. Smalley (2023u) pointed out that the July 2021 wave of excess deaths for 15- to 44-year-olds in England started two weeks after the peak of the vaccination campaign for this cohort. Joel Smalley's modelling of excess deaths in England and Wales showed a consistent pattern of excess mortality since vaccine rollout (HART, 2023d). Also, notably, there was no impact of COVID-19 itself or restrictions on mortality for 17–35-year-olds in autumn 2020, which begs the question of why they needed vaccination. The Exposé (2022b) showed that the age-standardised mortality rate per 100,000 person-years among 18- to 39-year-olds in England in December 2021 was higher for the vaccinated than the unvaccinated, with those having had exactly two doses being worse off than those who had a third dose or booster. Whilst the real-world vaccine effectiveness against death among the double vaccinated for the period January–March 2022 was negative for weeks 5, 9 and 13 after vaccination, for all age groups over 50. The Exposé (2022e) presented a chart of monthly age-standardised mortality rates by vaccination status for all-cause deaths, per 100,000 person-years among adults aged 18 to 39 in England. The data was extracted from an ONS dataset on deaths by vaccination status between 1 January 2021 and 31 January 2022. The unvaccinated, on average, have the lowest age-standardised mortality rate. In a disturbing analysis, The Nobody Who Knows EveryBody (2023a) showed that for those aged 18 to 39, all-cause mortality was higher for the vaccinated than the unvaccinated. For those who had

had 1, 2 or 3 doses, deaths were 19% higher than expected. For those who had 2 or 3 doses, deaths were 21% higher than expected. For those who had 3 doses, deaths were 34% higher than expected. Smalley (2024b) noted that in England and Wales excess mortality in both males and females born in 1970 is at least as bad after the vaccination campaign as before. In both cases, excess mortality started in the week of lockdown (23 March 2020) and, but for a brief pull-forward effect retracement in the females over the summer, continued unabated since. If the large majority of non-COVID-19 excess deaths are from vaccine injury, ONS data suggest a vaccine fatality rate in the over-75s of up to one death for every 275 doses administered, and for the under-75s one death per 2,350 doses (Bowler, 2022b).

5.6.4 North America

5.6.4.1 Canada

In Toronto paramedic call volumes for heart attacks, strokes and trauma dropped in 2020, then rose in 2021 and again in 2022 (Bridle, 2023e). Using data up to 2022, Bridle (2023b) noted that in the Niagara Region (in Ontario, Canada) ambulance calls for 'cardiovascular events' increased in the COVID-19 vaccine era at 2.7 times the rate of the pre-COVID era.

5.6.4.2 United States

In a retrospective cohort study using data from 14 December 2020 to 31 August 2021, S. Xu et al. (2023) found *no* increased risk for non-COVID-19 mortality among recipients of three COVID-19 vaccines used in the US. The Defense Medical Epidemiological Database (DMED) provides data on diseases and medical events for US military personnel. A data leak showed that many diseases and medical events had increased considerably in 2021, since the vaccine programmes were rolled out (Crawford, 2022a; Kirsch, 2022c; Malone, 2022b). The official explanation is that the 2016–2020 data was underreported. Table 6 shows how three causes of death on death certificates, relative to the 2015–2019 mean, increased in 2020, then further in 2021. Pulmonary

Table 6: Cause of death on death certificates in 2020 and 2021 relative to 2015–2019 mean. Source: Coquin de Chien (2022a).

Diagnosis	2020	2021
Pulmonary embolism without mention of acute cor pulmonale	+23%–28%	+38%–46%
Disseminated intravascular coagulation (defibrination syndrome)	+18%–26%	+18%–29%
Thrombocytopenia, unspecified	+12%–25%	+24%–43%

embolism-related deaths in 2021 (the year of the vaccine) were 64% higher than in 2020 (the year of the pandemic)! In 2020 we had a pandemic of a respiratory infectious disease with aerosols entering the lungs, which led to an excess of respiratory deaths. Whilst in 2021 we had a vaccine that was injected into the bloodstream, with a 15%–20% excess of circulatory system deaths. In the US, deaths in 2021, relative to 2020, increased from July to October, peaking with a maximum increase of 60% on 9 September 2021. Kirsch (2022j) argued that that sort of increase can only be caused by something novel that affected massive numbers of people, and hypothesises that deaths from the vaccine are happening an average of five months from the last dose. In a study of vaccinated Florida residents aged 18 years or older, using data up to 1 June 2022, Florida Department of Health (2022a) determined that COVID-vaccination was *not* associated with an elevated risk for all-cause mortality. Using the US Department of Veterans Affairs' national healthcare database, using data from 1 March 2020 to 25 June 2022, Bowe et al. (2022) analysed the risk and burden of sequelae in people with SARS-CoV-2 reinfection versus no reinfection by vaccination status before reinfection. Those who had

one vaccination had a 35% higher risk of dying (all-cause mortality) than the unvaccinated. Whilst those who had had two or more vaccinations had an 18% higher risk of dying (all-cause mortality) than the unvaccinated. In August 2022, The Ethical Skeptic (2022c) reported stark rises in mortality after April 2021 (when most vaccinations were administered) as follows: excess non-COVID-19 natural cause, 8+ sigma; cancer and lymphomas, 9+ sigma; other respiratory conditions, 2 sigma; nephritis/nephrotic syndrome, 4 sigma; septicemia, 2 sigma; heart diseases and ailments, 2 sigma; and all other ICD-10 tracked natural cause deaths, 7+ sigma. On his blog, analysing data up to 15 August 2022, Coquin de Chien (2022b) noted that vaccine deaths from blood, blood-forming organs, blood-cleaning organs, blood transport system (circulatory system including the heart) and blood-related cancers are all exceptionally higher. He concluded that it's all about the blood. Analysing data up to October 2022, Mowrey (2023b) noted that in the US excess circulatory deaths persisted towards the end of 2022. He believes they were mostly virus-related, perhaps due to vaccine harms, but more likely due to vaccine failure (the vaccines cannot be preventing severe outcomes if just as many people are dying). In November 2022, Data Matters (2022a) argued that an analysis of deaths and vaccination rates strongly suggests that the mRNA vaccines may be responsible for the early deaths of 308,000 Americans in the 8 months following vaccine rollout. In the US, Kory (2023b) interpreted the May 2023 Society of Actuaries Report. He concluded that younger people and people who were working suddenly had worse mortality in 2021 and 2022. As of year-end 2022, non-COVID excess mortality continued, and any benefits to the vaccinations in early 2021 were no longer helpful and were likely harmful in 2022. B. Rice Jr. (2023) analysed US military deaths due to COVID-19 up to March 2023. Only nine US active duty military personnel died, allegedly, due to COVID-19. In the first year of the pandemic, there were no COVID-19 deaths among active duty in the Air Force or Marines. More than twice as many military members died of COVID-19 in the second six months of 2021 (52 deaths) than died in the first 12 months of the pandemic (24 deaths). From a vaccine effectiveness perspective, this is not encouraging. Early onset cancer has increased (Kory & Pfeiffer, 2024b). In the US, from pre-pandemic 2019 to 2023 cancer deaths rose by 2%. But in people 15 to 44 years old, mortality rose by 4%. Deaths from colorectal cancer rose 17% among those 15 to 44 in that time, four times the population-wide increase. Uterine cancer deaths rose 37% among 25-to-44-year-olds from 2019 to 2023; they rose 15% overall. Pierre Kory believes that the data strongly if not definitively implicates the COVID-19 mRNA vaccine as the most proximate cause (Kory, 2024f). Hulscher, Cook, Stricker, and McCullough (2024) investigated excess cardiopulmonary arrest and mortality after COVID-19 vaccination in King County, Washington, US. Their analysis revealed a 25.7% increase in total cardiopulmonary arrests and a 25.4% increase in cardiopulmonary arrest mortality from 2020 to 2023. Excess cardiopulmonary arrest deaths were estimated to have increased by 1,236% from 2020 to 2023, rising from 11 excess deaths in 2020 to 147 excess deaths in 2023. A quadratic increase in excess cardiopulmonary arrest mortality was observed with higher COVID-19 vaccination rates. In the US, in a survey published in January 2024, 1,000 households were surveyed, and 194 reported a death in their household since 2021 (Kirsch, 2024n). 47% of the respondents thought the death was due to the COVID-19 vaccine.

Let us now consider different age groups. Kory and Pfeiffer (2023b) reported that life insurance data show a massive spike in excess deaths among younger, working-age people that began in 2021. Experts have suggested that these may be due to rising obesity rates, extreme heat, lagging effects from lockdowns and/or alcohol abuse. However, the authors stress that, given the sheer number of COVID-19 vaccine deaths reported to the VAERS, more than 36,000, the possible role of vaccines should be examined, too. W. M. Briggs (2023a) analysed excess deaths in the US, and concluded that there is at least good circumstantial evidence that vaccines could explain some deaths, especially in those 35 or older. But we can't be sure. Briand (2022) presented plots of US monthly deaths per age group for each of the six main causes of death. She noted that in September 2021 the middle-aged were dying in greater numbers than the elderly

of COVID-19, which she claims is consistent with the vaccine deaths hypothesis. Using data up to 5 February 2022, D. G. Rancourt, Baudin, and Mercier (2022) analysed all-cause mortality data in the US. Excess all-cause mortality was *higher* during the vaccination period for those aged under 70. Overall, the vaccination programmes did not decrease all-cause mortality.

5.6.5 Global

The WHO declared that for the years 2020 and 2021 there had been 5.4M COVID-19-associated excess deaths and 9.5M non-COVID-19-associated deaths (Ben, 2023e). The vaccine appears to reduce excess mortality for a couple of months, before it increases. Globally, overall, the vaccine programmes appear to have led to an overall increase in excess deaths. Globally, COVID-19 deaths and other pandemic-related mortality were significantly higher in 2021 than in 2020 (GBD 2021 Causes of Death Collaborators, 2024). Globally, between 2020 and 2021 COVID-19 deaths increased significantly across all age groups (between 145% and 174%) (S. Andrews, 2024). Globally, as of May 2022, regions with high vaccination rates do not have lower all-cause mortality (Data Matters, 2022c). Chudov (2022h) reported in August 2022 that, according to official statistics, excess mortality in many highly vaccinated countries is 15–20% above its historical norms. Bulgaria, which is only 30% vaccinated, was no longer experiencing excess mortality. Whilst Australia's excess deaths began before the country even experienced its first COVID-19 wave. People who received COVID-19 vaccines keep experiencing elevated mortality for prolonged periods. Cancer deaths, which take time, are above the long-term trend, roughly by 1,000 cancer deaths per week in the USA. Therefore, most likely, we are seeing the effect of acceleration of existing cancers, in other words cancers that existed but began to grow more aggressively. Another significant factor for increased mortality is the fact that some people get reinfected every three months or so. In November 2022, Chudov (2022a) noted that, across countries, the relationship between vaccination rates and excess mortality was positive and getting stronger. Igor Chudov showed that among countries, in 2022, there was a very strong statistically significant association between uptake of COVID-19 boosters and excess mortality, and also between vaccination rate and excess mortality (Chudov, 2022b, 2022k). This is extremely worrying. Ben (2023c) calculated that in 2020 the median excess mortality in the top 20 highly developed countries was 4.5%, with the mass vaccine rollout in 2021 it increased to 9.9%, and in 2022 it increased even further to 11.2%. In a preprint, Sakura (2024) used multiple linear regression to analyse vaccinations and excess mortality in highly vaccinated north temperate zone and north frigid zone countries. He stated that the result clearly shows that COVID-19 vaccination increases excess mortality in post-vaccination periods and the effect keeps increasing. Furthermore, according to his model, the excess mortality caused by COVID-19 vaccinations is higher than that caused by COVID-19 itself.

In January 2023, N. Fenton and Neil (2023a) argued that, not only is there strong evidence of an increase in all-cause mortality among the vaccinated, but they do not believe there is any objective reliable evidence that the COVID-19 vaccines saved any *preventable* deaths from COVID-19. In January 2023, Benn et al. (2023) reviewed randomised controlled trials of mRNA (Pfizer, Moderna and CVnCoV) and adenovirus-vector (AstraZeneca, Johnson&Johnson, Gam-COVID-Vac and Ad5-nCoV) COVID-19 vaccines. mRNA vaccines reduced COVID-19 deaths (by 60%) but, disturbingly, increased cardiovascular deaths (by 45%) and non-accident, non-COVID deaths (by 17%), leading to no change in overall mortality (actually a 3% increase). This is a shocking result, especially as the majority in Europe and the US received mRNA vaccines. Whilst adenovirus-vector vaccines significantly reduced COVID-19 deaths (by 89%), and surprisingly significantly reduced cardiovascular deaths (by 93.5%) and non-accident, non-COVID deaths (by 62%), leading to a significant reduction in overall mortality (by 63%). The Swedish biostatistician Martin Kulldorff, co-author of The Great Barrington Declaration, pointed out that a preprint of Benn et al. (2023) was the first study to answer the right questions with the right data (Kulldorff, 2022b). Its strength is that it is based on randomised controlled trials,

whilst its weaknesses are that the follow-up time is short, and the data does not allow us to determine how these results may differ by age. He also pointed out that governments, corporations and universities should stop mandating vaccines when randomised controlled trials show a null result for mortality. D. E. Allen (2023) analysed Organisation for Economic Co-operation and Development (OECD) country-level data generated by the COVID-19 pandemic as revealed in data related to booster vaccinations, excess deaths, populations, infections, recovered cases and tests, for a sample of 38 countries, plus measures of their policy responsiveness and relative preparedness, including various other indicators of trust, stringency and gross domestic product (GDP) per capita. COVID-19 booster vaccinations had by far the greatest explanatory power in the explanation of excess deaths. Cross sectional regression analyses suggested that COVID-19 booster vaccines explain between 69% and 79% of the variation in excess deaths in OECD countries as captured by excess deaths in the first week or averaged across the first three months of 2023. Mark Steyn described the excess deaths due to vaccinations as 'known unknowns', because governments have the data to determine what is going on, but the public will not be informed (Steyn, 2023). Ben (2024d) analysed global data for the period 2020–2023, and concluded that vaccinations did not show a clear positive impact on all-cause mortality. Analysing data from 2015 to 2023, D. G. Rancourt, Baudin, Hickey, and Mercier (2023b) claim to prove that in the Southern Hemisphere COVID-19 vaccines caused an increase in all-cause mortality. The authors estimated the overall vaccine-dose fatality rate (vDFR) to be 0.126% (1 death per 800 injections). This implies that there were 17 million COVID-19 vaccination deaths globally following the vaccine roll-out. vDFR grows exponentially with age. They found the risk of dying from the COVID-19 injection doubled with every 4–5 years of age, which is approximately half the doubling age of dying of all causes of mortality, including cancer, pneumonia and heart disease. In other words, vaccines fail a cost–benefit analysis for all ages. This, of course, is a shocking result. Ben (2024f) agreed that Rancourt's estimate of 17 million excess deaths due to COVID-19 vaccination is definitely within a possible range. For a rebuttal to the 17 million vaccination deaths claim, see Hoeg (2024). For a rebuttal of the rebuttal, see D. Rancourt (2024). In the US, UK, Denmark, Finland and Norway, as of June 2024, cumulative excess deaths increased monotonically ever since the COVID-19 vaccines were rolled out (Kirsch, 2024q).

Now consider different age groups. Edward Dowd, author of *Cause Unknown* (Dowd, 2022), concluded that excess death rates, in those aged 26–41, are closely related to the administration of COVID-19 vaccinations (Beck, 2023b). People aged under 40 have been dying unexpectedly, a phenomenon known as 'sudden adult death syndrome' (SADS) (Heaton, 2022). The fact-checkers were quick to claim that there is no evidence that deaths from SADS are caused by COVID-19 vaccines (T. Thompson, 2022). However, COVID-19 vaccines contributing to SADS is consistent with the evidence (Kirsch, 2022k). We simply don't know, but in the context of everything else we know (myocarditis, etc.), in my mind it seems more likely than not that in some cases COVID-19 vaccines have contributed to SADS.

5.7 Excess Mortality and Iatrogenesis

Iatrogenesis is the causation of a disease, a harmful complication, or other ill effect by any medical activity, including diagnosis, intervention, error or negligence. To what extent is the excess mortality due to iatrogenesis? Wallach (2023) argued that midazolam and ventilators were responsible for the early localised spikes in deaths. E. Stewart (2024) reported that, across countries, if anything there appears to be some statistical inverse correlation between excess COVID-19-related health expenditure, as a proportion of GDP, and excess mortality.

5.7.1 Asia

5.7.1.1 India

In a retrospective analysis Srinivasaiah et al. (2023) found that, in India, patients admitted to ICU with COVID-19 that were invasive positive pressure ventilation (IPPV)-intubated had significantly higher rates of mortality than those who were not.

5.7.2 Europe

5.7.2.1 United Kingdom

Dee (2023i) argued that the spike in non-COVID-19 deaths during spring 2020 was due to unwarranted end-of-life (EOL) protocols and attendant use of powerful medication designed for severe COVID-19 cases and severe COVID-19 cases only. He analysed excess deaths data for England, and concluded that the spike in spring 2020 was iatrogenic in nature, in the wider sense of poor patient management, inappropriate use of end-of-life (EOL) protocols, overuse of potentially lethal sedatives, failure to provide a basic standard of care and the misguided application of ill-advised government policies (Dee, 2023a). In a nutshell it was the response to COVID-19 that killed. He believed that the spike in deaths in the spring of 2020 was due to the disastrous policies rather than a genuine pathogen passing through a population (Dee, 2024h). Analysing data from January 2017 to September 2021, he found that two weeks during lockdown and three weeks immediately after vaccine rollout stand out as outliers in terms of the ratio of in-hospital to emergency department (ED) deaths (Dee, 2024f). He guessed that this was due to inappropriate clinical protocols/patient management followed by vaccine harm. In other words, iatrogenesis. Sy (2024) showed that the UK spike in deaths, wrongly attributed to COVID-19 in April 2020, was not due to the SARS-CoV-2 virus, which was largely absent, but was due to the widespread use of midazolam injections which were statistically very highly correlated (coefficient over 90%) with excess deaths in all regions of England during 2020. Excess deaths remained elevated following mass vaccination in 2021, but were statistically uncorrelated to COVID-19 vaccination, whilst remaining significantly correlated to midazolam injections. He concluded that the UK COVID-19 pandemic was iatrogenic, due to midazolam injections, particularly in care homes, under a systemic policy of euthanasia. In the UK, at least one NHS trust put in place a blanket 'do-not-resuscitate' (DNR) order for sick patients in the pandemic (Reed, 2024a). The Scottish COVID-19 Inquiry revealed that the elderly and disabled (the latter regardless of age) were pressured to agree to DNACPR ('do not attempt cardiopulmonary resuscitation') notices during lockdown, with one witness speaking of a forged signature DNR form (Biologyphenom, 2024e). Police Scotland investigated whether DNR forms were illegally signed for elderly and disabled people (Walker, 2024).

5.7.3 North America

5.7.3.1 United States

M. P. Senger (2022b) concluded that low-income, population density, cold weather and the overuse of mechanical ventilators were all strong correlates with excess deaths in spring 2020. He estimated that some 30,000 patients in New York, New Jersey, Connecticut and Massachusetts appear to have been killed by mechanical ventilators or other medical iatrogenesis in April 2020. According to M. P. Senger (2023b), tens of thousands of Americans died after being placed on mechanical ventilators in spring 2020. In eleven municipal hospitals in New York City from 1 March 2020 to 1 December 2020, Parish et al. (2021) assessed the effect of early intubation and mechanical ventilation on all-cause, in-hospital mortality for COVID-19 patients. They concluded that intubation within 48 hours of triage, as well as at any time point in the hospital

course, was associated with increased mortality in COVID-19 patients in this observational study. This is disturbing.

5.7.4 Global

M. Neil and Engler (2024) believe the evidence strongly supports the hypothesis that the 'COVID pandemic' was an iatrogenic phenomenon and was not caused by a novel and deadly virus. Whilst Engler (2024a) believes that the weight of the evidence suggests that the lives of large numbers of people worldwide were ended prematurely as a result of the administration of midazolam.

5.8 Excess Mortality and Coinfections

To what extent have coinfections contributed to excess mortality? Jefferson and Heneghan (2023a) argued that coinfections (more than one viral agent infecting the same person) and secondary infections (caused by the superimposition of one or more bacterial or fungal agents on a viral infection) are another possible cause of the excess mortality observed in so many countries. Data from Italy suggested that at least a quarter of deaths are caused or made more likely by the burden of coinfection or secondary infections.

5.9 Excess Mortality, COVID-19 and Lockdowns

Some of the literature considers excess mortality in terms of both COVID-19 and lockdowns.

5.9.1 North America

5.9.1.1 United States

Zalla, Mulholland, Filiatreau, and Edwards (2022) analysed age-specific mortality in 2020 in the United States. They observed 16.6 excess deaths per 10,000 US population in 2020. 84% were directly attributed to COVID-19. Whilst the indirect effects of the pandemic accounted for 16% of excess mortality, with proportions as low as 0% among adults aged 85 years and older and more than 60% among those aged 15 to 44 years. Indirect causes accounted for a higher proportion of excess mortality among racially minoritised groups (e.g. 32% among Black Americans and 23% among Native Americans) compared with White Americans (11%).

5.10 Excess Mortality, COVID-19 and Vaccinations

Some of the literature considers excess mortality in terms of both COVID-19 and vaccinations. W. Jones (2023j) suspects that an interaction between COVID-19 infection and the COVID-19 vaccines may be responsible for the excess deaths from non-COVID-19 causes. He hypothesizes that the mechanism could be an autoimmune attack primed by the action of the vaccine in triggering sustained production of spike protein in numerous organs in the body including the heart, circulatory system and brain. S. Andrews (2023f) argued that excess mortality in the Omicron era is due to Omicron continually mutating. The healthy generate mutations and transmit them to unhealthy individuals. Because their immune systems are less healthy this results in a rapid challenge and much more severe activation of their immune systems. This immune response results in other dormant pathogens and other infections getting a foothold resulting in increased mortality. This will result in multi-factorial causes of death. It is conceivable that vaccination that redirects the immune system to a response for prior variants (original antigenic sin) may have a detrimental impact on mortality.

5.10.1 Europe

In Europe the second half of 2021 experienced higher all-cause mortality than the second half of 2020. Approximately half of the excess deaths were due to COVID-19, whilst the other half were largely deaths involving cardiovascular conditions with an unknown underlying cause. The question is, why? W. Jones (2022x) speculates: 'is the immunological state of the population, whether from vaccination or natural immunity, somehow leading to a wave of deaths triggered by exposure to the virus but not caused by detectable infection with the virus?'

5.10.2 North America

5.10.2.1 United States

In October 2022 Mowrey (2022b) noted that there was an increase in cardiac deaths among teenagers in the US, but it may not be possible to know whether it was due to the vaccines or the virus. Ben (2024e) analysed age-standardised mortality rates (ASMR) in Montana, US, and its counties, from 2020 to 2023. COVID-19 vaccination levels in Montana varied greatly, ranging from 19% to 95%+ in different counties. However, no statistically significant correlation between the share of the COVID-19 vaccinated population and excess mortality was found. Excess mortality was likely caused by local events, such as poverty, injury, overdose and alcohol related deaths, and not by COVID-19.

5.11 Excess Mortality, Lockdowns and Vaccinations

Some of the literature considers excess mortality in terms of both lockdowns and vaccinations.

5.11.1 Europe

5.11.1.1 United Kingdom

Smalley (2024k) annotated a timeline of lockdowns, vaccination uptake and deaths in the UK from 23 March 2020 to September 2022, with both lockdowns and vaccinations apparently doing more harm than good.

5.11.2 Asia

5.11.2.1 China

China suffered significant excess mortality only from October 2022 to January 2023 (Huang, Li, & Yin, 2023). This coincided with both the end of their lockdown and an increase in their vaccination rate. Hong Kong suffered from a jump in excess mortality from February 2022 to May 2022, and this followed an increase in both lockdown stringency and a spike in the vaccination rate. Taiwan suffered from excess mortality from May 2022 onwards, after their vaccination campaign.

5.11.3 Europe

5.11.3.1 United Kingdom

Smalley (2023m) analysed data from 300+ lower tier local authorities (LTLA) administrative areas of England. He found that the increase in excess deaths (wave 4 (vaccinated) minus wave 1 (pre vaccinations)) was positively correlated with the percentage that had received the COVID-19 vaccine third dose. He claims that one way to interpret the results is that the vaccine is responsible for 40% of the change in excess deaths and, therefore, all the other iatrogenic activity (denial of healthcare and long-term effects of non-pharmaceutical interventions) are responsible for the rest.

5.11.4 Global

Fazi and Green (2023) consider the reasons for the excess deaths throughout the second half of 2022, and conclude that they are likely due to the lockdowns and possibly the vaccines, but we simply don't know for sure. Scherb and Hayashi (2023) analysed all-cause mortality for Germany and Japan from 2005 to 2022. There was not a high death toll in 2020 from COVID-19. However, the authors concluded, the 5–10% highly significant increased mortalities in 2021 and 2022 might be due to the pandemic countermeasures and high vaccination rates.

5.12 Excess Mortality, Lockdowns, Vaccinations and Iatrogenesis

Some of the literature considers excess mortality in terms of lockdowns, vaccinations and iatrogenesis.

5.12.1 Global

D. G. Rancourt, Hickey, and Linard (2024) studied all-cause mortality in 125 countries during the COVID-19 period, 2020–2023. They estimated that there were 30.9 million (all-cause) excess deaths globally over the 3-year period 2020–2022. They concluded that the COVID-period (2020–2023) excess all-cause mortality in the world was incompatible with a pandemic viral respiratory disease as a primary cause of death. The authors argued that the three primary causes of death associated with the excess all-cause mortality during (and after) the COVID period are: 1) biological (including psychological) stress from mandates such as lockdowns and associated socio-economic structural changes, 2) non-COVID-19-vaccine medical interventions such as mechanical ventilators and drugs (including denial of treatment with antibiotics) and 3) COVID-19 vaccine injection rollouts, including repeated rollouts on the same populations.

5.13 Conclusion

M. Neil and Fenton (2022) did an exploratory analysis of 2022 excess mortality, and concluded with the following:

- The surge in COVID-19 and its effect on excess deaths shows that the vaccines are not effective.
- There is no evidence to support long COVID as a cause of excess deaths.
- There is weak evidence of the negative effect of lockdown measures.
- Healthcare quality looks to be irrelevant (but they were not satisfied that they had good metrics for this).
- There is a clear signal that the vaccination programme is causing at least some of the excess deaths; the vaccines don't look to be safe.

COVID-19, lockdowns and vaccinations created the perfect storm for excess mortality over the longer term, increasing most of the risk factors for mortality. Lockdowns increased poverty (Palomino, Rodríguez, & Sebastian, 2020), whilst poverty increases mortality (Fiscella & Franks, 1997). Lockdowns increased loneliness and social isolation (Sayin Kasar & Karaman, 2021), whilst loneliness and social isolation increase mortality (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015). Lockdowns increased obesity (Pellegrini et al., 2020), whilst obesity increases mortality (Abdelaal, le Roux, & Docherty, 2017). Lockdowns led to an increase in hypertension (Fosco, Silva, Taborda, & Ahumada, 2020), whilst hypertension increases mortality (Arima, Barzi, & Chalmers, 2011). Lockdowns led to a decrease in education, whilst less education increases mortality (Lleras-Muney, 2005). COVID-19 vaccines can suppress innate immunity

(Seneff, Nigh, et al., 2022), whilst depressed immunity increases mortality (Wayne, Rhyne, Garry, & Goodwin, 1990). My view is that excess mortality was originally largely due to COVID-19 and iatrogenesis, and later largely due to both COVID-19 and the vaccinations (directly, indirectly, in combination and over the short and longer term), plus collateral damage caused by lockdowns. In October 2023 Elijah (2023c) noted that there had been a deafening silence over excess deaths from governments and the mainstream media, who had previously been quite fixated on the daily death toll for COVID-19.

6 Discussion

The conclusions from the above literature reviews and analyses inform us that lockdowns fail to pass a cost–benefit analysis and, worse, fail to even make a significant positive impact on COVID-19 infections/deaths. Similarly, mask policies had no noticeable positive effect. These results beg several questions. Why did the world overreact? If lockdowns don't determine COVID-19 case/death rates, what does? If lockdowns don't work, why did influenza all but vanish during the COVID-19 pandemic? Would early treatment have helped? Is long COVID a real issue? Who were the good actors, and which groups made matters worse? In this section, I seek to answer these questions.

6.1 Why Did the World Overreact?

We all make mistakes. But how could almost the entire world, with its collective wisdom, get things so wrong? It was clear from near the start that 1) a lockdown should pass a cost–benefit analysis, and 2) a lockdown failed a cost–benefit analysis (M. Sewell, 2020a; T. Young, 2020a). In an article entitled 'Generation stupid', Hopkins (2023) wrote 'I never imagined in my wildest dreams that people could behave in such a way as to leave me completely baffled'. My sentiments exactly.

If lockdowns failed to work, why did governments continue to pursue them, despite the evidence? Various cognitive biases have evolved, some of which impacted the way governments, the media and the public reacted to COVID-19. Natural selection is a slow process, and evolutionary psychology informs us that our minds today are adapted to seeking our ultimate goal of reproduction in the environment of evolutionary adaptedness (EEA), which roughly coincided with the Pleistocene (Buss, 2019). For this reason, some of the heuristics and biases that follow are explained in the context of evolution. The Centre for Evidence-Based Medicine at Oxford host an impressive 'Catalogue of bias', that details the many biases that can affect health studies (CEBM, 2023).

6.1.1 Representativeness

Representativeness exists when one assumes that A is probably B, because A resembles B, whilst ignoring the fact that B is unusual (*base rate neglect*) (Tversky & Kahneman, 1974). This could, for example, lead to someone with a cough assuming that they have COVID-19, when it is more likely that they simply have a cold. Or, during the COVID-19 era, if someone dies, one might assume that they probably died from COVID-19, when in reality between March 2020 and April 2021 just one in five of all deaths in the UK were due to COVID-19 (The King's Fund, 2021).

6.1.2 Overreaction

As discussed in Section 2.6, the UK, and the world, exhibited a significant *overreaction* to COVID-19. Representativeness, via underweighting the base rate, is likely to cause overreaction. There is also evidence that, although we expect underreaction to news, we expect an overreaction to a series of good or bad news (Barberis, Shleifer, & Vishny, 1998). And we certainly experienced a series of bad news at the start of the pandemic: images of a strict local lockdown in Wuhan, Ferguson's overly-pessimistic model (N. M. Ferguson et al., 2020) and disturbing scenes from ICUs in northern Italy.

6.1.3 Availability

Our ancestors lived without the luxury of the media, and they would only have recalled events that they had witnessed. Whilst during our modern-day lives we are constantly exposed to the media. What is the effect of the media reporting news? News, by definition, is unpredictable

(otherwise, it would have been reported yesterday). If we cannot predict something, it will be a surprise. So news is surprising, and the most likely to be reported news is the most surprising. This means that rare events are likely to be heavily reported, and mundane events ignored. In other words, the media create a biased impression of the world around us. Modern man is far more likely than his ancestors to recall events that he is unlikely to experience. It is possible that this is how the availability heuristic evolved. *Availability* is a cognitive heuristic in which we rely upon knowledge that easily comes to mind, rather than examine other alternatives (Tversky & Kahneman, 1973). Rare events, such as a child dying from COVID-19, are likely to be heavily reported in the media (whilst, for example, a child dying of cancer is much more common, but goes unreported). The continuous stream of news about COVID-19, and the sad stories about individuals affected, made a disproportionate impact on our minds and instilled fear. Note that in 2021 COVID-19 vaccinations were really only effective against severe cases of COVID-19 in the elderly, but did not work as well as expected, so the public health message, arguably, given the information available at the time, should have been (and was) to get vaccinated, whilst the news (the surprise) should have been (but was not) that they failed to work as well as expected.

6.1.4 Risk Aversion and Fear

Humans, in common with all organisms, have evolved such that they are each motivated to propagate their genes. The longer that we survive, the better we are able to propagate our genes. A fundamental bias that helped us to survive is *risk aversion*. We have a rational tendency towards slight risk aversion (M. Sewell, 2011). Risk-averse behaviour can also be the result of fear conditioning. Fear of COVID-19 was likely caused by its novelty and uncertainties about how bad the outbreak might become (Asmundson & Taylor, 2020) and propagated by government communication and saturated media coverage. The fear, however, was disproportionate. M. P. Senger (2023a) argued that it was Western leaders' own policies that were responsible for a major portion of that fear.

6.1.4.1 United Kingdom

Foad et al. (2021) found that in the UK people polled on 30 June 2020 and 14 December 2020 judged COVID-19 to be a severe threat because the government imposed a lockdown. In other words, they thought 'it must be bad if the government's taking such drastic measures'. The public presumed a lockdown was necessary from the very existence of such measures, and the government and the media presumed such measures were desired by the public. In a UK survey conducted during 10–15 July 2020, the median respondent believed that 1% of the population had died from COVID-19, when the true figure was just 0.06% (Kekst CNC, 2020). Whilst in 2020 in England, if you were under 60 and without health conditions, you were 2.5 times more likely to die in a road accident than of COVID-19 (Boycott-Owen, 2020). During 17–29 July 2020 in the UK, 94% of those polled were concerned about the knock-on impact of COVID-19 (for example on lifestyles and the economy), whilst 86% were concerned about the impact of COVID-19 itself on the health and well-being of the nation (Ipsos MORI, 2020a). In fact, the British public became so fearful of COVID-19 that they discovered an enthusiasm for authoritarianism. Astonishingly, 19% of those polled (during 2–3 July 2021) stated that there should be a curfew against leaving the home after 10pm without a good reason *permanently, regardless of the risk from COVID-19* (Ipsos MORI, 2021). Incredibly, in Great Britain, in March 2023, just 19% of adults thought that the Government's handling of the COVID-19 outbreak was too strict, whilst 37% thought it was not strict enough (YouGov, 2023a). It is interesting how detached from reality the general public is. The demographics that had the highest 'too strict' percentages (those on the right side of the science) were in Scotland (23%), male (22%), Conservative (25%), voted leave (26%), aged 25–49 (21%) and/or social grade C2DE (21%). Again, incredibly, in April 2023 56% of adults thought the pandemic in Britain was still ongoing, whilst 34% said

they thought it was over (YouGov, 2023b). The pandemic was over, COVID-19 is endemic. The demographic that were closest to the truth were in London, male, voted Conservative and aged 18–24 and social grade ABC1. An incredible 78% of those aged 65+ thought the pandemic was still ongoing. Most of the elderly were perpetually living in fear.

In the UK, members of Independent Scientific Pandemic Insights Group on Behaviours (SPI-B) published an article in *The BMJ* stating that the government attempted to frighten people into COVID-19 protective behaviours, but that this was at odds with their scientific advice. However, Dodsworth et al. (2024) showed that SPI-B themselves supported the use of fear messaging during the COVID-19 pandemic. In other words, government advisers were caught falsely claiming never to have supported pandemic fear messaging (Dodsworth, 2024a). HART (2023g) reviewed an article published in *The BMJ* (Wilde et al., 2023), which they describe as biased fear-mongering over COVID-19 in children. N. Fenton and Neil (2024c) showed how statistics and science were manipulated to create the hysteria needed to convince people to fear 'the virus' and in response adopt extraordinary changes in their behaviour.

6.1.4.2 United States

Tucker (2024a) argued that, at least in New York City in March 2020, people were not just afraid of the virus, but were afraid of lockdowns. In the US, a Franklin Templeton–Gallup Economics of Recovery Study, conducted 2–14 July 2020, revealed that Americans misperceived the risks of death from COVID-19 for different age cohorts to a shocking extent (S. Desai, 2020). In reality 0.2% of COVID-19 deaths were among those aged 24 and below, whilst those polled estimated the figure to be 8.0%. The misperception was greatest for those who identify as Democrats, and for those who relied more on social media for information.

6.1.5 Prisoner's Dilemma

The *prisoner's dilemma* is one of the most famous games in game theory (Poundstone, 1993). Prisoner's dilemmas occur in nature whenever an individual's self-interest is opposed to group interest.[13] Although the participants are better off as a whole if both players cooperate, economic theory informs us that the rational choice is for both players to always defect. When two players play the prisoner's dilemma more than once in succession and they remember previous actions of their opponent and change their strategy accordingly, this is known as the *iterated prisoner's dilemma*. If you're involved in a scenario that may be modelled as an iterated prisoner's dilemma, regardless of your own actions, you will always be better off if the other player cooperates. It will be in their interest to cooperate if and only if you cooperate. It is therefore in your interest to 1) assume a cooperative persona, 2) identify and shun those who won't cooperate and 3) avoid being identified as a non-cooperator if you don't intend to cooperate. A natural way of adopting a cooperative persona is by way of virtue signalling, shunning those who won't cooperate leads to cheater detection, whilst self-deception helps avoid detection. Let us consider all three in turn.

6.1.6 Virtue Signalling

Virtue signalling is the expression of a disingenuous moral viewpoint with the intent of communicating good character. Relevant examples include naively framing the issue as health vs the economy and supporting the health side of the argument (this is a false dichotomy, the economy exists to mediate life, which includes health (Worstall, 2020a)) or supporting lockdowns to save granny (when the evidence suggests that lockdowns don't reduce deaths whilst the costs exceed the benefits by an order of magnitude). Of course, people are not genuinely virtuous, in the

[13]Formally, the prisoner's dilemma is a non-zero-sum game in which the unique Nash equilibrium is not a Pareto-optimal solution.

UK only 20.2% of those who experienced symptoms of COVID-19 (excluding those that had subsequently tested negative) bothered to fully self-isolate (L. E. Smith et al., 2021). David McGrogan, an Associate Professor of Law at Northumbria Law School, makes a good point: the majority of people are motivated to follow the prevailing moral norm, so simply accepted the mainstream narrative that lockdowns are the ethically right thing to do (McGrogan, 2021). Most people were not interested in the science or cost–benefit analyses. It became received wisdom (and in terms of effectiveness as a filter, true (Ueki et al., 2020)) that masks worked primarily as a source control, which enabled masks to gain traction as virtue signalling badges of honour. That masks are deeply uncomfortable prima facie suggests they're harmful (Changizi, 2024a). And that absurdity made masks a better membership signal. Which evolved into a virtue signal. It could be that hand hygiene (which was initially promoted) was forgotten about because it lacked the virtue signalling credentials of mask-wearing. Other examples of virtue signalling in the UK include Keir Starmer calling for further measures and the public's clapping in support of the NHS. In August 2024 Rebecca Hilsenrath, Parliamentary and Health Service Ombudsman, pointed out, wisely, that clapping for the NHS as though it was a national religion during the pandemic may have protected it from necessary criticism (M. Cox, 2024).

6.1.7 Cheater Detection

In order to police tactical subversion of the male dominance hierarchy (Moxon, 2009), and in situations involving social exchange, detecting cheaters was a useful adaption, so human beings evolved to be effective *cheater detectors* (Cosmides, 1989; Cosmides & Tooby, 2005). This has led to those who dissent from the prevailing narrative of supporting lockdowns and wearing masks being called a 'covidiot' or 'COVID denier', and the reporting of rule breakers (by the 'COVID stasi'). We also evolved a strong natural desire to punish rule breakers. The public became so fearful of COVID-19 that they began to support unusually harsh punishments. In the UK travellers who lie about recent travel history in order to avoid quarantine face up to ten years in jail if convicted (BBC News, 2021b). When polled in February 2021, 13% of British adults stated that the rule was *not harsh enough* (YouGov, 2021).

6.1.8 Purity Spiral

A *purity spiral* is a social dynamic in a group where members engage in competitive victimhood, or in the zealotry or purity of their views. It works when there is no optimal value. For example, when applied to virtue signalling, the more virtuous the better. Why wear one mask when you can wear two (Parker-Pope & Blum, 2021)?

6.1.9 Self-Deception

Due to conflicts between predator and prey, group living, and the competition for reproduction, deception has evolved under natural selection. The easiest way of avoiding detection is to effectively lie to ourselves. This is known as *self-deception*. So, not only do we wish to appear (genetically) fitter than others (this has obvious advantages when it comes to sexual selection), but we actually believe that we are. We will also attribute successful outcomes to our own skill but blame unsuccessful outcomes on bad luck. This is known as *self-attribution bias*. An apparently genuine belief that we can provide a rosy future is another trait that increases our fitness. Self-deception leads to *overconfidence* and *optimism*. Such biases likely contributed to our naive assumption that we could successfully mitigate COVID-19. Neil Ferguson was sending emails to Patrick Vallance and Chris Whitty at 3:37am on 15 March 2020 with naive overconfidence in his model: 'we will have to adopt one of the two policies', 'In the absence of vaccine, we'll still be doing it in over a year's time', 'These conclusions are robust to uncertainty in severity and R0' and 'there is no other way' (N. M. Ferguson, 2020). I suspect that the

general public have too much confidence in what is known by scientists. For example, we don't even know whether long COVID exists, let alone what causes it (see Section 6.6).

6.1.10 Herding

There is both greater safety and improved efficiency with task sharing in numbers, so human beings have always tended to live in groups. The size of social groups was likely to have been constrained by the information-processing capacities of the brain, with 150 people being a good average. This led to the type of conversation that helped our ancestors, such as information about food sources, dangers or (most importantly) other people. Today, due to faster and wider means of communication, such behaviour can lead to information cascades and create *herd behaviour* and *behavioural contagion*, with many people copying each other.

Groupthink is the tendency for people to seek harmony within the group, rather than make rational decisions that lead to optimal outcomes. Such biases may explain why nearly all countries took a similar approach and implemented lockdowns. Also, why seemingly irrational behaviour, such as supporting lockdowns and young healthy people wearing masks outdoors, can spread within communities. It was possibly groupthink that led to the cover-up of a possible lab leak (W. Jones, 2023o). The UK Covid-19 Inquiry found that Civil Service 'groupthink' led Britain to be unprepared for the pandemic (N. Johnston & Mendick, 2024). Sikora (2023c) noted that the UK Covid-19 Inquiry showed how the scientific process was perverted by advisers steeped in groupthink. *The Telegraph* (2023b) pointed out that COVID groupthink was avoidable. If Downing Street had treated critics with respect rather than contempt, fewer mistakes might have been made.

The *illusion of consensus* is the observed phenomenon where people are equally confident in conclusions drawn from a true consensus (derived from independent primary sources) and a false consensus (derived from only one primary source) (Yousif, Aboody, & Keil, 2019). Countries tended to enter lockdowns because other countries entered lockdowns, rather than due to independent reasoning (Sebhatu, Wennberg, Arora-Jonsson, & Lindberg, 2020) (no country performed a cost–benefit analysis anyway). In other words, people believed that lockdowns must be the right response because nearly all countries elected to impose lockdowns, despite the fact that it was a false consensus. Countries, including liberal democracies, were essentially mimicking the irrational response of an authoritarian regime, China.

6.1.11 Illusion of Control

The *illusion of control* is the tendency for people to overestimate their ability to control events. This has led to the assumption that lockdowns work, when in reality SARS-CoV-2 has dictated the epidemic curve, not the acts of politicians. Whilst *belief perseverance* is maintaining a belief despite new information that firmly contradicts it. Politicians and academics, in particular, who called for lockdowns are unlikely to subsequently admit that they don't work. Politicians prefer to avoid U-turns if possible, even in the light of new evidence. Finally, the *sunk cost fallacy* exists when people believe that past investments (sunk costs) justify further expenditures. Because the government had already invested a colossal amount of money, effort and time into lockdowns, they had a greater tendency to continue.

6.1.12 Compliance

Perhaps the greatest surprise of the pandemic, at least to me, was how compliant the British population became in the face of draconian and unjustified restrictions. A major contributor to the mass obedience of the British people was likely to have been the activities of government-employed psychologists working as part of the 'Behavioural Insights Team' (BIT) (Sidley, 2020). Gary Sidley explained that the four main tactics used in their COVID-19 communication campaigns to 'nudge' the public towards compliance were 'messenger', 'ego', 'affect' and 'norms'. He

explained how the UK Government, among many other countries, drew on behavioural-science interventions—often referred to as 'nudges'—to strengthen their public-health communications, and thereby increase compliance with the pandemic restrictions and subsequent vaccine roll-out (Sidley, 2024c, 2024f). There were three nudges that evoked the most attention and ethical concerns: affect, ego and norms; which were experienced by many as inflation of fear, shaming and peer pressure respectively. Sidley argued that it is questionable whether the deployment of fear, shame and peer pressure to achieve compliance with unprecedented and non-evidenced public health policies that infringe basic human rights and freedoms would have found favour with the British people. The nudge-infused COVID messaging was devoid of any ethical oversight. In short, the UK Government, and a corresponding group of behavioural science advisers, were willing to frighten and shame an already fearful population to lever compliance with state diktats (R. Jones, 2024). *Nature* published an article entitled 'Mastering the art of persuasion during a pandemic', which discussed the most effective means of persuading people to wear masks, take vaccines and socially distance (Svoboda, 2022). I suspect that much of the public would be better persuaded by such measures if there was more convincing evidence that they were actually effective! According to the Democracy Perception Index 2022, globally, 54% said that their government had done too much to limit basic freedoms during the COVID crisis (Latana, 2022). The United Kingdom was the fifth most content with their restrictions (after China, Sweden, Taiwan and Japan).

6.1.13 Publication Bias

6.1.13.1 Journals

Ioannidis (2005) claimed that most published research findings are false. Assuming that his paper is itself correct, problems with experimental and statistical methods mean that there is less than a 50% chance that the results of any randomly chosen scientific paper are true. The reasons for this include small sample sizes, poor study design, researcher bias and selective reporting. We can no longer trust even the most reputable journals to deliver us unadulterated science. Some of *Nature*'s editorials (e.g. Nobles, Womack, Wonkam, and Wathuti (2022)) compromise science for the sake of social justice (Staddon, 2022). There have even been calls to replace scientific papers with mini-websites (S. Ritchie, 2022).

Journals and Big Pharma In a systematic review, Lexchin, Bero, Djulbegovic, and Clark (2003) found that research sponsored by the pharmaceutical industry was more likely to produce results favouring the product made by the company sponsoring the research than studies funded by other sources. The results applied across a wide range of disease states, drugs and drug classes, over at least two decades and regardless of the type of research being assessed—pharmacoeconomic studies, clinical trials or meta-analyses of clinical trials. The authors concluded that there is some kind of systematic bias to the outcome of published research funded by the pharmaceutical industry.

Richard Smith, a former editor of the *British Medical Journal*, has argued that medical journals have essentially become an extension of the marketing arm of pharmaceutical companies (R. Smith, 2005). The companies seem to get the results they want not by fiddling the results, which would be far too crude and possibly detectable by peer review, but rather by asking the 'right' questions.

In a systematic review of 37 studies, L. Hazell and Shakir (2006) found that the median under-reporting rate of adverse drug reactions was 94%. Whilst the median under-reporting rate for the 19 studies investigating specific serious/severe adverse drug reactions-drug combinations was 85%. Common reasons for not reporting included a lack of time, different care priorities, uncertainty about the drug causing the adverse drug reactions, difficulty in accessing reporting forms, lack of awareness of the requirements for reporting and lack of understanding of the

purpose of spontaneous reporting systems.

Unfortunately, Big Pharma's incentives (Goldacre, 2013) and the commercialisation of higher education (Bok, 2004) are not compatible with evidence-based medicine, which remains an illusion (Jureidini & McHenry, 2020, 2022). Big Pharma can make more money from patented drugs than from generic drugs (FDA, 2016). Whilst Big Pharma are in a position to influence high-impact journals. This leads to a publication bias. So we end up with high-impact journals biased towards publishing articles that show patented drugs (e.g. COVID-19 vaccines) in a favourable light, and generic drugs (e.g. ivermectin) unfavourably (Kory, 2022). Such results can then be reported in the mainstream media, including with headlines that simplify and exaggerate, giving the general population a misleading understanding of the science.

Ahn et al. (2017) examined the relationship between the financial ties with industry of principal investigators and study outcome across a random sample of randomised controlled trials (RCTs) published in 2013, which represented a cross-section of the evidence base. They specifically focused on RCTs that examined the efficacy of drugs, because these studies have a high impact on both clinical practice and healthcare costs. The prevalence of financial ties of principal investigators was 76% (103/136) among positive studies and 49% (29/59) among negative studies. The authors concluded that their findings may be suggestive of bias in the evidence base. Lammers, Edmiston, Kaestner, and Prasad (2017) found evidence of financial conflict of interest and academic influence among experts speaking on behalf of the pharmaceutical industry at the US Food and Drug Administration (FDA)'s Oncologic Drugs Advisory Committee (ODAC) meetings. They found that most (92.1%) expert speakers at FDA ODAC meetings receive sizable industry payments (median, $35,435). Whilst there were strong correlations between metrics of academic success (publications/citations/h-index) and industry payments.

Patients and doctors expect drug regulators to provide an unbiased, rigorous assessment of drugs before they reach the market. However, an investigation by *The BMJ* showed that the independence of the regulators from the drug companies is compromised in various ways (Demasi, 2022). The majority of regulators' budget, particularly the portion focused on drugs, is derived from industry fees. Furthermore, most regulatory agencies do not undertake their own assessment of individual patient data, but rather rely on summaries prepared by the drug sponsor. Whilst a 'revolving door' has seen many agency officials end up working or consulting for the same companies they regulated.

Sharyl Attkisson's 2024 book *Follow the Science: How Big Pharma Misleads, Obscures, and Prevails* exposes the corruption that has ruled the pharmaceutical industry for decades (Attkisson, 2024). D.-D. Nguyen et al. (2024) found that between 2020 and 2022, among US physician peer reviewers ($n = 1962$) for *The BMJ*, *JAMA*, *The Lancet*, and *The New England Journal of Medicine* (*NEJM*), 58.9% received at least one industry payment, 54.0% of reviewers accepted general payments, and 31.8% received research payments. In total, reviewers received $1.06 billion in industry payments ($1.00 billion to individuals or their institutions and $64.18 million in general payments).

Ghostwriting *Ghostwriting* is the practice whereby individuals make significant contributions to writing a manuscript but are not named as authors (Bosch & Ross, 2012). Such practices are thought to predominantly occur when academic investigators collaborate with industry. Strategically planned and placed ghostwritten manuscripts provide an aura of objectivity around clinical research and conceal conflict of interest. Ghostwriting can be used to promote pharmaceutical products. The purpose of ghostwriting is to make an article appear as if it came from a disinterested academic rather than the corporate sponsor (Moffatt & Elliott, 2007). Roughly 10%, possibly more, of papers published in biomedical journals use ghostwriting, commissioned by pharmaceutical companies. Drug companies get the results they want by asking the right questions, and use ghostwriting as a tool for marketing drugs. As of 2011, there were at least 250 different companies engaged in the business of planning clinical publications for the

pharmaceutical industry (Ross, 2011). The planning companies are paid to implement high-impact publication strategies for specific drugs. They target the most influential academics to act as authors, draft the articles, and ensure that these include clearly defined branding messages and appear in the most prestigious journals. 'Key messages' laid out by the drug companies are accommodated to the extent that they can be supported by available data.

Journals and COVID-19 A Viewpoint article entitled 'Science Denial and COVID Conspiracy Theories' published in *JAMA*, a peer-reviewed medical journal with an impact factor of 63.1, starts with 'The US public health response to coronavirus disease 2019 (COVID-19) has been dismal, characterized by antimask behavior, antivaccine beliefs, conspiracy theories about the origins of COVID-19, and vocal support by elected officials for unproven therapies' (B. L. Miller, 2020). Antimask behaviour is perfectly rational because masks fail a cost–benefit analysis, antivaccine beliefs can be reasonable in cases when they fail a cost–benefit analysis (such as vaccinating infants), theories about the origins of COVID-19 are not necessarily conspiracy theories and we have evidence that early treatments can work. There was pressure to produce findings that COVID-19 containment measures are effective, and bias against findings that COVID-19 containment measures are not effective (eugyppius, 2021g). The preprint sites medRxiv and arXiv consistently rejected papers that challenged the 'official' COVID-19 narrative (N. Fenton & Neil, 2022b). Whilst flawed pro-lockdown papers received far more citations than more accurate anti-lockdown papers (Carl, 2023a). Ridley (2023b) pointed out that, in practice, peer review has become less a means of challenging papers than a way of keeping out heretics whilst waving through true believers. We ended up with a publication bias towards showing that lockdowns, masks, vaccines and epidemiological models all work, and that COVID-19 is of zoonotic origin.

Denis Rancourt, a former professor of physics at the University of Ottawa, had a perfectly reasonable paper that concluded that masks don't work (D. G. Rancourt, 2020) removed from ResearchGate, the social network service for scientists. ResearchGate claimed that the paper didn't comply with their Terms of Service and had the potential to cause harm. Whilst the authors of the Danish mask study (Bundgaard et al., 2021) had difficulty getting their paper, which found that the effectiveness of masks was not statistically significant, published (World-Health.net, 2020). The CDC's *Morbidity and Mortality Weekly Report* were happy to publish the original paper on paediatric COVID-19 cases in counties with and without school mask requirements (Budzyn et al., 2021), despite serious defects (W. M. Briggs, 2021a). Yet they refused to publish the much larger replication study (Chandra & Høeg, 2022), which failed to find any protective effect from masking when using the same methodology on a much larger dataset (eugyppius, 2022i). A study that purports to show that face masks are highly effective at preventing COVID-19 (Alihsan et al., 2022) spread like wildfire among scientists, despite the fact that it was unpublished junk science (A. Munro, 2022). Prasad (2022b) explained how the US's Centers for Disease Control and Prevention (CDC) pushed weak or flawed studies on face masks and vaccinations in order to support the administration's pandemic policy goals. In other words, science was compromised in order to further political goals and objectives. In October 2021 a paper was published showing how the mRNA vaccines could massively impact the risk of ovarian and breast cancer. Two scientists, linked to the National Institutes of Health in the US and academia, successfully conspired to have the publication retracted (Syed, 2022d). A paper entitled 'Repetitive mRNA vaccination is required to improve the quality of broad-spectrum anti-SARS-CoV-2 antibodies in the absence of CXCL13' (Azarias Da Silva et al., 2023) was analysed by Bridle (2023d). Contrary to the title, the totality of the evidence provided by the authors showed that naturally acquired immunity is as good as it gets. In fact, the evidence provided by the authors suggested that getting booster shots risks narrowing the focus of naturally acquired immunity against a single target on SARS-CoV-2—a target that the virus has shown a propensity to mutate. Scientific literature at the start of the pandemic on vaccinations was

biased, so as not to report severe adverse events (SAEs), due to social and political concerns and overwhelming corporate greed (Thoene, 2024). From 2020 to 2024, the literature went from claiming there were absolutely no SAEs from mRNA-based vaccines (2020/2021) to an acknowledgment of a significant number of various SAEs (2023/2024); including but not limited to neurological complications, myocarditis, pericarditis and thrombosis.

S. C. L. Lim et al. (2022) published an article in *JAMA Internal Medicine* to determine the effectiveness of ivermectin treatment on disease progression among adults with mild to moderate COVID-19 and comorbidities. They conducted an open-label randomised clinical trial at 20 government hospitals and a COVID-19 quarantine centre in Malaysia between 31 May and 25 October 2021. The primary outcome was the proportion of patients who progressed to severe disease. Whilst the secondary outcomes of the trial were time of progression to severe disease, patients who had mechanical ventilation, patients admitted to ICU, all-cause in-hospital mortality and length of stay. The p-value is the probability, given the assumption that the drug has no effect, of obtaining, by chance, a better outcome than the outcome actually observed. $p < 0.05$, which of course is arbitrary, was considered statistically significant. None of the outcomes were statistically significant, and the authors concluded with 'The study findings do not support the use of ivermectin for patients with COVID-19.' However, four out of the six outcomes favoured ivermectin. Plus the outcome with the highest level of statistical significance, all-cause in-hospital mortality, favoured ivermectin with $p = 0.09$. The bottom line is that if you were in hospital with COVID-19, you would most likely want to receive ivermectin (which is inexpensive, easy to administer and widely available) because it could save your life. In summary, the study was underpowered (DrBeen, 2022), but actually showed that ivermectin works (Chudov, 2022f; Rose, 2022c) and those who received it had a lower death rate (N. Fenton, 2022c). The study even showed, unwittingly, that ivermectin was three times more effective than vaccines at preventing patients from dying (Kirsch, 2022e)!

6.1.13.2 Newspapers

Wondemaghen (2023) argued that the print press used the COVID-19 pandemic to categorise and reconfigure sections of the British citizenry into conformists and deviants. Left-leaning newspapers such as *The Guardian* and *The Mirror* failed to deliver a balanced representation of the concerns, misunderstandings and debates, which compromised effective public health communication. Whilst the conservative newspaper *The Daily Mail* revealed a different tone focusing on lockdown fatigue and its crippling nature on the economy, rather than on sceptics.

6.1.13.3 Wikipedia

Wikipedia is biased against those who question the official narrative on COVID-19 (N. Fenton, 2022b). The Wikipedia page on COVID-19 lockdowns states that 'Lockdowns are thought to be most effective at containing or preventing COVID-19 community transmission, healthcare costs and deaths when implemented earlier, with greater stringency, and when not lifted too early' (Wikipedia, 2024a). The Wikipedia page on face masks during the COVID-19 pandemic states that 'Properly worn masks […] help protect healthy individuals from infection' (Wikipedia, 2024c). The Wikipedia page on COVID-19 vaccines states that 'The COVID-19 vaccines are widely credited for their role in reducing the spread of COVID-19 and reducing the severity and death caused by COVID-19' (Wikipedia, 2024b).

6.1.13.4 Conclusion

The world overreacted due to various cognitive biases. Risk aversion led to fear. Overconfidence suppressed doubt. The illusion of consensus minimised dissent. Virtue signalling and cheater detection kicked in. A self-perpetuating cycle of fear and virtue signalling developed, spiralling from politicians to the media to the public.

6.2 The Determinants of COVID-19 Case/Death Rates

If lockdowns don't have a significant impact on COVID-19 infections/deaths, what factors do influence COVID-19 outcomes?

6.2.1 Dynamics of COVID-19

What have we learnt about the dynamics of COVID-19? In the introduction, it was stated that the herd immunity threshold is a function of the frequency of infection-producing contacts within the host population, the mean infectious period of time and the season. This explains the dynamics of COVID-19, with a couple of caveats. Firstly, because COVID-19 infects via aerosol transmission (as well as respiratory droplets), with the majority being exposed, but only a minority being susceptible (C. Craig, 2021a), the contact rate within the population is less significant (whilst time spent indoors matters). This likely explains why lockdowns had no significant impact. Secondly, many people have pre-existing immunity, which lowers the peaks of the epidemic curve. This explains why it was estimated that the original strain of COVID-19 had a herd immunity threshold of 65% (Billah et al., 2020), yet by my estimate, during their first wave, Sweden reached herd immunity after just 5.6% of the population had been infected. Estimates for the herd immunity threshold for variants of COVID-19 are: the original virus in Wuhan 60%, the version that caused Europe's first wave 67%, the Alpha variant 78% and the Delta variant 85% (Gallagher, 2021), which, along with seasonality, explain the various pre-Omicron waves.

W. Jones (2022y) hypothesised that COVID-19 began spreading undetected all over the world by autumn 2019 at the latest, then in February 2020 a new more transmissible variant emerged (or at least more transmissible among certain subgroups of people) which was then able to spread much more readily. But for some reason it wasn't able to become dominant everywhere at once, or get into care homes everywhere, thus the early patchwork of deaths, the staggered start and also the gradual convergence. In August 2020, Atkeson, Kopecky, and Zha (2020) determined four stylized facts about COVID-19. Firstly, across all countries and US states that they studied, the growth rates of daily deaths from COVID-19 fell from a wide range of initially high levels to levels close to zero within 20–30 days after each region experienced 25 cumulative deaths. Secondly, after this initial period, growth rates of daily deaths hovered around zero or below everywhere in the world. Thirdly, the cross-section standard deviation of growth rates of daily deaths across locations fell very rapidly in the first 10 days of the epidemic and remained at a relatively low level since then. Fourthly, when interpreted through a range of epidemiological models, these first three facts about the growth rate of COVID-19 deaths imply that both the effective reproduction numbers and transmission rates of COVID-19 fell from widely dispersed initial levels and the effective reproduction number hovered around one after the first 30 days of the epidemic virtually everywhere in the world. The authors noted that failing to account for these four stylized facts may result in overstating the importance of policy-mandated NPIs for shaping the progression of the pandemic. Farr's law, formulated by William Farr, states that epidemic events rise and fall in a roughly symmetrical pattern approximated by a bell-shaped curve (Farr, 1840). Pacheco-Barrios, Cardenas-Rojas, Giannoni-Luza, and Fregni (2020) argued that Farr's law seems to be a useful model to give an overview of COVID-19 pandemic dynamics.

Levitt, Scaiewicz, and Zonta (2020) showed that the trajectory of cases or deaths in any outbreak can be converted into a straight line. Specifically, where $X(t)$ is the total number of cases or deaths on day t, $Y(t) \equiv -\ln(\ln(N/X(t)))$ is a straight line for the correct plateau value N, which is determined by a new method, best-line fitting. In a given country, the cumulative death toll of the first wave of the COVID-19 epidemic follows a sigmoid curve as a function of time (Rypdal & Rypdal, 2020). In most cases, the curve is well described by the Gompertz function, which is characterised by two essential parameters, the initial growth rate and the decay rate as the first epidemic wave subsides.

On his blog, eugyppius (2022j) posits that Hope-Simpson's model of influenza (Hope-Simpson, 1992) may apply to COVID-19. S. Andrews (2022b) pointed out that the world chose to largely ignore the extensive work of Robert Edgar Hope-Simpson and D. B. Golubev (Hope-Simpson & Golubev, 1987). A respiratory virus such as those that cause influenza or COVID-19 has the ability to embed itself within a high proportion of the population and lie in a low-level or latent state. The embedded virus is activated in a proportion of the population by a solar related/seasonal mechanism that creates a number of highly infectious individuals who suffer only minor symptoms. These individuals are only infectious for a brief period as their immune systems rapidly deal with and prevent escape of infectious viral particles. The individuals with secondary infections have very limited infectious potential but can react severely to the viral challenge. Verduyn (2024c) concluded that since COVID-19 did not spread out of Wuhan despite five million travellers to other Chinese provinces, there was no reason to think that it spread out of Wuhan to other countries either.

As referenced in the section on masks, Will Jones hypothesised that COVID-19 outbreaks can be explained via aerosol transmission susceptibility thresholds (W. Jones, 2021a). The primary means of infection is through relatively prolonged exposure to air contaminated with a sufficiently high viral load from the aerosols produced by infectious people. An outbreak is triggered when the viral load of infectious aerosols in the air in most indoor communal spaces reaches a certain threshold such that anyone who enters those spaces and spends more than a trivial amount of time in them is exposed to an infective dose of the virus, some of whom will be susceptible. When herd immunity is reached infections then fall. The threshold will be lower in the winter, and the proportion susceptible will increase with a new dominant variant. He wisely argues that almost all people are exposed during a surge, but the vast majority are already immune, so that relatively few of them are infected (W. Jones, 2021e). The surge then ends when enough of that small minority have been infected (herd immunity is reached). And, seasonality aside, there won't be a new wave unless there is a new variant. So, what prevents people from contracting the virus is their level of susceptibility, not their level of exposure. HART (2021d) argued that only 5–15% of the population are susceptible to each variant and the spread of materially symptomatic disease only occurs between the 5–15% of the population who are susceptible. Each variant will infect the susceptible population and once those people have been infected that variant will disappear.

Heneghan and Jefferson (2023i) pointed out that in England March–April 2020 the regional deaths were synchronous, but were asynchronous by the end of 2020. Fazekas-Pongor et al. (2022) found that in Hungary, during the second wave of the epidemic, relative mortality peaked for ages 65–84. Whilst during the third wave, relative mortality peaked for ages 35–44. Witzbold (2023b) showed that in Germany, from the 2020/2021 winter onwards, the seasonal waves of excess deaths appeared to come early. In January 2023, Witzbold (2023c) noted that in Denmark, Germany and the UK, COVID-19 waves appear to exhibit a three-month periodicity. Witzbold (2023a) argued that the pandemic (the first wave of COVID-19 in spring 2020) has been followed by an unusual 'slow burn' of ongoing transmission and case occurrence, but without a clear wave pattern. Coddington (2022b) hypothesised that every country is likely to experience at least one serious wave of COVID-19 deaths, regardless of vaccination rate, and it is the accumulation of natural immunity and the deaths of the most vulnerable in previous waves that lead to fewer deaths moving forward. Shahar (2023h) noted that it seems that countries should undergo at least two major mortality waves before reaching the endemic stage, regardless of the prevailing COVID-19 strain.

Faridi et al. (2020) investigated the air of patient rooms with confirmed COVID-19 in the largest hospital in Iran, on 17 March 2020. Samples were collected 2 to 5 m from the patients' beds. All samples were negative. In a systematic review of 24 studies on the air contamination by SARS-CoV-2 in hospital settings, 17% of air sampled from close patient environments was positive for SARS-CoV-2 RNA, with viability of the virus found in 9% of cultures (Birgand et al.,

2020). High viral loads were found in toilets, bathrooms, staff areas and public hallways. Cornell University re-opened for residential instruction in the autumn of 2021. Vaccination and masks became mandatory, whilst extensive testing, contact tracing and isolation programmes were implemented. Meredith et al. (2022) reviewed the surveillance data. Despite high vaccination rates (97.9% of campus), 98.6% of cases were breakthrough infections. The authors concluded that traditional public health interventions were not a match for the Omicron variant.

To conclude, it seems likely that many people have pre-existing immunity, COVID-19 is extremely infectious, and the epidemic curve was dominated by seasonality and new dominant (more infectious) variants. So in practice the rate of COVID-19 infections is a function of the herd immunity threshold (which is a function of the infectiousness of the dominant variant and the season) and the proportion of the population that are susceptible. This explains why SARS-CoV-2 apparently doesn't care about lockdowns, face masks or even vaccination programmes. We next consider pre-existing immunity and seasonality in detail.

6.2.2 Pre-Existing Immunity

The country that arguably implemented the world's strictness lockdown, Peru (Tegel, 2020), ended up with the highest total COVID-19 death rate (666 deaths/100k population) (Johns Hopkins University & Medicine, 2023). Whilst Laos, a poorer country, had among the lowest death rates (close to zero until their vaccination programme) (Johns Hopkins University & Medicine, 2023). How can a country with a strict lockdown end up with a COVID-19 death rate orders of magnitude greater than that of a poorer country? A possible clue is that it is quite likely that bats in Laos carry coronaviruses similar to SARS-CoV-2 (The Economist, 2020). A plausible hypothesis would be underlying differences in susceptibility. Let us explore the evidence for pre-existing immunity against COVID-19. Note that those with pre-existing immunity have less severe illness.

6.2.2.1 Influenza

Like pre-Omicron COVID-19, influenza is a seasonal respiratory disease. The plentiful literature on influenza may help inform us about the global patterns of susceptibility to COVID-19. Perhaps uniquely, a region within East Asia and Southeast Asia combines a tropical equatorial climate with a dense population. In an article published in *Science*, C. A. Russell et al. (2008) discovered that influenza A (H3N2) viruses circulate continually in East Asia and Southeast Asia via a region-wide network of temporally overlapping epidemics, and that epidemics in the temperate regions are seeded from this network each year. Seed strains generally first reached Oceania, North America and Europe, and later South America. Mathews, Chesson, McCaw, and McVernon (2009) deduced that isolated populations without recent exposure to seasonal influenza seem more susceptible to new pandemic viruses, and much collateral evidence suggests that this is due to immunity directed against epitopes shared between pandemic and previously circulating strains of inter-pandemic influenza A virus. Bedford, Cobey, Beerli, and Pascual (2010) found that China and Southeast Asia lie at the centre of the global network of influenza A transmission, with the USA making an important contribution. J. Chan, Holmes, and Rabadan (2010) found that a wave of seasonal flu originates in China and feeds an East Asia and Southeast Asia subnetwork. From there, viruses transmit to an Oceanic subnetwork dominated by interchange between Australia and New Zealand. Both subnetworks seed into the USA, which in turn seeds many countries, particularly in South America. Lemey et al. (2014) confirmed a central role for mainland China and Southeast Asia in maintaining a source population for global influenza diversity. The 2018 flu virus caused the highest death rates in Africa, followed by South Asia, Southeast Asia and South America (Champion Traveler, 2019). Paget et al. (2019) compiled influenza-associated excess respiratory mortality estimates for 31 countries representing 5 WHO regions during 2002–2011. Nearly 50% of influenza-associated

respiratory deaths occurred in East Asia, Southeast Asia and Australasia.

6.2.2.2 COVID-19

Now let us consider the evidence relating to COVID-19 directly. Grifoni et al. (2020) detected SARS-CoV-2-reactive CD4+ T cells in ~40%–60% of unexposed individuals, suggesting cross-reactive T cell recognition between circulating 'common cold' coronaviruses and SARS-CoV-2. Weiskopf et al. (2020) detected low levels of SARS-CoV-2-reactive T cells in 2 out of 10 healthy controls not previously exposed to SARS-CoV-2, which is indicative of cross-reactivity due to past infection with 'common cold' coronaviruses. In July 2020 a well-cited article in *Nature Reviews Immunology* concluded that it was established that SARS-CoV-2 pre-existing immune reactivity exists to some degree in the general population. It was hypothesised, but not yet proven, that this might be due to immunity to 'common cold' coronaviruses (Sette & Crotty, 2020). In a *Nature* article, Bert et al. (2020) showed that patients who had recovered from SARS possessed long-lasting memory T cells that were reactive to the N protein of SARS-CoV 17 years after the outbreak of SARS in 2003; these T cells displayed robust cross-reactivity to the N protein of SARS-CoV-2. They also detected SARS-CoV-2-specific T cells in individuals with no history of SARS, COVID-19 or contact with individuals who had SARS and/or COVID-19. Braun et al. (2020) detected spike-reactive $CD4^{+}$T cells not only in 83% of patients with COVID-19, but also in 35% of healthy donors. The results indicated that spike protein cross-reactive T cells are present, which were probably generated during previous encounters with endemic coronaviruses. In September 2020 *The BMJ* reviewed the matter in their article 'Covid-19: Do many people have pre-existing immunity?' (Doshi, 2020a). Apparently, 20% to 50% of people have a degree of pre-existing immunity. Nelde et al. (2021) found that cross-reactive SARS-CoV-2 peptides revealed pre-existing T cell responses in 81% of unexposed individuals and validated similarity with common cold coronaviruses, providing a functional basis for heterologous immunity in SARS-CoV-2 infection. Sagar et al. (2021) found that patients with a previously detected endemic coronavirus infection had less severe COVID-19 illness. Sekine et al. (2020) detected cross-reactive T cell responses directed against the spike and/or membrane proteins of SARS-CoV-2 in 28% of unexposed healthy blood donors, consistent with a high degree of pre-existing immunity in the general population. Their findings most likely reflect widespread exposure to seasonal coronaviruses, which could shape the subsequent immune response to SARS-CoV-2. As such, it remains likely that a fraction of the anamnestic SARS-CoV-2-specific T cell response was initially induced by seasonal coronaviruses in seronegative individuals. The authors speculate that such responses may provide at least partial protection against SARS-CoV-2, given that pre-existing T-cell immunity has been associated with beneficial outcomes after challenge with the pandemic influenza virus strain H1N1. In an article in *Science*, Mateus et al. (2020) reported that pre-existing cross-reactive T cell memory exists in 20% to 50% of people, depending on location. They concluded that coronaviruses that cause the common cold may underlie at least some of the extensive heterogeneity observed in COVID-19 patient disease outcomes. Bolourian and Mojtahedi (2021) hypothesised that flu-like epidemics may cause a graver disease in regions further from the origin of the disease, with some close viruses being more prevalent in those regions. The COVID-19 pandemic and the three main flu pandemics in the last centuries followed a similar pattern: the further from the pandemic origin, the graver the disease. The authors suggested that a compelling explanation for the pattern might be a partial pre-existing cross-immunity to SARS-CoV-2/influenza viruses in areas close to the origin of the pandemics.

Dobaño et al. (2021) found that the antibodies to the nucleocapsid (N) protein elicited by patients of other coronaviruses can confer some protection against COVID-19. In an analysis of data from Canada, Majdoubi et al. (2021) concluded that the majority of uninfected adults show preexisting antibody cross-reactivity against SARS-CoV-2. In *Nature Communications*, Z. Wang et al. (2021) reported that individuals who were exposed to SARS-CoV-2 (close contacts of COVID-19 patients) but not infected by the virus developed SARS-CoV-2-specific T-cell

immune memory. In addition, comparable levels of SARS-CoV-2-specific memory T cells were detected in the samples of asymptomatic and symptomatic COVID-19 patients. Mahajan et al. (2021) found that pre-existing T-cell immunity to SARS-CoV-2 is contributed by T-cell receptors (TCRs) that recognise common viral antigens such as influenza and cytomegalovirus (CMV), even though the viral epitopes lack sequence identity to the SARS-CoV-2 epitopes. Their findings suggest that SARS-CoV-2 reactive T-cells are likely to be present in many individuals because of prior exposure to flu and CMV viruses. Girardot (2022a) argued that due to past coronavirus infections, most people already had cross-reactive immunity, and never needed vaccination. In the US, Fillmore et al. (2022) found that prior infection with non-SARS human coronaviruses (HCoVs) provided short-term cross-protection against SARS-CoV-2. Although distant infections were not associated with reduced risk, suggesting that immunity to HCoVs is partial and short lived. B. Adhikari et al. (2023) measured levels of antibodies from prior common cold coronavirus infections in hospitalised patients with varying severity of respiratory failure. Some had tested positive for COVID-19, whilst others had not. They found that there was a positive correlation between common cold antibody levels and COVID-19-specific antibodies. Higher common cold antibody levels in the control (Covid negative) patients suggested that catching a cold might offer a potentially protective effect against COVID-19 severity (Citroner, 2023). In the UK, in a controlled 'challenge trial' for COVID, unvaccinated healthy volunteers with no prior history of COVID-19 were deliberately exposed to an extremely low dose of the original strain of SARS-CoV-2 (Nikolic & Worlock, 2024). Out of 16 volunteers, six (38%) developed typical mild COVID-19, testing positive for several days with cold-like symptoms, three (19%) went on to develop an 'intermediate' infection with intermittent single positive viral tests and limited symptoms, and seven (44%) remained negative on testing and did not develop any symptoms.

COVID-19 deaths per capita have been highest in North America, South America and Europe (Wikipedia, 2021). In 2021, the highest age-standardised death rates from COVID-19 occurred in sub-Saharan Africa (271.0 deaths [250.1–290.7] per 100,000 population) and Latin America and the Caribbean (195.4 deaths [182.1–211.4] per 100,000 population) (GBD 2021 Causes of Death Collaborators, 2024). Whilst the region with the highest age-adjusted excess mortality (the most reliable measure of the impact of COVID-19) was South America plus Mexico (Latin America) (Heuveline & Tzen, 2021; Karlinsky & Kobak, 2021). The largest reduction in life expectancy due to COVID-19 occurred in Latin America and the Caribbean (3.6 years) (GBD 2021 Causes of Death Collaborators, 2024). Latin America is clearly furthest from the source of COVID-19. Meanwhile, Southeast Asia, East Asia and Oceania had the smallest reduction in life expectancy due to COVID-19 (0.4 years) (GBD 2021 Causes of Death Collaborators, 2024). To conclude, it seems likely that the populations of East Asia, Southeast Asia and Australasia had greater pre-existing immunity (from other coronaviruses) due to their closer proximity to the origin of COVID-19.

6.2.3 Seasonality

If COVID-19 is seasonal, then the COVID-19 case/hospitalisation/death rate should obviously be dependent on the season. We know that influenza is highly seasonal, though the exact mechanism behind the seasonality is unknown. What is the evidence that COVID-19 is seasonal? Natural seasonal phenomena are ultimately caused by variation in solar radiation, which is a function of latitude and time of the year.

Dopico et al. (2015) found evidence that our immune system has seasonal components, with inverted patterns observed between Europe and Oceania. Quinn et al. (2024) examined the progression of COVID-19 in six Northern European countries (Ireland, UK, Denmark, Norway, Sweden and Finland) over the duration of the pandemic (March 2020 to May 2023) and assessed how much of the pandemic progression could be explained in terms of three different factors, namely: the stringency of NPIs, the percentage of the population fully vaccinated with

COVID-19 vaccines and the expected seasonality of human beta-coronaviruses. The waves of the pandemic correlated well with the seasonality of human beta-coronaviruses (HCoV-OC43 and HCoV-HKU1). Whilst the authors could not find clear or consistent evidence that the stringency of NPIs or vaccination programmes reduced the progression of the pandemic.

6.2.3.1 Influenza

Hope-Simpson (1992) hypothesised that the influenza virus lays dormant in people and is reactivated by a seasonally mediated stimulus. He proposed a new concept of the epidemic process of the influenza A virus (Hope-Simpson & Golubev, 1987):

> It proposes that influenza A virus cannot normally be transmitted during the illness because it too rapidly becomes non-infectious in a mode of persistence or latency in the human host. Many months or a year or two later it is reactivated by a seasonally mediated stimulus which, like all seasonal phenomena, is ultimately dependent on variations in solar radiation caused by the tilt of the plane of earth's rotation in relation to that of its circumsolar orbit. The carriers, who are always widely seeded throughout the world population, become briefly infectious and their non-immune companions, if infected, comprise the whole of the next epidemic. The reactivated virus particles must encounter the immunity they have engendered in the carrier, thus allowing minor mutants an advantage over virions identical with the parent virus, and so favouring antigenic drift and automatic disappearance of predecessor and prompt seasonal replacement. Antigenic shift and recycling of major variants may also be explained by virus latency in the human host.

6.2.3.2 Latitude

Whittemore (2020) found that 16% of the variation in death rates among nations is accounted for by the latitude of the country. During Autumn 2020 in Europe, the time of the resurgence of COVID-19 correlated with latitude (Walrand, 2021). X. Liu et al. (2021) found that both COVID-19 infectivity and mortality were stronger in colder climates, and that COVID-19 seasonality was more pronounced at higher latitudes. In an article published by PANDA, Verduyn, Kenyon, and Engler (2023) found that in the US there is a weak trend of decreasing COVID-19 mortality with increasing latitude. In another PANDA article, this time analysing worldwide data, the same authors identified a weak negative correlation between COVID-19 mortality and latitude (Verduyn, Engler, & Kenyon, 2023).

6.2.3.3 Temperature and Humidity

In a review paper, Byun et al. (2021) deduced that COVID-19 appears to be temperature-sensitive and, therefore, seasonal. Ma, Pei, Shaman, Dubrow, and Chen (2021) estimated that in the United States the fraction of the reproduction number attributed to temperature was 3.73%, specific humidity 9.35% and ultraviolet radiation 4.44%. Fontal et al. (2021) applied scale-dependent correlation analysis to the time series of reported cases, and found strong consistent negative effects of both temperature and absolute humidity at large spatial scales. They concluded that COVID-19 is a true seasonal infection.

6.2.3.4 Ultraviolet (UV) Light

Merow and Urban (2020) found that ultraviolet (UV) light, in particular, was associated with decreased COVID-19 growth rate relative to other analysed factors. Y.-W. Choi, Tuel, and Eltahir (2021) analysed the roles of temperature, humidity, air drying capacity (an atmospheric state variable that controls the fate/evolution of virus-laden droplets) and ultraviolet radiation

on their potential to influence the spread of COVID-19. They determined that air drying capacity and ultraviolet radiation were the most significant environmental determinants that influence the transmission of COVID-19 at the seasonal time scale. S. Andrews (2022a) hypothesised that certain conditions of UV light impact the ability of SARS-CoV-2 to infect cells. S. Andrews (2023g) applied the Darwinian principles of natural selection and the more specific hypothesis on influenza of (Hope-Simpson & Golubev, 1987) to the transmission and lethality of COVID-19. The successful replication of the COVID-19 virus involves a complex interplay between its latent/lysogenic cycles and the transition to lytic cycles. Mutations occur during the lysogenic cycle due to replication errors. The virus likely circulated globally at a low but highly transmissible level initially, causing mild illness and developing specific immunity in many individuals. Quorum sensing and UV light conditions regulate the transition to the lytic cycle. Infected individuals continuously exhale the virus, which undergoes modifications in UV light. These modified viral fragments act as feedback signals, accelerating the shift to the lytic cycle when a successful variant escapes the immune system. The lytic phase releases favourable mutations, affecting individuals with vulnerable immune systems, particularly the elderly. The goal is successful virus replication, leading to the emergence of variants like Alpha, Delta and Omicron. Individuals with prior coronavirus immunity may carry the virus in a latent/lysogenic form, but their immune system resists viral escape, limiting feedback signals for replication or intense lytic cycles. S. Andrews (2023b) demonstrated that low-level ultraviolet (UV) light are involved in the triggering and selection of successful mutations of respiratory viruses such as COVID-19. He also showed that both influenza and COVID-19 are highly seasonal because these UV light conditions are seasonal.

6.2.3.5 Conclusion

In conclusion, it is highly likely that COVID-19 was seasonal, and seasonality explains a large proportion of COVID-19 cases/deaths. However, unlike the previous variants, Omicron does not appear to be seasonally activated (S. Andrews, 2023f).

6.2.4 Other Factors

In addition to pre-existing immunity and seasonality, let us review the literature on other factors that may influence COVID-19 infections/cases/deaths.

6.2.4.1 Genetics

To what extent does the human genome influence susceptibility to COVID-19? A gene cluster on chromosome 3 is the major genetic risk factor for severe COVID-19 symptoms (Zeberg & Pääbo, 2020). It is present in 50% of people in South Asia (highest in Bangladesh at 63%), 16% in Europe and almost no one in Africa or East Asia. It may have decreased in frequency in East Asia via negative selection, perhaps due to coronaviruses. Whilst the same authors later found that a haplotype on chromosome 12 is *protective* for severe COVID-19 disease (Zeberg & Pääbo, 2021). It is present in populations in Eurasia and the Americas at carrier frequencies that often reach and exceed 50%. Both the risk-increasing and protective genomic regions were inherited from the Neandertals. Augusto et al. (2023) provided evidence of a genetic basis underlying asymptomatic infection with SARS-CoV-2. They observed that individuals carrying the allele *HLA-B*15:01* (approximately 10% in individuals with European ancestry) are more than twice as likely to remain asymptomatic after SARS-CoV-2 infection compared with those who do not, with the notable effect of *HLA-B*15:01* homozygosity increasing the chance of remaining asymptomatic by more than eight times. In the UK 'challenge trial', where volunteers were deliberately exposed to a dose of SARS-CoV-2 (Nikolic & Worlock, 2024), the researchers identified a specific gene, HLA-DQA2, which was expressed at a much higher level

in the volunteers who did not go on to develop a sustained infection and could hence be used as a marker of protection.

6.2.4.2 Lived Density/Collectivism

Hofstede's cultural dimensions theory (Hofstede, Hofstede, & Minkov, 2010), a framework for cross-cultural psychology, developed by Geert Hofstede, includes an individualism–collectivism dimension. Individualism emphasizes the interests of the individual, whilst collectivism emphasizes salient in-group/out-group dynamics and conformity. Western countries tend towards individualism, whilst non-Western countries tend towards collectivism. In the trolley problem (Thomson, 1976), individualistic cultures show a stronger preference for sparing the greatest number of people, whilst collectivistic cultures, which emphasize respect for older members of the community, show a weaker preference for sparing younger people (Awad et al., 2018). This implies that collectivistic cultures should make greater efforts to mitigate COVID-19, which disproportionately affects the elderly. Fincher, Thornhill, Murray, and Schaller (2008) suggested that behavioural manifestations of collectivism can inhibit the transmission of pathogens; and they hypothesise that collectivism (as opposed to individualism) will more often characterise cultures in regions that have historically had a higher prevalence of pathogens. Garland et al. (2020) found that the rate of spread of COVID-19 was well explained by the combination of population-weighted density (which captures density as perceived by a randomly chosen individual) and individualism. Lu, Jin, and English (2021) provided evidence from four studies that people in more collectivistic regions (both within the United States and globally) were more likely to wear masks during the COVID-19 pandemic.

6.2.4.3 Longevity

In a systematic review and meta-analysis, Levin et al. (2020) found that the incidence of fatalities from a COVID-19 outbreak depends crucially on the age groups that are infected, which in turn reflects the age structure of that population and the extent to which public health measures limit the incidence of infections among vulnerable age groups. Given that COVID-19 mortality increases exponentially with age, this should come as no surprise, and holds the key to effective mitigation policies: protect the elderly.

6.2.4.4 Healthcare

In a preprint using a model of survival, Zahran, Altringer, and Prasad (2021) showed that countries with a more favourable survival environment will have a larger susceptible (health frail) population and, therefore, a higher COVID-19 death rate. In other words, somewhat counterintuitively, the better the healthcare system, the higher the COVID-19 death rate.

6.2.4.5 Mortality Displacement

D. B. Klein et al. (2020) deduced that the most significant reason for Sweden's high COVID-19 death rate in 2020 relative to the other Nordic countries was *mortality displacement*. Sweden experienced remarkably soft mortality during the preceding (2018–2019) flu season, which led to a larger inventory of highly vulnerable people. This phenomenon, which they term the 'dry tinder' effect, accounted for 25%–50% of Sweden's COVID-19 death toll. Similarly, Herby (2020) calculated that the stock of 'dry tinder' in Sweden was very large compared to other Nordic countries going into the COVID-19 pandemic, and large even from a historical perspective.

6.2.4.6 Obesity

In a systematic review and meta-analysis J. Yang, Hu, and Zhu (2021) concluded that severe COVID-19 patients had a higher body mass index than non-severe ones, and COVID-19 patients with obesity were more severely affected and had a worse outcome than those without. In a meta-analysis on the association between obesity and COVID-19, J. Yang, Ma, and Lei (2021) concluded that obesity was associated with a higher risk of SARS-CoV-2 infection and increased severity of COVID-19 (hospitalisation rate, severe cases, need for intensive care unit admission, need for invasive mechanical ventilation and mortality). In another systematic review and meta-analysis, X. Zhang, Lewis, Moley, and Brestoff (2021) concluded that obesity is associated with a more severe COVID-19 disease course but may not be associated with increased mortality. A retrospective cohort study of 194,191 adults in California who had COVID-19 between January 2020 and May 2021 found that those who were consistently inactive were 191% more likely to be hospitalised and 391% more likely to die than those who were consistently active (D. R. Young et al., 2022).

6.2.4.7 Vitamin D Deficiency

In a systematic review and meta-analysis, Teshome, Adane, Girma, and Mekonnen (2021) concluded that individuals with Vitamin D deficiency were 80% more likely to acquire COVID-19 infection than those who had sufficient Vitamin D levels. In another systematic review and meta-analysis, Borsche, Glauner, and von Mendel (2021) concluded that low blood levels of vitamin D3 are a predictor of COVID-19 mortality. The authors recommended raising serum 25(OH)D levels to above 50 ng/mL. In a retrospective study conducted in Israel, Dror et al. (2022) demonstrated that among hospitalised COVID-19 patients, pre-infection deficiency of vitamin D was associated with increased disease severity and mortality. Note that this result was both causal and highly significant. Because levels of vitamin D were measured *prior* to infection, vitamin D deficiency contributes to the *causal* pathway of COVID-19 mortality risk. Whilst patients with vitamin D deficiency (<20 ng/mL) were *14 times* more likely to have severe or critical disease than patients with 25(OH)D $\geq$ 40 ng/mL. Gibbons et al. (2022) investigated the association between vitamin D supplementation and COVID-19 infection and mortality. Vitamin D_2 and D_3 fills were associated with reductions in COVID-19 infection of 28% and 20%, respectively. Mortality within 30 days of COVID-19 infection was similarly 33% lower with Vitamin D_3 and 25% lower with D_2. They also found that after controlling for vitamin D blood levels, veterans receiving higher dosages of Vitamin D obtained greater benefits from supplementation than veterans receiving lower dosages. In a systematic review and meta-analysis, Sartini et al. (2024) found that vitamin D supplementation has a protective effect against the incidence of COVID-19 in RCT studies (odds ratio (OR) 0.403), in the incidence of COVID-19 in analytical studies (OR = 0.592) and in ICU admission (OR 0.317).

6.2.4.8 Pollution

In an editorial in the journal *Atmosphere*, Contini and Costabile (2020) concluded that exposure to air pollution could increase vulnerability and have detrimental effects on the prognosis of patients affected by COVID-19. Bashir et al. (2020) found that environmental pollutants such as $PM_{2.5}$ (fine particulates, with a diameter of 2.5 µm or less), PM_{10} (coarse particulates, with a diameter of 10 µm or less), nitrogen dioxide, carbon monoxide and sulphur dioxide were significantly correlated with total COVID-19 cases and total COVID-19 deaths in California. X. Wu, Nethery, Sabath, Braun, and Dominici (2020) found that, in the United States, higher historical $PM_{2.5}$ exposures were positively associated with higher county-level COVID-19 mortality rates. Travaglio et al. (2021) found positive relationships between air pollutant concentrations, particularly nitrogen oxides, and COVID-19 mortality and infectivity in England. They also showed that $PM_{2.5}$ was a major contributor to COVID-19 cases in England. Grandjean et al. (2020)

found that elevated exposure to perfluorinated alkylates was associated with a greater severity of COVID-19.

6.2.4.9 Stress

Psychological stress can compromise the immune system. In a meta-analytic study, Segerstrom and Miller (2004) found that chronic stressors were associated with suppression of both cellular and humoral measures. In some cases, physical vulnerability as a function of age or disease also increased vulnerability to immune change during stressors.

6.2.5 Conclusion

Geographically, the total cumulative number of COVID-19 cases and deaths are likely largely a function of pre-existing immunity (with cases/deaths an increasing function of the distance from the source of the pandemic, China/Southeast Asia), and in the shorter-term mortality displacement (with a greater number of cases/deaths following a soft flu-season). Whilst temporally, the season, extent of immunity within the community and progression and nature of the most prevalent variant of the virus dominate in terms of governing the rate of cases/deaths. So, in practice, apart from rolling out a vaccination programme, in the short term there was little that governments could do to mitigate the epidemic.

6.3 Why Did Influenza All But Vanish?

During the COVID-19 pandemic influenza all but vanished globally (WHO, 2021b) (including in countries like Sweden that didn't lock down (Folkhälsomyndigheten, 2020)). If social distancing and lockdowns had no significant impact on COVID-19 outcomes, how can we explain the lack of flu? It was likely due to the poorly understood phenomenon of viral interference (I. Miller, 2022b; Piret & Boivin, 2022). *Viral interference* is the inhibition of viral reproduction caused by previous exposure of cells to another virus. The exact mechanism for viral interference is unknown. Factors that have been implicated are the generation of interferons by infected cells and the occupation or down-modulation of cellular receptors. The term *pathogen interference* is also used, as a superset of viral interference that can also involve non-viral organisms.

In the UK there was a dip in acute respiratory conditions just prior to the onset of the pandemic (Dee, 2024g). A lull before the storm. In Northern Ireland, flu suddenly disappeared during the main COVID-19 mortality period of March 2020 to October 2022 and then just as suddenly reappeared after that. However, M. Neil (2023) suggested that the flu appeared to have disappeared because people stopped testing for it. Remnant (2021) argued that influenza facilitates infection of SARS-CoV-2 which leads to higher viral load and more severe lung damage. Superinfection with multiple pathogens is analogous to having a weak immune system, or having comorbidities with the same effect. Viruses have evolved to maximise their ability to replicate and infect as many host cells as possible. S. Andrews (2023a) hypothesised that when upper respiratory viruses infect a host a chemical signal is released that effectively communicates the availability of cells. A virus that has evolved a superior capacity to evade the host's immune system will therefore suppress other viruses and prevent them from infecting. This is pathogen interference.

Pinky and Dobrovolny (2016) hypothesised that simultaneous viral infections lead to competition for the resource of target cells, and that the virus with the largest growth rate will out-compete viruses with slower growth rates. Subsequently, using viral respiratory infection data from 2005 to 2013, Nickbakhsh et al. (2019) found strong support for the existence of negative interactions between influenza and non-influenza viruses. This negative interaction may be driven by virus competition for susceptible cells or as a consequence of virus-induced innate immune responses. On his blog, eugyppius (2022k) explained that pre-Omicron SARS-2 lineages displaced influenza, whilst leaving the other human-infecting coronaviruses undisturbed.

Then Omicron displaced harmless cold-causing human coronaviruses, and influenza returned. COVID-19 added a whole new seasonal pathogen, but the overall respiratory disease burden hasn't substantially increased. S. Andrews (2023c) noted that in virtually all European countries there was a pronounced and consistent excess mortality dip that was evident prior to the impact of the pandemic. This is consistent with the extended hypothesis of Hope-Simpson (1992). A novel virus entered the European population. Because it is novel it can readily evade the prevailing state of the human immune system. There is a prolonged phase of cell entry/embedding within the population, and pathogen interference causes a dip in mortality in virtually all countries. COVID-19 alters coinfection and superinfection by other pathogens via pathogen interference (R. P. Jones & Ponomarenko, 2023). During COVID-19 in 2020 the genetic diversity of influenza(s) was dramatically reduced with influenza B/Yamagata going 'extinct'. Such changes were primarily caused by COVID-induced pathogen interference, not lockdowns. In May 2023 eugyppius (2023j) reported that the surging infections of the XBB variant in China were due to viral interference, specifically the collapse of the anomalous, late-spring Chinese influenza wave. In an excellent article eugyppius (2023c) explained that COVID-19 suppressed influenza across much of the world for the first two years of the COVID pandemic, via viral interference. Viral interference does not—cannot—involve the direct competition of viruses within the same host. Prior infection with one respiratory virus means that the recovered person is not susceptible for many other viruses for a while afterwards. This is likely due to interferon, but there may be other mechanisms at play too.[14] If you're in the minority 5% susceptible and you get influenza, you're most likely invulnerable to COVID-19 for a while afterwards, and vice versa. Ordinary endemic viruses are an important defence against potentially dangerous novel pathogens. We know that SARS-2 was circulating widely as early as autumn 2019, and yet it only coincided with serious mortality as influenza infections collapsed in the course of February and March 2020.

6.4 Fomite Transmission and Hand Sanitiser

An April 2024 WHO report concluded that colds, influenza and COVID-19 are mainly spread through the air, not via surfaces (Morrison, 2024; WHO, 2024a). Cleaning products used daily during COVID-19 may have done more harm than good (A. M. Jones, 2023). Disinfectant wipes containing uaternary ammonium compounds (QACs) were often used on children's school desks, hospital exam tables and in homes, where they remain on these surfaces and in the air. QACs may be connected to asthma, dermatitis and inflammation in humans (W. A. Arnold et al., 2023). Even seemingly innocuous and ever-present hand sanitiser came with costs. An ArtNaturals distribution centre in California caught fire, and chemicals, including ethanol, passed through the city's sewer system and into the Dominguez Channel, causing elevated levels of hydrogen sulphide to be emitted into the air (Martyn, 2023; Powell, 2021). At one point, the hydrogen sulphide levels in the local waterway were about 230 times higher than California's nuisance standard. The lingering stench cost the Los Angeles Department of Public Works an estimated $5.4 million to remedy.

6.5 Early Treatment

There is evidence that hydroxychloroquine and ivermectin are effective treatments for patients with COVID-19 (Covid Analysis, 2024; Rushworth, 2021c). There may, however, be belief perseverance, risk aversion, profit-seeking or political reasons for opposing it. Harper (2022) pointed out that when someone tests positive for COVID-19, Western nations offered no immediate treatment, yet many poorer countries offered evidence-based treatment kits. On average, the

[14] *Interferons* are a group of signalling proteins made and released by host cells in response to the presence of several viruses. In a typical scenario, a virus-infected cell will release interferons causing nearby cells to heighten their anti-viral defences.

countries that offered early treatment had lower COVID-19 death rates than those that did not. Archibald (2021a) noted that regions that used ivermectin as an early treatment, such as the Indian state of Uttar Pradesh and Japan, managed to reduce cases rapidly. In his book *Pandemic Blunder*, Hirschhorn (2021) argued that the US should have offered early home/outpatient COVID-19 treatment. In April 2020 a group of physicians and former journalists formed the Front Line COVID-19 Critical Care Alliance (FLCCC), which develops treatment protocols to prevent the transmission of COVID-19 and improve the outcomes for patients ill with the disease (FLCCC Alliance, 2020). McCullough et al. (2021) stated that COVID-19 hospitalisations and deaths can be reduced with outpatient treatment. Principles of COVID-19 outpatient care include: 1) reduction of reinoculation, 2) combination antiviral therapy, 3) immunomodulation, 4) antiplatelet/antithrombotic therapy, and 5) administration of oxygen, monitoring and telemedicine. In her book, Huber (2021a) cites over 500 medical studies and prescribes nutritional interventions: vitamin D, vitamin C, zinc, hydroxychloroquine and ivermectin.

6.6 Long COVID

Long COVID is a group of health problems persisting or developing after an initial period of COVID-19 infection. Kory (2024b) argued that long COVID, although a new name, is not a new disease. It meets the diagnostic criteria for a decades-old condition called myalgic encephalitis/chronic fatigue syndrome (ME/CFS). Vivaldi et al. (2023) found that people with non-COVID-19 acute respiratory infections (e.g. colds, influenza, or pneumonia) experienced long-term symptoms similar to those who had had COVID-19. In both groups the same proportion, 22%, suffered from prolonged symptoms after infection. In other words, 'long colds' exist, and feeling unwell for weeks after a respiratory infection is not a new phenomenon (Ely, 2023; Gregory, 2023). Note that nobody worries about long influenza, long heart disease or long cancer. Høeg, Ladhani, and Prasad (2023) found that the existing epidemiological research on long COVID has suffered from overly broad case definitions and a striking absence of control groups, which have led to an exaggeration of the risk. This has led to unnecessary public anxiety and healthcare spending, a failure to diagnose other treatable conditions misdiagnosed as long COVID and a diversion of funds away from more worthy areas. An intensive care nurse was diagnosed as having long COVID, despite never testing positive for the virus, but actually had cancer (breast cancer spread to her lungs) and subsequently died (Stearn, 2023b). Who gets long COVID? Jangnin et al. (2024) found that long COVID was associated particularly with individuals under 60 and those exhibiting a cough as an early symptom. Perhaps surprisingly, no significant link was found between the presence of comorbidities or the severity of the initial COVID-19 infection and the emergence of long COVID symptoms.

What causes long COVID? Santopaolo et al. (2023) found that long COVID symptoms did not correlate with cellular immune activation/pro-inflammatory cytokines. Long COVID may not be an inflammatory immune reaction to the SARS-CoV-2 virus. Instead, the body appears to be responding to the activation of dormant viruses many of us already have in our systems (Anson, 2023). Hanson et al. (2024) suggested that long COVID may be caused by low iron levels in the blood following infection. However, R. Watson (2024b) argued that long COVID may simply be another name for anaemia. We have evidence that long COVID is caused by lockdowns (Selvakumar et al., 2023). R. Watson (2024c) reported that everything bad (e.g. cancer and heart disease) is being attributed to COVID-19, and that what people are reporting as long COVID may not be caused by COVID-19, but by the vaccines.

How can long COVID be cured? R. Watson (2023d) argued that the apparent protection offered by the COVID-19 vaccines against long COVID is in people's minds—a case of the placebo effect. Swift et al. (2024) investigated the association of COVID-19 vaccination with risk of medically-attended post-acute sequelae of COVID-19 (PASC) during the ancestral, Alpha, Delta and Omicron variant eras. They found no association between vaccination status at time of infection and subsequent development of medically diagnosed PASC. McCullough (2024b)

reported that vaccination fails to reduce long COVID. However, apparently, sniffing an orange twice a day can help alleviate a key symptom of long COVID, anosmia (the loss of smell and taste) (Pinkstone, 2023b; Wingrove et al., 2023)!

6.6.1 Europe

6.6.1.1 Germany

In a surprising German study published in the *International Journal of Infectious Diseases*, Diexer et al. (2023) found that among those infected with a specific variant of SARS-CoV-2, the number of preceding vaccinations was not associated with a risk reduction for post-COVID-19 condition (PCC) (long COVID), whereas previous infection was strongly associated with a lower PCC risk. In fact, for Alpha, Delta and Omicron variants, the PCC was higher for the vaccinated than the unvaccinated.

6.6.1.2 Italy

In Italy, as of June 2020, 71.4% of patients with COVID-19 presented with symptoms (Carfì, Bernabei, Landi, & the Gemelli Against COVID-19 Post-Acute Care Study Group, 2020). 87.4% of patients who had recovered from COVID-19 reported persistence of at least one symptom, particularly fatigue and dyspnoea.

6.6.1.3 Norway

In Norway, Selvakumar et al. (2023) tested SARS-CoV-2-positive individuals and a control group of SARS-CoV-2 negative individuals, all aged 12 to 25 years, after six months, for symptoms of post-COVID-19 condition (PCC) (long COVID) using the WHO case definition. The prevalence of PCC was similar in infected and noninfected individuals. The persistent symptoms and disability that characterise PCC were associated with factors other than SARS-CoV-2 infection, including psychosocial factors. Symptom severity correlated with personality traits. Low physical activity and loneliness were also associated with the outcome. In other words, half of so-called long COVID sufferers have never had COVID-19. It sounds like lockdowns, rather than COVID-19, may have contributed to 'long COVID'.

6.6.1.4 United Kingdom

In the UK, 10.8% of Civil Servants claimed to be suffering from long COVID, compared to 3.3% of the general population (Fawkes, 2023). In other words, public servants claim to suffer long COVID at more than three times the rate of the public. The ONS reported that in England and Scotland from November 2023 to March 2024 an estimated 3.3% of people (two million) living in private households in England and Scotland were experiencing self-reported long COVID symptoms (Office for National Statistics, 2024). The most common symptom reported was weakness or tiredness (54.0%), followed by shortness of breath (43.7%), difficulty concentrating (39.4%) and muscle ache (36.7%). In Scotland NHS Highland reported that there was not a single reported diagnosis of 'long COVID' within NHS Highland hospitals in three years.

6.6.2 North America

Using data from the US and Canada, S. Wang et al. (2022) found that probable depression, probable anxiety, worry about COVID-19, perceived stress and loneliness were associated with post-COVID-19 conditions in individuals with SARS-CoV-2 infection.

6.6.2.1 United States

If a vaccinated person becomes infected, their risk of 'long COVID' is the same as that of an unvaccinated person (Taquet et al., 2022). In the US, COVID-19 vaccination does little to protect against severe long COVID, including death (Al-Aly et al., 2022; TrialSite, 2022). Ahmad, Anderson, Cisewski, and Sutton (2022) analysed deaths with long COVID in the United States from 1 January 2020 to 30 June 2022. The percentage of COVID-19 deaths with long COVID peaked in June 2021 (1.2%) and in April 2022 (3.8%). The long COVID death rate from 1 July 2021 through to 30 June 2022 was highest among adults aged 85 and over, non-Hispanic American Indian or Alaska Native people, and males. HART (2024b) noted that the timing of the deaths follows COVID-19 waves with a lag of about 1 to 2 months. They also point out that the paper actually provides evidence of some people dying within weeks of infection rather than large numbers dying months or years later. Beusekom (2023) reported that SARS-CoV-2 infection can lead to abnormal mitochondrial function in the heart, kidneys and liver, which leads to long-term damage and may help explain long COVID. Iwashyna et al. (2023) conducted a retrospective cohort study of 208,061 veterans infected with COVID-19 and 1,037,423 matched uninfected comparators. The infected had a higher risk of all-cause death for six months after infection, but a lower risk of all-cause death thereafter. Wong et al. (2023) found that long COVID was associated with reduced circulating serotonin levels. Also, viral RNA was detected in the stool of a subset of individuals with long COVID, highlighting a possible connection between the presence of viral components in the gastrointestinal tract and the persistence of long-term symptoms in certain individuals.

6.6.3 Does Long COVID Exist?

Does long COVID exist? In November 2020, Sebastian Rushworth reviewed the evidence for 'long COVID', and concluded that it is not a distinct medical condition (Rushworth, 2020c). He points out that we don't talk about 'long-influenza'. Sneller et al. (2022) found that a high burden of persistent symptoms was observed in persons after COVID-19. However, extensive diagnostic evaluation revealed no specific cause of reported symptoms in most cases. On his blog, eugyppius (2022d) argued that long COVID is a social construct. Sequelae from viral infection are very real; but long COVID syndrome, not so much. In the US, Wisk et al. (2022) enrolled adult participants with acute symptoms suggestive of SARS-CoV-2 infection from December 2020 to September 2021 (pre-Omicron). The participants were tested for COVID-19, some were positive, some negative. After three months the patients reported outcomes of physical, mental and social well-being. 39.6% of COVID-19-positive and 53.5% of COVID-19-negative patients reported residual symptoms. In other words, those who had COVID-19, after three months, were better off than those who had not, which lends credence to the argument that long COVID is a social construct (eugyppius, 2022e). Wise (2023) explained that long COVID is uncommon, not severe, improves over time, is decreasing in prevalence, does not exist biochemically and is similar to the symptoms experienced after other respiratory infections. In April 2023 R. Watson (2023f) argued that it is 'time to consign long Covid to the medical waste bin, relegate it to the realm of myth and turn our attention to solving some real medical problems such as cancer and cardiac disease'. Høeg, Ladhani, and Prasad (2023) found that when limiting studies to those with acceptable post-acute sequelae of COVID-19 (PASC) definitions and appropriate controls, there was little to no difference in the prevalence of reported persistent symptoms in children by 4 weeks or in adults younger than 50 years by 12 weeks post-infection compared with controls. The Chief Health Officer of Queensland, Australia, said that there is no such thing as 'long COVID'. It is no different from the after-effects of viruses like the flu. Sufferers are simply experiencing the normal effects of recovering from a virus, which can include fatigue, brain fog and shortness of breath—known as post-viral syndrome. R. Watson (2024d) argued that long COVID is a construct rather than a diagnosis. A new definition of long COVID has been proposed based on

consensus by the US National Academies of Sciences, Engineering, and Medicine (Volberding, Chu, & Spicer, 2024). According to their defintion, there is no requirement for any evidence that a person with long COVID was ever infected with COVID-19!

6.6.4 Children

Long COVID is rare in children. In Canada, Dun-Dery et al. (2023) found that just 0.52% of children who tested positive for COVID-19 still had symptoms six months later (Dahnke, 2024). In England long COVID increased among children (Bawden, 2022). In November/December 2021 1.0% of those aged 4–11 and 2.7% of those aged 11–18 suffered from long COVID. In March 2022 1.8% of those aged 4–11 and 4.8% of those aged 11–18 suffered from long COVID. Although the increase may be related to testing. Note that in England for the 5–11 age group, only 9% had been vaccinated. Mowrey (2024c) interpreted a US study (Razzaghi et al., 2024), and concluded that with children the vaccine is worse at preventing overall long COVID than preventing overall infection itself, which means it is increasing per-infection long COVID.

6.6.5 Conclusion

We are not sure whether long COVID exists, but we have evidence that long COVID is caused by COVID-19, lockdowns (Selvakumar et al., 2023), masks (in a retracted paper, Kisielinski, Hirsch, et al. (2023)) and vaccinations (Section 4.3.17)!

6.7 Voices of Reason

Who were the good guys? Although the vast majority of governments, academics and the media overreacted to COVID-19 and falsely believed that lockdowns, masks and vaccines were effective at mitigating COVID-19, there were a few voices of reason who followed the science.

6.7.1 Individuals

In March 2020, Toby Young was the first to conduct a decent cost–benefit analysis of the UK's lockdown (T. Young, 2020a). Since March 2020 Irish biochemical engineer Ivor Cummins understood the nature of the pandemic and the futility of lockdowns and regularly publicised what was going on on YouTube (Cummins, 2020), and even co-produced a film (O'Neill & Cummins, 2021). Former New York Times reporter Alex Berenson wrote a series of five booklets about COVID-19, lockdowns, masks and vaccinations (Berenson, 2020a, 2020b, 2020c, 2020d, 2021c).[15] Since August 2020 Sebastian Rushworth, a doctor in the emergency room of one of the largest hospitals in Stockholm, has published an informative blog (Rushworth, 2020a). His book *Covid: Why Most of What You Know Is Wrong* (Rushworth, 2021a) has aged very well. He rightly pointed out that COVID-19 was nowhere near as bad as it was portrayed in the mainstream media, COVID-19 tests are problematic, lockdowns are ineffective and harmful and masks are pretty ineffective, whilst he was sceptical of vaccines due to the uncertainty (but favoured the Moderna vaccine). Martin Kulldorff, Sunetra Gupta and Jay Bhattacharya, three professors from Harvard, Oxford and Stanford respectively, published *The Great Barrington Declaration* (Kulldorff, Gupta, & Bhattacharya, 2020), which wisely recommended focused protection. Clare Craig wrote the book *Expired: Covid the Untold Story* (C. Craig, 2023b). She covers airborne virus transmission, and examines twelve beliefs on spread, lockdowns, asymptomatic infections and masks. She also champions the importance of Western ethical principles, damaged by pandemic actions, and calls for their restoration.[16] Peter Doshi, a senior editor at *The BMJ*, has published balanced articles on pre-existing immunity (Doshi, 2020a), what the vaccine trials tell us (Doshi, 2020b), serious adverse events of special interest following mRNA COVID-19

[15] `https://alexberenson.substack.com/`
[16] `https://drclarecraig.substack.com/`

vaccinations and sources bias in vaccine trials (Doshi & Fung, 2023; Fung et al., 2023). He also called for complete data transparency from the pharmaceutical companies (Doshi et al., 2022). John Dee, a former NHS head of department for clinical audit with specialism in assessment of clinical outcomes for cardiac surgery, cardiology and cardiac anaesthesia at a busy teaching hospital, meticulously analysed admissions records for the emergency departments of an undisclosed NHS Trust and published the results on his well-written blog.[17] Other notable contributors to the literature reviews in this article include Paul Alexander,[18] Stephen Andrews,[19] Rebekah Barnett,[20] William Briggs,[21] Mark Changizi,[22] Coquin de Chien,[23] el gato malo,[24] Jonathan Engler,[25] Ethical Skeptic,[26] eugyppius,[27] Norman Fenton, Emeritus Professor of Risk and Information Management, School of Electronic Engineering and Computer Science, Queen Mary, University of London,[28] Guy Gin,[29] Jestre,[30] Will Jones,[31] Steve Kirsch,[32] Pierre Kory, an American critical care physician,[33] Raphael Lataster,[34] James Lyons-Weiler,[35] Peter McCullough,[36] Ian Miller,[37] Brian Mowrey,[38] Martin Neil, Professor in Computer Science and Statistics, School of Electronic Engineering and Computer Science, Queen Mary, University of London,[39] Vinay Prasad, Professor of Epidemiology and Biostatistics and Medicine, and a practicing Hematologist Oncologist at San Francisco General Hospital,[40] Radagast,[41] Bill Rice Jr.,[42] Eyal Shahar,[43] Gary Sidley,[44] Joel Smalley,[45] Ah Kahn Syed,[46] Paul Thacker[47] and The Naked Emperor.[48]

6.7.2 Organisations

Since March 2020, Swiss Policy Research have published articles on COVID-19, lockdowns, face masks and vaccinations (Swiss Policy Research, 2020b). In April 2020 the British social commentator Toby Young started the excellent blog *Lockdown Sceptics* (now renamed *The Daily Sceptic*) (T. Young, 2020b). In the same month PANDA (Pandemics Data & Analytics) was

[17] https://jdee.substack.com/
[18] https://palexander.substack.com/
[19] https://sandrews.substack.com/
[20] https://news.rebekahbarnett.com.au/
[21] https://wmbriggs.substack.com/
[22] https://www.loofwired.com/
[23] https://coquindechien.substack.com/
[24] https://boriquagato.substack.com/
[25] https://sanityunleashed.substack.com/
[26] https://theethicalskeptic.substack.com/
[27] https://www.eugyppius.com/
[28] https://www.normanfenton.com/
[29] https://guygin.substack.com/
[30] https://jestre.substack.com
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[32] https://kirschsubstack.com/
[33] https://pierrekorymedicalmusings.com/
[34] https://okaythennews.substack.com/
[35] https://popularrationalism.substack.com/
[36] https://petermcculloughmd.substack.com/
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[38] https://unglossed.substack.com/
[39] https://www.eecs.qmul.ac.uk/~martin/
[40] https://vinayakkprasad.com/
[41] https://www.rintrah.nl/
[42] https://billricejr.substack.com/
[43] https://shahar-26393.medium.com/
[44] https://dailysceptic.org/author/dr-gary-sidley/
[45] https://metatron.substack.com/
[46] https://www.arkmedic.info/
[47] https://disinformationchronicle.substack.com/
[48] https://nakedemperor.substack.com/

established by a group of multi-disciplinary professionals who perceived the global reaction to COVID-19, and lockdowns in particular, as overwrought and damaging to the fabric of society (PANDA, 2020). In January 2021 a group of UK doctors, scientists, economists, psychologists and other academic experts came together over shared concerns about policy and guidance recommendations relating to the COVID-19 pandemic and formed the HART group (HART, 2021b). Governments should have heeded their advice, but instead were naturally motivated to appease their voters. In May 2021 the Brownstone Institute, a non-profit think tank, was founded by Jeffrey Tucker to oppose COVID-19 restrictions (Brownstone Institute, 2024). React19 is a science-based non-profit offering financial, physical, and emotional support for those suffering from long-term COVID-19 vaccine adverse events globally is a science-based non-profit offering financial, physical, and emotional support for those suffering from long-term COVID-19 vaccine adverse events globally (React19, 2023).

6.7.3 Science and Academia

Saltelli, Sturmberg, Sarewitz, and Ioannidis (2023) argued that the successes of medicine during the COVID-19 pandemic pertained to speed, for example, real-time information sharing, record-time development of vaccines, and unprecedented rapidity in getting results from some large randomised trials of interventions, solidly documenting or refuting claims of effectiveness. Academic journals deserve credit for making articles about COVID-19 free (Wellcome, 2020) (but see Section 6.8.4.3). Whilst *ResearchGate* (N. Fenton, Neil, & Mr Law, Health and Technology, 2024) deserve credit for not censoring (although they removed a perfectly reasonable paper that concluded that masks don't work (D. G. Rancourt, 2020)).

6.7.4 Media

Among British newspapers, *The Daily Mail* and *The Telegraph* did well, taking a more balanced approach. Whilst Substack, BitChute and Rumble deserve credit for not censoring.

6.8 Bad Actors

Who were the bad guys? Firstly, in the UK, Neil Ferguson and Dominic Cummings convinced Patrick Vallance and Chris Whitty to put the country into lockdown (Rendell, 2023b). Paula Jardine detailed in *The Conservative Woman* how Dominic Cummings pushed the UK into lockdown (Jardine, 2024a, 2024b, 2024c). 'Cummings's hubris and misguided certainty went unchecked. Susceptible to and manipulated by big business/life science/gain of function/vaccine development interests, Cummings proved to be a useful and dangerous fool. He cranked up and exploited an emergency to catalyse his data-led government dream, the consequences of which could not have proved more disastrous for the country.' M. Senger (2022) lists 101 leading voices who pushed for lockdowns. Whilst face masks were introduced in the UK partly due to The Royal Society and the DELVE group (Sidley, 2023a).

6.8.1 World Health Organization (WHO)

The WHO were good before they were bad. Even the World Health Organization (WHO), the agency of the United Nations responsible for international public health, are responsive to politics.

6.8.1.1 Lockdowns

Recall that in October 2019, in relation to a potential influenza pandemic, the WHO stated that they did *not* recommend contact tracing, quarantine of exposed individuals, entry and exit screening or border closure in any circumstances (WHO, 2019). Then in October 2020, the

WHO stated that they did *not* advocate lockdowns as the primary means of control of this virus (Doyle, 2020). The WHO's position on lockdowns on 31 December 2020 was as follows (WHO, 2020b):

> Large scale physical distancing measures and movement restrictions, often referred to as 'lockdowns', can slow COVID-19 transmission by limiting contact between people. However, these measures can have a profound negative impact on individuals, communities, and societies by bringing social and economic life to a near stop. Such measures disproportionately affect disadvantaged groups, including people in poverty, migrants, internally displaced people and refugees, who most often live in overcrowded and under resourced settings, and depend on daily labour for subsistence. WHO recognizes that at certain points, some countries have had no choice but to issue stay-at-home orders and other measures, to buy time. Governments must make the most of the extra time granted by 'lockdown' measures by doing all they can to build their capacities to detect, isolate, test and care for all cases; trace and quarantine all contacts; engage, empower and enable populations to drive the societal response and more. WHO is hopeful that countries will use targeted interventions where and when needed, based on the local situation.

In other words, the WHO did not initially want to recommend lockdowns, and were well aware of the harms that they caused. However, because governments were imposing them anyway, they felt the need to change tack, and recognise and accommodate lockdowns as part of their mitigation advice.

6.8.1.2 Face Masks

In October 2019, the WHO stated that there was *no evidence* that face masks are effective in reducing transmission of laboratory-confirmed influenza (WHO, 2019). As previously referenced, in May 2020 the WHO supported a systematic review on face masks in preparation for the development of their guidelines on the use of nonpharmaceutical interventions for pandemic influenza in non-medical settings (Xiao et al., 2020). A pooled analysis of ten randomised controlled trials on face masks *did not find evidence* that surgical-type masks are effective in reducing laboratory-confirmed influenza transmission, either when worn by infected persons (source control) or by persons in the general community to reduce their susceptibility. The WHO then made a U-turn. In December 2021, WHO (2021a) wrote, 'Make wearing a mask a normal part of being around other people'. This is sad. Then on 7 March 2022, the WHO stated that in areas where SARS-CoV-2 was spreading, children ages 6–11 years are recommended to wear a well-fitted mask in indoor settings where ventilation is poor/unknown and/or when physical distancing of at least one metre cannot be maintained. (WHO, 2022). This is tragic.

6.8.1.3 Vaccination Programmes

On 31 December 2020 the WHO wrote, 'To safely achieve herd immunity against COVID-19, a substantial proportion of a population would need to be vaccinated, lowering the overall amount of virus able to spread in the whole population' (WHO, 2020b). This was also false, vaccination programmes compromised herd immunity.

6.8.1.4 Immunity

On 3 March 2020, WHO (2020e) wrote 'While many people globally have built up immunity to seasonal flu strains, COVID-19 is a new virus to which no one has immunity.'. This turned out to be false, we have known since 2020 that 20% to 50% of people have a degree of pre-existing immunity to COVID-19 (Doshi, 2020a).

6.8.1.5 Airborne Transmission

In March 2020, the WHO announced that COVID-19 was not airborne (WHO, 2020c). This was false. The WHO were alerted early in the pandemic about the potential significance of the airborne transmission of SARS-CoV-2 and the urgent need to control it, but they ignored the warnings (Morawska et al., 2023).

6.8.1.6 Seasonal

In July 2020, the WHO announced that COVID-19 'is likely not impacted by the changing seasons like other respiratory diseases'. This was false.

6.8.1.7 Conclusion

Ikejezie et al. (2024) reviewed the WHO's Weekly Epidemiological Updates (WEU) during the COVID-19 era. However, Verduyn (2024b) took issue with their summary, and described the WHO's Weekly Covid Reports as 'non-science'. Either COVID-19 is radically different from influenza, decades of science have suddenly changed, or, most likely, politics has come into play.

6.8.2 European Union

The COVID-19 pandemic exposed the failings of the European Union. At the start of the pandemic, the EU failed to help Italy in their moment of need (Braw, 2020), because nation-states are more coherent in-groups than the EU. Then, because the EU increases regulation and stifles intra-EU competition, the populations of EU member states had to wait longer for vaccinations (The Economist, 2021a). This didn't turn out to be crucial, but that's another story…

6.8.3 Academia

Firstly, the pandemic may have been started by scientists (Knapton, 2024a; Washburne, 2024a). Either way, many academics embraced the pandemic narrative (S. Murphy, 2023) by churning out poor science. Thacker (2024h) argued that the COVID-19 pandemic broke academic researchers who put their personal politics ahead of science and the public good. Saltelli et al. (2023) argued that the failures reflected efforts by influential scientists and their political allies to demonise dissenting scientific views and evidence. The consequences for education, healthcare, small businesses, social life and democratic politics itself were often disastrous. When surveyed in 2024, 44% of scientists believed pandemic modelling was 'excellent' or 'good' (Knapton & Pinkstone, 2024). Whilst 37% thought it was 'average', 'poor' or 'very poor'. In other words, a disturbing proportion of scientists were delusional and/or in denial. In January 2019, 73% of US adults said that science has had a positive effect on society (Kennedy & Tyson, 2023). By October 2023, this figure had fallen to 57%. Foster and Frijters (2024) noted that the majority response of Australian academic economists in public sight was to fall in line with government policies and produce papers, blogs, and op-eds that rationalised policies already decided upon using assumptions known to be wrong at the time and making basic mistakes regarding standard cost–benefit analysis.

Dr Martin Kulldorff, an author of The Great Barrington Declaration, was fired from his position as Professor of Medicine at Harvard University for not getting vaccinated (Kulldorff, 2024a). He had good reason not to be vaccinated. He already had superior infection-acquired immunity, and it was risky for him to be vaccinated without proper efficacy and safety studies on patients with his type of immune deficiency. Whilst Tracy Beth Høeg lost her position at UC Davis for publishing vaccine myocarditis research (Bhattacharya & Høeg, 2024).

Some researchers from MIT, who stated that there is 'a preponderance of evidence that masks are crucial to reducing viral transmission' and 'anti-mask groups mobilize visualizations politically to achieve powerful and often horrifying ends', lurked within lockdown/mask sceptic communities by analysing Twitter data (almost 500,000 tweets) and conducting a six-month-long observational study of five sceptic groups on Facebook (C. Lee, Yang, Inchoco, Jones, & Satyanarayan, 2021). They discovered that sceptics were predisposed to digging through the scientific literature, applying scientific rigour, trusting scientific analysis only insofar as they could replicate it themselves by accessing and manipulating the data first-hand, engaging deeply with public datasets, often using the same datasets as health officials, were critical about data sources, sought to make the process of understanding data as transparent as possible, practised a form of data literacy 'in spades', used data-driven narratives and the language of data-driven decision-making, explicitly stated analytical limitations of specific models, and were prolific and skilled purveyors of polished data visualizations that would not be out of place in scientific papers. The authors stated that their analysis does not in itself help them understand how anti-maskers invoke data and scientific reasoning to support policies like reopening schools and businesses. Could it not be because, via their superior analysis, they're on the right side of the argument?

O. J. Watson et al. (2022) used a mathematical model of COVID-19 transmission and vaccination, and estimated that globally vaccinations prevented 14.4 million (based on official reported COVID-19 deaths) or 19.8 million (based on excess deaths) deaths from COVID-19. One of the authors has received personal consultancy fees from GlaxoSmithKline and is a non-remunerated member of scientific advisory boards for Moderna. However, Verduyn (2023b) argued that whether one looks at the average CFR, the age-specific IFR, the average IFR, the NNV or Pfizer's own data, it is quite impossible that the COVID-19 vaccines prevented 14.4 million deaths in the first year. Kirsch (2024d) argued that, in fact, zero lives were saved by the vaccines, and 10M or more lives were lost worldwide.

6.8.4 Publications

6.8.4.1 Magazines

The Economist *The Economist* was good for data, but bad for analysis. Of all publications, they should have been aware that the lockdowns would have a devastating effect on the economy. An article from February 2021 with the headline 'Evidence from Britain shows covid-19 vaccines are very effective' states that 'The evidence from Britain shows that once jabs are in arms, the simple beauty of science alone will write the headlines' (The Economist, 2021b). That didn't age well.

Mother Jones In May 2020 the American progressive magazine *Mother Jones* ran an article entitled 'Anti-vaxxers have a dangerous theory called "natural immunity." Now it's going mainstream' (K. Butler, 2020). The article claims that our immune systems have no natural defences against COVID-19. This is false, many people had natural immunity. The article also claims that social distancing could not weaken the immune system. This is also false, once it opened up, Australia was hit by multiple viruses.

6.8.4.2 Newspapers

Financial Times The *Financial Times* was good for data, but poor for analysis. The FT should have been well aware that the lockdowns would have a devastating effect on the economy. Stephen Bush wrote abject nonsense (Bush, 2022): 'Compared with those historic lockdowns, the global response to the pandemic was, broadly speaking, successful. Lockdowns, stay-at-home orders and voluntary action helped stem the spread of the disease and avoided overwhelming

healthcare capacity, as lockdowns and voluntary action always have done. Effective vaccines, deployed at scale, allowed a comparatively swift end to lockdowns across the world.'

Independent In July 2024 the *Independent* published an article citing Ruhm (2024) with the headline 'Stricter Covid mask rules could've saved hundreds of thousands of lives, new study finds' (Marcus, 2024). Never mind that there is no quality evidence (e.g. randomised controlled trials) that wearing masks reduces the spread of COVID-19 (Jefferson et al., 2023).

The New York Times Jennifer Sey pointed out that during the pandemic, *The New York Times* presented one viewpoint—that kids are at terrible risk and schools need to stay closed—as the undisputed 'science' (Sey, 2023). And only in November 2023, more than three years too late, did the newspaper finally admit the harm done to children. I. Miller (2023h) reported how *The New York Times* published misinformation on masks to placate its readers. In an insightful article, Thacker (2024e) reported how *The New York Times* undermined the evidence that masks were ineffective, and smeared scientists such as Tom Jefferson who had spent decades researching the topic. Haslam, Harshman, and Prasad (2024) examined the errors and corrections in *The New York Times* and assessed if there was an imbalance towards overstating or understating the severity of the pandemic. 54.7% of errors overstated the situation, whilst only 23.7% understated it (the rest were equivocal). In other words, when *The New York Times* got things wrong, it tended to do so in a way that falsely stoked fear and encouraged harmful social restrictions.

The Times Tom Whipple, science editor at *The Times*, even with hindsight in November 2023, did not believe that it was clear that the UK should have taken Sweden's approach, given the data for UK COVID-19 deaths in January 2021 (Whipple, 2023).

6.8.4.3 Journals

Academic journals were no better.

Annals of Internal Medicine R. Watson (2023e) reported that a June 2023 an article in *Annals of Internal Medicine* (Palmore & Henderson, 2023), without reference to the recent Cochrane review, recommended the continued use of masks in healthcare settings.

Medscape R. Watson (2023e) also reported that an article *Medscape* (Croft & Barclay, 2023), again without reference to the recent Cochrane review, recommended the continued use of masks in healthcare settings. Later, R. Watson (2024a) reported that *Medscape* have been misleading regarding COVID-19 vaccinations and pregnant women, exaggerating vaccine effectiveness and downplaying the associated risks.

Nature We have already covered the controversy surrounding the influential article entitled 'The proximal origin of SARS-CoV-2' published in *Nature Medicine* that claimed that the virus emerged naturally (K. G. Andersen et al., 2020) in Section 1.1.3. Some of the authors were not entirely honest.

Science Magazine *Science Magazine* published Western studies that downplayed the possibility of a lab accident, then subsequently worked to protect those studies (Thacker, 2024d). Thacker (2024g) reported that *Science Magazine* published a malicious hit piece (Kaiser, 2024) to defame and attack researchers for pointing out research fraud and dishonest reporting at *Science Magazine*.

Scientific American Thacker (2024h) argued that *Scientific American* wrote a couple of articles claiming that masks work (M. Oliver, Ungrin, & Vipond, 2023; Oreskes, 2023) that 'are rife with fraud and citation sorcery'.

The BMJ An article commissioned, peer-reviewed and edited by *The BMJ* questioned why masking in schools was 'undervalued and de-emphasised', and why vaccination was 'offered late to children and considered low priority' (Gurdasani et al., 2022). The answers are that the current body of scientific evidence does not support masking children (Sandlund et al., 2023) or vaccinating children (Hoffmann et al., 2024). Even in November 2022, another article commissioned, peer-reviewed and edited by *The BMJ* stated that 'Recent false or misleading covid-19 narratives promoted by some groups to discredit legitimate public health measures, in particular non-pharmacological interventions, may have likewise contributed to preventable illness and death and those responsible must be held legally accountable' (Y. Wang et al., 2022). In other words, Britain's leading medical journal states the polar opposite of the truth regarding the most important health economics issue of our times. Peter Gøtzsche wrote an article on why he and some other medical researchers no longer want to publish in prestigious medical journals (Gøtzsche, 2023b). His reasons include widespread censorship (peer reviewers often abuse their anonymous position to protect their guild and financial interests), and also because most major journals and virtually all specialist journals are very beholden to the drug industry. He details personal experiences. One when *The BMJ*'s editorial input was biased. Carl Heneghan and Tom Jefferson even wrote an 'obituary' for *The BMJ*, describing it as a once fearsome watchdog that was brought to heel by pharma and government (Heneghan & Jefferson, 2023g). Kepp, Cristea, Muka, and Ioannidis (2024) conducted a meta-research evaluation of advocacy bias in *The BMJ*. Their analysis suggested that *The BMJ* massively published advocate authors championing zero-COVID policies and, later, other indieSAGE-led aggressive approaches to COVID-19 during the pandemic. Leading members of SAGE, highly cited UK scientists and the most prolific researchers on COVID-19 across the entire scientific literature had very limited BMJ presence compared with the preferred advocates. Whilst advocates of restricted, focused measures were almost absent from *The BMJ*. Prasad (2024d) reported that the British Medical Journal failed to foster debates about COVID-19 policies and instead sided with the most irrational, zero-COVID zealots, massively publishing views supporting unproven restrictions. They took sides, betraying their duty as a medical journal, and ended up on the wrong side of history. Vinay Prasad sensibly argued that the BMJ failed because it is an extreme progressive organisation. Most progressives lack the ability to independently think about issues, they instead reflexively oppose their enemy, so took the opposite view of Donald Trump. 'The BMJ's extreme political bias meant that on COVID19 it was little more than a rag during the pandemic', he wrote, 'completely missing the big picture and promoting policies that did massive harm. Sadly, they have not course corrected and still publish COVID19 drivel'.

The Lancet In October 2020 *The Lancet* published a correspondence that has not aged well (Alwan et al., 2020). For example, 'there is no evidence for lasting protective immunity to SARS-CoV-2 following natural infection'. 'The evidence is very clear: controlling community spread of COVID-19 is the best way to protect our societies and economies until safe and effective vaccines and therapeutics arrive within the coming months. We cannot afford distractions that undermine an effective response; it is essential that we act urgently based on the evidence.' They were not only wrong, but appear to be calling to silence any dissenting voices. Marinos (2022) explained how, from the lab leak hypothesis to early treatment, from human-to-human transmission to lockdowns, *The Lancet* was there to make some absolutely understandable errors, but always in the same direction. *The Lancet* published an unrealistically positive article on the effectiveness of vaccines, claiming that they prevented 14.4–19.8 million deaths globally (O. J. Watson et al., 2022). Verduyn (2023b) called for the paper to be retracted. Whilst Rendell (2023j) described

the claim that vaccinations saved that many lives as 'nonsense'. The 'narrative' asks you to believe that global deaths would have been 40% higher without the vaccines. Rendell (2023i) showed that this is ludicrous, and points out that the credit should go to whoever developed Omicron, along with Mother Nature, rather than the developers of useless vaccines.

For more on the problems with publications, see the section on publication bias (Section 6.1.13).

6.8.5 Independent SAGE

The Scientific Advisory Group for Emergencies (SAGE) is a British Government body that advises central government in emergencies. During the COVID-19 pandemic, it became more prominent. Independent SAGE (the Independent Scientific Advisory Group for Emergencies) is a group of scientists set up as a counter-voice to the UK government's official advisers on how best to mitigate COVID-19. They have been accused of advocating policies without considering the uncertainties in the evidence and the potential for harm, and in some circles, have become a byword for poorly evidenced alarmism (L. Clarke, 2021). David Spiegelhalter, Winton professor of the public understanding of risk at the University of Cambridge, with reference to Independent SAGE's authoritarian prescriptions, understands the importance of civil liberties, 'Scientific expertise, from whatever discipline, may allow an assessment of some of the potential harms and benefits of alternative actions, but unless the solution is barn-door obvious it cannot come to a conclusion as to what people should do' (L. Clarke, 2021). Tragically, Independent SAGE ended up being wrong on all of the major issues: they supported a zero-COVID strategy (Independent SAGE, 2020b), recommended making the wearing of face coverings compulsory in enclosed public indoor spaces (Independent SAGE, 2020c), called for an immediate national lockdown in December 2020 (Independent SAGE, 2020a), and advocated vaccinating primary school aged children (Independent SAGE, 2022). Incredibly, even in April 2023, Stephen Griffin, chair of Independent SAGE, encouraged adults to wear a well-fitted N95 mask or high-quality mask when in 'poorly ventilated indoor spaces or public transport' (Matthews, 2023). Kepp (2023) wrote a Twitter thread on Independent SAGE, reminding us that they had a name easily confused with SAGE, were closely affiliated with the World Health Network (WHN) which could be confused with the World Health Organization (WHO), advocated a zero-COVID strategy, wanted schools to remain closed until we reached zero COVID and used methods and data very distinctly from mainstream science. Alice Roberts, the English academic, TV presenter, author and recent president of Humanists UK, who chaired Independent SAGE's weekly briefings apparently campaigned for zero-COVID policy, lockdowns, school closures and the masking of children to appease the National Education Union (K. Cox, 2023). We needed an Independent SAGE, one that opposed the restrictions recommended by SAGE, not one that was even worse.

6.8.6 Experts

Another factor that can lead to sub-optimal outcomes could be described as the *tyranny of experts*. One should recognise that most organisations are not paid to maximise the aggregate utility of the population over time, but naturally focus on their own goals. If your job is to reduce COVID-19 deaths, you are probably not focusing on cardiovascular disease or the value people place on their liberty. The division of labour creates a division of knowledge (Koppl, 2015). Rod Liddle pointed out in *The Spectator* that SAGE may have been providing the government with advice with which all or most epidemiologists might concur ('the science'), but without the corrective advice that might have been provided by an economist or an oncologist (Liddle, 2023). The lesson to be learned, he rightly says, is that it is no use following 'the science' if the science comes from only one direction and there is no open debate about its efficacy or otherwise. Feynman would have been appalled. 'Science,' he wisely noted, 'is the belief in the ignorance of experts' (Swanson, 2023). Toby Rogers asked how the world's smartest people

failed so miserably (T. Rogers, 2023b):

> Suddenly, in 2020, some of the smartest people in the world — James Surowiecki, Naomi Klein, Nassim Taleb, Noam Chomsky, Slavoj Žižek, and so many more that you can name — stopped being smart. This happened all across the ideological spectrum. The test was simple — apply all of your smart social, economic, and political theories to the Covid response and vaccines. That task is not difficult — spend a few hours reading widely and apply a lifetime of sophisticated critical theory to our present conjuncture. They all failed completely and catastrophically. It's even worse than that actually — not only did they fail to use any of the skills that they developed over a lifetime, but they collapsed into fascism. Regressed into the most raw, primitive, pathological, reptilian parts of their brain — in response to a psyop that can be figured out in about two hours.

Swiss Policy Research (2023e) offered some answers as to why the smartest people in the world failed so miserably during the pandemic: fear (rational and irrational), they are progressives or even socialists, many smart people embrace science (which was politicised) and technology (which was nowhere near being able to suppress a flu-like pandemic), the pandemic propaganda was strong and they were not that smart in the context of the pandemic.

Sir Jeremy Farrar, the director of the Wellcome Trust from 2013 to 2023, resigned from SAGE after calling for stronger action to prevent the spread of COVID-19 (Donnelly, 2021). Providing 'further evidence that Government scientific advisers live in a fantasy world constructed from models that bear a tenuous relationship to real-world evidence' (W. Jones, 2021c). He also urged the public to wear masks in shops and on public transport. Since 2023 he has served as Chief Scientist at the World Health Organization. It is no wonder that people have lost trust in 'experts'. Professor David Halpern (the leader of the Behavioural Insight Team (BIT), also known as the 'Nudge Unit', energetically lobbied senior scientists and politicians to impose community masking upon British citizens in the early summer of 2020 (Sidley, 2024h). Professor Susan Michie, a senior scientist on the SAGE committee, said that face masks and social distancing measures should continue 'forever, to some extent' (L. Fisher, 2021). Professor Peter Openshaw, a virus expert at Imperial College London, said 'To help stop the spread, those who haven't had the Covid booster should consider wearing face masks in public places, like on trains, when shopping and at large events' (Bunn, 2024). Devi Sridhar, professor and chair of global public health at the University of Edinburgh and one of the top advisers to the Scottish Government on COVID-19 during the early part of the pandemic, made her fame in 2020 by being a fanatical zero-COVID advocate. In July 2020, Professor Sridhar wrote that the only real question about face masks is: what took England so long? (Sridhar, 2020). Also, 'Wearing face coverings protects us, protects others - and could help prevent a second wave'. Her mask gobbledegook was on full display at the Covid-19 Inquiry (Sidley, 2024b).

6.8.7 Midwits

A *midwit* is a person of middling intellect. They tend to act as if they are smarter than they are, are oversocialised and hold socially acceptable views as if they were intellectually profound. Such people tended to be the most pro-lockdowns, masks and vaccines. They tend to be from the political left. Interestingly, the association between vaccine hesitancy and education level follows a U-shaped curve (King, Rubinstein, Reinhart, & Mejia, 2021). Those with just a high school education were the most hesitant, those with a master's degree the least hesitant and those with a doctorate intermediate.

6.8.8 Politicians

If Sweden did best, which countries' politicians made the worst decisions during the pandemic? Dalgleish (2024c) was of the opinion that 'Without doubt the lockdowns imposed in New Zealand

under Jacinda Ardern and in Victoria under Dan Andrews eclipsed even those the Scots suffered under Nicola Sturgeon'.

6.8.8.1 Australia

Australia is in contention for the worst-performing country (Waterson, 2022). Despite being a stable liberal democracy with a wealthy market economy, lying mostly outside the temperate zone, with likely high pre-existing immunity to COVID-19 and a bad flu season in 2019 (so less 'dry tinder'), Australia closed its borders, originally pursued a naive zero-COVID strategy, used police force unbecoming of a liberal democracy, and was then late to vaccinate their population. The country, and Melbourne in particular, implemented draconian lockdowns that severely, but needlessly, damaged democracy, civil liberties and the economy (Bolt, 2020). A bad flu-like disease that almost exclusively affects the most elderly and vulnerable does not warrant policies normally associated with a fascist regime. Note also that when governments obtain greater powers, they are often reluctant to revoke them.

Australia's zero-COVID policy, which ultimately failed anyway, kept their population immunologically naive, as everyone else built up immunity (Radagast, 2023b). Immunity in Australia was lowered due to a lack of exposure due to strict lockdowns, and the country came under attack from multiple viruses (Talintyre, 2022). They faced a multi-demic of respiratory viruses: COVID-19, influenza, respiratory syncytial virus (RSV), parainfluenza, adenovirus and human metapneumovirus (HMPV). They also ended up with an unusual hybrid Delta-Omicron version of the virus, XBC, which only seems to thrive in Australia (Radagast, 2023b).

At the Covid Royal Commission in Australia, Professor Ian Brighthope argued that all Australian governments failed completely (Brighthope, 2024a). 'The lockdowns, masking, social distancing, hygiene, testing, tracking and tracing were introduced based on flawed science. This approach is essentially ineffective, dangerous to the health of the population, extremely costly and is a reflection of the failure to fully research, train in, understand, plan and manage infectious diseases.' 'Seven gone, two to go', wrote Terry McCrann on 26 September 2023 (McCrann, 2023). Seven out of the nine state, territory and federal premiers who 'led' Australia through the COVID years had lost their position, implying that the population were not happy with their performance.

Melbourne, capital of the state of Victoria, went from the world's most liveable city (as ranked by the EIU from 2011 to 2017 (Chalkley-Rhoden, 2017)) to the world's most locked down hellhole (Barnett, 2023d). The city had the longest lockdowns in the world—six lockdowns with a cumulative total of just over 260 days. Melbourne had some of the most restrictive and arbitrary COVID rules, and witnessed police brutality previously unheard of in Australia. Peaceful protestors were hunted by police in the streets, beaten, pepper sprayed, shot at with rubber bullets and arrested on charges of incitement. The fascist policing in Melbourne during the lockdown has to be seen to be believed, see Matt (2021). Professor Jay Bhattacharya stated that 'Victoria is an example of how not to handle a pandemic. Authoritarian government is bad public health policy.' (Barnett, 2024f). Barnett (2024j) argued that in Australia, which had some of the most coercive COVID-19 vaccine mandates in the world (e.g. restrictions based on vaccination status), human rights were violated. Of course, the governments were the bad actors, not the good people of Australia, who saw sense. In his book *Australia Breaks Apart*, Stapleton (2023) documents the protests led by the Australians who stood up against the humanitarian crimes committed by Australian authorities against their own citizens. In a review of the book, Collits (2023) proclaimed that 'we were the worst, and surely we, of all places, should have been above all this'.

The first COVID-19 deaths in Queensland were fully vaccinated, although this was not disclosed at the time (Barnett, 2023c). In February 2024, Barnett (2024b) reported that the Australian Technical Advisory Group on Immunisation (ATAGI) recommended COVID-19 boosters only to those aged 65 and over. Australians presumably noticed that the vaccinations failed to

do what they were supposed to do: prevent COVID-19. Just 8.5% of Australia's 20.1 million adults had had the COVID-19 booster in the previous six months. 90% had at least one vaccination previously, but had not kept up-to-date. Whilst the Therapeutic Goods Administration (TGA) admitted to 14 deaths arising from COVID-19 vaccination, over 1,000 deaths had been reported. In June 2024, Barnett (2024m) reported that two years after the COVID-19 mandates ended, the West Australian Police Force fired nearly 20 unvaccinated police officers and public servants for refusing to get vaccinated.

It was reported in August 2024 that Victoria was facing an increased risk of bankruptcy (Barnett, 2024f). The credit rating agency S&P Global Ratings blamed Victoria's prolonged lockdowns for the state's ballooning debt. Australia's Covid response cost $938.4 billion and resulted in 31× more life years lost than were saved (Barnett, 2022; Begg & Wild, 2022).

6.8.8.2 New Zealand

Jay Bhattacharya analysed New Zealand's zero-COVID strategy, and concluded that, ultimately, it was immoral, incoherent and a grand failure (Bhattacharya, 2022). New Zealand had strict lockdowns, border controls, high mask compliance and a high vaccination and booster uptake (I. Miller, 2023c). Yet the increase in all-cause mortality from 2021 to 2022 was over 10%, the largest single-year increase in New Zealand since the 1918 flu. From 2020 to 2022 there was an over 17% increase. Whilst Jacinda Ardern, prime minister of New Zealand during the pandemic, lost popularity and resigned in January 2023 (Harman, 2023). Incredibly, in October 2024, she received a damehood in honour of her draconian response to COVID-19 (W. Jones, 2024g). Her official citation listed her response to the COVID-19 pandemic, 'positioning New Zealand as having one of the lowest Covid-19 related death rates in the Western world' (Chiorando, 2024).

6.8.8.3 United Kingdom

Under a Conservative government the UK sleepwalked into a socialist and authoritarian state, which led to dependency and compromised health, wealth and freedom. In October 2020, Keir Starmer, Leader of the Opposition and Leader of the Labour Party, called on the government to 'follow the science' and impose a two to three-week 'circuit breaker' lockdown in England (H. Stewart, Halliday, & Pidd, 2020). He would have gained political virtue signalling points, plus plunged the country into worse health and financial outcomes. Many aspects of the response to COVID-19 in the UK were the responsibility of the devolved governments. The devolved administrations imposed harder lockdowns than England. This helped them politically (increasing nationalist sentiment in Scotland and making Labour look caring in Wales) yet harmed their populations further, with the knowledge that ultimately it was Westminster that had to pick up the tab.

Scotland Scotland's lockdown was stricter than England's, politically motivated, not based on science and copied from the UK government. The Scottish Government, led by Nicola Sturgeon, then Leader of the Scottish National Party (SNP), ensured that Scotland endured the longest and strictest lockdown of any of the four UK nations (McCall, 2021). Whilst Scotland went into lockdown at the same time as the rest of the UK, Nicola Sturgeon was generally far slower to ease restrictions and reopen society. As referenced earlier, Ms Sturgeon's draconian COVID-19 rules caused children to attempt to take their own lives and parents to consider 'suicide pacts' (Sanderson, 2023). During the pandemic, those living in Scotland had to live with harsher restrictions compared to those in England (Dunn, 2024). The Scottish government's approach, to be more cautious than England, was politically motivated rather than driven by concerns about public health. Scotland suffered a greater number of deaths from COVID-19 during the Delta and Omicron waves than England. Boris Johnson said Ms Sturgeon pursued a 'policy of gratuitous differentiation' during the pandemic, whereby she always appeared to be

'slightly more risk-averse' than his government (S. Johnson, 2024b). He also stated that her tougher COVID restrictions in Scotland were 'probably useless' but made her look like 'Princess Twinkletoes'. Sir Patrick Vallance wrote in his Covid diary that Nicola Sturgeon's decision to force Scotland's secondary school children to wear face masks was 'totally political' and 'not based on medical advice' (S. Johnson & Johnston, 2024). Scottish government papers showed that Nicola Sturgeon's Cabinet discussed using COVID-19 to boost the drive to break up the UK (Tapsfield, 2024a). Michael Gove, Chancellor of the Duchy of Lancaster during the pandemic, told the Covid-19 Inquiry that the SNP response to the COVID-19 pandemic was partly driven by its aim to 'destroy the UK' and for political advantage (N. Johnston, 2024b). In the UK's Covid-19 Inquiry, Baroness Hallett concluded that instead of developing its own bespoke risk assessment and resilience plans, the Scottish Government simply copied and pasted the equivalent documents that had been prepared for the UK government (T. Harris, 2024). No separate analysis was conducted before COVID-19 hit that adequately took into account specific factors that might particularly affect the population of Scotland. In other words, devolution failed.

Wales Wales' lockdown was both draconian and deliberately contrary. In October 2020 the Welsh Government, a Labour minority administration led by Mark Drakeford, Leader of Welsh Labour, ordered that shops were only allowed to sell essential items (J. Johnson & Hope, 2020). Clothing, toys, books, electrical goods and even baby products were deemed 'non-essential' by the Welsh Government. Aisles in supermarkets were cordoned off or covered up. Allison Pearson in *The Spectator* pointed out that Mark Drakeford had made Wales a laughing stock (Pearson, 2020). In 2024 Drakeford told the Covid-19 Inquiry that local COVID-19 lockdowns were a 'failed experiment' (Heneghan & Jefferson, 2024f). It is troubling that policy enforced by law was considered an 'experiment', but at least he conceded that lockdowns were a failure. It was reported during the Covid-19 Inquiry that the Labour-run Welsh Government brought in different pandemic rules for the sake of being different (N. Johnston, 2024c). In his testimony at the Covid-19 Inquiry, Simon Hart, the Secretary of State for Wales during the pandemic, said that the different rules in Wales were brought in for the sake of being different from those in England, rather than being based on evidence (Heneghan & Jefferson, 2024g).

6.8.9 Teaching Unions

The teaching unions were clearly calling for policies that were to the detriment of children. Teachers were not at significantly higher risk of death from COVID-19 than the general population, according to ONS figures for 2020 (Schraer, 2021). In an article published in *The BMJ*, L. Fenton et al. (2021) found that, in Scotland, compared with adults of working age who are otherwise similar, teachers and their household members were not found to be at increased risk of hospital admission with COVID-19 and were found to be at lower risk of severe COVID-19. In January 2021 six teachers' unions were urging the government to pause the return of pupils to classrooms until they could guarantee their safety (Sky News, 2021). The unions claimed that a full reopening of schools in England could put teachers at 'serious risk' of falling ill with COVID-19 and could 'fuel' the pandemic. D. S. Siegel and Sauer (2021) pointed out that the unions colluded with officials to not only close schools, but keep them closed for as long as possible and, once they reopened, to keep mask mandates in place. They state that trade unions are guilty of child abuse. Children were forced back into face masks during the pandemic because teaching unions threatened that teachers would not show up to work otherwise (Turner, 2023). Rod Liddle noted that teachers, who one would hope would consider the interests of children, were too often ideologically committed to the leftish view that lockdowns were a good thing, should be stringent and should continue for as long as possible (Liddle, 2023). We have seen the harmful effect this has had on schoolchildren (Section 2.3.7). It wasn't only in the UK that teaching unions compromised children's education. The American Federation of Teachers had influence on the CDC's school-reopening guidelines released on 12 February 2021.

6.8.10 Censors

Societies tend to work best when the only restrictions on the right to free speech are libel and incitement to immediate violence. Censorship compromises this. Aaron Kheriaty, MD, Fellow and Director, Bioethics and American Democracy Program, stated that the pandemic presented an opportunity for censorship and propaganda to manifest and to advance in ways that would have probably taken several decades if they hadn't occurred during the crisis (Sarv, 2024a). Censorship was used as a tool of power and to control the flow of information online. Also to try to manage public opinion, not through open debate, dialogue and discussion, but through operating behind the scenes to control the mechanisms that allow information to get out. We shall consider, in turn, censorship in the context of government, academia, media and social media.

6.8.10.1 Government

In a global study, T.-H. Lin, Chang, Chang, and Chou (2022) found that internet censorship by governments led to the underreporting of the incidence of respiratory infections. Whilst the US government (the Biden Administration) pressured Amazon to reduce the visibility of books for sale on its platform that were critical of vaccines during the pandemic, and they obliged (Rankovic, 2024; S. Watson, 2024a).

6.8.10.2 Academia

Within academia, when it came to non-pharmaceutical interventions, high-quality evidence not supporting the predominant narrative was suppressed, and its authors were attacked, silenced and censored (Jefferson & Heneghan, 2024c). Carl Heneghan and Tom Jefferson documented how the Cochrane reviews found no evidence that masks worked, but attempts were made to silence such a conclusion because it contradicted the politically acceptable narrative (Heneghan & Jefferson, 2023a). Shamefully, in the summer of 2020 the Oral Health Group withdrew John Hardie's excellent 2016 article on why face masks don't work (Hardie, 2016), with the excuse 'The content was published in 2016 and is no longer relevant in our current climate' (Oral Health, 2020). Dr Hardie lost a publication, and professionals and the public are denied a review of the science, for political reasons. Clearly, the paper was extremely relevant, and masks didn't suddenly start working in 2020. Stanford University censored Scott Atlas for (rightly) speaking out against restrictions and face masks (Golchha & Johnson, 2024; Stanford Review, 2024). Hart (2023) detailed how myocarditis became the censored scandal of COVID-19 vaccination. N. Fenton, Neil, and Mr Law, Health and Technology (2023) reported that medRxiv and arXiv were systematically rejecting academic papers that did not fit the narrative.

6.8.10.3 Media

Shir-Raz, Elisha, Martin, Ronel, and Guetzkow (2022) found that media organisations, and especially information technology companies, played a central role in attempting to stifle debate over COVID-19 policy and measures. In the effort to silence alternative voices, widespread use was made not only of censorship, but of tactics of suppression that damaged the reputations and careers of dissenting doctors and scientists, regardless of their academic or medical status and regardless of their stature prior to expressing a contrary position. *The Telegraph* reported that the BBC morphed from a national broadcaster founded on impartiality into a state broadcaster that stifled voices challenging the authoritarian response to COVID-19 (Rayner, 2023).

6.8.10.4 Social Media

During the pandemic, social media companies censored posts that were inconsistent with the pro-lockdown/mask/vaccine narrative. Social media censored accurate health information (e.g.

the superiority of natural immunity) and rational prescriptions (e.g. The Great Barrington Declaration) (Bhattacharya & Kulldorff, 2023).

Facebook *The Guardian* reported in May 2021 that Facebook had lifted its ban on posts claiming that COVID-19 was man-made (Hern, 2021). Presumably because it is possible (and always was possible) that the virus responsible for COVID-19 was man-made. Facebook censored a *Spectator* article (Heneghan & Jefferson, 2020) that correctly reported that the Danish study (Bundgaard et al., 2021) found that face masks had no significant effect (Jefferson & Heneghan, 2022). Facebook implemented AI algorithms to suppress posts their computers deemed 'antivax' (Bhattacharya & Kulldorff, 2023). Gutentag and Shellenberger (2023) reported how Facebook censored an accurate story in Public (a newsletter on Substack founded by Michael Shellenberger) on COVID-19 vaccine mRNA in breast milk. Victims who suffered life-changing injuries from the Oxford-AstraZeneca COVID-19 vaccine say they have faced censorship on Facebook when trying to discuss their symptoms (Corless, 2024). In the UK, the AstraZeneca COVID-19 vaccine gave Caroline Pover chronic health complications, but Facebook censored her for posting a link to a *Daily Express* article about what happened to her (Carr, 2024). Facebook regularly gave in to White House pressure to remove anti-vaccine posts (Titcomb, 2024a). To his credit, Mark Zuckerberg, co-founder, chairman and CEO of Meta Platforms, has said Facebook and Instagram were wrong to censor posts about COVID-19 during the pandemic and that the company should have fought pressure from the Biden administration (Titcomb, 2024b).

LinkedIn Apparently, LinkedIn considered both a cost–benefit analysis of the UK's response to the pandemic (exactly what was needed) and citing a Cochrane review on face masks (the gold standard of evidence) to be 'misinformation' (M. Sewell, 2023). You couldn't make it up.

Twitter Twitter blacklisted Martin Kulldorff for arguing that schools should re-open and Jay Bhattacharya for posting a link to The Great Barrington Declaration (Bhattacharya & Kulldorff, 2023). In *The Wall Street Journal*, Swanson (2023) explained how the government and social-media companies colluded to stifle dissenters who turned out to be right:

> Twitter blacklisted Stanford physician and economist Jay Bhattacharya for showing Covid almost exclusively threatened the elderly, severely reducing the visibility of his tweets. When Stanford health policy scholar Scott Atlas began advising the White House, YouTube erased his most prominent video opposing lockdowns. Twitter banned Robert Malone, a pioneer of mRNA vaccine technology, for calling attention to the vaccines' dangers. YouTube demonetized evolutionary biologist Bret Weinstein, who suggested the virus might be engineered and predicted vaccine-evading variants.

However, in Twitter's defence, McCullough (2024a) reviewed X. Zhou et al. (2023) (which analysed tweets regarding COVID-19 vaccination between 1 January 2020 and 30 June 2022) and noted that the bottom line was that Twitter was impactful in getting safety information out to the public in the midst of censorship observed in the peer-reviewed literature, mainstream media, Google and Meta (Facebook and Instagram). In October 2022, Twitter was acquired by Elon Musk, and since then free speech on the platform has improved significantly. In July 2023, Twitter was rebranded as 'X'.

YouTube In March 2023 Member of Parliament (MP) Andrew Bridgen made an important and perfectly reasonable speech in the UK Parliament about the mRNA COVID-19 booster (Bridgen, 2023; N. Fenton, Craig, Neil, Engler, & Mr Law, 2023). YouTube removed the video, but later reinstated it. In other words, a foreign-owned commercial entity censored the views

of an elected member of parliament in a democracy. YouTube also censored an interview with Norman Fenton about COVID-19 vaccines at a Rome conference that was broadcast on Italian TV (N. Fenton, 2024a, 2024b). In July 2024, YouTube were still censoring content questioning the efficacy of the vaccines (N. Fenton, 2024c).

6.8.11 Fact-Checkers

6.8.11.1 Fact-Checking

Self-titled fact-checkers make sense in the context of facts. But they make far less sense in the context of science, which generally involves hypotheses (and probabilities). Besides, science is provisional. The fact-checking industry have performed poorly during the pandemic, having to update some of their 'facts' on, for example, natural immunity and theories on the origin of the virus (Thacker, 2022). Upon reviewing criticisms of their earlier paper, Herby et al. (2022b) noted that the striking feature of the media flow was its unoriginality. So-called fact-checkers would adopt and circulate others' opinions without even reading the primary text. They state that 'the new cottage industry called "fact checking" has arguably become highly politicized. As a result, there is not much fact checking, but rather opinions about whether the so-called fact checkers agreed or disagreed with the policy implications or conclusions of what they are supposed to be fact checking.' The fact-checkers tend to be funded by left-wing organisations, and are not unbiased arbiters of truth (New York Post, 2021). Because they are risk averse and wish to appear virtuous, the academic journals and the mainstream media have a bias towards showing vaccinations in a favourable light. So-called 'fact-checkers' therefore identify sources that are sceptical of vaccines as 'low credibility'. It is thus hardly surprising that when Pierri et al. (2022) used a fact-checker (Media Bias/Fact Check (MBFC)) to identify 'low credibility sources' (which was dominated by Children's Health Defense), they deduced that 'online misinformation' is linked to COVID-19 vaccination hesitancy and refusal. Yet their very own paper, published in Nature's *Scientific Reports*, erroneously states that 'populations must reach a threshold vaccination rate to achieve herd immunity'. COVID-19 vaccinations are non-sterilizing (they don't prevent infections), and herd immunity is reached via natural immunity. Furthermore, it is quite possible that vaccinations have compromised herd immunity, by suppressing innate immunity (Seneff, Nigh, et al., 2022) or via viral immune escape (Menegale et al., 2022). Why should we trust a self-appointed fact-checker? Indeed, who fact-checks the fact-checkers? NewsGuard is a tool that provides trust ratings for news and information websites. The American Institute for Economic Research (AIER) rated NewsGuard according to its own standards, and concluded that it fails to adhere to several basic journalistic standards, and should be used with extreme caution as a source for verifying the reliability of the websites it purports to rate (Magness & Yang, 2021). Fact-checkers are not scientists, too often they are censors (Heying, 2021). #FollowTheScience is an anti-scientific rhetorical move (Heying, 2021). The media employ fact-checkers to reassure their audience that their views are grounded in facts, logic and science (and anyone who disagrees is wrong and dangerous) (eugyppius, 2023f). Whilst the fact-checkers themselves can be stupid, because they simply call up various 'experts' and write down what they are told. J. Brown (2024) examined the fact-checking industry worldwide and concluded that the intrusion of fact-checking into free speech extends globally, covers all forms of media, captures academia, the technology industry and legacy media.

Fact checkers can get facts wrong. The *New York Post* identified no less than ten myths told by COVID-19 experts that ended up being debunked (Makary, 2023). For example, 'Natural immunity offers little protection compared to vaccinated immunity' (false (COVID-19 Forecasting Team, 2023)). Even the World Health Organization (WHO)'s 'fact-check' declaring that COVID-19 was not airborne was wrong (WHO, 2020c). Zweig (2023b) describes how *The New York Times* 'fact check' on excess mortality in California and Florida was both bizarre are wrong. Igor Chudov's post about VAIDS in children (Chudov, 2023l) was fact-checked, but the

fact-checker needed fact-checking (Chudov, 2023h). Another means of appearing authoritative is to write an 'FAQ'. For example, the website 'Anti-virus: The Covid-19 FAQ', a joint project by Stuart Ritchie, Mike Bird, Neil O'Brien MP, Saloni Dattani, Sam Bowman, Michael Story, Lawrence Newport, Mustafa Latif-Aramesh, Jonathon Kitson, Ben Hoskin and other volunteers.[49] It ended up on the wrong side of almost every argument, for example: 'cases fall when lockdowns are imposed' (false (S. N. Wood, 2021)), 'lockdowns might lower the economic costs of COVID' (false (TaxPayers' Alliance, 2024)), 'mask usage reduces transmission of COVID-19' (false (Jefferson et al., 2023)) and 'we have very effective vaccines… a great many people now have the possibility to never get the virus in the first place' (false (Emani et al., 2022)). The website has not been updated since January 2021. Joomi (2021a) described fact-checking articles as 'beyond shoddy', especially when they fail to link to studies or data, whenever possible. Even after being presented with the strongest evidence that masks don't work, fact-checkers don't update their 'facts', they go into denial (Siglaugsson, 2023b).

6.8.11.2 Fake News

Fake news is false or misleading information (misinformation, including disinformation, propaganda, and hoaxes) presented as news. The term 'fake news' became popular when Donald Trump won the 2016 United States presidential election. The media, dominated by the political left, dealt with their cognitive dissonance by declaring that people voted for Trump because they were subject to 'fake news'. A similar thing happened in the UK with Brexit. Rebecca Harris, the British Conservative Party MP for Castle Point has a web page that lists various items of 'fake news' relating to COVID-19 (R. Harris, 2020), many of which turned out to be true or partly true (R. Watson & McCrae, 2023). Fraser Nelson pointed out that it was 'fake news' that trapped Britain in lockdown, and that misinformation is at its most lethal when believed and acted upon by governments (F. Nelson, 2023c).

6.8.11.3 Disinformation

Disinformation is false information deliberately spread to deceive people. With reference to the revelation that the authors of the 'The proximal origin of SARS-CoV-2' article (K. G. Andersen et al., 2020) covered up their true beliefs, National Review (2023) wrote 'In the name of fighting disinformation, America's leading scientists collaborated with America's leading public-health authorities to create disinformation themselves — which just happened to be in the interests of funding for their projects and agencies.' In an essay in *Tablet*, Jacob Siegel explained how 'disinformation' is an invention that morphed into a tool of governance (J. Siegel, 2023). Declaring information as true or untrue is a means to control public discourse. In October 2023, over a hundred academics, historians and journalists warned Rishi Sunak, Prime Minister, that social media firms were silencing free speech with 'disinformation' claims (Gutteridge, 2023). Slater (2023) pointed out that the war on disinformation is really a war on dissent. And that the British state's monitoring of lockdown sceptics was a democratic outrage. The UK Government's Counter Disinformation Unit (CDU) monitored lockdown sceptics and flagged 'disinformation' content to social media companies and encouraged censorship (Devlin, 2023). The UK's only headteacher to question lockdowns, masking children and vaccinating children had his social media posts monitored by the Counter Disinformation Unit (CDU) (Fairclough, 2023). In October 2022, in the US, The Ethical Skeptic (2022b) argued that the Centers for Disease Control and Prevention (CDC) were guilty of disinformation, misinformation and deception in an attempt to 1) conceal excess deaths potentially caused by the mRNA vaccines, and 2) make mRNA vaccines falsely appear as uber-effective in saving lives. In the US, the House Committee on Energy and Commerce's Subcommittee on Oversight and Investigations conducted an investigation into the effectiveness and scientific accuracy of the 'We Can Do This'

[49] `https://www.covidfaq.co/`

COVID-19 vaccine promotional campaign launched by the Department of Health and Human Services (HHS), in partnership with the Fors Marsh Group (FMG), which ran from August 2020 to June 2023 (U.S. House of Representatives, 2024). Their report is devastating (Bhattacharya, 2024). The Biden administration spent over $900 million of taxpayers' money to push falsehoods about COVID-19 vaccines, boosters and masks on the American people. According to many respected doctors and scientists, the authorities, including the WHO, the European Commission and the US administration, turned out to be the main source of disinformation during the COVID-19 crisis (Glück, 2024). T.-H. Lin et al. (2022) integrated global surveys from the Digital Society Project, Global Burden of Disease and other data sources across 149 countries for the period 2001–2019, and examined the association between government-sponsored disinformation and the spread of respiratory infections before the COVID-19 outbreak. They found that government-sponsored disinformation was significantly associated with the incidence and prevalence percentages of respiratory infections in susceptible populations during the period 2001–2019. Government-sponsored disinformation was also positively associated with the incidence rate ratio (IRR) of cases of COVID-19 before vaccination programme implementation. Devine (2023) reported that, since the COVID-19 pandemic, authoritarians around the world have used claims of 'disinformation' to censor people and stifle dissent about things like the efficacy of masks and vaccines.

6.8.11.4 Misinformation

Unlike disinformation, *misinformation* refers to inaccuracies that stem from inadvertent error. Though some argue that disinformation is a subset of misinformation (Zeng & Brennen, 2023). Misinformation is rampant online. But it was far worse before the internet, when myths could persist for centuries. D. Williams (2023) argued that the current panic about a misinformation epidemic is itself rooted in fake news. Officially defining 'misinformation' necessarily requires a Ministry of Truth, the ministry of propaganda from the 1949 dystopian novel *Nineteen Eighty-Four* by George Orwell. D. Klein (2023) points out that what is being labelled and attacked as 'misinformation' is not a matter of true or false information, but of true or false knowledge. The policing of 'information' is the stuff of Naziism, Stalinism, Maoism and similar anti-liberal regimes, and 'misinformation' is a word designed to crush dissent.

David Thunder, a political philosophy researcher and lecturer at the University of Navarra, Spain, pointed out, rightly, that one of the remarkable features of the COVID-19 years was the amount of misleading and downright false information emitted by official sources, most notably public health authorities, government-appointed regulators and mainstream media (Thunder, 2023). For example, we were told that lockdowns would mitigate COVID-19 and save lives (false (Agrawal et al., 2021)), community masking is effective (false (Jefferson et al., 2023)), and young children should get vaccinated to prevent spread (false (Hoffmann et al., 2024)). None of which was true. He says that his 'whole faith in the political, media, and scientific establishment, limited as it was, was shaken to the core', and I concur. In order to make informed decisions about lockdowns, face masks and vaccinations, it was necessary to take the time to do my own research. I. Miller (2022a) described the CDC's February 2022 study on the effectiveness of masks (Andrejko et al., 2022) as 'purposeful misinformation'. Whilst Stieber (2024a) reported that the CDC labelled multiple news articles as misinformation even though the articles were accurate. Dr Aseem Malhotra, whose position is that 'The covid mRNA vaccines have common and serious adverse consequences including death and should likely never have been approved in the first place' has been accused of spreading misinformation (Parr, 2023). A group of doctors, including some GPs, are to take legal action against General Medical Council (GMC) over 'inaction' against Dr Malhotra's COVID-19 'misinformation'. Barnett, Anandamide, Courageous Truth, et al. (2024) reported that Australia's drug regulator, the Therapeutic Goods Administration (TGA) issued a statement alleging that the scientific evidence of DNA contamination in mRNA vaccines is invalid, and that online reporting of the issue is 'misinformation'. However, the TGA's

statement contains false and misleading claims, but does not contain any evidence to refute the contamination findings and implications. The authors categorically reject the TGA's claim.

In August 2023, *JAMA Network Open* published an article on the communication of COVID-19 misinformation on social media by physicians in the US (Sule et al., 2023). Unfortunately, the authors assumed that the truth was whatever the CDC said, which was often untrue, so the article itself ended up spreading misinformation (Prasad, 2023). They considered stating that vaccines were unsafe and/or ineffective, masks and/or social distancing did not decrease the risk of contracting COVID-19 and the virus originated in a laboratory in China to be examples of misinformation. The authors called for physicians who participated in misinformation to be disciplined. I. Miller (2023b) pointed out that the article contains inaccurate claims, disproven beliefs and offensive conclusions, and desribed it as the most offensive example yet of researchers attempting to disqualify differing opinions. Whilst N. Wilson (2023) pointed out that the authors should be careful what they wish for.

In April 2024, *The Lancet* published a couple of articles by authors that included some that worked for the CDC on 'misinformation' (Ishizumi et al., 2024; Jin et al., 2024). Ishizumi et al. (2024) wrote 'Examples of harm that have been reported in connection with the COVID-19 infodemic include methanol poisoning, improper use of medications such as hydroxychloroquine and ivermectin for COVID-19 treatment, negative attitudes toward masking, reduced vaccination intent or uptake, and stigma or discrimination against specific population groups at high risk of COVID-19.' This is absurd. There is evidence that hydroxychloroquine and ivermectin work (Covid Analysis, 2024), no quality evidence that masks work (Jefferson et al., 2023), plenty of reasons to be vaccine-hesitant (Mead, Seneff, Wolfinger, et al., 2024a) and the greatest stigma was directed at lockdown/mask/vaccine sceptics (Bor et al., 2023). Whilst Thacker (2024f) pointed out that, ironically, *The Lancet* and the CDC have previously spread pandemic misinformation themselves. Whilst in an email to Norman Fenton, *The Lancet* wrote that describing reported adverse reactions to Pfizer vaccines as 'substantial' was 'factually incorrect' and 'misinformation' (N. Fenton & Neil, 2023d).

6.8.12 Sceptics and Sceptical Magazines

By 'sceptics' here, I mean those who support organisations or publications that embrace scientific scepticism. Sceptics have historically done a commendable job of calling out pseudoscience, and have rightly supported evidence-based medicine. They are biased towards assuming that mainstream narratives in general are correct, and therefore lockdowns, masks and vaccines are all good. Unfortunately, when we needed them most, they got it wrong. Many sceptics were ignorant of the actual science and failed to update their beliefs.

6.8.12.1 *Skeptic*

Harriet Hall, a retired family doctor, published a patronising and preachy article in *Skeptic* entitled 'Wear a mask, but act as if it doesn't work' (Hall, 2020). If she was a genuine sceptic, she should not have uncritically quoted the ludicrous 'even homemade masks made from cotton t-shirts or dishcloths can prove 90% effective at preventing transmission'. She finishes her virtuous article explaining that 'Mask refusers sound like petulant children'. Well, at least their voices aren't muffled. In another article published in *Skeptic*, Barglow and Schaefer (2021) unsceptically stated that 'vaccination remains essential, given that our most effective remedy to COVID-19 will be advance toward herd immunity, which only vaccination can achieve without massive and unacceptable loss of life' when if anything the vaccination appears to have compromised herd immunity. They also stated that 'the manifest effectiveness of COVID-19 vaccination is the most persuasive argument for its value', which is odd, given that COVID-19 vaccines have failed to mitigate the disease. However, to their credit, in July 2024 *Skeptic* interviewed Jay Bhattacharya (Shermer, 2024).

6.8.12.2 *Skeptical Inquirer*

Stuart Vyse wrote a bizarre article in the *Skeptical Inquirer* entitled 'COVID-19 and the tyranny of now' (Vyse, 2020). Here, 'tyranny' does not refer to the tyrannical lockdown policies imposed by some governments; the author is using 'tyranny of now' to mean delayed gratification. He assumed that a lockdown was a short-term cost, that preceded a long-term benefit (a reduction in COVID-19 cases). This is incorrect, because lockdowns failed to mitigate cases and caused long-term harms. Besides, a better example would be catching COVID-19 whilst young and fit in order to improve one's immune system in order to protect you when you are older and more vulnerable. In an extraordinarily naive article, also in *Skeptical Inquirer*, that hasn't aged well, the founder of *The Skeptic* magazine, Wendy M. Grossman, warned against ending the UK lockdown in July 2021, and claimed that the scientific consensus was that it would be disastrous (Grossman, 2021). This may even have been the case, mainstream academic science on such matters during the pandemic has been abysmal. The author enters melodrama when she absurdly claims that 'Most people understand that the "freedom" of dumping masks effectively imprisons millions of vulnerable people in their homes and forces essential workers in health, retail, education, transport, and entertainment to risk their lives.'

6.8.12.3 *The Skeptic*

Danny Bradley, a full-time musician, wrote a remarkably naive article in *The Skeptic* (Bradley, 2021). He decided to take aim at what has arguably been the single best resource for lockdown-related science, the Lockdown Sceptics website (T. Young, 2020b), and included a spiteful attack on its Editor-in-Chief, Toby Young. He then attempts to criticise an article on masks by the talented Will Jones, but clearly has no understanding of the science.

6.8.12.4 *Science-Based Medicine* (*SBM*)

'Science-based medicine' (SBM) is a blog owned and operated by the New England Skeptical Society (Ingraham, 2022). SBM has been described as selectively sceptical and dogmatic (J. Cohen, 2020). Like other so-called sceptical entities, the authors appear to embrace orthodoxy, consensus and the establishment, but fail to update their beliefs in the face of new evidence (i.e. do science). They religiously assume that lockdowns, masks and vaccines work, and defend them, rather than take a neutral stance and view them under the lens of cost–benefit analyses. Recall that in October 2020 the authors of *The Great Barrington Declaration* (GBD) (Kulldorff et al., 2020) recommended focused protection. SBM responded with an article that called the GBD authors COVID-19 deniers and compared them with creationists, HIV/AIDS denialists and climate science deniers (Gorski, 2020)! Given that lockdowns turned out to be an unmitigated disaster, the authors of GBD turned out to be prescient, and deserve credit. SBM have since written articles claiming that mask-wearing policies are effective and justified (Novella, 2021b), and children should be vaccinated (Howard, 2021). Neither policy passes a cost–benefit analysis.

In March 2021 SBM published an article entitled 'COVID vaccines probably prevent spread' (Novella, 2021a). There was no shame in getting this wrong at the time. However, in October 2022 SBM published an article entitled 'The Pfizer COVID-19 vaccine doesn't prevent transmission: antivax disinformation goes viral again' (Gorski, 2022). The second article, if honest and objective (remember, news should be 'surprising'), should have been along the lines of 'the vaccines turned out to be a failure, we were wrong, and the antivaxers were right', but instead they falsely (el gato malo, 2021o) claimed that the vaccines were never sold as stopping spread, and blamed 'antivax disinformation' in an article full of *ad hominem*.

SBM, apparently unable or unwilling to consider the science in sufficient depth, analyse the data or conduct or review quantitative cost–benefit analyses (that would undermine their

established world views), have resorted to writing hit pieces on individuals they disagree with, thus committing *ad hominem* (Gorski, 2021; Howard, 2022).

6.8.12.5 Office for Science and Society, McGill University

The Office for Science and Society (OSS) at McGill University also publish sceptic-type articles. Similarly, rather than apply healthy scepticism, they simply defend the mainstream narrative. They recommend wearing a cloth mask over a procedural mask (Labos, 2021a), masking children (Jarry, 2022) and claim that it is important to vaccinate children against COVID-19 (Labos, 2021b). Again, none of these would pass a cost–benefit analysis.

6.8.12.6 Cambridge Skeptics

Cambridge Skeptics, still apparently oblivious of the science, even in 2023, advertised a pub event with 'We recommend wearing an N95/FFP2-rated face covering to reduce the risk to yourself and others of respiratory virus transmission, though this is not required. Please stay home if you or someone in your household has new-onset symptoms that may be cold or flu.' (Cambridge Skeptics, 2023).

6.8.12.7 Conclusion

As scientific evidence accumulated about possible vaccine dangers, rather than update their beliefs, several pro-vaccine zealots (e.g. David Gorski, Steve Novella, Dorit Reiss and David Grimes) simply went into denial (Thacker, 2021c). Those in the pro-vaccination camp, rather than conduct analysis and engage in reasoned debate, are often reduced to *ad hominem* (Thacker, 2021b). Vaccine sceptics are the true critical thinkers (Chudov, 2022n). Ethical Skeptic (2024b) agreed that 'scientific sceptics' failed us when it counted most. The worst thing about the sceptics is that they failed at their speciality—they should have known better.

6.8.13 Zero COVID Zealots

Zero COVID policies were naive, failed everywhere and were harmful. They failed a cost–benefit analysis spectacularly, see what happened in Australia (Section 6.8.8.1). Covid Action UK (formerly known as Zero Covid UK) had the aim of eliminating community transmission of COVID-19 (Covid Action UK, 2020a). In November 2020, Covid Action UK (2020b) wrote 'If we'd [adopted the zero-COVID approach] in the spring, by now we'd be living without the virus…'. The Zero Covid Coalition, a broad campaign jointly convened by Diane Abbott MP and the Morning Star, campaigned for a zero-COVID strategy (Zero Covid Coalition, 2021). Jefferson and Heneghan (2024h) list institutions and individuals who pushed zero-COVID.

6.8.14 Mask Zealots

Before the COVID-19 pandemic, and with reference to an influenza pandemic, meta-analyses of RCTs on community masking published by the WHO (WHO, 2019) and the Centers for Disease Control and Prevention (CDC) (Xiao et al., 2020) both showed no benefit. So there really was no excuse for those pushing for masks. We knew they didn't work. Joseph Perla was responsible for the graph with circles around 'no masks' and 'masks' that went viral (Perla, 2020a, 2020b). He informed us that you can make a mask out of a t-shirt, and sold masks online. DELVE (Data Evaluation and Learning for Viral Epidemics), a group convened by the Royal Society, were responsible for making masks mandatory in the UK, along with Dominic Cummings and Nicola Sturgeon (Sidley, 2022c). Trish Greenhalgh, an expert in primary health care at Oxford University, said 'puffing and panting' runners should wear coverings because they can transmit COVID-19 to people they pass on the street (J. Davies & Greep, 2021; Greenhalgh,

2021; HART, 2021a). This, of course, is insane. Apparently, the scientific establishment rewards virtue-signalling nonsense. Professor Greenhalgh was inducted into the National Academy of Medicine (NAM) in October 2021 (NAM, 2021; Prasad, 2024e). She also claimed that if two parties are both wearing masks, the chance of transmission is reduced to 2% of what it was if neither party was wearing a mask (Sidley, 2023c) (in reality, they do next to nothing). She also stated that in June/July 2020 the mask mandate brought cases under control within a couple of weeks (in reality, cases started *rising*). Meanwhile, it appears that no amount of evidence will persuade the likes of Independent SAGE that masks don't work (Sidley, 2023e). As of February 2024, in the US the CDC continued to recommend masks for 2-year-olds and upwards (Heneghan & Jefferson, 2024n). Shamefully, the decision to mandate masks for schoolchildren was driven solely by political motives. In February 2024, *Rolling Stone* published an article asking which face masks we should be wearing now (Wisely, 2024). Naturally, they were roasted (S. Watson, 2024b).

6.8.15 Anti-Anti-Vaxxers

Anti-anti-vaxxers tend to include sceptics (in the sense of those who embrace scientific scepticism), as discussed above. There are many bright well-meaning people who are normally on the right side of science, who condition on the assumption that 'anti-vaxers' are always wrong. Their prior that vaccinations are safe and effective is so high that any excess deaths must be due to something else. They would say due to lockdowns, but they supported lockdowns, so don't and can't explain excess deaths. So they end up in denial and resort to *ad hominem*.

Sceptics such as David Gorski (who writes for Science-Based Medicine (SBM)) have historically done a commendable job of calling out pseudoscience, but during the pandemic many, like him, failed to update their beliefs. Unable to deal with the cognitive dissonance, Professor Gorski has resorted to *ad hominem* on both his blog (Gorski, 2023) and on Twitter.[50] Lyons-Weiler (2023) noted that Gorski always tries to spin the narrative that vaccines are always safe, and resorts to vacuous and empirically impoverished *ad hominem*. In September 2021 Yamey and Gorski (2021) wrote an article critical of The Great Barrington Declaration and the American Institute for Economic Research (AIER). The article is perfectly summarised by an online comment from Thorstein Veblen: 'This is a shoddy smear that is not for publication. The authors have not shown where their targets are scientifically incorrect, they just attack them for receiving funding from sources they dislike or having their videos and comments removed by social media corporations as if that was some indication of guilt.'

Jonathan Howard, another hysterical alarmist who also writes for SBM, wrote a book (structured around *ad hominem*!) claiming that herd immunity was not a sensible goal (Howard, 2023). In reality, herd immunity is inevitable, and allowing the young and healthy to mingle increases herd immunity and can lead to fewer deaths in the long term (K. Rice et al., 2020). He also claimed that Americans *under*estimated the risk of COVID-19 to young people. This is the polar opposite of the evidence provided by polls. A July 2020 Franklin Templeton–Gallup Economics of Recovery Study revealed that Americans *over*estimated the risks of death from COVID-19 for your people to a shocking extent (S. Desai, 2020). In reality, 0.2% of COVID-19 deaths were among those aged 24 and below, whilst those polled estimated the figure to be 8.0%. His Twitter account is also full of *ad hominem*.[51]

Susan Oliver, 'a scientist with a PhD in nanomedicine', produced a YouTube video entitled 'More excess death bollocks! (Andrew Bridgen)' (S. Oliver, 2024). Excess deaths are real (see Section 5), and there was nothing wrong with Andrew Bridgen's speech to the UK Parliament (N. Fenton, Craig, et al., 2023). She also falsely accused the preprint of Fraiman et al. (2022) of p-hacking (N. Fenton & Neil, 2022a). Whilst Ian Copeland, a 'PhD Level Geneticist' and

[50] `https://twitter.com/gorskon`

[51] https://twitter.com/19joho

'Debunker of Nonsense' was largely reduced to *ad hominem* on Twitter.[52]

6.9 Strengths and Weaknesses

6.9.1 Strengths

This article combines a pretty exhaustive review of the literature with original research. For those who, not unreasonably, consider this document to be overly long, the abstract provides a summary. Also, the experiments conducted aim to be as informative and free from bias as possible. Charts showing lockdown stringency, mask index, vaccination uptake, COVID-19 deaths and excess mortality are available for every country in the world (depending on the availability of data). All code is available, too. A lot of effort was expended in order to find countries that had matching excess mortality before vaccination programmes began. Croatia and Hungary being the best candidate. Whilst I have focused on the bottom line, which is cost–benefit analyses and all-cause mortality. In addition to peer-reviewed articles, I have used less traditional sources like blogs, but which are often written by experts. Although social media may have an anti-vax bias, for funding reasons mainstream journals generally have a pro-vax bias. There are many instances when a blogger's interpretation of a paper is more honest and insightful than the conclusion of the article's cautious authors. An advantage to publishing over four years after the pandemic began is that the longer-term health and economic impacts have been included.

6.9.2 Weaknesses

One weakness is that the paper has an obvious bias towards the United Kingdom. This is because I am British and live in the UK. Another weakness is that I am not qualified on matters pertaining to biology or medicine.

[52] `https://twitter.com/IanCopeland5`

7 Conclusion

How can we draw conclusions from such a large quantity of, at times conflicting, data, analysis and literature? The key to getting the science right is to understand the underlying dynamics, consider various strands of evidence looking for convergences, and recognise any underlying human biases and keep these out of analysis.

7.1 General

A seasonal influenza-like illness became a pandemic of governmental overreach and collective hysteria. Everyday people evolved to, generally, trust what the experts think, on the basis that doing so generically ensures conformity, reduces friction, and seems not to result in being eaten by tigers. In the UK, when the Prime Minister, Chief Scientific Adviser and Chief Medical Officer stood united behind their lecterns, the public would have naturally assumed that they had their best interests at heart. But they did not. The age of deference is gone. Michael P. Senger, an attorney based in the United States, stated that it was an absolute human tragedy that governments and institutions continue to entertain mask mandates, social distancing, test and trace, and other COVID theatre as legitimate policy in 2023 (M. P. Senger, 2023c). 'It was never science. It was totalitarianism. And it's a moral obligation to disobey.' Before COVID-19 struck, economists found that fewer people die from natural disasters in countries with laws that restrict the power of national leaders during an emergency (Bjørnskov & Voigt, 2022). If leaders can suspend people's personal and economic liberties, then the disruptions hinder people's voluntary efforts to deal with the disaster. Tierney (2023b) pointed out that the COVID-19 pandemic turned out to be the deadliest confirmation yet of that pattern. On his blog, el gato malo (2023b) argued that the greatest lie told during COVID-19 was that pandemics are dangerous to modern societies. There has never been a seriously dangerous global pandemic in the post-antibiotic era. Many of the Spanish flu and COVID-19 deaths were iatrogenic (when the doctor kills you), caused by excessive doses of aspirin in the former and ventilators in the early days of the latter. Koops (2020) pointed out that the healthy people in our society should not be punished for being healthy, which is exactly what lockdowns, distancing, mask mandates, etc. do. Traditionally, the act of imposing risks on children for the perceived benefit of adults has been considered one of the worst crimes. Bell and McCarthy (2023) pointed out that in response to the pandemic, society reversed its norms of behaviour: Western public health institutions, politicians and the media turned on children.

Lockdowns and vaccines were marketed as the best way to save lives. On his blog, eugyppius (2023i) pointed out that placing life saving ahead of all other outcomes is very dangerous and also very stupid, for the simple reason that we are all going to die. R. Watson (2023a) reviewed *Expired: Covid the Untold Story* (C. Craig, 2023b) in a piece entitled 'Covid was a period of sheer insanity' . Toby Rogers points out that first and foremost the pandemic was a spectacle—a stage play that reordered society and dictated that this is how things are going to be now (T. Rogers, 2023a).

Tierney (2023a) stated that the American response to the COVID-19 pandemic was an unprecedented disaster—surely the costliest public-policy mistake ever made in peacetime. He also noted that most of the politicians, public health officials, scientists and journalists responsible still refuse to acknowledge the damage they caused. The Brownstone Institute published the book *The Great Covid Panic: What Happened, Why, and What to Do Next*, which covers all the issues central to the pandemic and the disastrous policy response (Foster, Frijters, & Baker, 2021). Three core protagonists provide the narrative part of the book: Jane the complier, James the decider and Jasmine the doubter. The authors of the book *The Big Fail* provide a devastating critique of the way the United States dealt with the COVID pandemic, and are supportive of The Great Barrington Declaration (Nocera & McLean, 2023a). In May 2021 it was reported as a mystery as to why Haiti, with no vaccinations, little mask-wearing and little social distancing,

had such a low COVID-19 death rate (Savage, 2022). It could be that vaccinations, masks and social distancing are not important, but a young population and ventilated homes helped.

Having written many insightful articles on COVID-19, Smalley (2022e) concluded that COVID-19 is only a problem for people with some form of compromised immunity and/or comorbidity. Also, excess non-COVID-19 mortality arises directly from futile interventions designed to mitigate the spread of COVID-19, including disruption to healthcare provision and inappropriate medical treatment. Whilst the COVID-19 vaccine causes immunosuppression (or sub-optimisation of the immunological response), leading to an increase in infections and progression to severe disease.

By 2023 those responsible for the ineffective and authoritarian polices of lockdowns, making face masks mandatory and making life difficult for the unvaccinated were in denial, they did not admit to supporting such terrible policies (Tucker, 2023b). In 2021 two silver medal-winning Georgian athletes were kicked out of the Tokyo Olympics after they were spotted committing the inexcusable crime of being outside of the designated Olympic venues (The Naked Emperor, 2024b). Yet at the Paris Olympics in 2024, running with COVID-19 was considered heroic.

7.2 Medicine

J. T. James (2013) estimated that in the US preventable harm in hospitals led to 400,000 premature deaths per year. Medical history informs us that doctors and scientists have made many mistakes through the centuries (Rushworth, 2021b). It is a conceit of the present to assume that we are not making mistakes currently. J. Droz jr. (2021) pointed out that the medical establishment's actions have been guided by political science, rather than science, and they have not acted in the best interests of the public. Contandriopoulos (2021) argued that the pandemic caused public health to turn back to its medical roots instead of leveraging the interdisciplinarity it long preached. It pushed many public health state bureaucracies to become tools for governments, rather than being carriers for evidence-based information. And more generally, it caused the discipline to renege on its principles of benevolence, science and equity. Russell L. Blaylock, an author and a retired US neurosurgeon, published a couple of editorial articles in *Surgical Neurology International* (R. L. Blaylock, 2021, 2022). He argued that, for the first time in medical history, major experts in virology, epidemiology, infectious diseases and vaccinology were not only ignored, but were also demonised, marginalised and, in some instances, became the victim of legal measures that can only be characterised as totalitarian. He adds that discussions involving various scientific opinions have been eliminated, top scientists have been frightened into silence by threats to their careers, doctors have lost their licences and the concept of early treatment has been virtually eliminated. Howick et al. (2022) found that more than 9 in 10 healthcare interventions tested by Cochrane Reviews published between 1 January 2008 and 5 March 2021 were not supported by high-quality evidence, and harms were under-reported.

7.3 Effectiveness of Lockdowns, Face Masks and Vaccination Programmes

Roger Koops, a PhD chemist, stated in an article published by AIER that all of the lockdowns, masking, distancing, closures, etc. have had no effect on the virus (Koops, 2020). Smalley (2021d) examined the impact of masks, lockdowns, vaccines and vaccine passports on COVID-19 hospitalisations and deaths in Northern Europe up to November 2021, and found that they offered no benefit. Smalley (2022t) conducted an empirical analysis of symptomatic COVID-19 and COVID-19 deaths in England using Gompertz distributions. He concluded that 1) there was no evidence that lockdowns, making masks mandatory or vaccination programmes had any positive impact, 2) every COVID-19 outbreak since December 2020 was associated with a rollout of the COVID-19 vaccine to various age groups, especially the younger ones, and 3) the case fatality rate is higher in every season since COVID-19 first emerged in spring 2020, indicating

that neither better treatment nor the vaccine reduced mortality. On his blog, eugyppius (2022c) argued that 'Mass containment, along with mass vaccination, will go down in history as the worst and most wrong-headed policy of the entire postwar era'. Sheftall and Yeadon (2022) argued that at least 150 million people will die from the 'cure'. That's 75 times as many as 'from' (not 'with') COVID-19. It is three times as many deaths as from the 1918 flu and double the number at the hands of Hitler, Stalin, Mao and Pol Pot combined. The book ranks names in order of the number of people who died as a result of the policies they endorsed.

Together with rushed mass vaccinations and vaccine mandates, lockdowns were one of the major 'COVID crimes' (Swiss Policy Research, 2023c). In the US, Bollyky et al. (2023), published in *The Lancet* and funded by the Bill & Melinda Gates Foundation, J. Stanton, T. Gillespie, J. and E. Nordstrom and Bloomberg Philanthropies, claimed that State governments' uses of protective mandates were associated with lower infection rates, as were mask use, lower mobility, and higher vaccination rate, whilst vaccination rates were associated with lower death rates. A lower poverty rate, higher mean number of years of education, and a greater proportion of people expressing interpersonal trust were statistically associated with lower infection and death rates, and states where larger percentages of the population identify as Black (non-Hispanic) or Hispanic were associated with higher cumulative death rates. However, the authors concede that the study was not designed to definitively determine causality. In his book *Illusion of Control*, Ian Miller examined information, studies and data used by experts and authority figures to justify pandemic-related policies (I. Miller, 2023d). The credentialed experts got nearly every possible pandemic-related question wrong. The mandates, endless masking and indefensible vaccine passports failed to control the pandemic. Instead of accepting that reality, those in power doubled down. Politicians, administrators and local officials repeated the same mistakes, refusing to limit ancillary consequences and damage. Shahar (2023a) summarised the response to the pandemic thus: 'Lockdowns were futile and detrimental, mask mandates were futile, COVID vaccines were marginally beneficial, futile, or worse, and influential studies of vaccine effectiveness contain at least one major flaw, and probably more'. The Scottish COVID-19 Inquiry published a report that suggested that there was 'insufficient or no evidence' to suggest that lockdowns, social distancing and face masks had any impact on slowing the spread of the virus (Walker, 2023). Using modelling, Atkeson (2023) claimed that in the US, through to June 2023, vaccines saved 748,600 lives and private and public efforts to mitigate the spread of COVID-19 saved an additional 751,600 lives. However, I. Miller (2024c) claimed that their model is a farce—a politically motivated tool for media outlets to use to justify their advocacy. In October 2023 PANDA published an analysis of worldwide COVID-19 mortality patterns (Verduyn, Engler, & Kenyon, 2023). They concluded that if there were any positive outcomes from the governments' various attempts to control and restrain COVID-19, such as lockdowns and COVID-19 vaccinations, the outcomes could not be discerned from the data. It is possible that all the efforts to contain COVID-19 actually had a negative effect, and instead increased mortality. Smalley (2023s) analysed seasonal mortality in England and Wales from 1970 to 2021. He concluded that non-pharmaceutical interventions (NPIs) had no effect, the vaccine provided no benefit, and only the costs of those interventions (economic and societal) need to be considered by any inquiry.

In his book *The Great Covid Panic*, former NHS hospital doctor Colin Barron challenges the effectiveness of lockdowns, masks and social distancing measures, suggesting they may have inflicted more harm than good (Barron, 2024b). He also confronts the safety and efficacy of COVID-19 vaccines head-on. In the US, Risch (2024) reported that the CDC had implicitly admitted that masks, distancing, lockdowns, closures and vaccines failed to control the pandemic. He argued that the public health agencies chose to prioritise a failed policy of reducing the spread rather than reducing mortality and lockdown harms. Robert Redfield, Director of the CDC from March 2018 to January 2021, admitted in 2024 that lockdowns were 'government overreach' (I. Miller, 2024d). Also, that mandating vaccines was a terrible decision. He said

that everyone had to get vaccinated due to huge influence by the pharmaceutical industry, Pfizer and Moderna. In his own medical practice he prefers to use protein-based vaccines, not mRNA, because mRNA vaccines make the body a 'manufacturing plant' for the spike protein, and the spike protein is immunotoxic. Prasad (2024a) showed that, given the information he had at the time, Anthony Fauci, objectively, did a bad job regarding lockdowns, masks and vaccination policies. Rendell (2024c) argued that lockdowns, masks and vaccine coercion were wrong, not because they were ineffective or harmful, but because they restricted personal freedoms by law.

The lockdowns were disastrous, face masks an embarrassment, and vaccines disappointing, and the overall response unscientific and totalitarian. However, we were rescued by Omicron, the current dominant strain being the mildest thus far.

7.3.1 Lockdowns

We have shown why lockdowns fail in theory, and evidenced that they failed in practice. Lockdowns were a gross overreaction. A once-in-a-decade epidemic was met by a response that caused a once-in-a-century recession. Lockdowns were inequitable, they essentially provided focused protection for the middle classes. Lockdowns, however, were implemented due to pessimistic modelling; then persisted ultimately because the majority of the population, being irrationally afraid due to a fear-mongering government and media, wrongly assuming that lockdowns worked and motivated to virtue signal, supported them; whilst politicians, motivated to court the median voter, ensured that they stayed in place. Western governments, the media and the WHO fell for China's global propaganda offensive, nearly all Western countries imported their totalitarian lockdown measures and hygiene regimes, and were subsequently too afraid to admit they were wrong, and defend Western values (M. P. Senger, 2021).

In December 2022 Matt Ridley reminded us of the Western elite's initial admiration of communist China's approach to the pandemic, hard lockdowns, and the subsequent failure of those policies: China ended up with both high rates of COVID-19 and harsh lockdowns (Ridley, 2022). In the UK, it is highly probable that the lockdowns, which cost the UK economy £251 billion in a year, failed to significantly reduce infections or deaths, and almost certain that lockdowns failed to pass a cost–benefit analysis. In March 2024, The Spectator (2024) reported that much of the current misery was rooted in decisions taken around Easter 2020. The lost years of education, the stagnant economy, the welfare crisis and the NHS waiting list of 7.6 million. Meanwhile Sweden, who had no lockdown, between January 2020 and June 2021 ended up with *negative* excess mortality (lower than the five-year average) for all categories measured (all ages, 0 to 64 and 65 years and over) (Coombs & Ward, 2021). Peru, who had a military-enforced lockdown, one of the strictest in the world (Tegel, 2020), ended up with the highest all-cause mortality in the world (Karlinsky & Kobak, 2021).

Jay Bhattacharya, a professor of medicine at Stanford University and a research associate at the National Bureau of Economic Research, stated that 'I do think that future historians will look back on this and say this was the single biggest public health mistake, possibly of all history, in terms of the scope of the harm that it's caused' (Southworth, 2021). Shahar (2022d) made the following point:

> History will not forget the wrongdoings of the Covid era. The foolishness and destructiveness of "non-pharmacological interventions" will be highlighted in history books. The fools who were responsible will not. There are too many of them to name.

L. Johnson (2024) argued that lockdowns were unquestionably the stupidest government intervention of our lifetimes. He stated that 'Their draconian actions were unscientific, ineffective, irrational and wholly destructive'. In summary, it is arguable that lockdowns turned out to be the single biggest health economics mistake in modern history.

7.3.2 Face Masks

It is highly probable that making masks mandatory in enclosed public spaces failed to mitigate COVID-19. Although face masks are not effective at mitigating COVID-19, they can cause dyspnoea, hypoxia, hypoxemia and hypercapnia, harbour pathogens, compromise communication, vision, exercise capacity, cognition and immunity, cause headaches, skin complaints, bad breath and particulate inhalation, facilitate crime and lead to pollution. Face masks serve no useful purpose in the community, in schools or in healthcare (except for splash and droplet protection). Masking children is particularly abhorrent.

7.3.3 Vaccination Programmes

Paul Weston's independently published book *Covid-19: All Lies. All Crime.* demolishes the claim that the virus was lethal and the mRNA vaccines necessary, effective and safe (Weston, 2024). The complete failure of COVID-19 vaccines to provide sterilizing immunity, stop infection or stop spread should have been headline news. Whilst COVID-19 vaccinations reduced the chances of severe COVID-19 outcomes among the elderly in 2021, taking a more holistic approach reveals that the data is consistent with vaccination programmes leading to an increase in COVID-19 cases, COVID-19 deaths and all-cause mortality, and a decrease in herd immunity. However, it is possible that Omicron, a milder strain, evolved due to vaccinations.

7.4 Ethics

Seedhouse (2023) pointed out that in the UK pre-pandemic recommendations included several references to ethics, yet during the COVID-19 pandemic ethics was never mentioned in any Government briefing by its expert advisers. In an article on the public health ethics of the pandemic, Jamrozik (2022) concluded with the following:

> During the pandemic, the moral value of health often became narrowly aligned with the avoidance of one particular virus while mental health and other harms increased, socioeconomic inequalities were exacerbated, and civil liberties were subject to sometimes draconian limitations. The interests of children were in multiple ways sacrificed, often with no strong justification, in the name of reducing harm from a virus that poses extremely low risks to healthy children. Inequality skyrocketed; the benefits of public health interventions and their economic effects overwhelmingly accumulated to the rich while the poor benefited little, were often harmed, and were sometimes placed at higher risk of infection. There was a lack of evidence that the benefits of many NPIs outweighed their harms, and a widespread failure to collect such evidence in an unbiased way. Transparency and legal checks on power were often limited.

Clare Craig noted that principles of medical ethics were overwritten during the COVID-19 crisis (Sarv, 2024b). In medical ethics, there are a few simple foundational principles: first do no harm, adults protect children (and not the other way around), informed consent and bodily autonomy. All of these were compromised during the pandemic.

7.5 COVID-19 Dynamics

If lockdowns had no significant impact, what explains COVID-19 death rates? Geographically, the cumulative number of COVID-19 deaths appears to be largely a function of pre-existing immunity (increasing with distance from the source of SARS-CoV-2, China/Southeast Asia), and severity of recent flu seasons (mortality displacement). Temporally, the number of COVID-19

deaths per day appears to be largely a function of seasonality, the proportion of the population that are still susceptible and the transmissibility, virulence and progression of the current dominant variant of the virus.

7.6 Media

Morefield, Schachtel, and Tucker (2022) reported that the media, both traditional and social media, had an outsized role during the pandemic in pushing the US government's COVID-19 response and defending the resulting coercive measures, including lockdowns, school closures, mask and vaccine mandates, whilst ignoring collateral damage and treating sceptics of these measures as having bad motivations. The result was a one-sided, often factually misleading or unsubstantiated narrative on important issues concerning science, economics and health, for the better part of two years. This has had the effect of both reducing trust in media and institutionalising cancellation and censorship in media.

7.7 Conspiracy Theorists

A *conspiracy theorist* believes an explanation for an event or situation that asserts the existence of a conspiracy by powerful and sinister groups, often political in motivation, when other explanations are more probable. In May 2024 *The Telegraph*'s Allison Pearson noted that she was accused of being a COVID conspiracy theorist by other pundits (Pearson, 2024). Yet almost every 'conspiracy theory' that she wrote between spring 2020 and winter 2022 turned out to be correct. Such pundits have now gone quiet, whilst sceptics have been more vindicated by the day. In June 2024 Frank Haviland, Editor of *The New Conservative*, noted that the truth about COVID-19 was finally being exposed (Haviland, 2024). The anti-vaxxers and covidiots, he says, were right about practically everything. He asks when there will be genuine consequences for those involved in the 'ultimate scamdemic'.

Kunst et al. (2024) published an article that leverages artificial intelligence to identify the psychological factors associated with conspiracy theory beliefs online in *Nature Communications*. Let us consider their six 'conspiracy theories' in turn, each followed by my interpretation of reality.

1. Conspiracy theory: 'Belief that the virus and response to it are aimed at creating economic instability and benefiting large corporations.' Reality: The virus did benefit Big Pharma and the response did create serious economic problems.

2. Conspiracy theory: 'Belief that the public is being intentionally misled about the true nature of the virus and prevention.' Reality: The public was told that the virus was unusually lethal, lockdowns were necessary and face masks worked, none of which was true.

3. Conspiracy theory: 'Belief that the virus is human-made and a bioweapon.' Reality: The virus may have been man-made.

4. Conspiracy theory: 'Belief that governments and politicians are intentionally spreading false information.' Reality: Politicians told us that lockdowns were necessary and face masks would be effective, when this was known to be false.

5. Conspiracy theory: 'Belief that China intentionally spread the virus to hurt other countries.' Reality: Chinese leaders initially suppressed information about the nature of the virus that may have helped other countries.

6. Conspiracy theory: 'Belief that the vaccines are unsafe or a means of population control.' Reality: The vaccines can cause myocarditis, pericarditis, thrombosis, pulmonary embolism, Guillain–Barré syndrome, etc. (Faksova et al., 2024; Gøtzsche & Demasi, 2022)

Clearly, many so-called conspiracy theorists were vindicated.

7.8 UK Covid-19 Inquiry

The UK Covid-19 Inquiry was set up to examine the UK's response to, and impact of, the COVID-19 pandemic, and learn lessons for the future (UK Covid-19 Inquiry, 2023). The Inquiry is Chaired by Baroness Heather Hallett, and the final Terms of Reference were received in June 2022. The barrister Francis Hoar pointed out that, first and foremost, the Covid-19 Inquiry should have questioned why the government failed to follow existing pandemic plans (Hoar, 2023). Various commentators rightly pointed out that the Covid-19 Inquiry's single biggest failing was that it failed to ask the only lockdown question that really matters: did the lockdowns pass a cost–benefit analysis (Bardosh, 2023d; Frost, 2023a; Glover, 2023; Hoar, 2023; *The Telegraph*, 2023c; Tominey, 2023a)? Rishi Sunak, then Prime Minister, rightly highlighted the possibility that, in terms of QALYs, the lockdown may have caused more harm than good (Sikora, 2023a, 2023e). He was promptly shut down by Hugo Keith KC, Lead Counsel to the Inquiry, who didn't even understand what the term 'QALY' meant, as he responded with 'I don't want to get into quality life assurance models [sic]' (Heneghan & Jefferson, 2023e). Incredibly, the Covid-19 Inquiry did not appear to be investigating the harms caused by lockdowns (N. Johnston, 2024a; UnHerd, 2023). A group of 55 professors and other academics wrote a letter to Baroness Hallett, rightly claiming that the process was failing to examine the costs of the lockdown (Turner, 2024b). The group also stated that the inquiry was neglecting to hear evidence from scientists who disagreed with choices made by the Government. Absurdly, the Covid Inquiry didn't recommend research into the effectiveness of lockdowns (Heneghan & Jefferson, 2024o). The inquiry appeared to be operating on the foregone conclusion that the UK should have locked down earlier, longer and harder (Tominey, 2023a). Patrick Vallance and Chris Whitty both simply asserted, without providing any evidence, that the UK should have locked down sooner (Rendell, 2023n). The politicians claimed to believe that lockdown rules should have been implemented earlier (Bardosh, 2023d). Given that lockdowns fail a cost–benefit analysis by orders of magnitude, they should not have been implemented at all. The inquiry was a politicised, pointless blame game (Glover, 2023; Tominey, 2023a) It seemed intent on showing that Boris Johnson, Prime Minister during the pandemic, was the villain of the piece, for not 'following the science' (*The Telegraph*, 2023c). This is unfair. Firstly, because he ended up largely following his scientific advisors, and secondly, given what we now know about the impact of the lockdowns, his scepticism was justified. Dan Hodges pointed out, rightfully, that the problem wasn't that Boris Johnson and his fellow ministers couldn't understand the science (Hodges, 2023). It was that the scientists couldn't understand the science. A pattern of advocacy, reversal and denial was repeated throughout the course of the pandemic. In my mind, what was more insightful than the inqury was the fact that politicians broke their own rules, so the revealed preferences of those with access to the data implied that the rules were not worth following (Bardosh, 2023d). Absurdly, the UK Covid-19 Inquiry provided face masks for anyone who wanted to wear them (I. Miller, 2023e). At hearings designed to delve into the UK's failures during the pandemic, they provided face masks. How tragicomic.

7.9 Hindsight Prescription

With the benefit of hindsight, what would a rational prescription have looked like? Radagast (2022n) suggested that instead of the current vaccination programme, we should have simply offered an intranasal live attenuated virus to the high-risk elderly. Whilst Bamji (2024) argued that proper treatment of the seriously ill was the only COVID-19 intervention that was ever needed. The small proportion of the population that suffer serious symptoms can be identified via a series of blood tests and measurement of oxygen saturation, and treated with steroids and anti-cytokine treatments. The tragedy of lockdowns is that they didn't protect the vulnera-

ble, but harmed them, and shifted the morbidity and mortality burden to the underprivileged (P. E. Alexander, Tenenbaum, & Dara, 2021), whilst needlessly disrupting the lives of the young and healthy. A sensible prescription would have involved providing support to the elderly and vulnerable (who are easily identified) that enabled them to be shielded, if that was their desire. For example, having live-in, or at least permanent, staff and frequent testing in care homes, and enabling the vulnerable to work and shop from home (if desired). However, although shielding is cheap (B. Sewell et al., 2022) there is evidence that it didn't work (W. Jones, 2024p; Snooks et al., 2023), so simply doing nothing may have been close to an optimal policy. Meanwhile, either way, we should have let the rest of the population get on with their lives and increase levels of immunity. Plus offer vaccinations to those who, at the time, would have benefitted, which was essentially those over 60 in 2021.

Back in July 2020, Stephen Archer, a Professor of Medicine at Queen's University in Canada, understood that a more holistic approach during the pandemic would have made far more sense (Archer, 2020):

> Managing healthcare in the Coronavirus Disease 2019 (COVID-19) era should be guided by ethics, epidemiology, equity, and economics, not emotion. Ethical healthcare policies ensure equitable access to care for patients regardless of whether they have COVID-19 or another disease. Because healthcare resources are limited, a cost per Quality Life Year (QALY) approach to COVID-19 policy should also be considered. Policies that focus solely on mitigating COVID-19 are likely to be ethically or financially unsustainable. A cost/QALY approach could target resources to optimally improve QALYs. For example, most COVID-19 deaths occur in long-term care facilities, and this problem is likely better addressed by a focused long-term care reform than by a society-wide non-pharmacological intervention. Likewise, ramping up elective, non-COVID-19 care in low prevalence regions while expanding testing and case tracking in hot spots could reduce excess mortality from non-COVID-19 diseases and decrease adverse financial impacts while controlling the epidemic. Globally, only ~0.1% of people have had a COVID-19 infection. Thus, ethical healthcare policy must address the needs of the 99.9%.

In October 2024, Rachel Nicoll, a medical researcher, lecturer and writer, gave her prescription on how we could have managed the pandemic better (Nicoll, 2024):

> We would have been far better off without the Imperial College Mathematical Modelling, PCR testing and the government's scientific advisors. We could have adopted the Swedish approach or that of the Great Barrington Declaration, both of which attempted to protect the vulnerable, while largely allowing life to continue as normal for the healthy. We should also not have been afraid of catching the virus if we were reasonably healthy, as some immunity to Covid will be of benefit to all of us now that it is endemic.

7.9.1 Focused Protection

The Great Barrington Declaration (Kulldorff et al., 2020) recommended focused protection.

7.9.1.1 United Kingdom

In March 2020 Jenny Harries wrote in an email that 'the reality will be we need to discharge Covid-19 positive patients into residential care settings' (Gupta, 2023). She argued that 'this will be entirely clinically appropriate because the NHS will triage those to retain in acute settings who can benefit from that sector's care'. Whilst she recognised that 'families and care homes will not welcome this in the initial phase'. The government should have directed their resources to

minimise the risk of infection among those who were at highest risk of severe clinical outcomes: what Sunetra Gupta calls 'state-supported personal risk reduction', more commonly known as 'focused protection'. Focused protection would have not only have led to significantly better outcomes, it would have been far easier to achieve. The vulnerable numbered no more than 2% of the population and were already mainly corralled in hospitals and care homes anyway. Protecting them would have also been far cheaper than shutting down the other 98%.

Snooks et al. (2023) conducted a retrospective comparison of linked demographic and clinical data for cohorts comprising people in Wales identified for shielding from 23 March to 21 May 2020 and the rest of the population. The known infection rate was higher in the shielded cohort (5.9% vs 5.7%). People in the shielded cohort were more likely to die (odds ratio (OR) 3.683), have a critical care admission (OR 3.339), hospital emergency admission (OR 2.883), emergency department attendance (OR 1.893) and common mental disorder (OR 1.762).

The total cost of administering the shielding programme and supporting people advised to stay at home in Wales during the initial fourteen weeks of the pandemic was £13,308,159, or £113 per person shielding (B. Sewell et al., 2022). So, although shielding didn't work (Snooks et al., 2023), it didn't cost much either.

7.9.1.2 United States

Chikina and Pegden (2020) used a simple SIR-like epidemic model integrating known age-contact patterns for the United States to model the effect of age-targeted mitigation strategies for a COVID-19-like epidemic. They found that, among strategies which end with population immunity, strict age-targeted mitigation strategies have the potential to greatly reduce mortalities and ICU utilization for natural parameter choices.

7.9.1.3 Global

Carl (2022b) argued that governments should have offered the vaccine to all over-60s and clinically vulnerable persons, as well as 30–60-year-olds who hadn't had COVID-19, and then donated the leftover vaccines to poor countries.

7.9.2 Politician's Syllogism

The totality of the evidence informs us that lockdowns (Section 2.3), face masks (Section 3.4) and cleaning products (A. M. Jones, 2023) were all harmful, whilst lockdown shielding failed to work (W. Jones, 2024p; Snooks et al., 2023). We should have done essentially nothing, except report data, which the ONS always do. Treating COVID-19 like the flu and doing essentially nothing would have led to a far better outcome. Due to politician's syllogism, this was difficult politically, but not impossible (Sweden managed to do very little).

7.10 Future

In the UK, Daniel Hannan reported that the scientists could not bring themselves to admit that they were wrong about COVID, and in a future pandemic we will repeat the mistakes made with COVID-19: stricter lockdowns, compulsory vaccination and a bigger role for the WHO. But with lessons learnt, what are sensible prescriptions for the future? Bell (2024b) described what 'pandemic preparedness' should be like. We should reduce the population's vulnerability to virus infection by ensuring that they have well-functioning immune systems through good diet, ensuring good levels of micronutrients and reducing metabolic diseases, building personal resilience.

7.10.1 Governance

Given that governments got their response to COVID-19 so wrong, it would not be surprising if the public began to question other official narratives, such as the appropriate response to climate change. If the publications on lockdowns and masks were biased towards the narrative, the same could be true for climate change. Colin Barron pointed out that the aftermath of the pandemic has also seen a renewed drive towards net zero, the implantation of greater surveillance, attacks on free speech and an attempt to phase out cash (Barron, 2024a). He also (correctly) argued that the Government's COVID response caused a series of events which will almost certainly lead to the election of a Labour Government by January 2025. I agree with the recommendation from Yanovskiy and Socol (2021): a future medical crisis should not be managed by means of government emergency powers. Anjuli Webster, writing for the *Mail & Guardian* in South Africa, argued that the proposed WHO pandemic treaty would compromise national and health sovereignty in Africa (Webster, 2024). But what should governments do? The UK Government is not going to investigate excess deaths (Jefferson, 2023). They should.

7.10.2 Censorship

Censorship was a problem, see Section 6.8.10. Most importantly, anti-lockdown, anti-mask and vaccine-sceptic opinions should not be censored, or considered conspiracy theories, not least because such views turned out to be on the right side of science. The debate should be opened up.

7.10.3 Lockdowns

First and foremost, there should be no more lockdowns for a virus that was within the envelope of a bad flu season. Alas, the WHO intends to make lockdowns and other non-pharmaceutical interventions intended to curb viral transmission part of official pandemic guidance (W. Jones, 2022w). In other words, they plan to endorse and codify the awful errors of the past few years. Buckley (2024) argued that we should not forget the damage caused by lockdowns.

7.10.4 Face Masks

We should abandon the pointless and authoritarian imported policy of making masks mandatory, which was nothing more than political theatre.

7.10.5 Vaccination Programmes

We should investigate the issues with vaccination programmes, conduct a cost–benefit analysis, and offer vaccinations to anyone who may benefit. According to Dalgleish (2024e), vaccine injury is treatable. It may be possible to detoxify the 'spike poison' in the vaccinated using products such as vitamin D3, bromelain, low-dose naltrexone (LDN) and ivermectin.

7.10.6 Excess Mortality

It is imperative that governments investigate excess deaths. They are significant, disturbing, and being ignored. It is unclear to what extent they are due to COVID-19, collateral damage caused by lockdowns, vaccinations and/or iatrogenesis.

7.10.7 Early Treatment

Various early treatments (e.g. hydroxychloroquine and ivermectin) for patients with COVID-19 show promising results (Covid Analysis, 2024). We should respect the hierarchy of evidence, and ensure that belief perseverance, risk aversion, profit-seeking or political reasons are not used to

oppose them. We should also bear in mind that sufficient Vitamin D level in serum is associated with a significantly decreased risk of COVID-19 infection (Teshome et al., 2021).

7.10.8 Education

Disturbingly, even in January 2023, in the UK 70% of hospital trusts still had some form of visiting restrictions in place (Roberts, 2023). A majority of hospitals were still not allowing more than two visitors at a time, with some patients only able to see friends and family for one hour a day. Some had restrictions on how many family members could visit mothers and newborns. Incredibly, even three years after Britain's lockdown, the majority of the population believed that lockdowns were *not* a mistake (Sayers, 2023).

7.10.9 New Normal

In May 2022 P. Marks, Woodcock, and Califf (2022) argued that it is time to accept that the presence of SARS-CoV-2 is the new normal. Because it will likely circulate globally for the foreseeable future, taking its place alongside other common respiratory viruses such as influenza. We should accept that COVID-19 was the equivalent of a severe flu, and has become another endemic seasonal mutating respiratory disease, like the cold and the flu, and do now what we should have done from the start: keep calm and carry on.

7.10.10 Risk

Regardless of COVID-19, what is the risk of a pandemic in the future? Matt Ridley believes that COVID-19 was the result of a lab leak, and that the risk of a future natural outbreak going global is much smaller than the risk of a lab-leak outbreak going global (Ridley, 2024c). Natural spillovers of novel animal viruses are rarely infectious enough to start pandemics.

7.11 Unanswered Questions

Livermore (2024a) has some pertinent questions about mRNA vaccines. There is an urgent need to understand where the problems lie. In the missile or the payload? Is the spike protein inherently toxic, leading to cardiac damage? Are induced bloodstream antibodies in the wrong place to abort infection in the upper airways? Have coronaviruses evolved so that you can't achieve lasting immunity however you try? Those would be payload problems, irrelevant to a different target. Or is the whole strategy flawed because lipid nanoparticles cause prolonged antigen production in tissues that the target viruses would never reach? Does harm arise from replacing uridine with pseudouridine in the mRNA, giving a persistent product? Such problems might require a total rethink of the missile.

Lyons-Weiler (2024l) listed eight hypotheses and outlined how each could be tested. These may be interpreted as eight questions that could potentially be answered:

1. Does mRNA vaccination increase the virulence of SARS-CoV-2?

2. Do mRNA vaccines promote the emergence of SARS-CoV-2 mutations associated with increased virulence?

3. Do mRNA vaccines lead to antibody-dependent enhancement (ADE) in the context of SARS-CoV-2 (Jacques Fantini's result)?

4. Is it the case that natural infection leads to a broader diversity of Abs than spike-only mRNA vaccines, which cannot possibly induce a broad immune response against SARS-CoV-2?

5. Does the dominance of IgG4 following mRNA vaccination compromise clinical outcomes?

6. Does vaccination exert evolutionary pressure favouring increased transmissibility and/or virulence of SARS-CoV-2?

7. Are prophylaxis and therapies effective in both vaccinated and unvaccinated populations against SARS-CoV-2?

8. Does mRNA vaccination lead to increased rates of autoimmunity or chronic illnesses via pathogenic priming?

I have attempted to answer many questions in this article; but I could, of course, be wrong. Our review of the research raises further (unanswered) questions, which may prompt future research. Most importantly, to what extent did COVID-19, lockdowns, vaccinations and iatrogenesis contribute to excess deaths? How can we reconcile the literature on pre-existing immunity reducing the severity of COVID-19 outcomes with the literature on original antigenic sin that increasingly suggests that pre-existing immunity leads to more severe outcomes? Why are vaccination programmes apparently increasing the rate of cases of COVID-19? To what degree do the various hypotheses mentioned above contribute? Why have the middle-aged (but not the elderly) in Europe and the US experienced a sustained increase in all-cause mortality throughout 2021 and beyond? It could be due to COVID-19, lockdown-induced delayed healthcare, adverse reactions from vaccinations or because vaccinations compromise immunity. Did encountering the Delta then Omicron variants trigger further deterioration in the vaccinated, or was it unrelated to vaccines? The timing and age category might suggest that vaccinations compromising immunity, in particular, might be worthy of further investigation. Is it the case that lockdowns, face masks and vaccinations have all killed more people than they have saved, and we would have been better off doing nothing? I think this is more likely than not. Next time we really should keep calm and carry on.

A Countries

Figures 37 to 272 show lockdown stringency, mask index, vaccination rate, COVID-19 death rate and excess mortality for 239 countries. All data was downloaded from Our World in Data on 1 August 2024.[53]

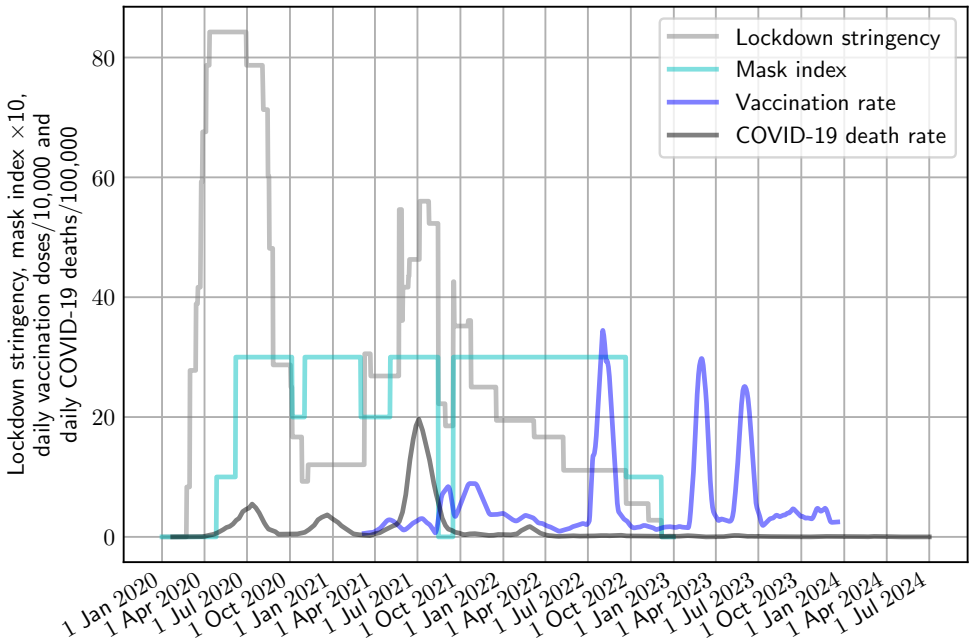

Figure 37: Afghanistan

[53] https://ourworldindata.org/

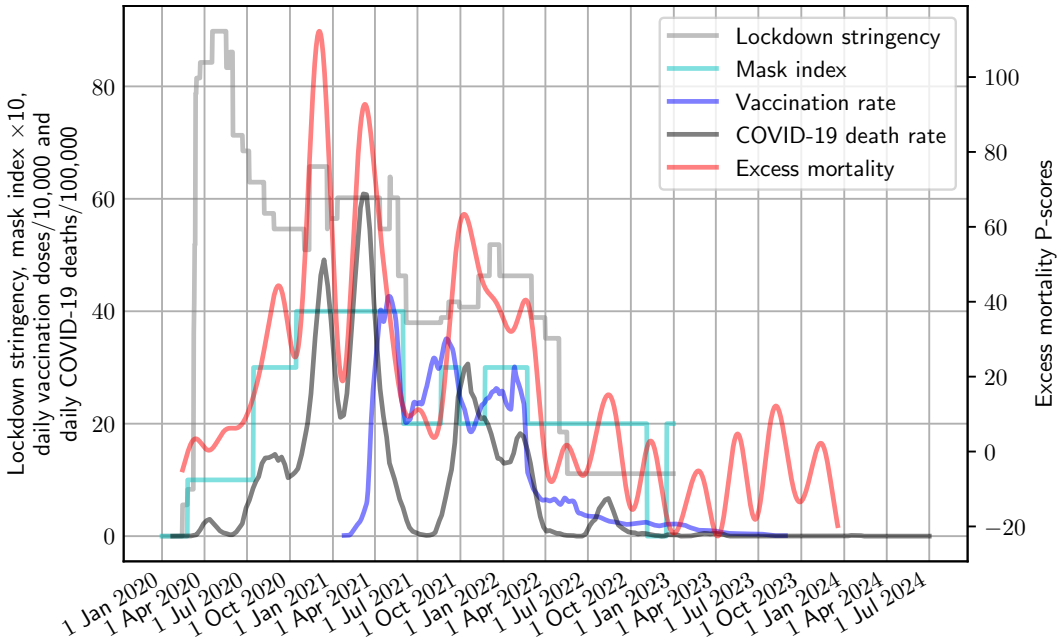

Figure 38: Albania

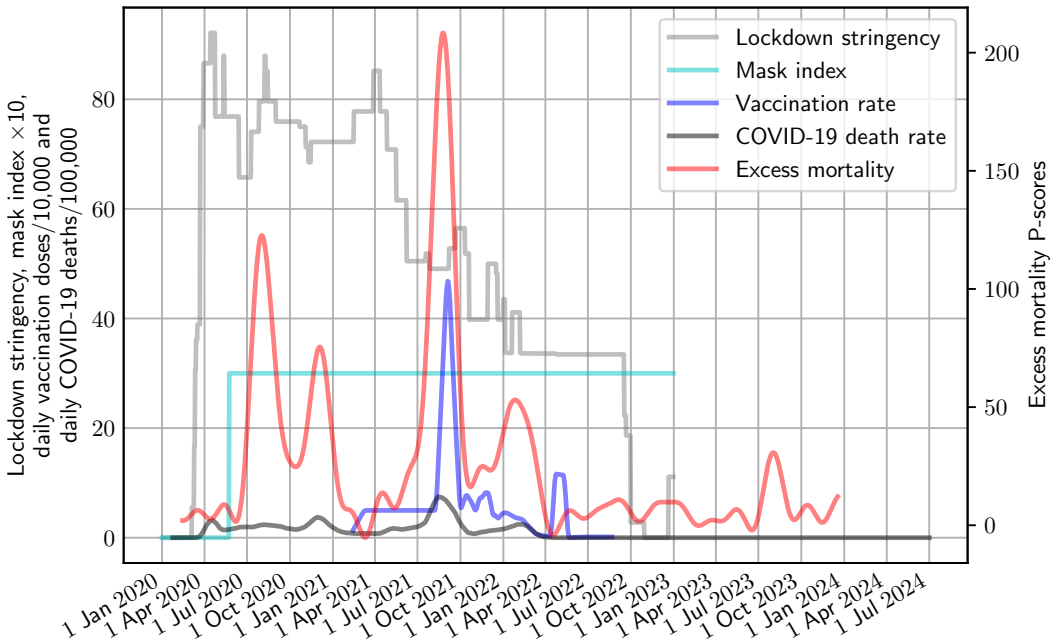

Figure 39: Algeria

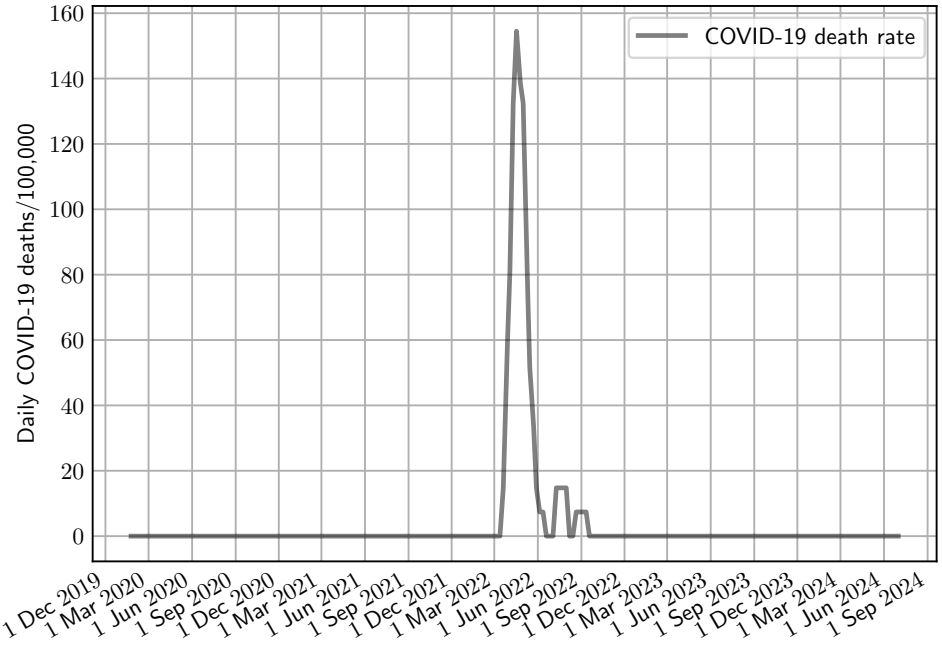

Figure 40: American Samoa

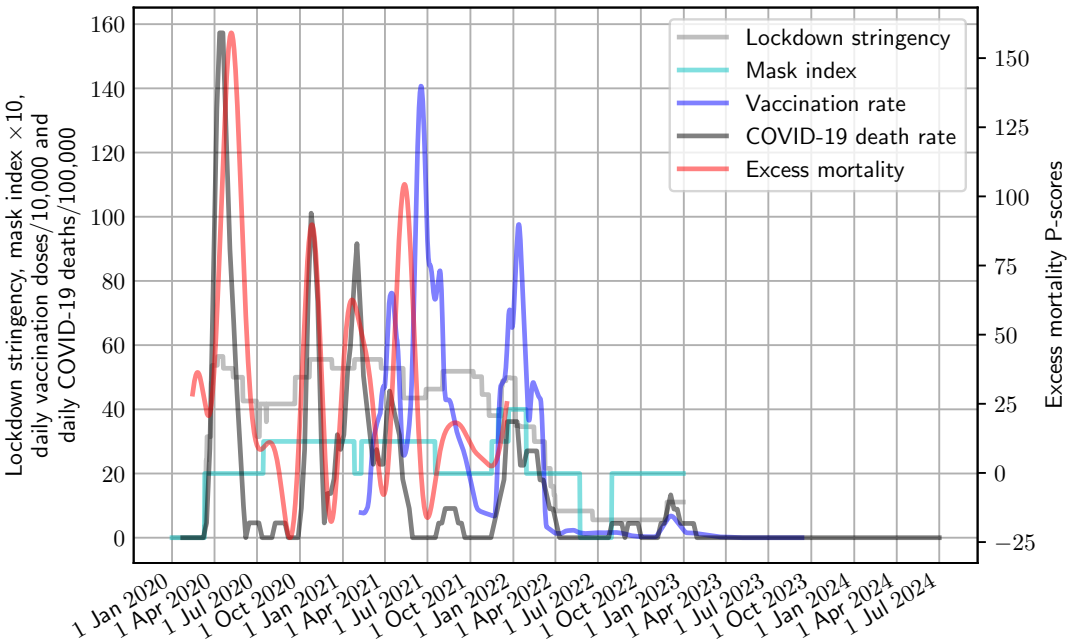

Figure 41: Andorra

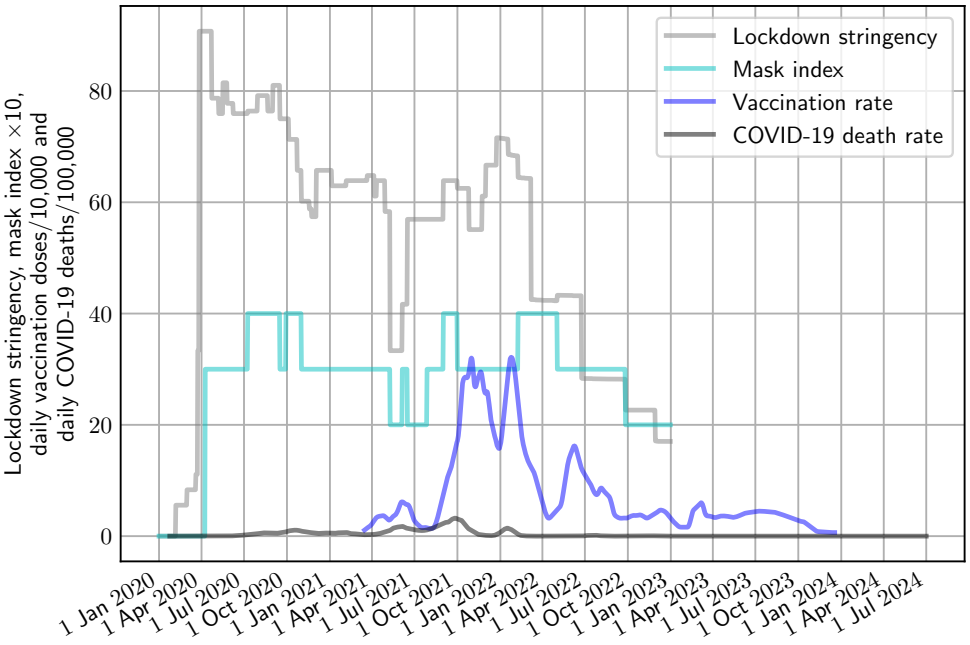

Figure 42: Angola

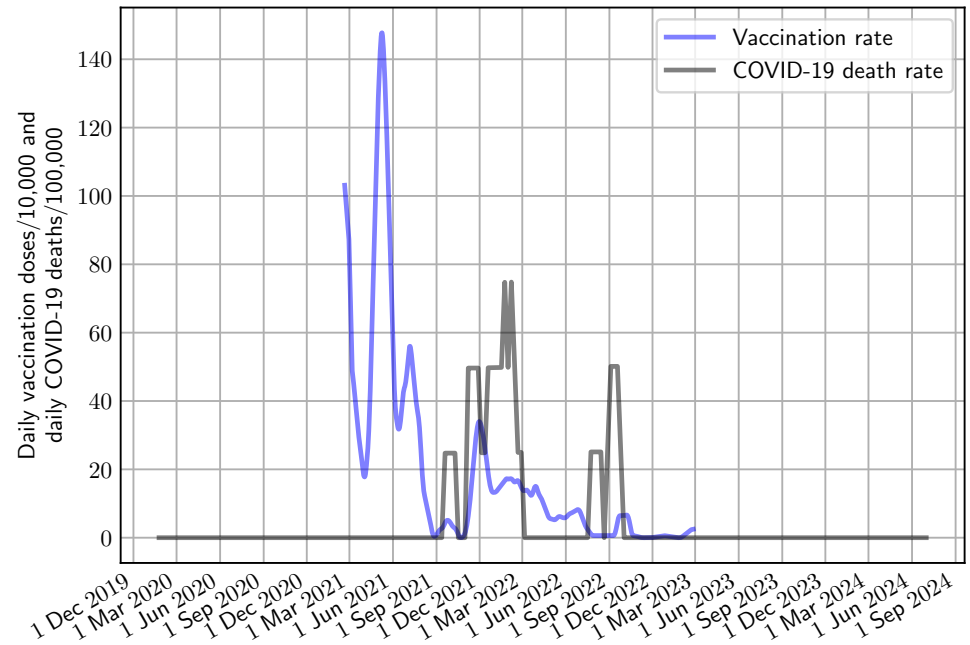

Figure 43: Anguilla

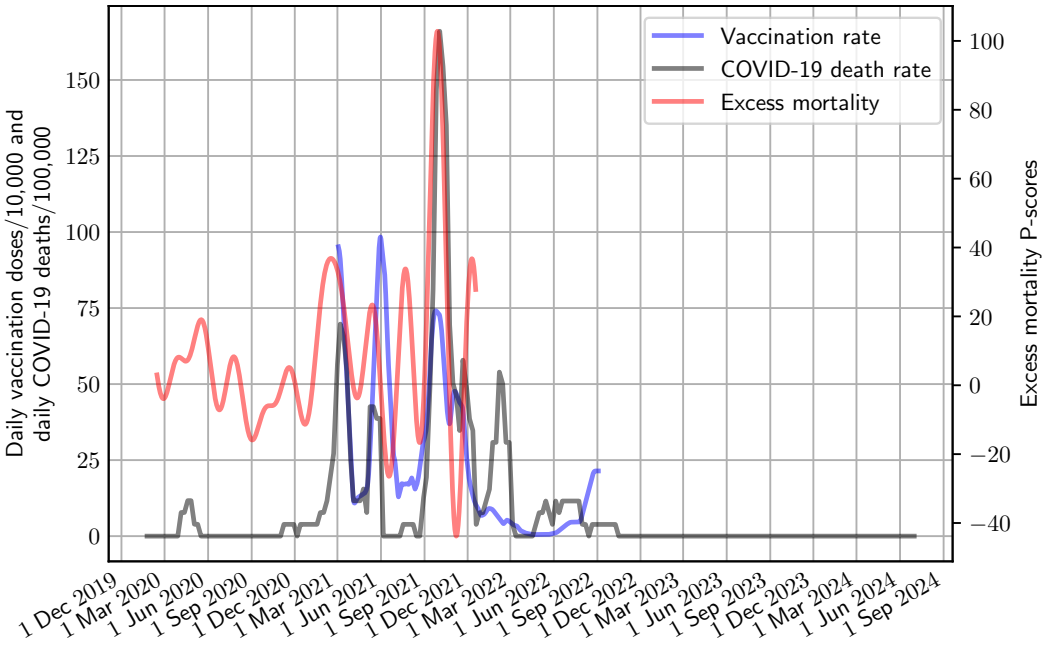

Figure 44: Antigua and Barbuda

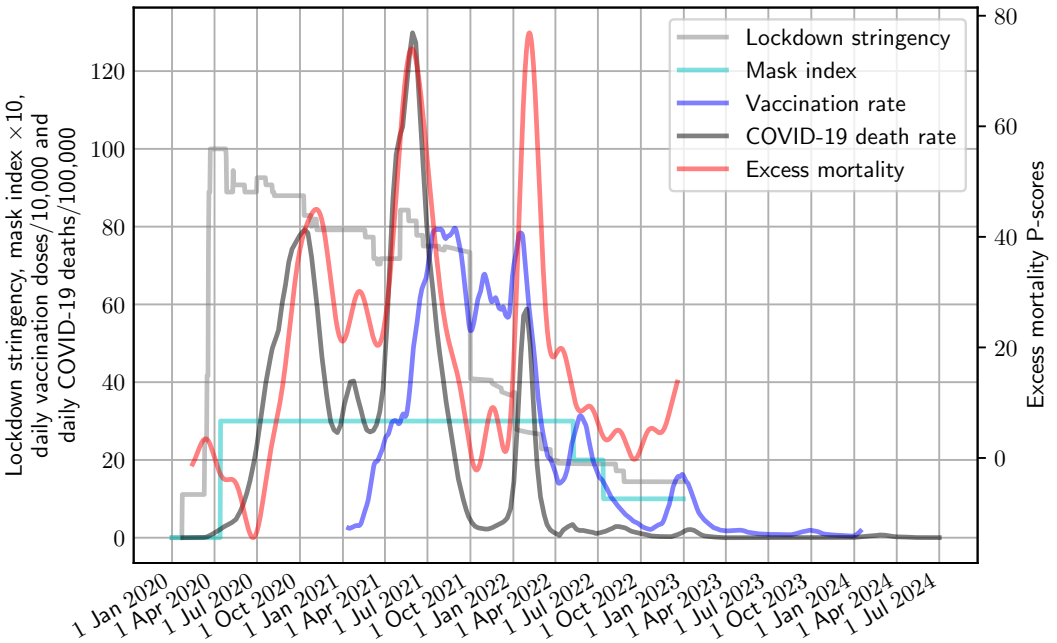

Figure 45: Argentina

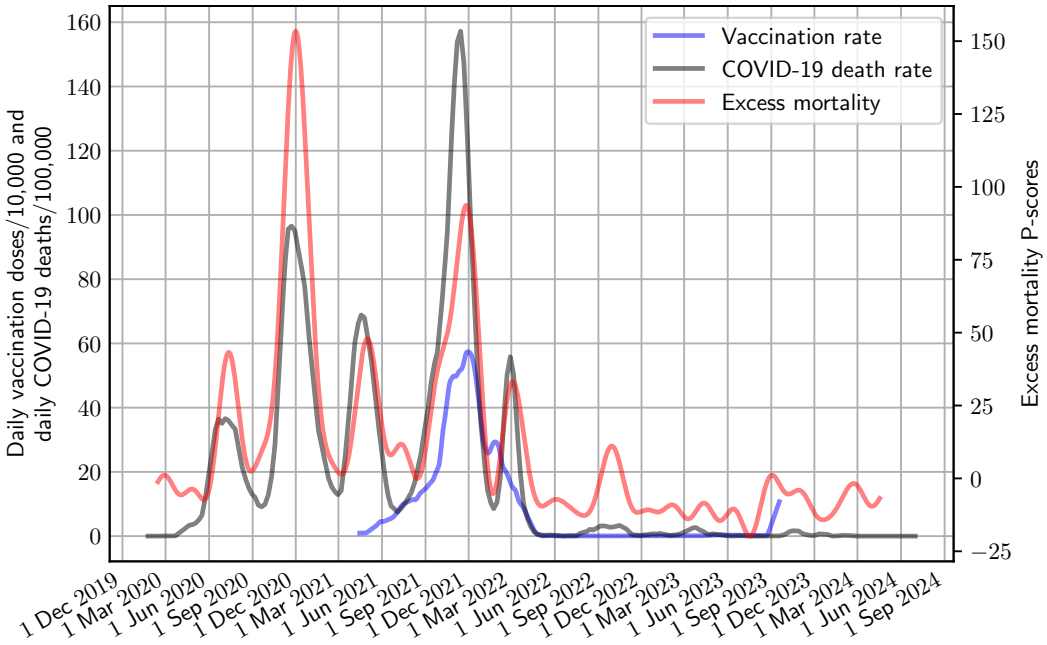

Figure 46: Armenia

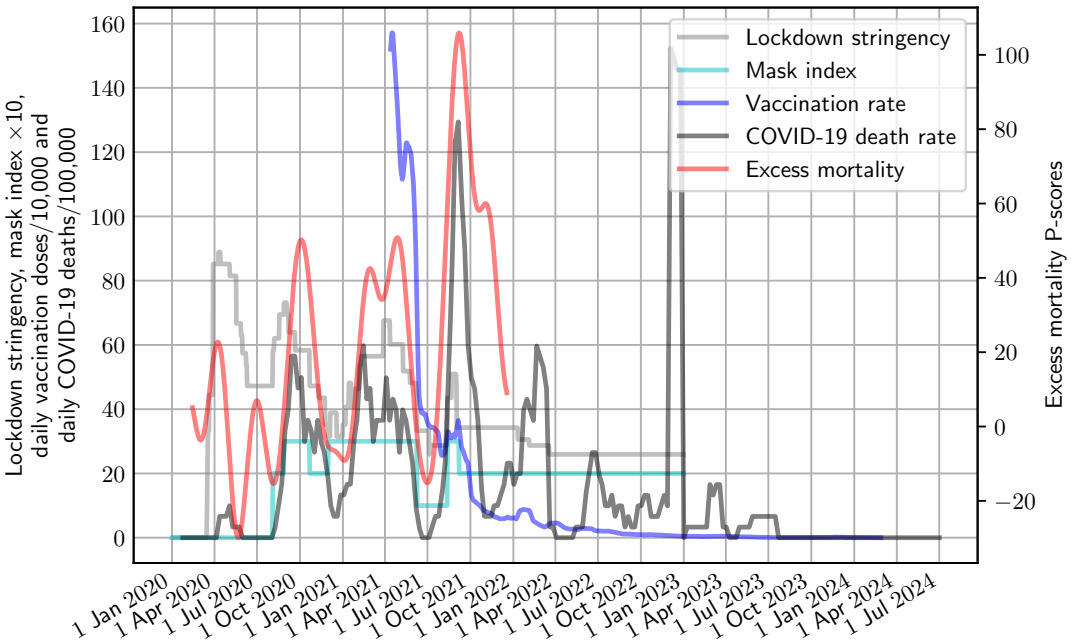

Figure 47: Aruba

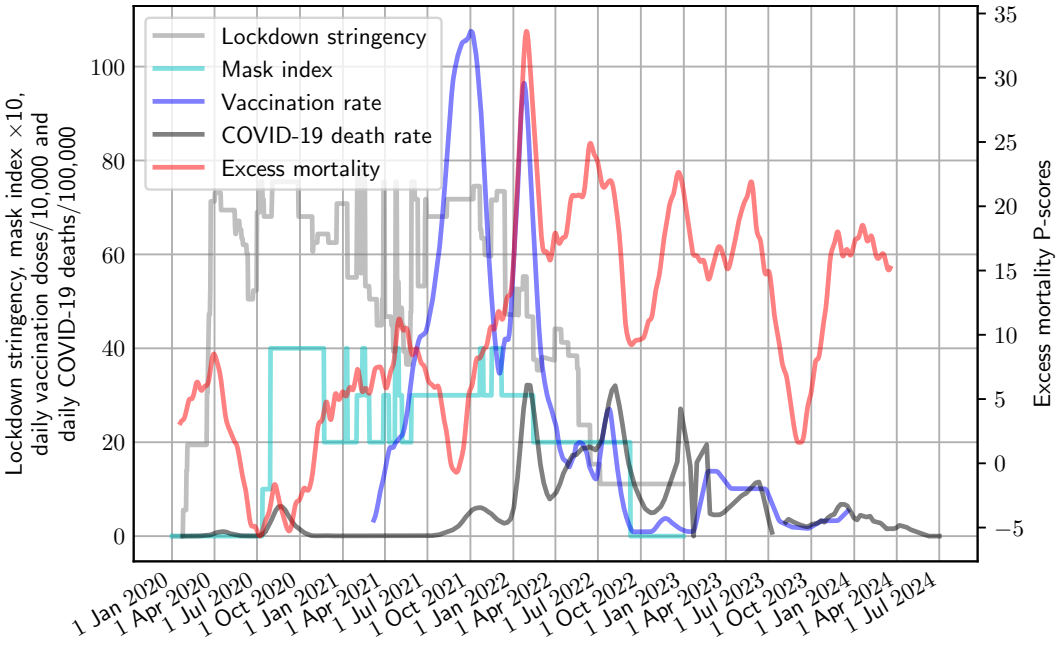

Figure 48: Australia

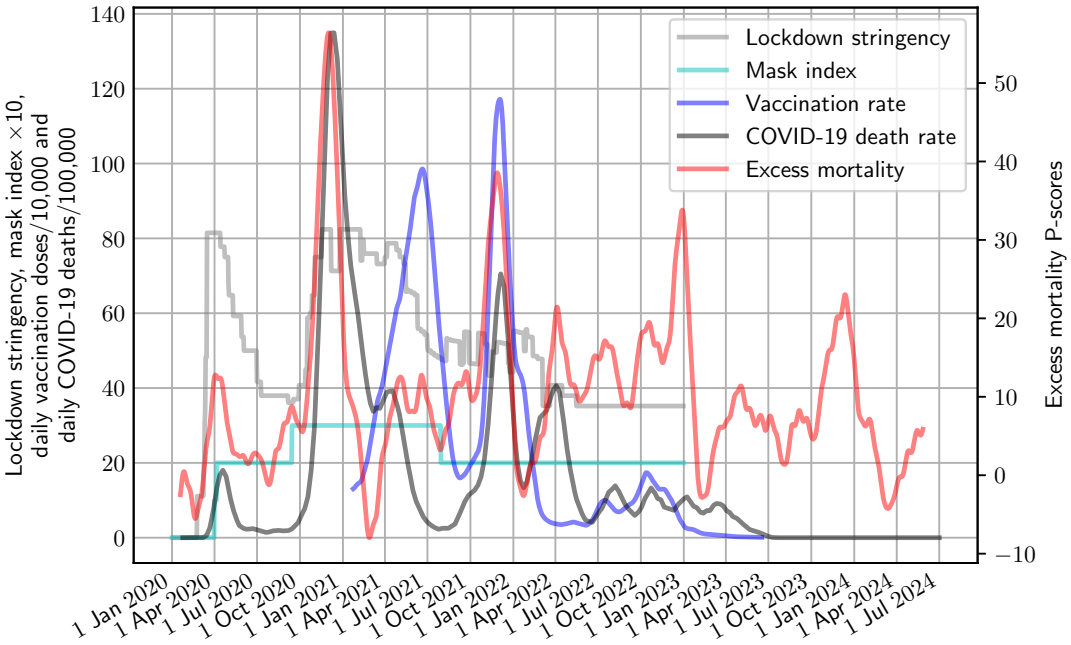

Figure 49: Austria

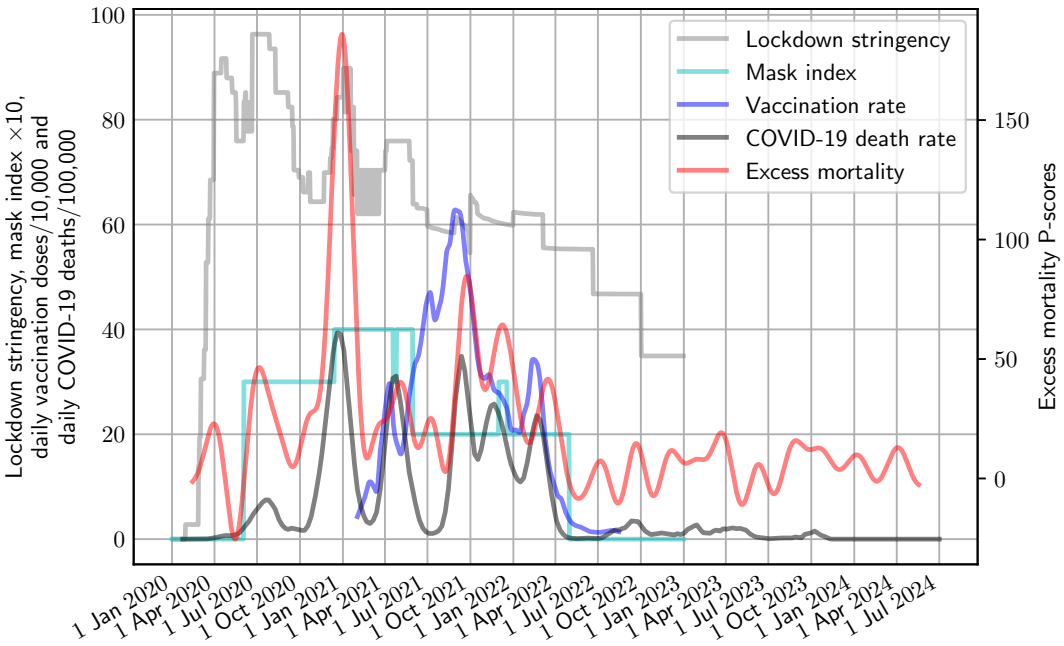

Figure 50: Azerbaijan

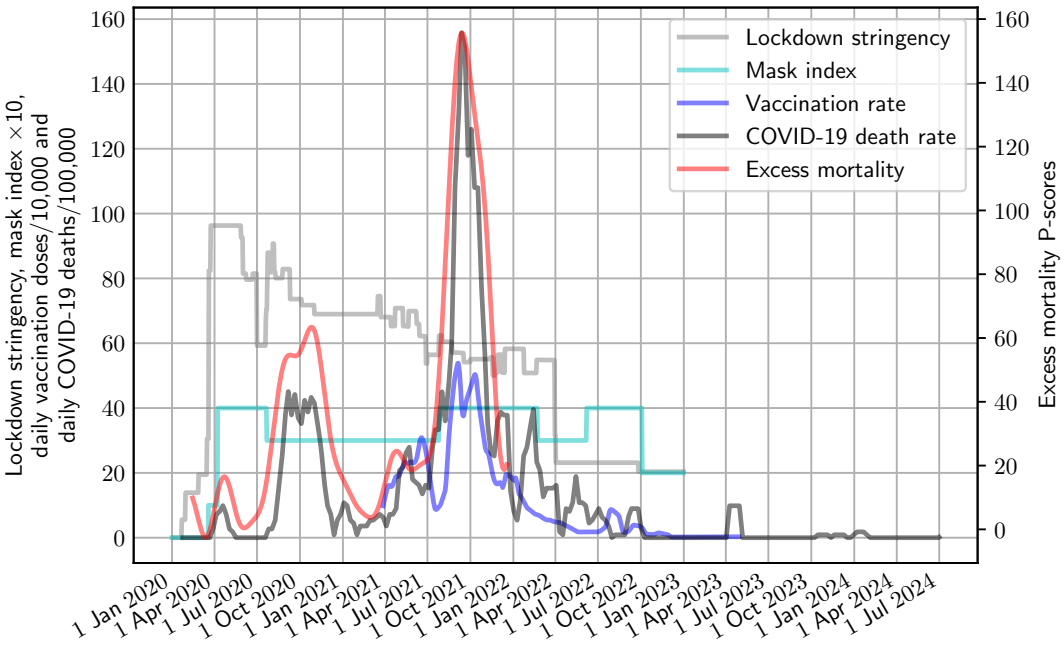

Figure 51: Bahamas

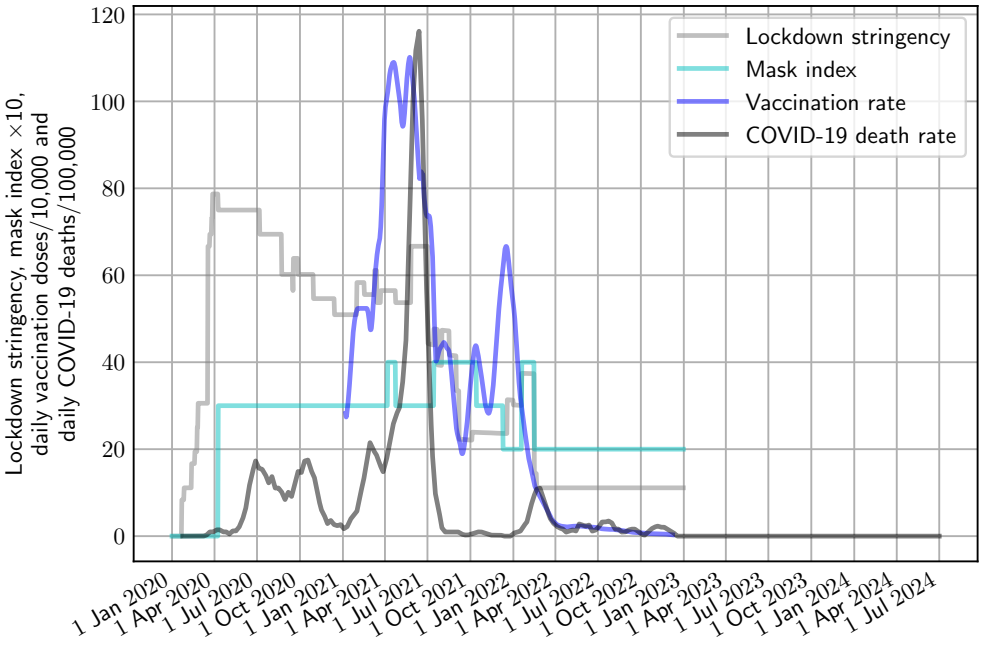

Figure 52: Bahrain

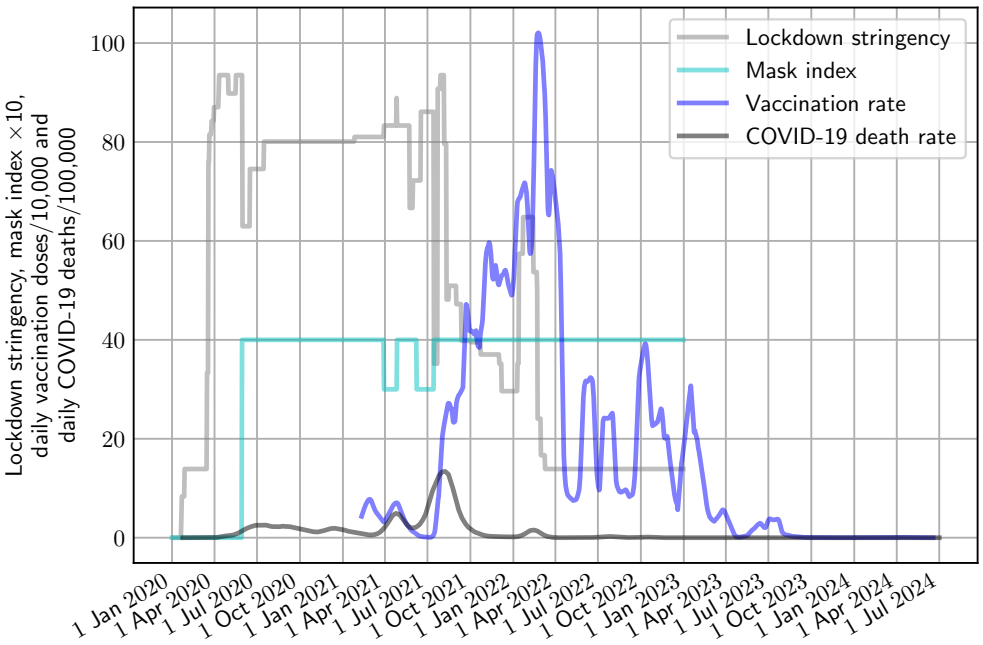

Figure 53: Bangladesh

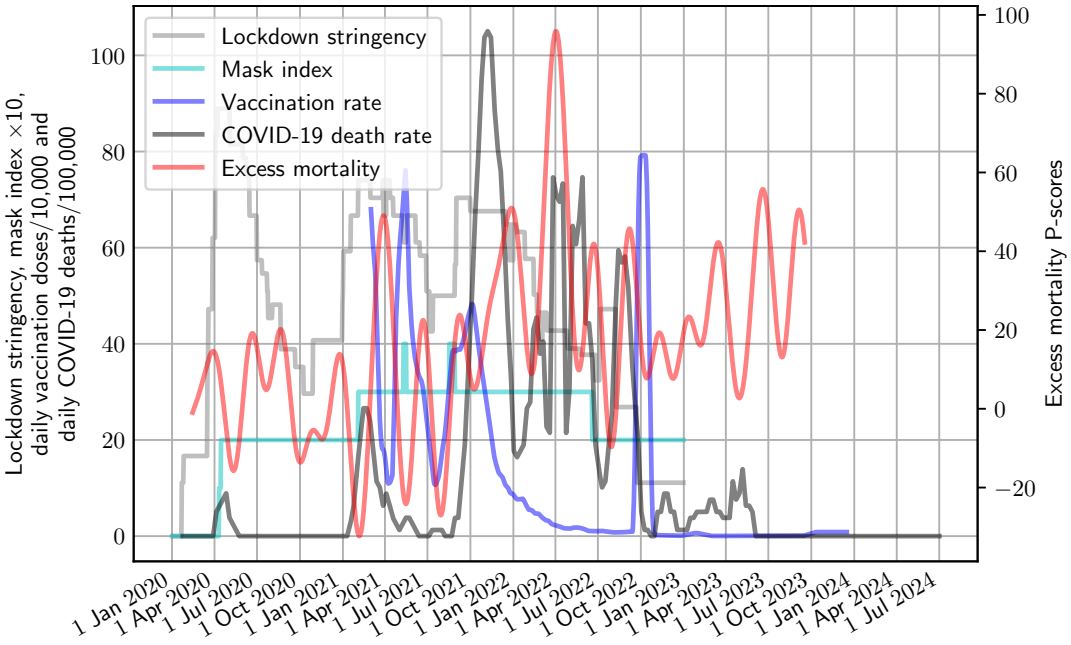

Figure 54: Barbados

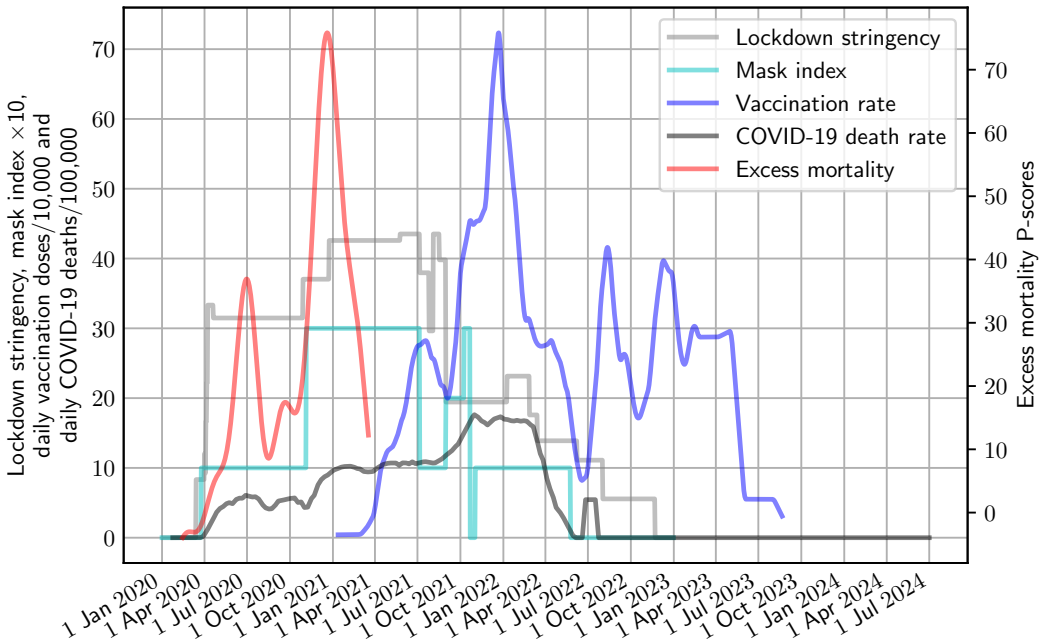

Figure 55: Belarus

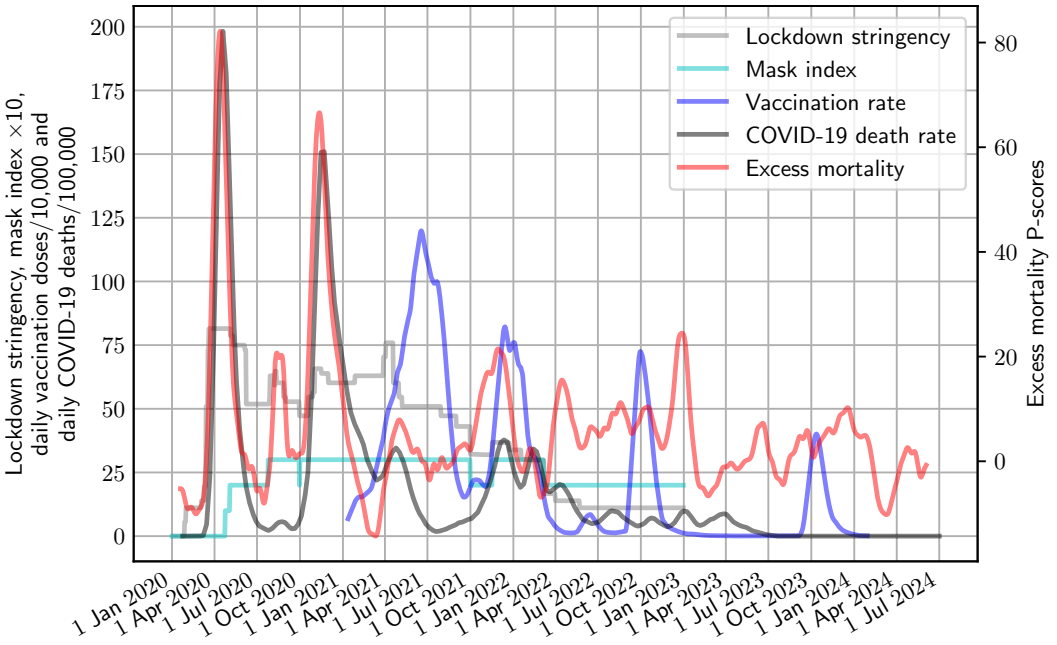

Figure 56: Belgium

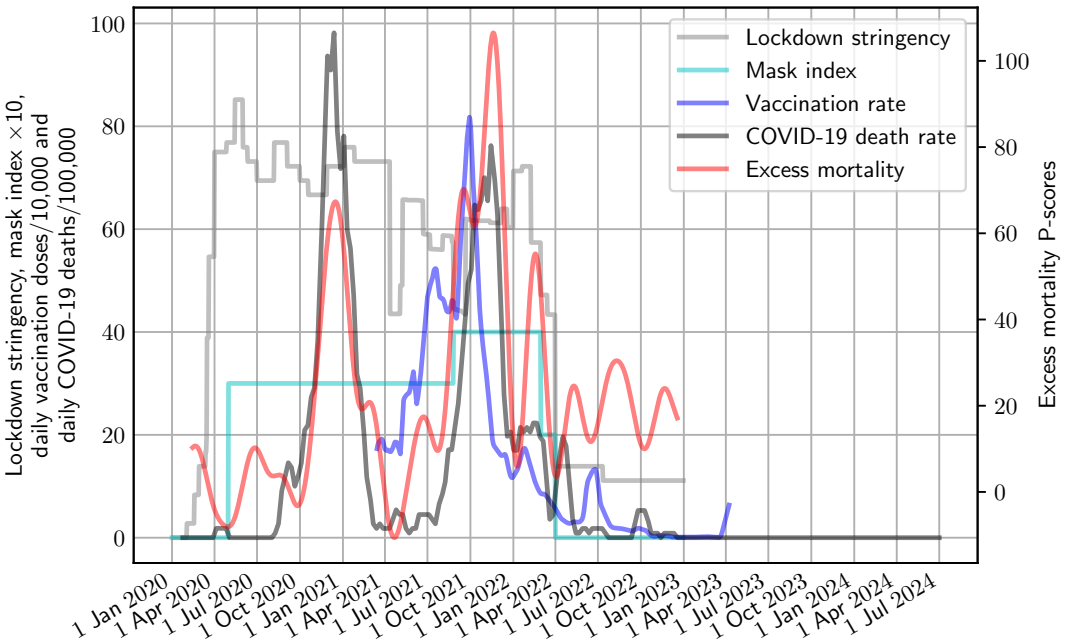

Figure 57: Belize

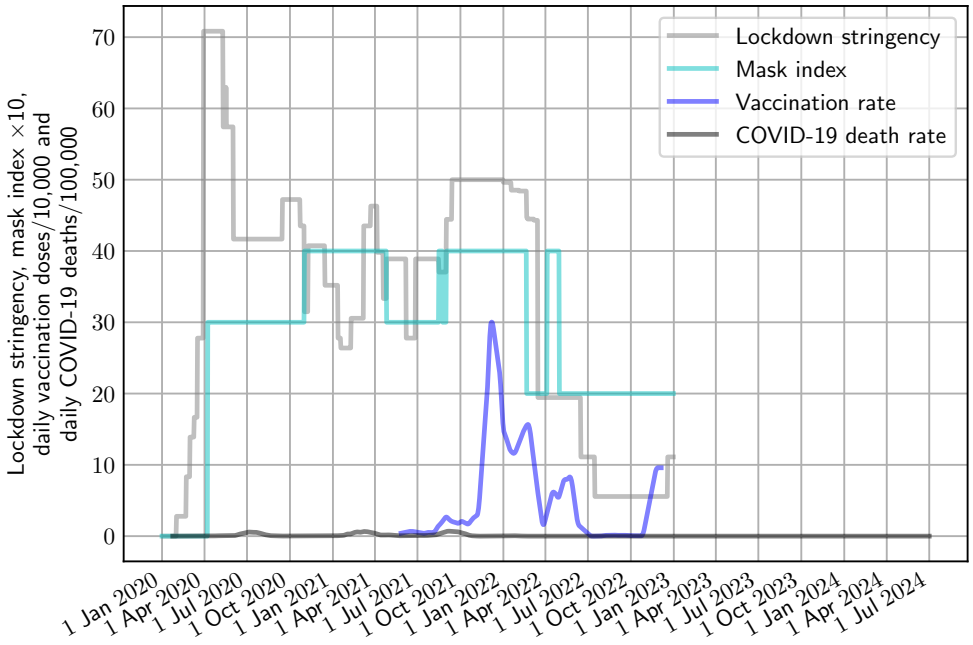

Figure 58: Benin

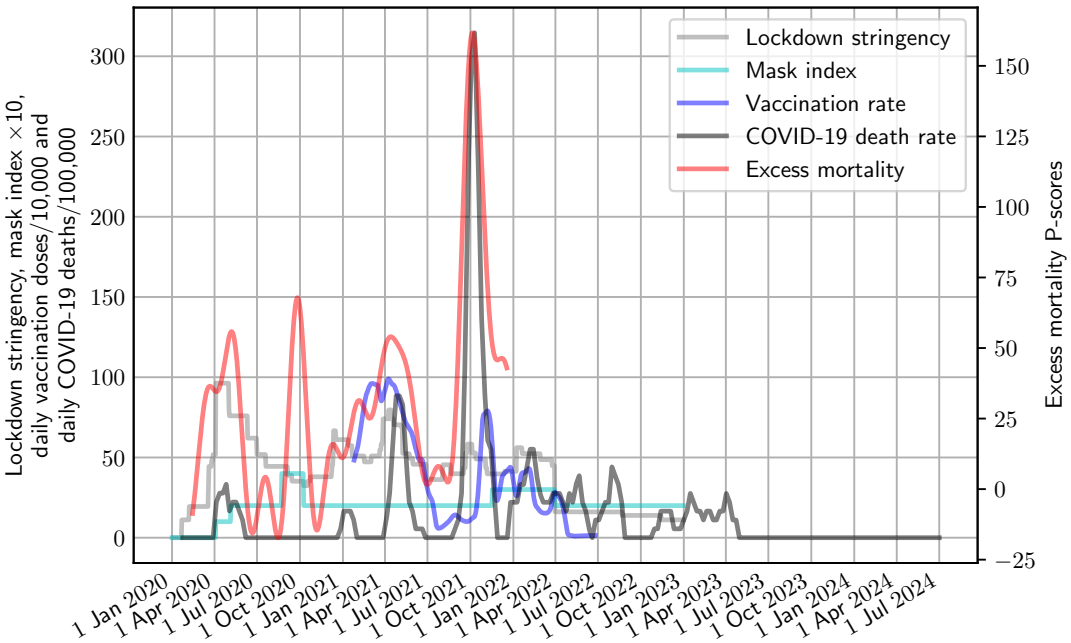

Figure 59: Bermuda

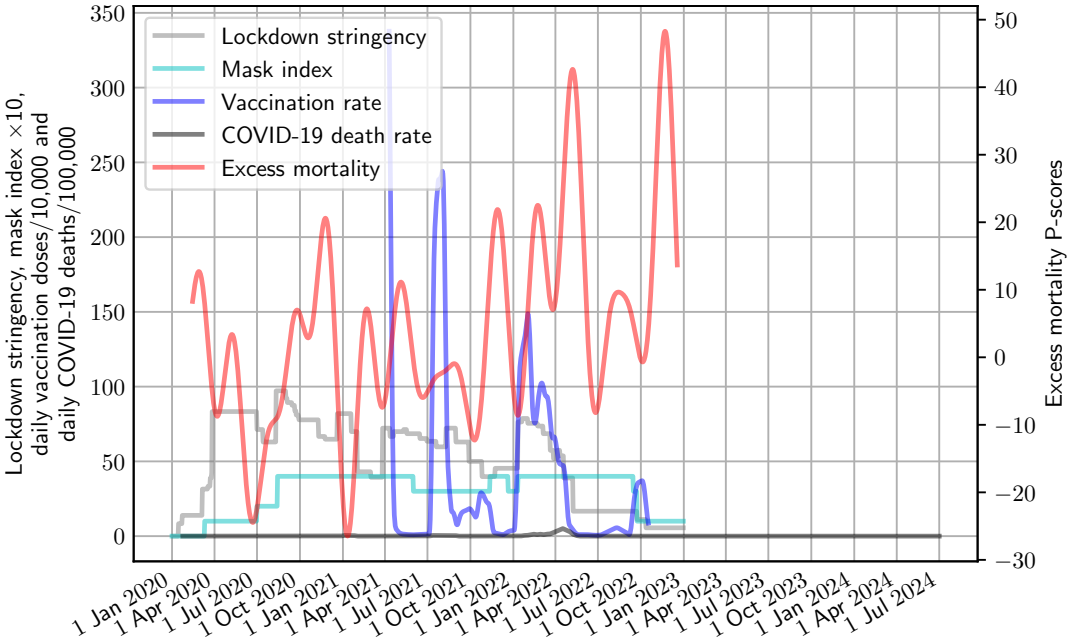

Figure 60: Bhutan

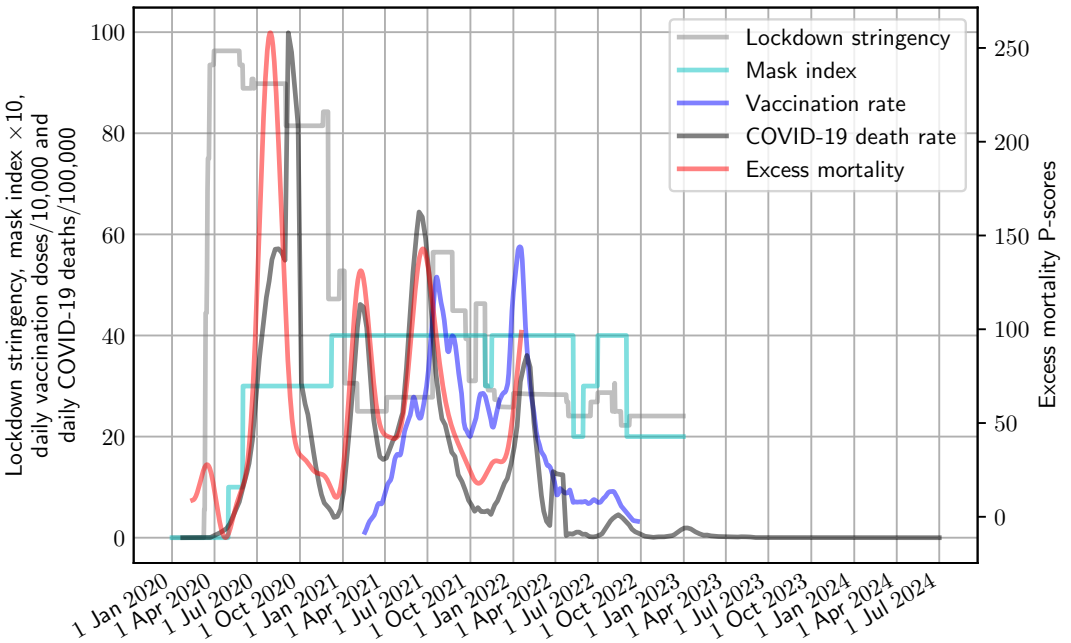

Figure 61: Bolivia

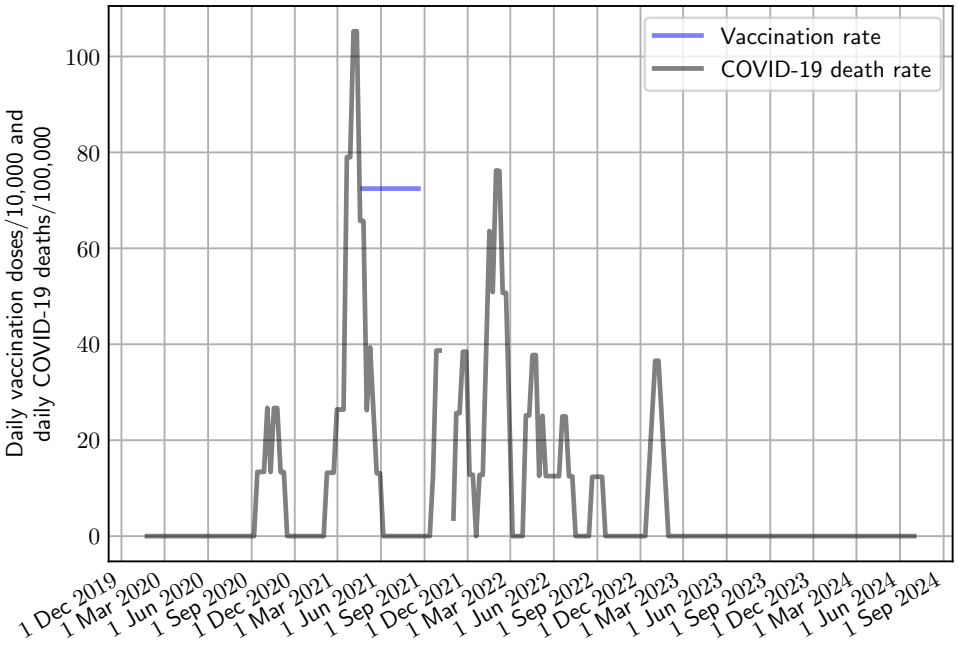

Figure 62: Bonaire Sint Eustatius and Saba

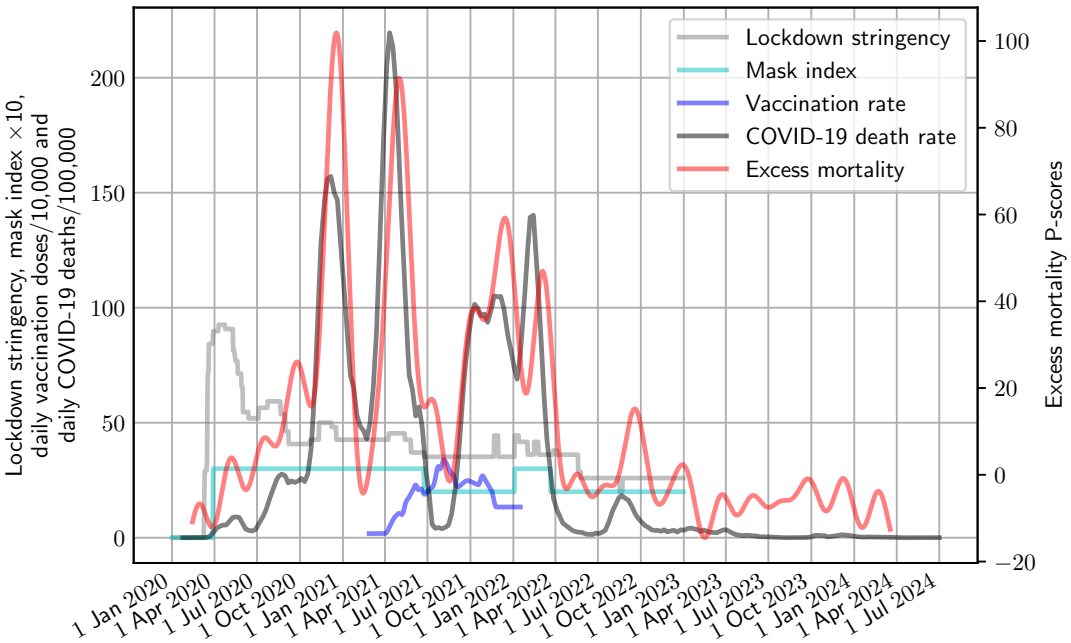

Figure 63: Bosnia and Herzegovina

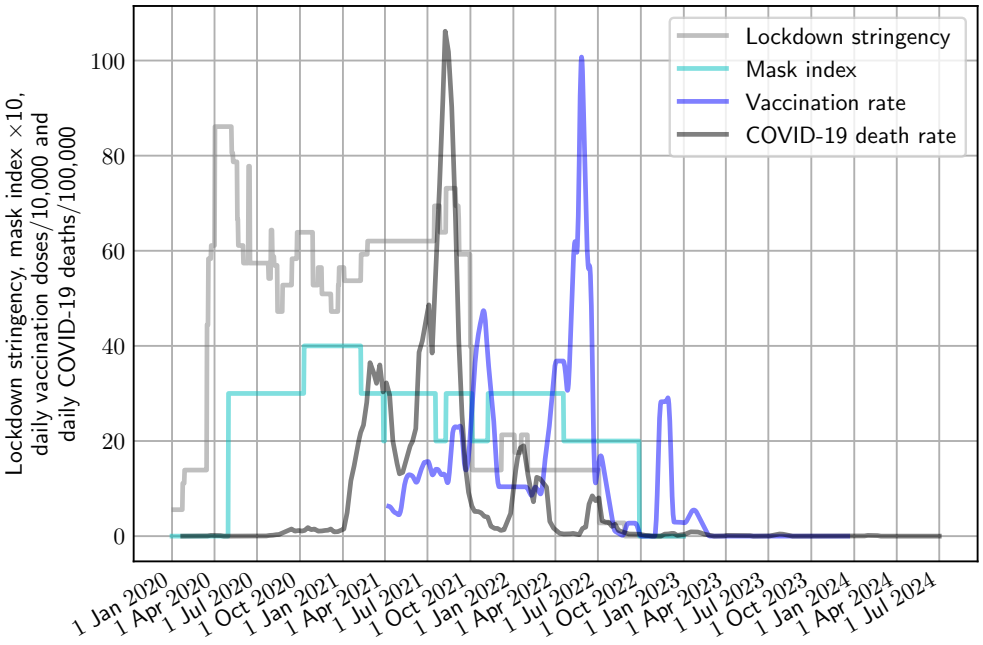

Figure 64: Botswana

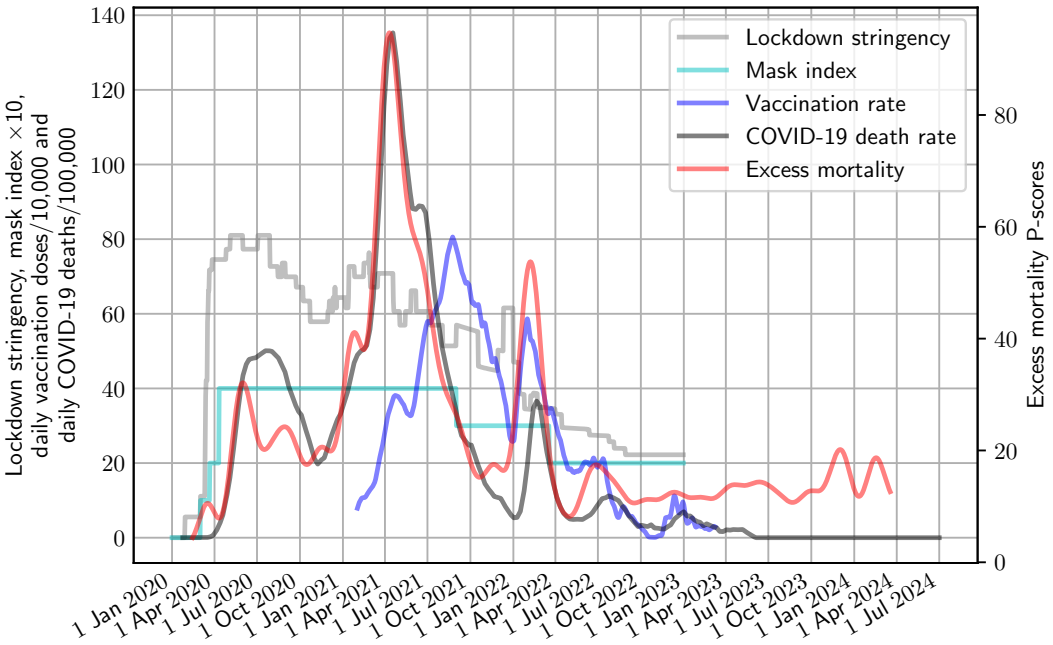

Figure 65: Brazil

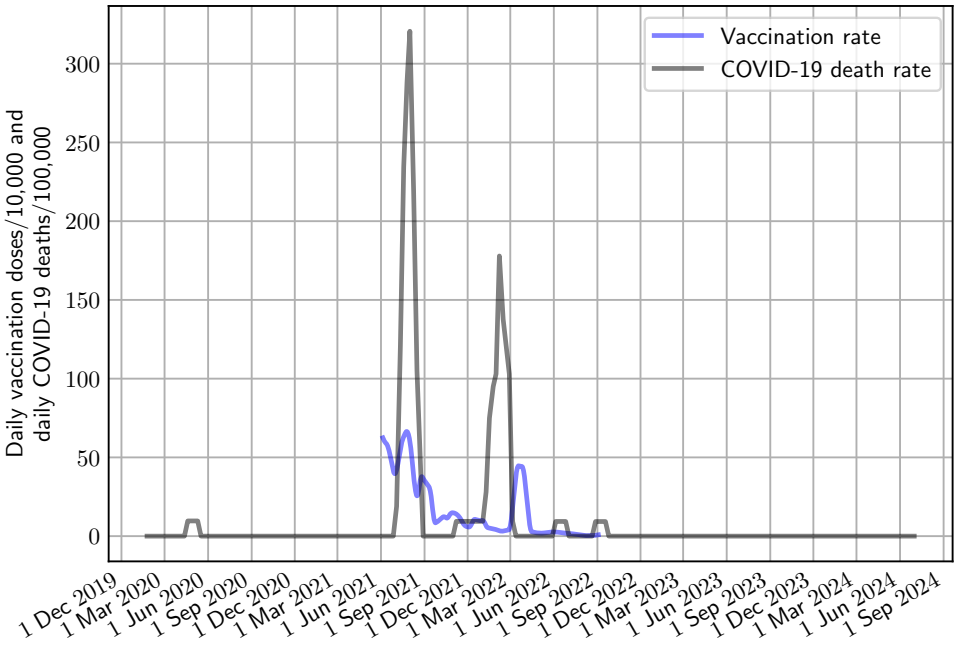

Figure 66: British Virgin Islands

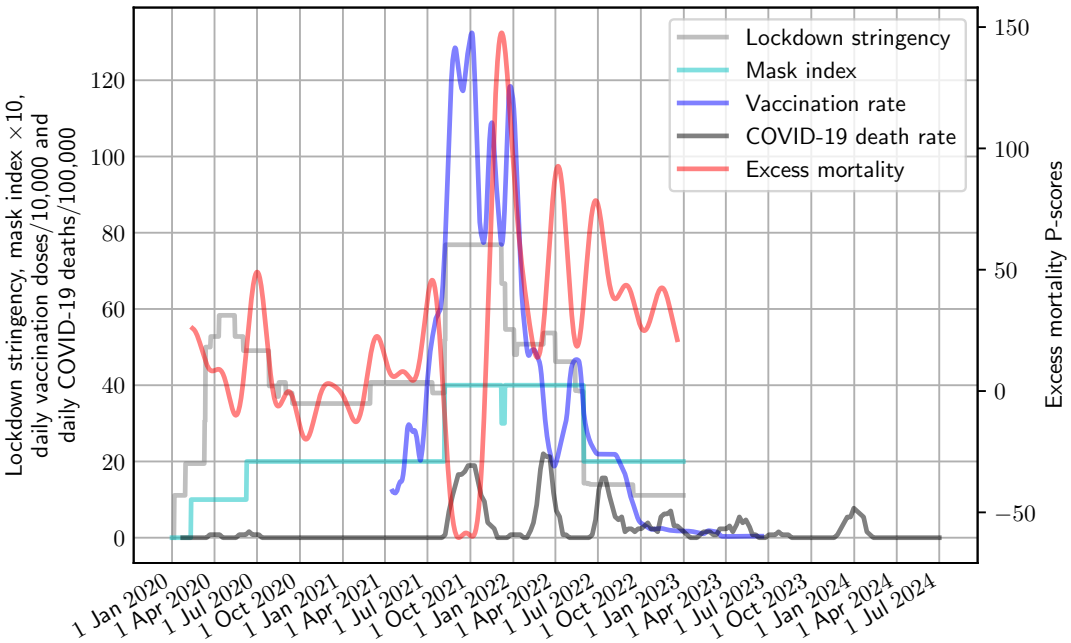

Figure 67: Brunei

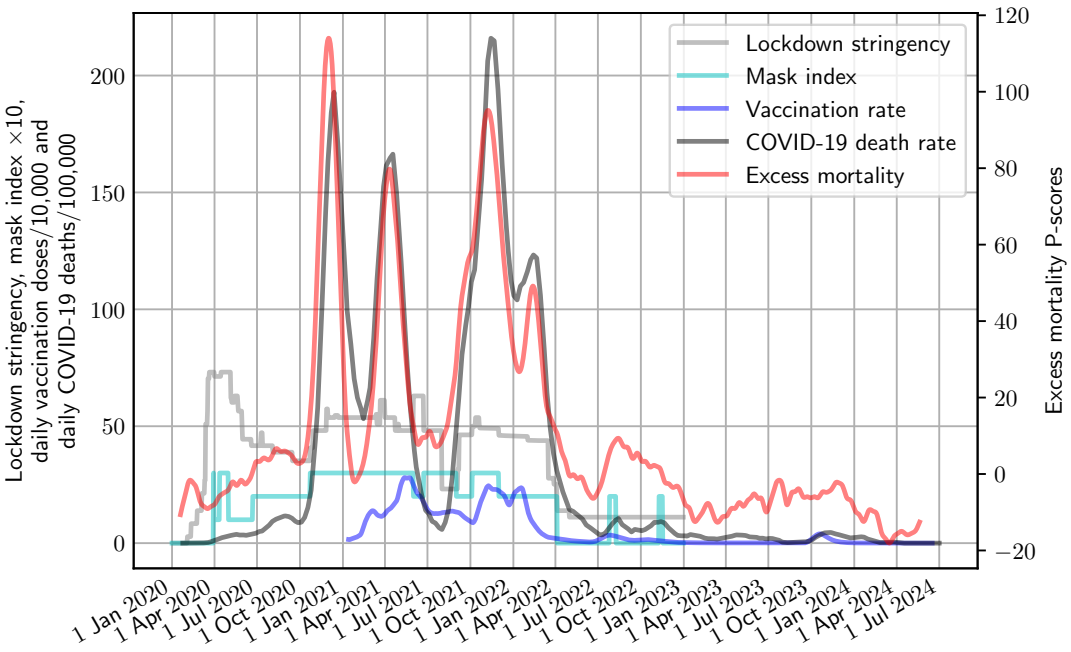

Figure 68: Bulgaria

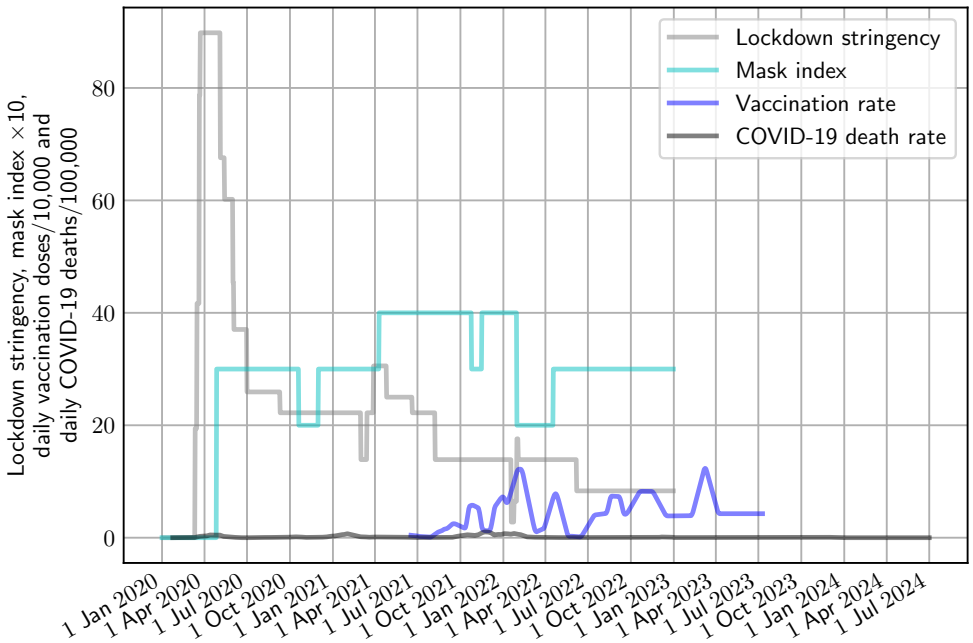

Figure 69: Burkina Faso

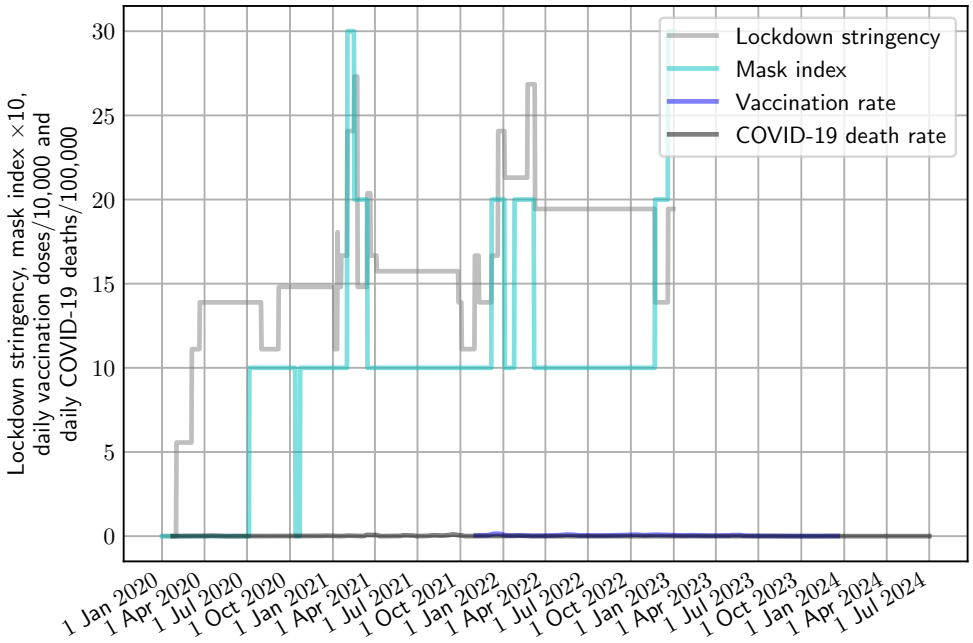

Figure 70: Burundi

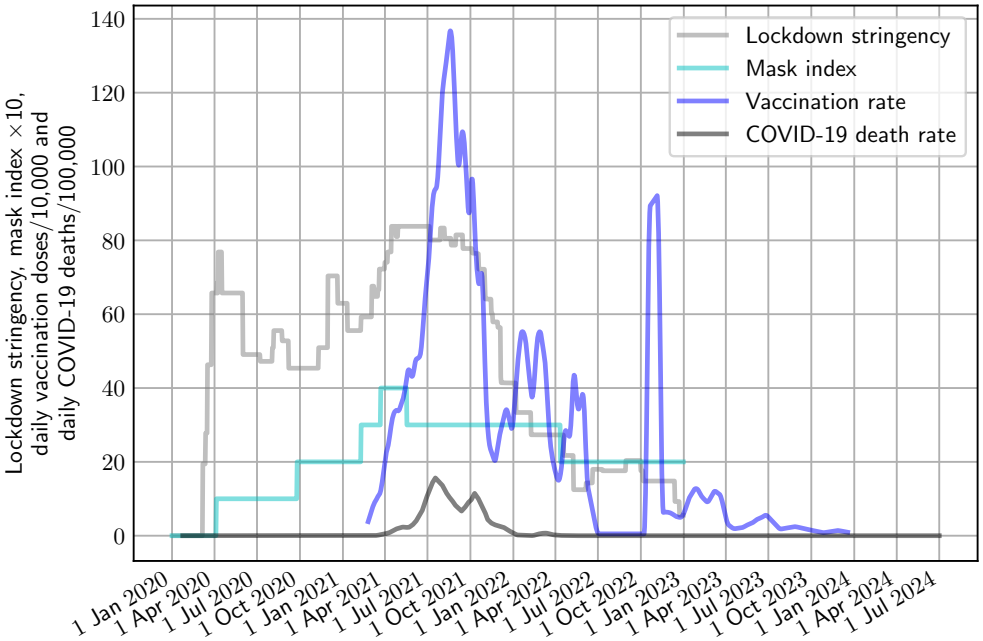

Figure 71: Cambodia

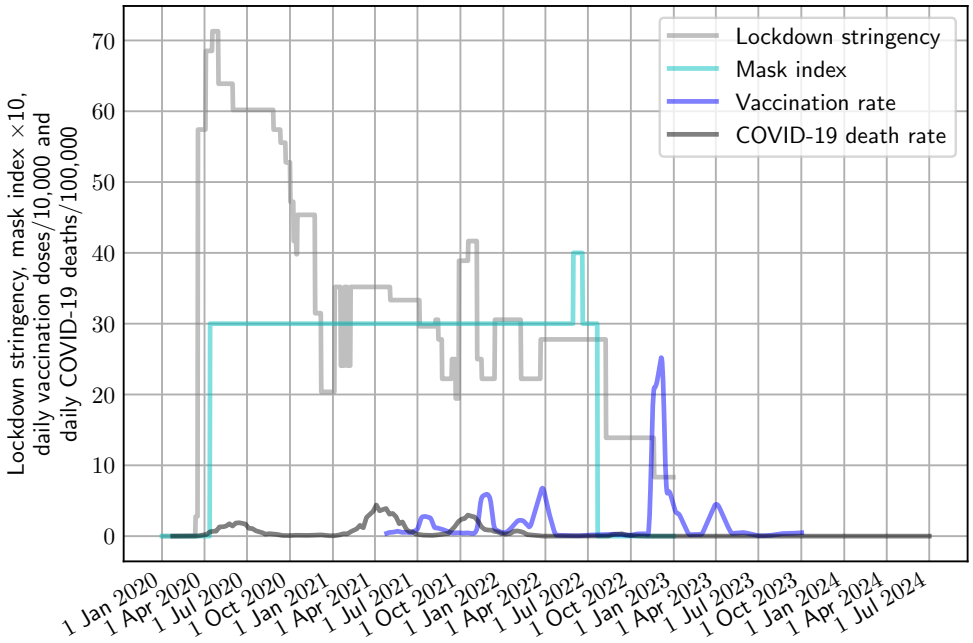

Figure 72: Cameroon

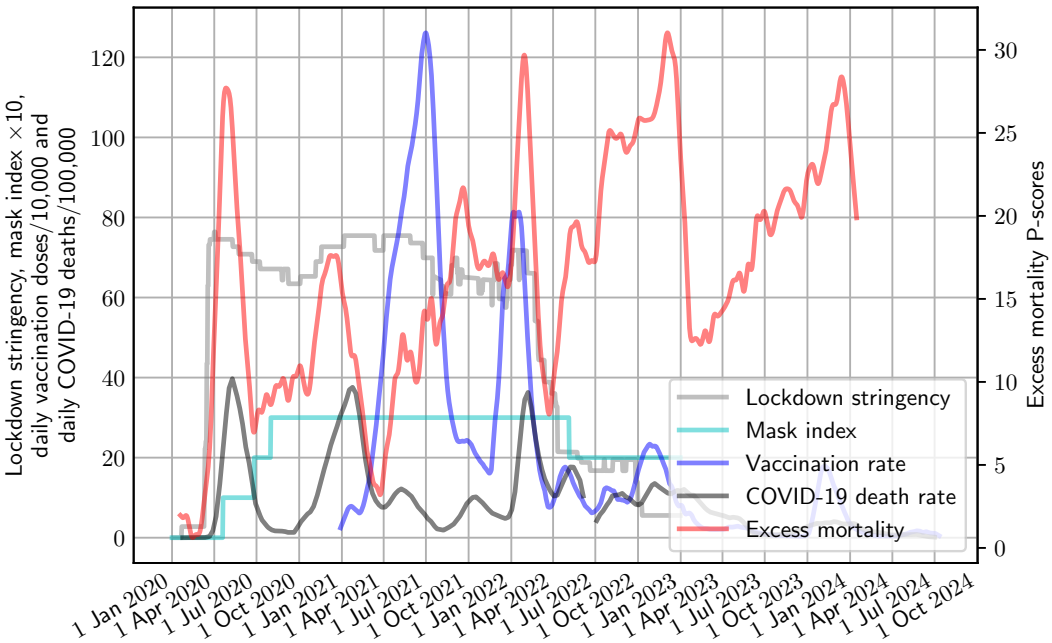

Figure 73: Canada

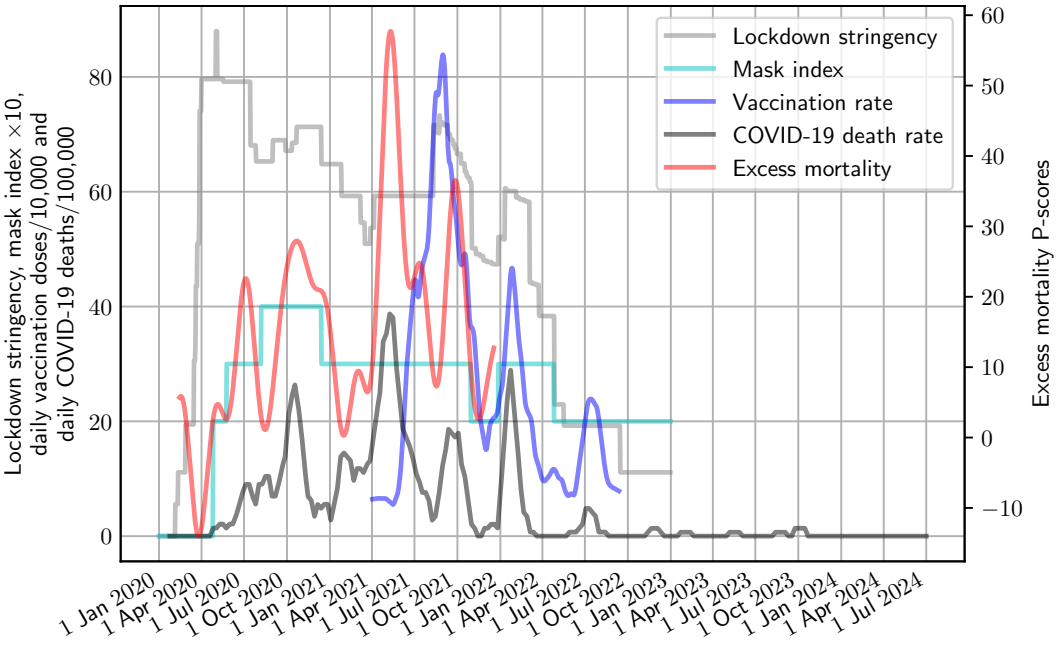

Figure 74: Cape Verde

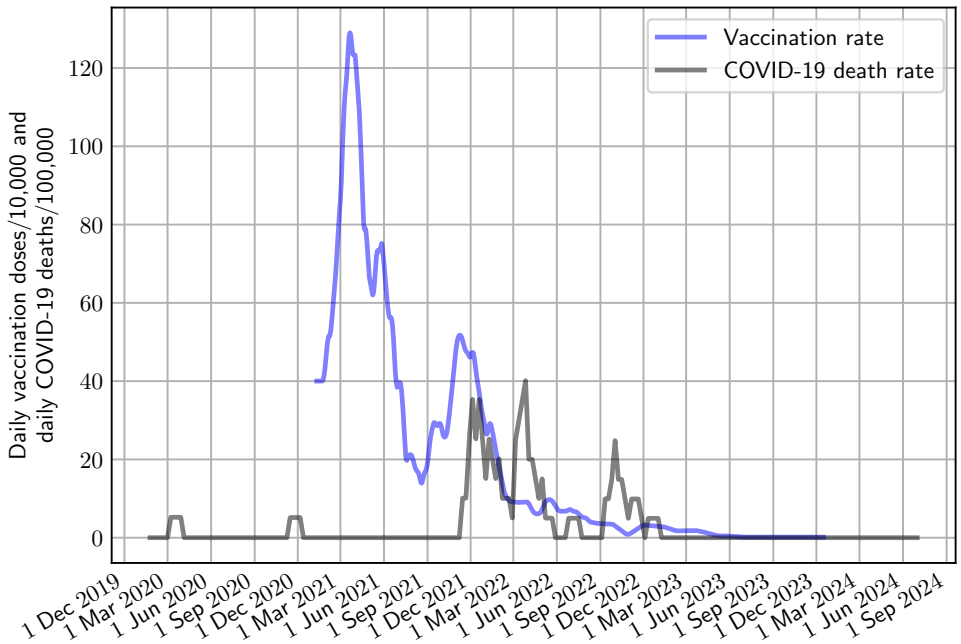

Figure 75: Cayman Islands

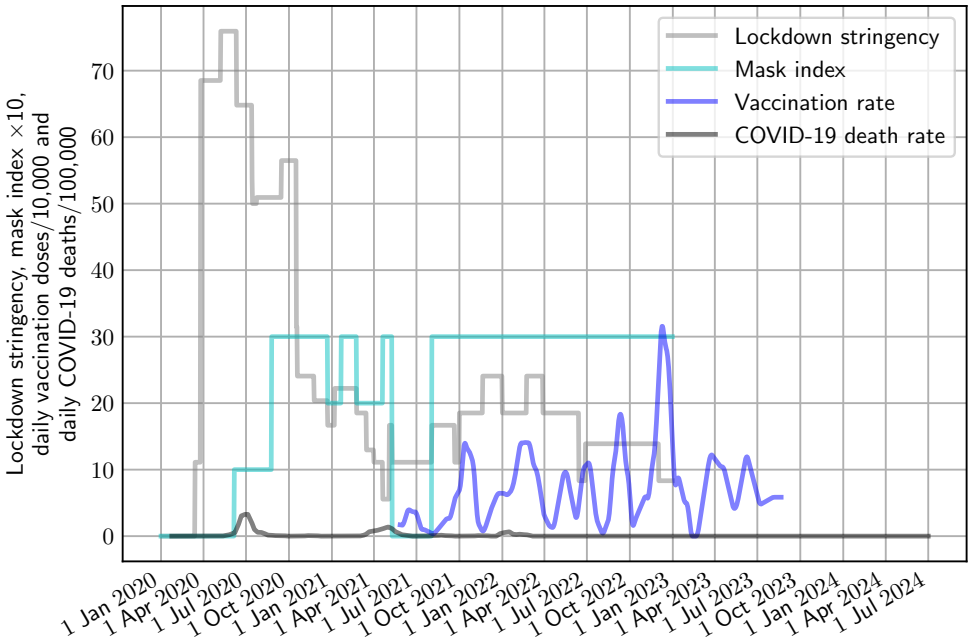

Figure 76: Central African Republic

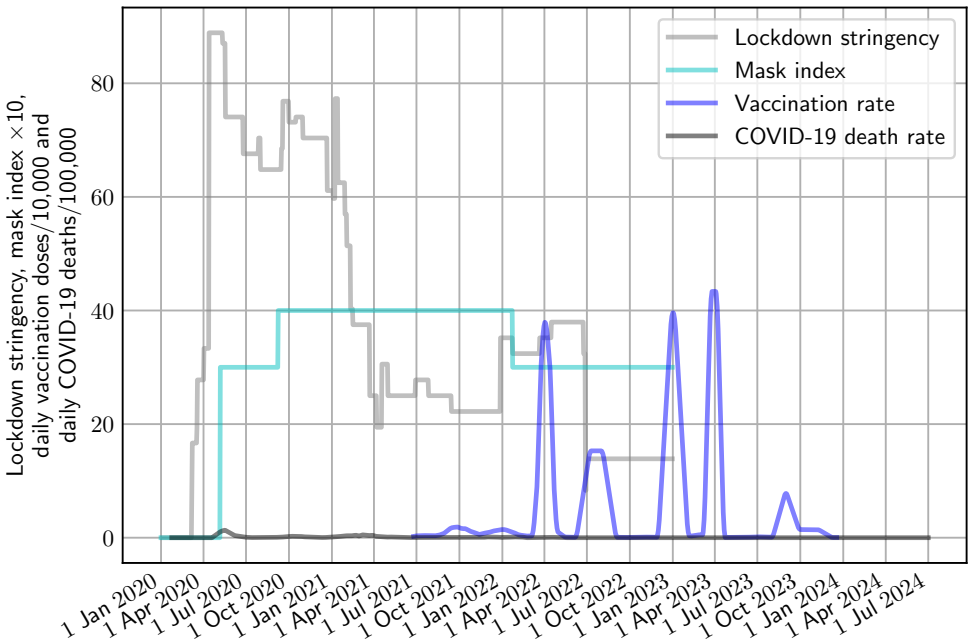

Figure 77: Chad

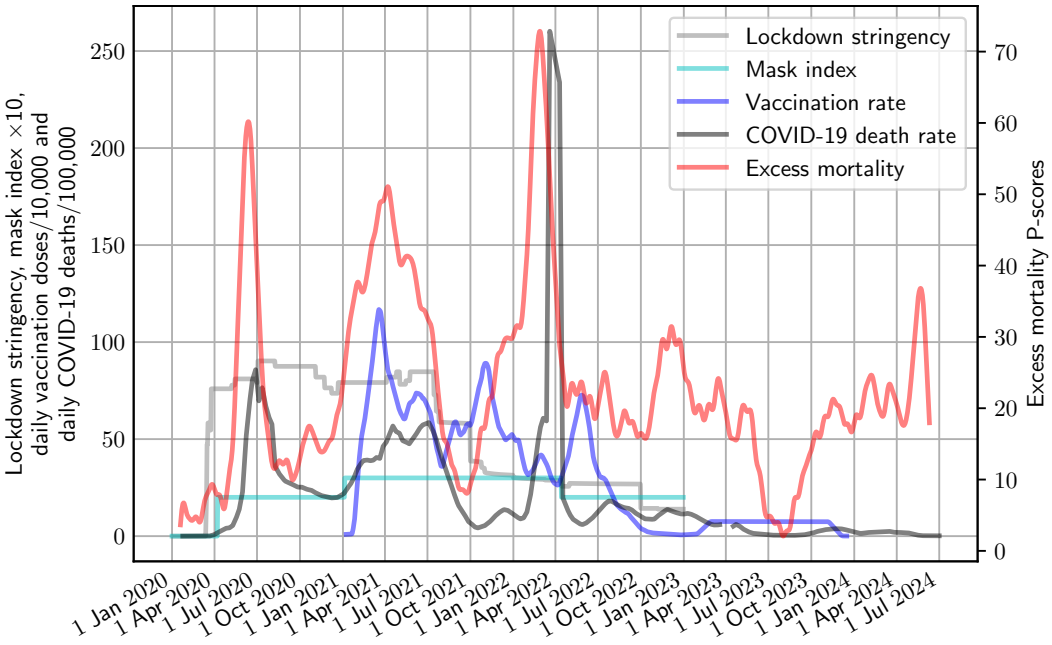

Figure 78: Chile

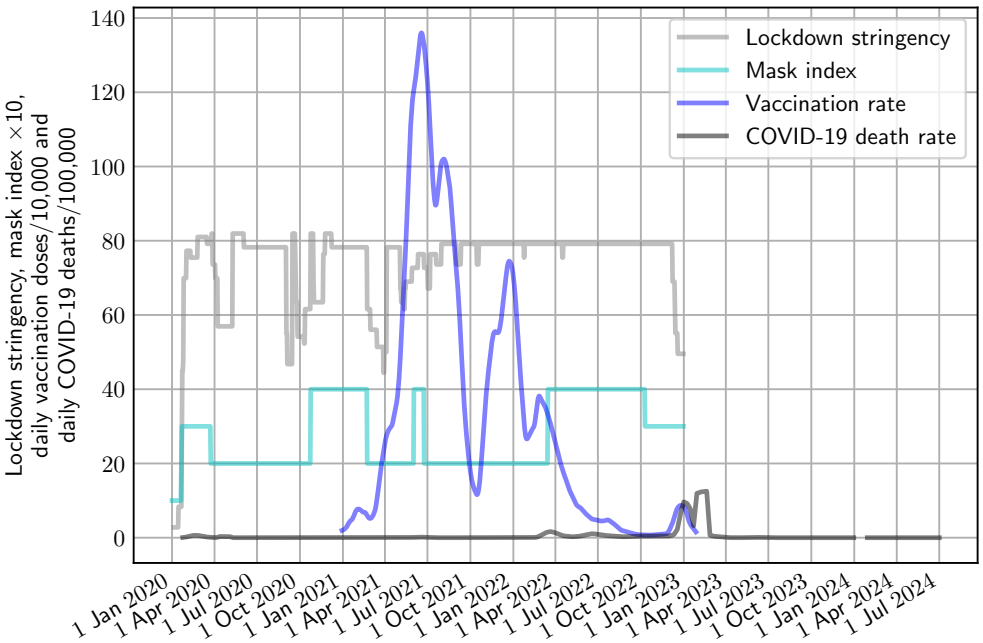

Figure 79: China

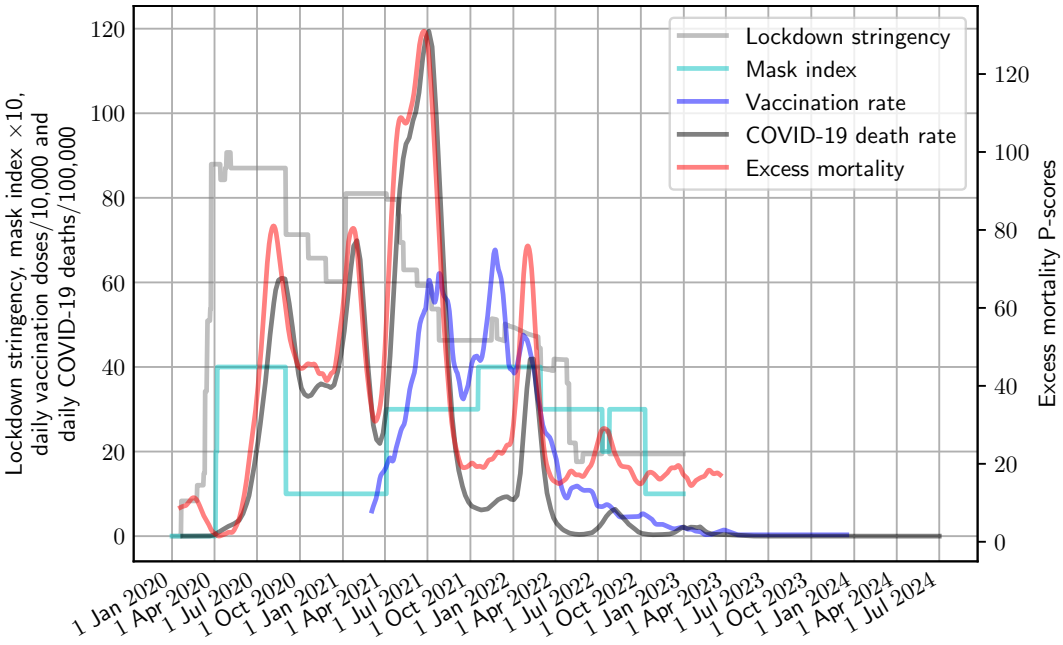

Figure 80: Colombia

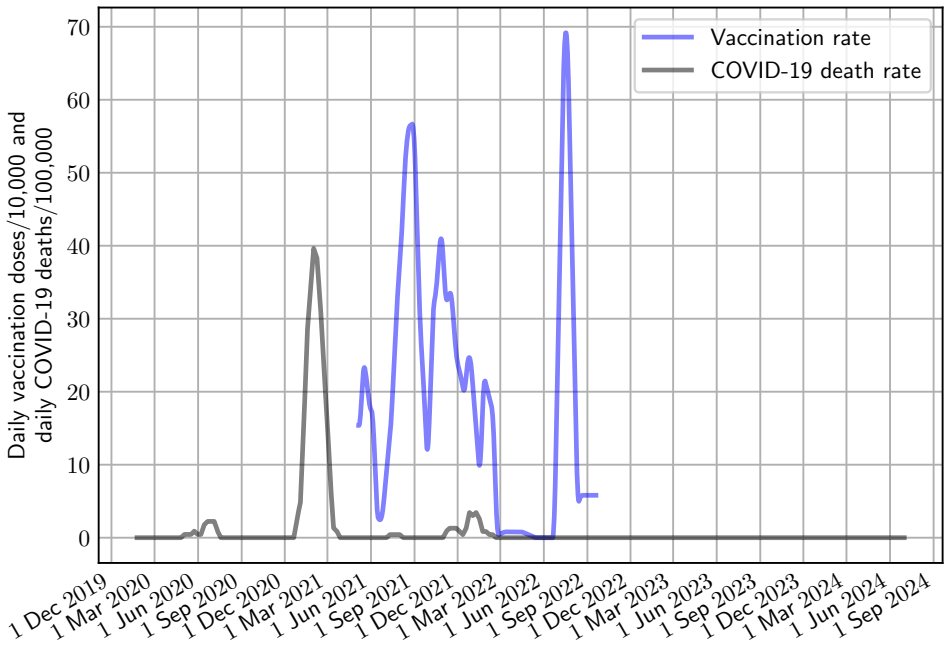

Figure 81: Comoros

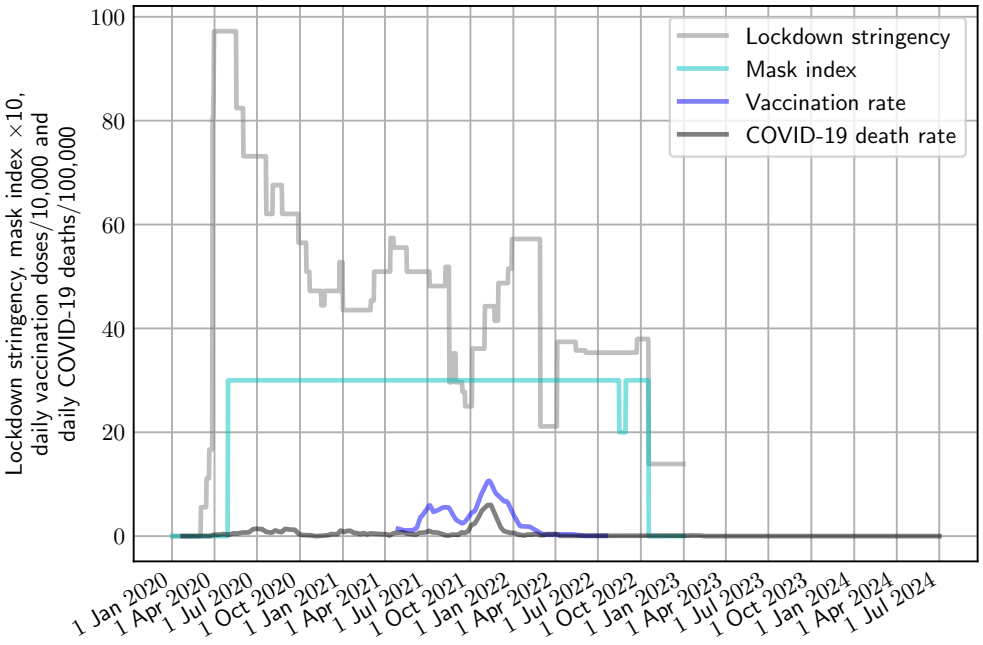

Figure 82: Congo

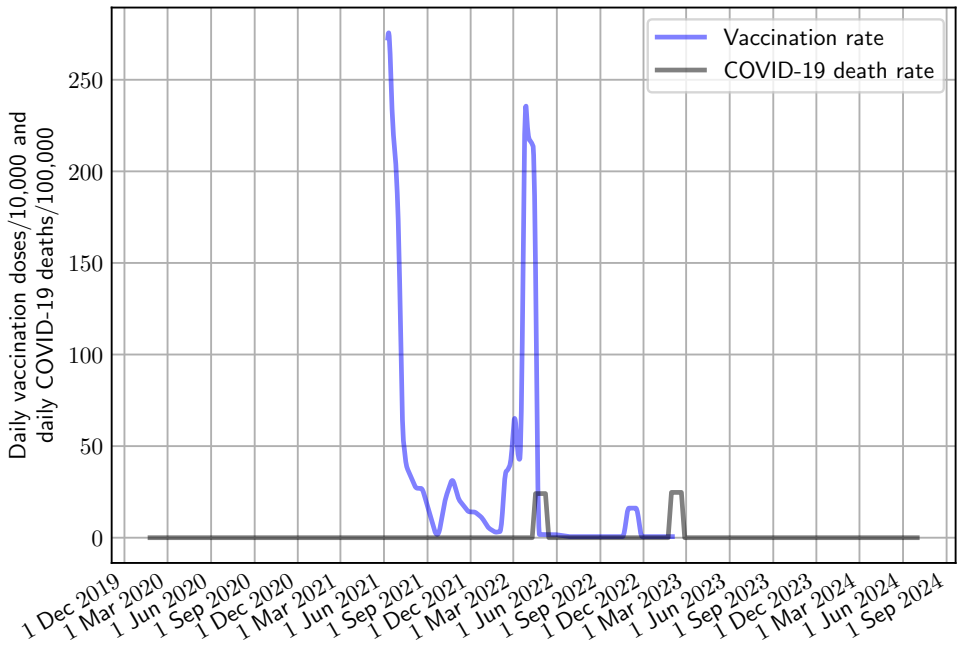

Figure 83: Cook Islands

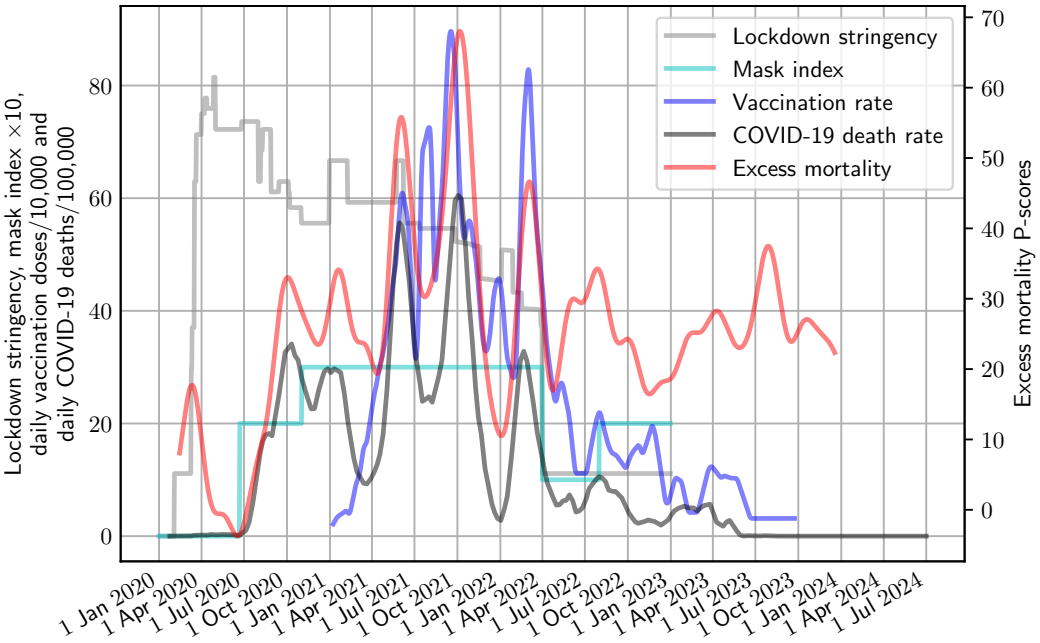

Figure 84: Costa Rica

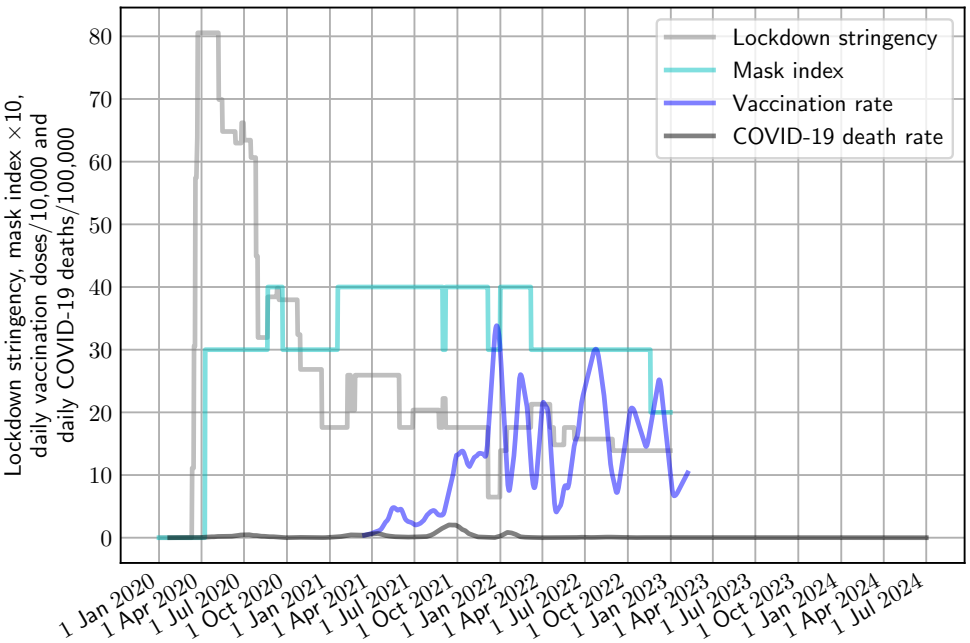

Figure 85: Cote d'Ivoire

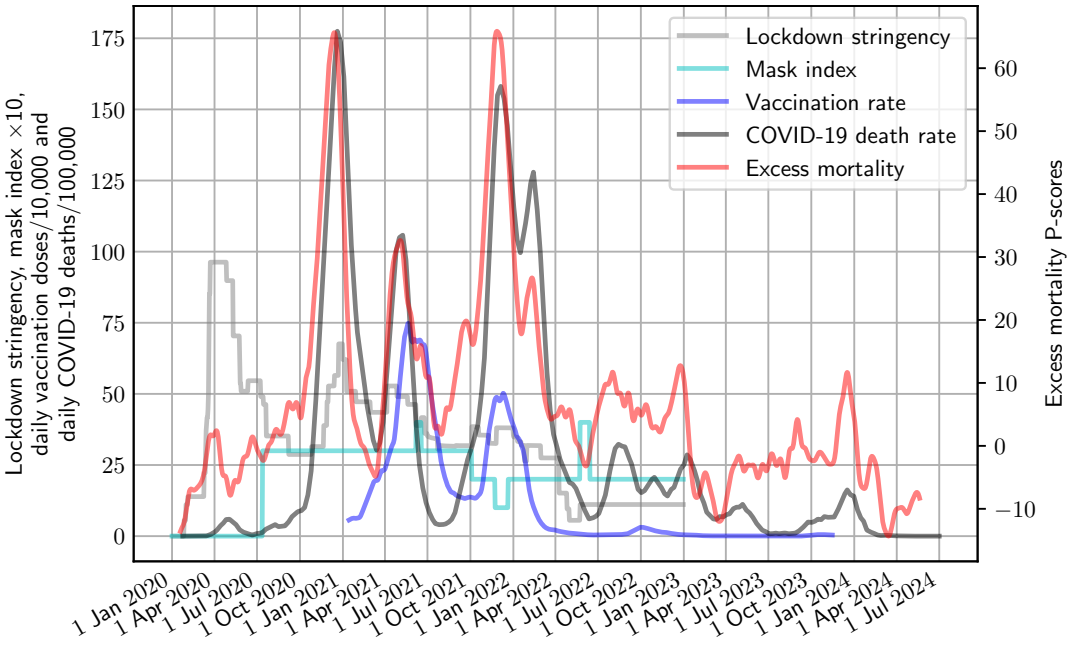

Figure 86: Croatia

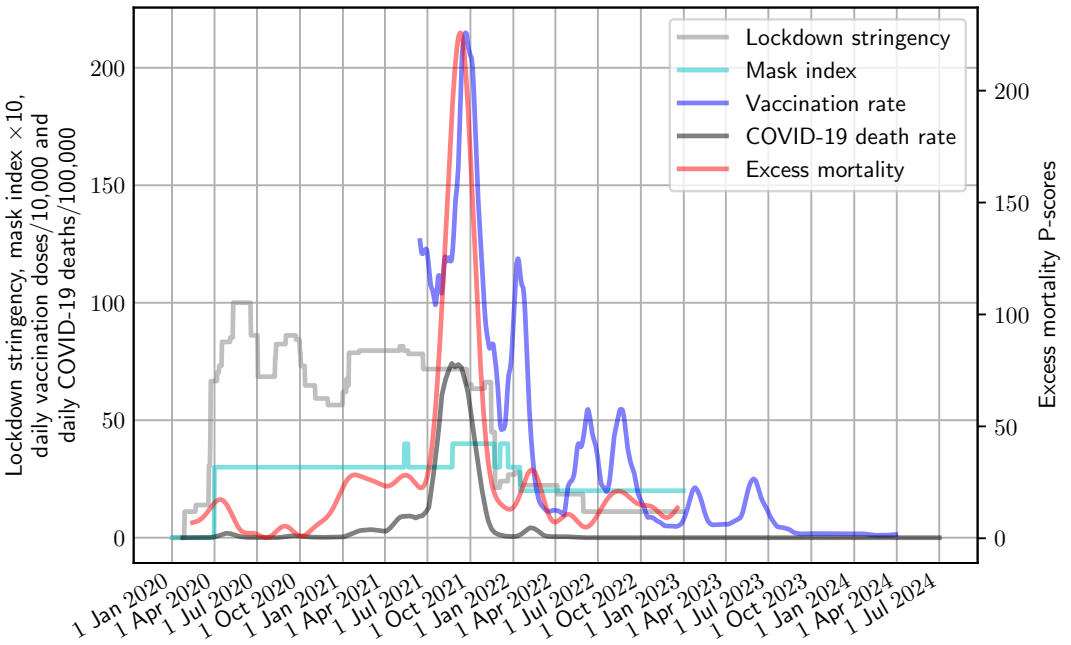

Figure 87: Cuba

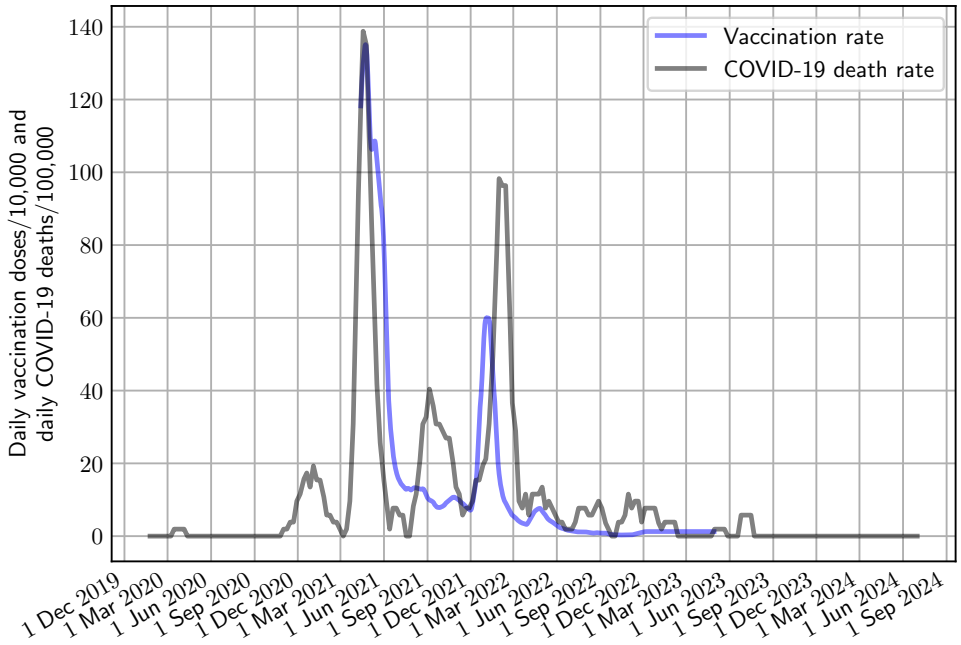

Figure 88: Curacao

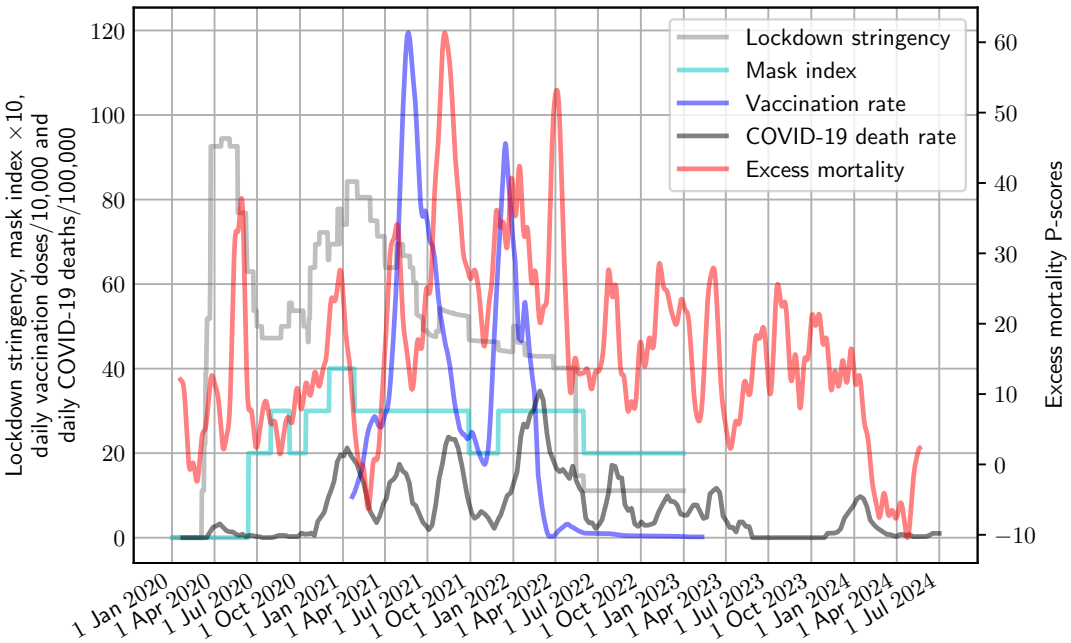

Figure 89: Cyprus

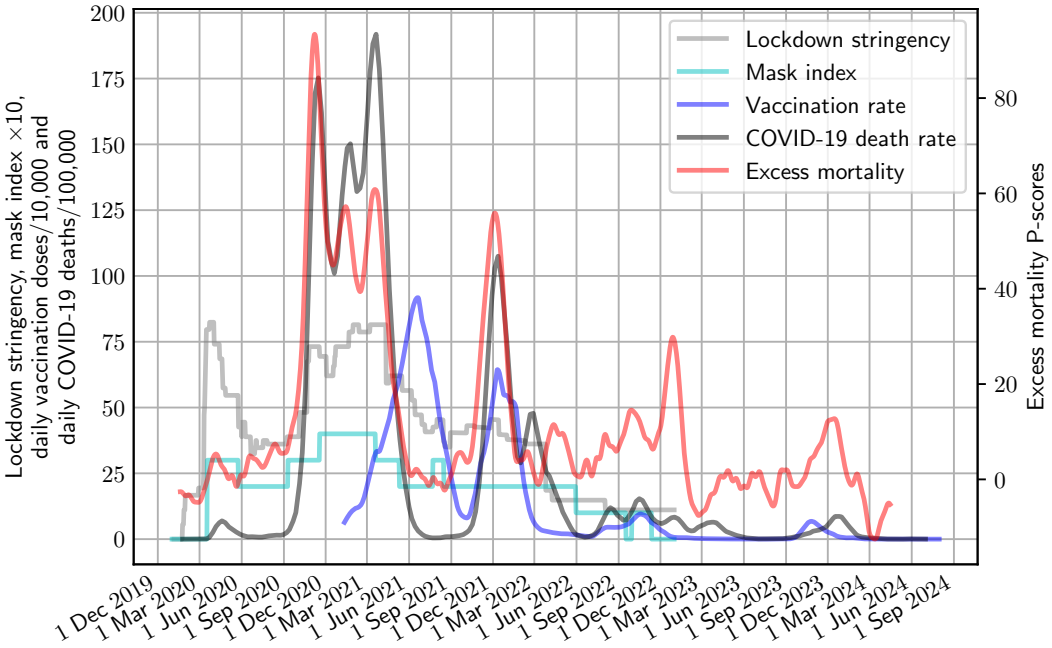

Figure 90: Czechia

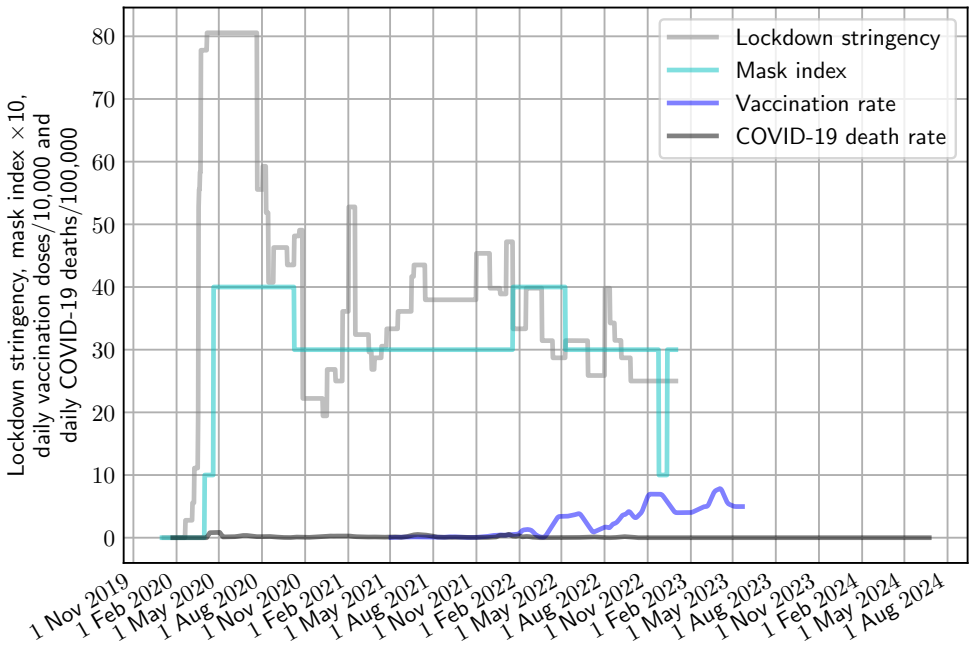

Figure 91: Democratic Republic of Congo

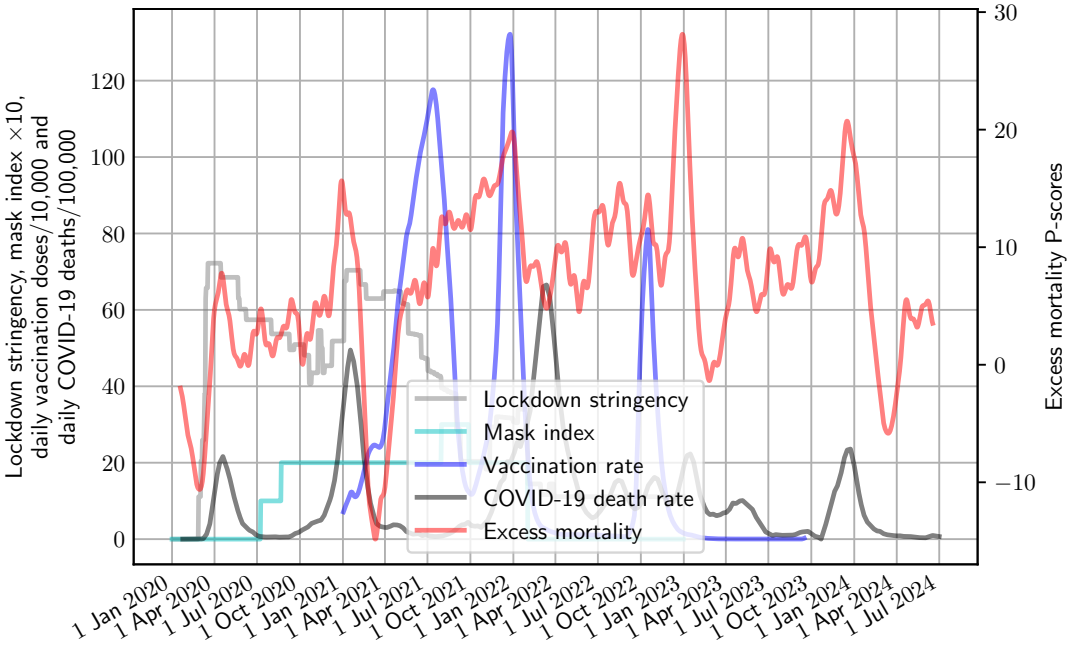

Figure 92: Denmark

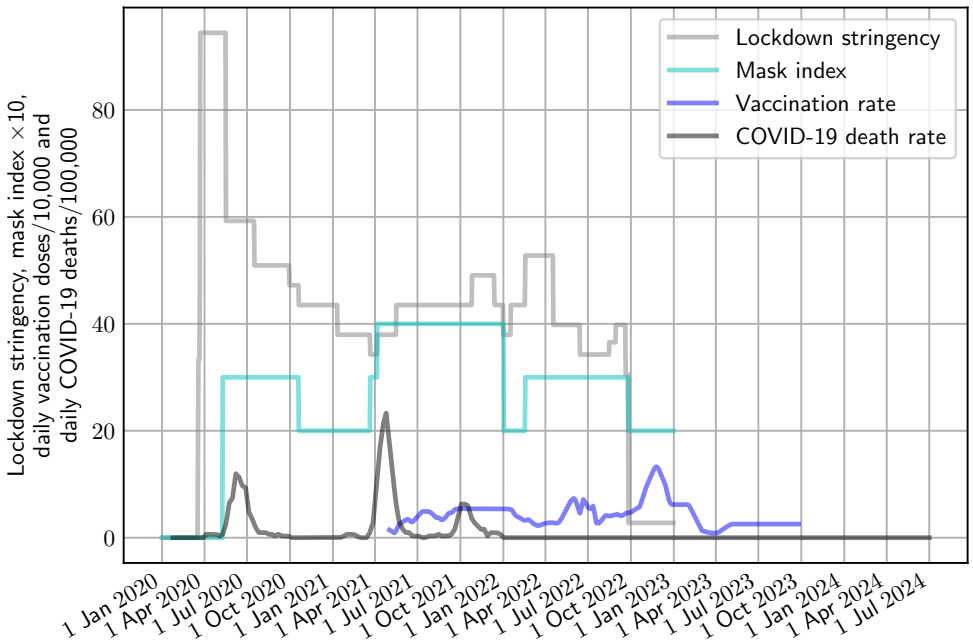

Figure 93: Djibouti

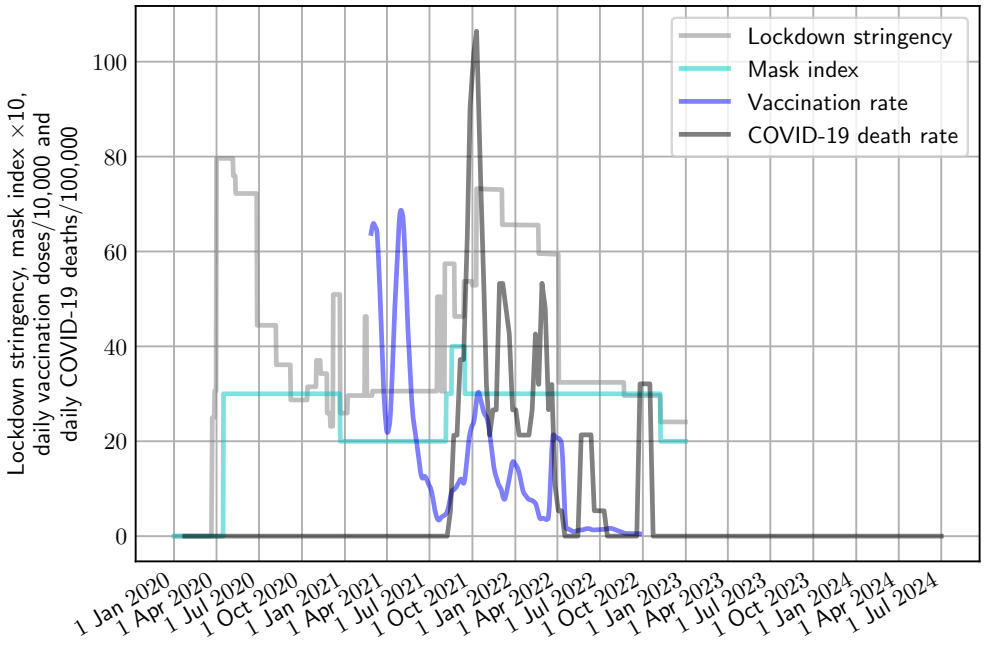

Figure 94: Dominica

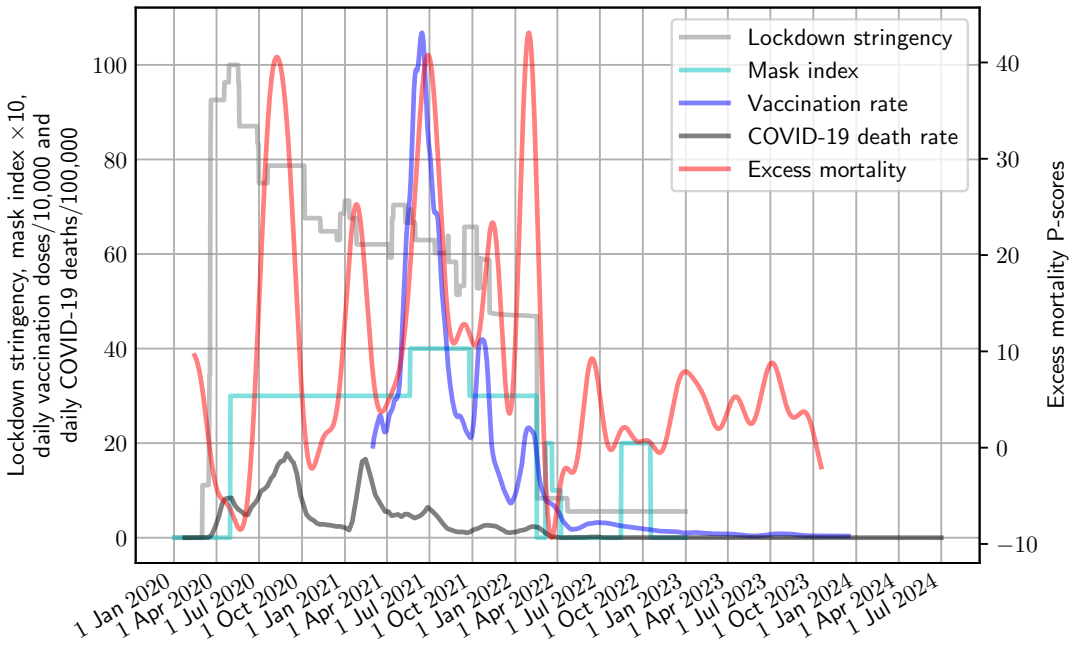

Figure 95: Dominican Republic

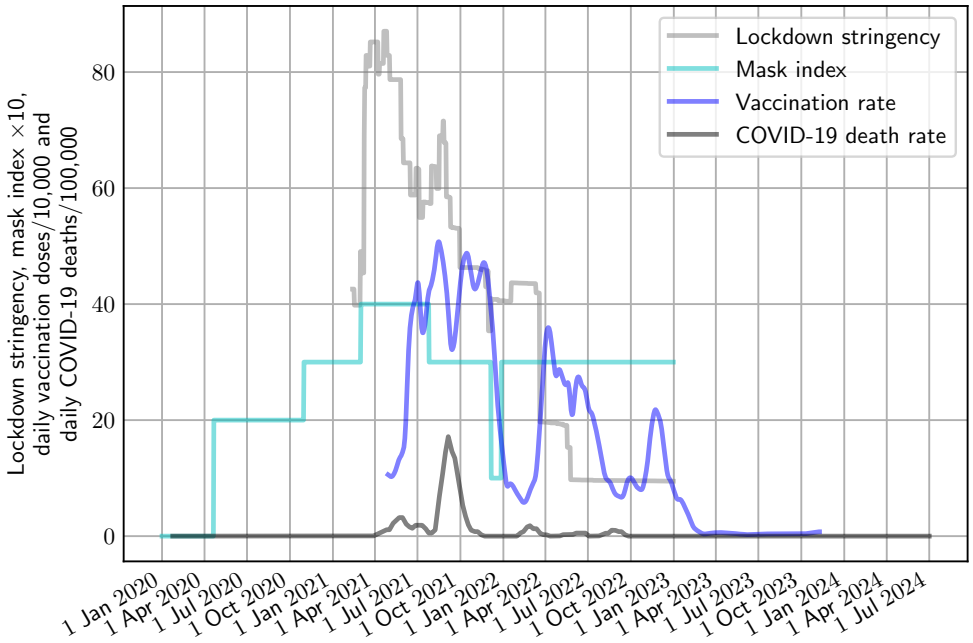

Figure 96: East Timor

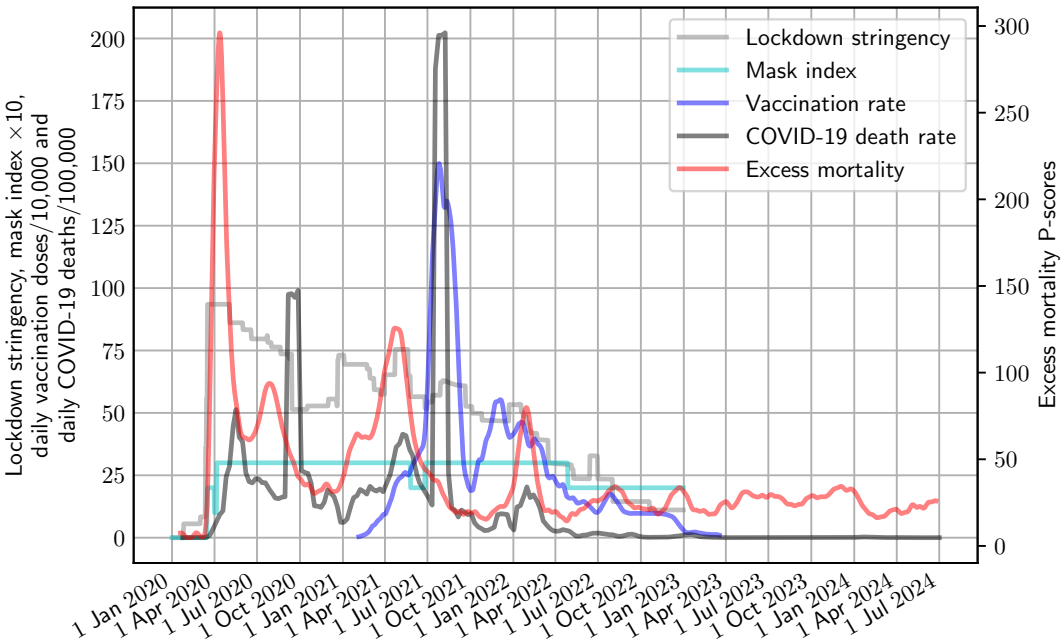

Figure 97: Ecuador

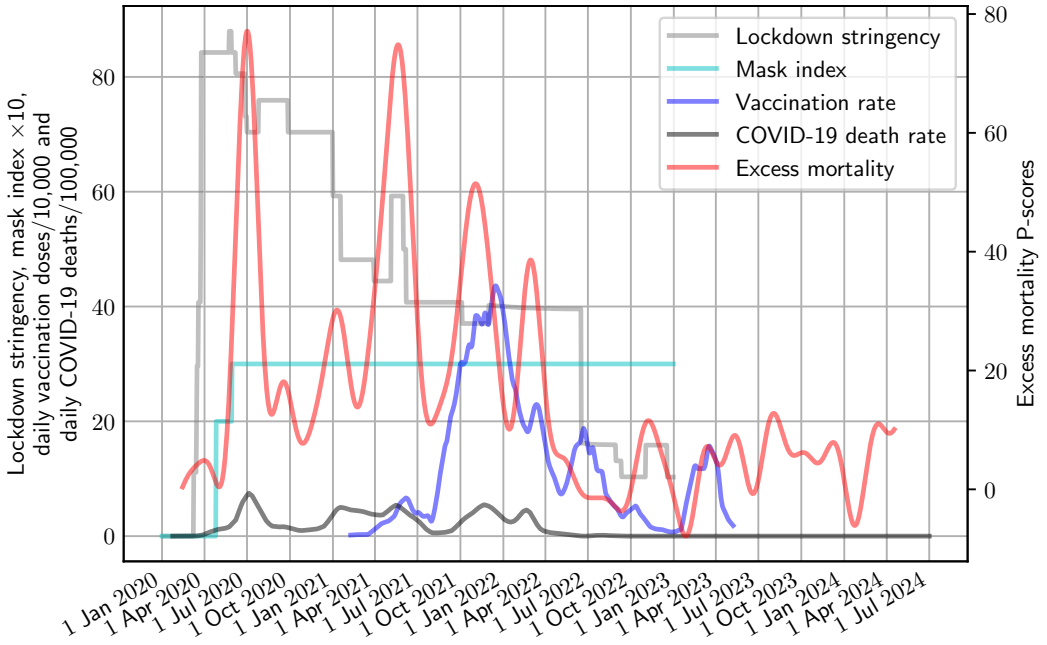

Figure 98: Egypt

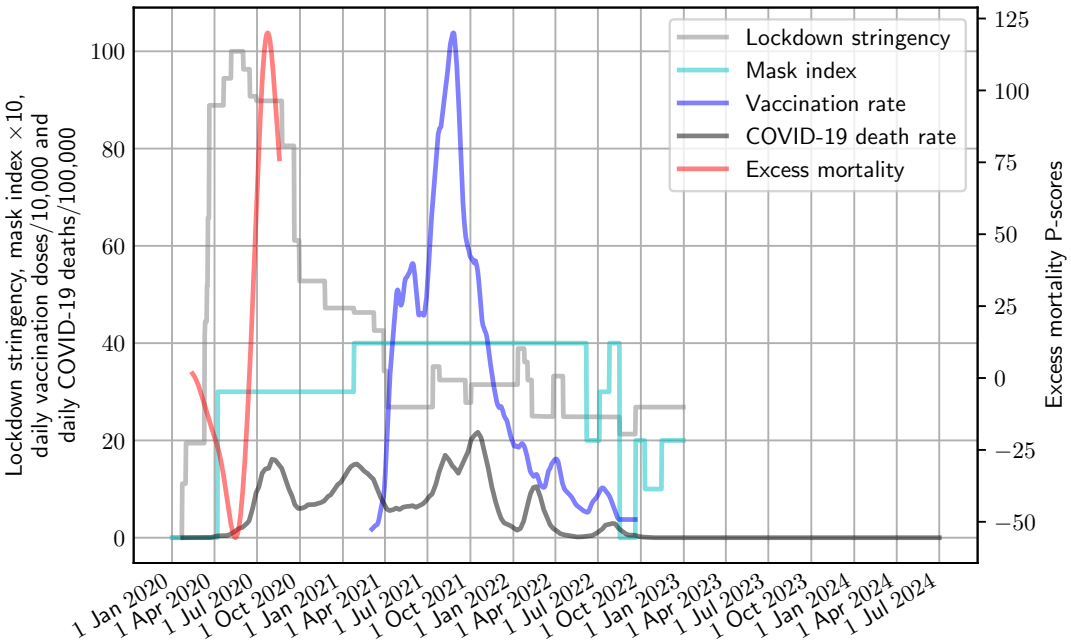

Figure 99: El Salvador

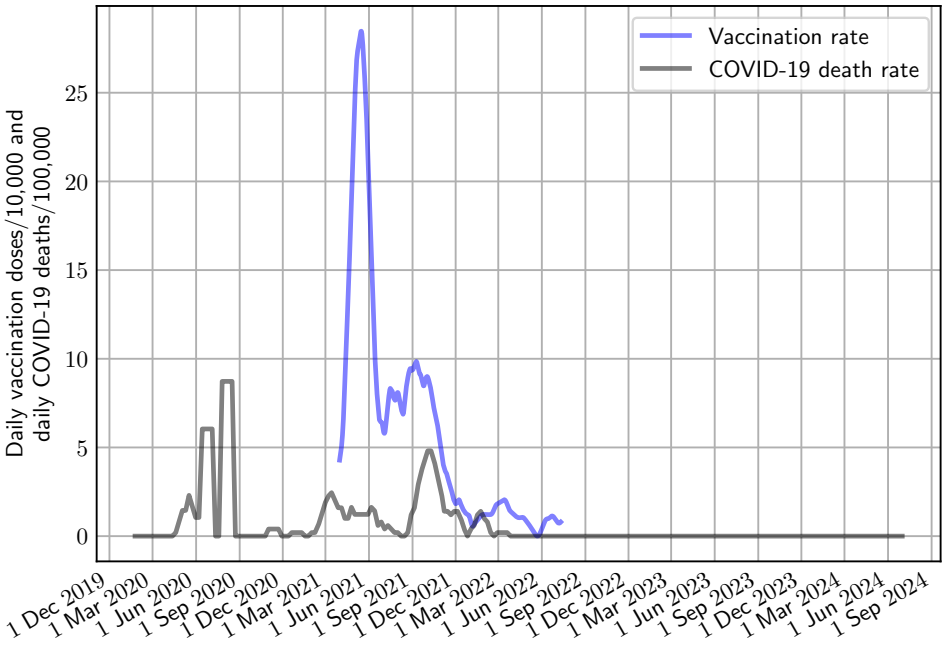

Figure 100: Equatorial Guinea

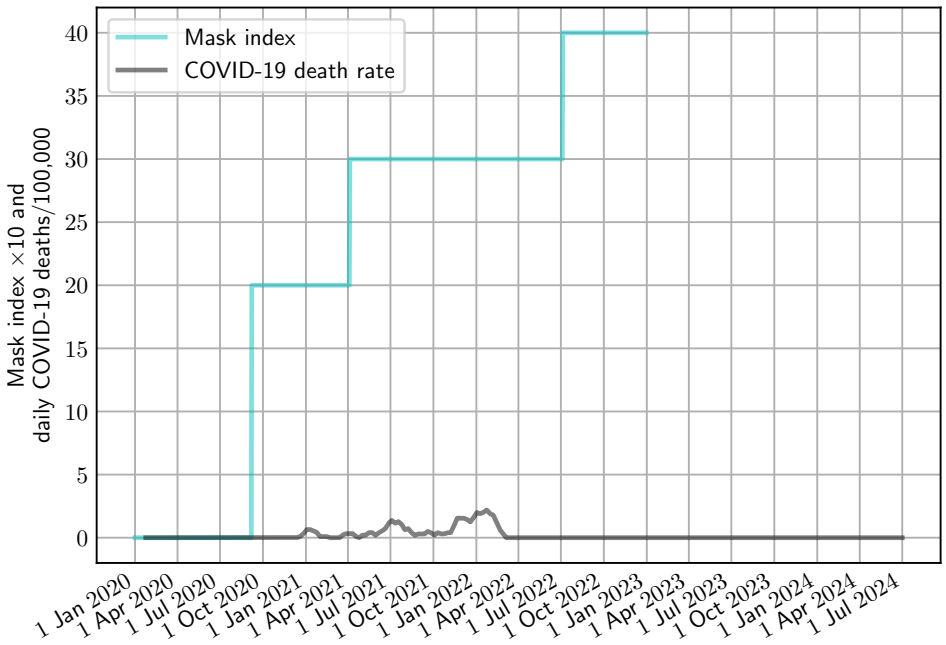

Figure 101: Eritrea

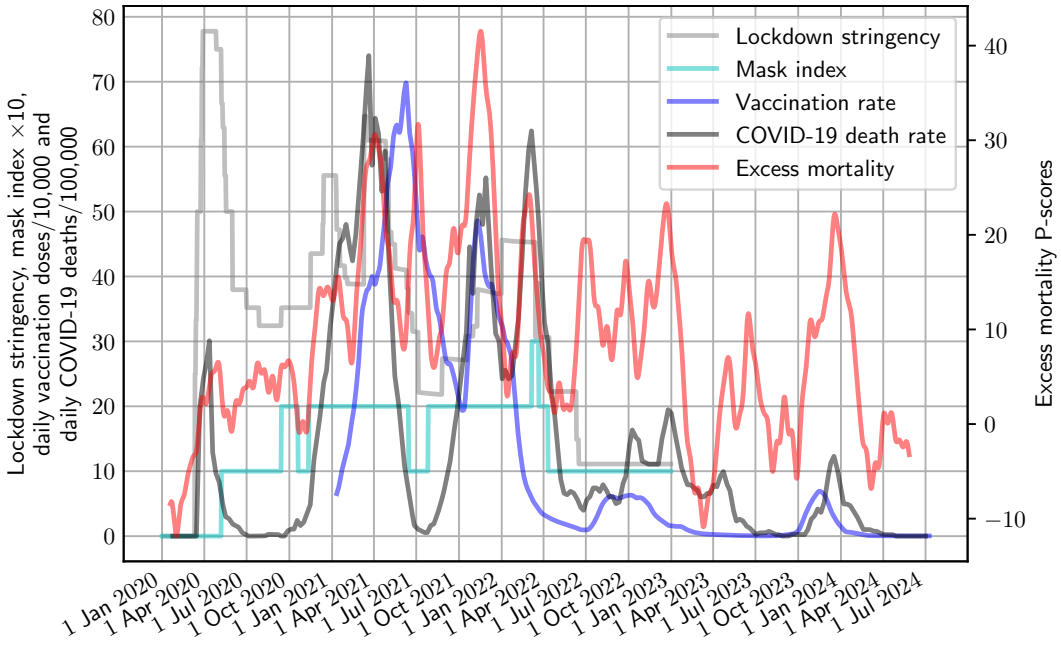

Figure 102: Estonia

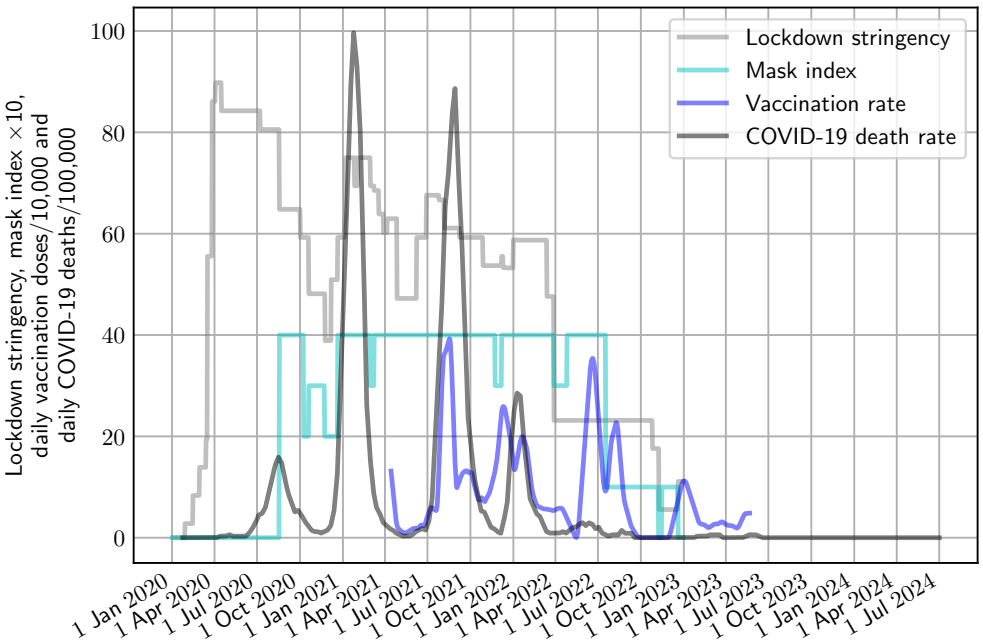

Figure 103: Eswatini

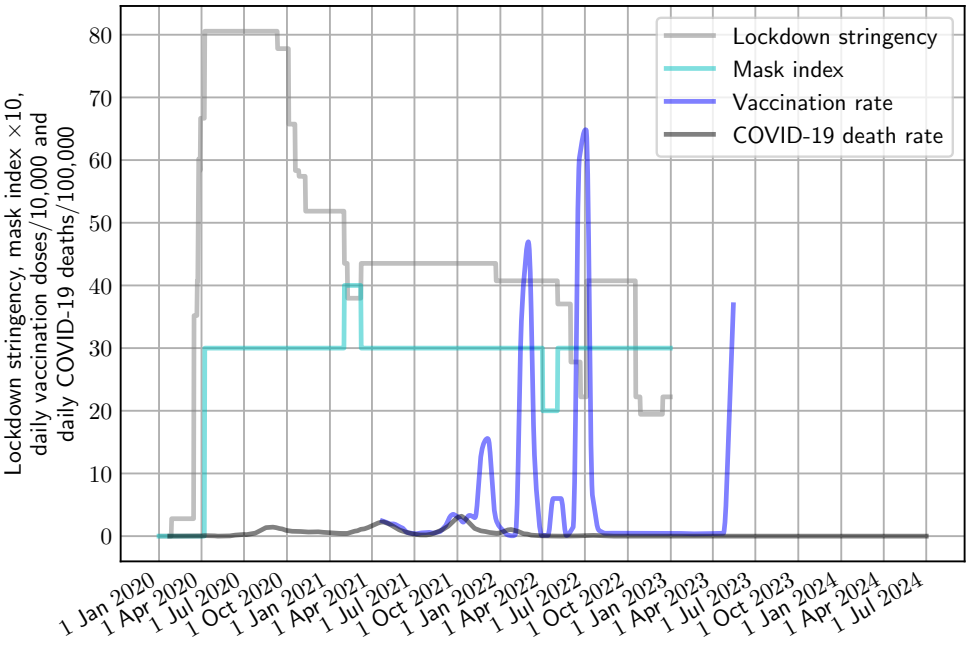

Figure 104: Ethiopia

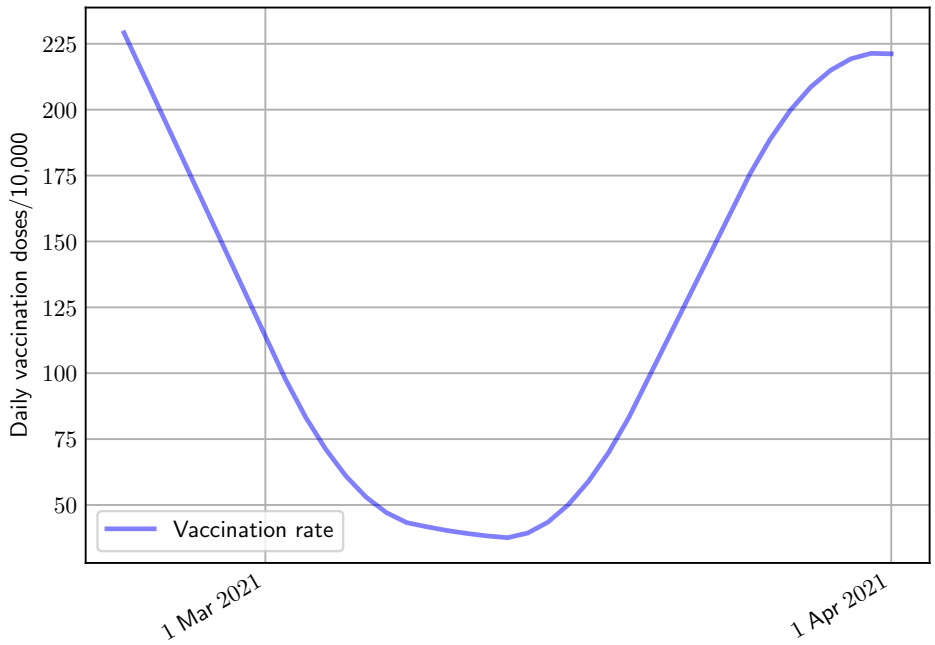

Figure 105: Falkland Islands

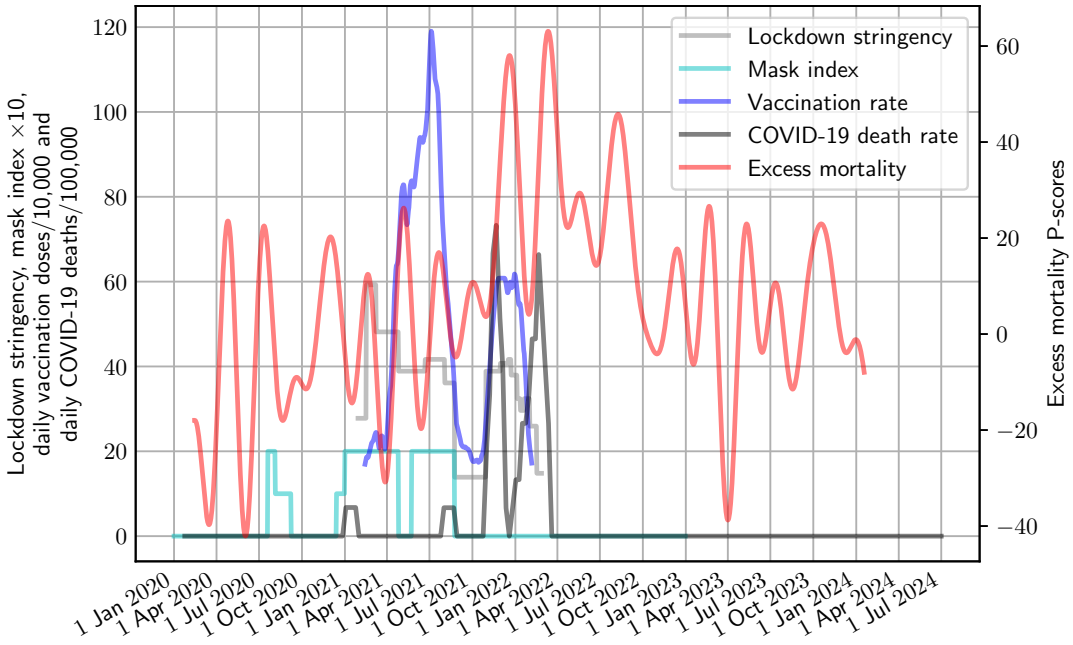

Figure 106: Faroe Islands

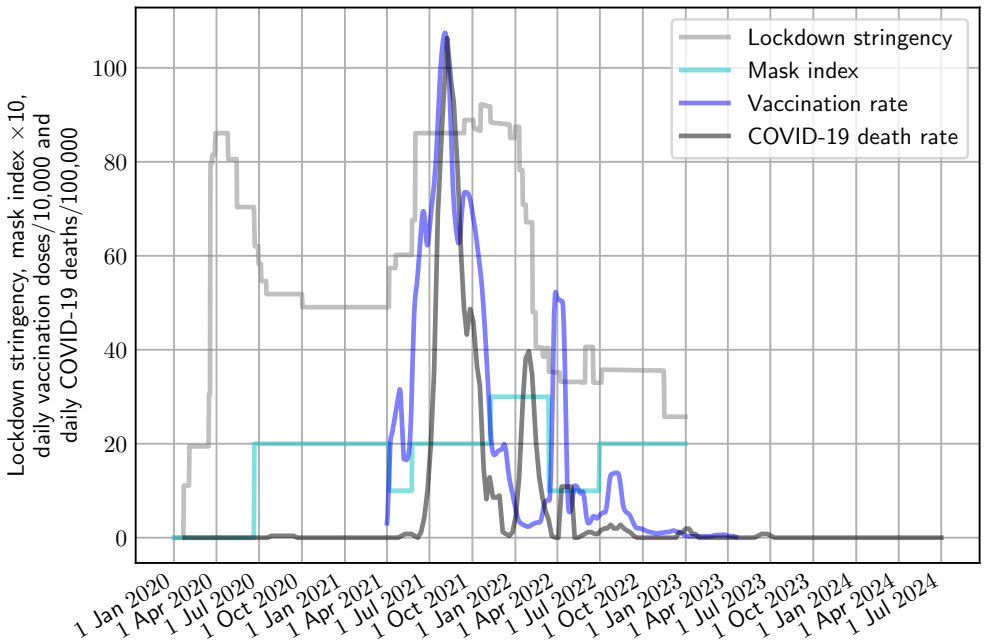

Figure 107: Fiji

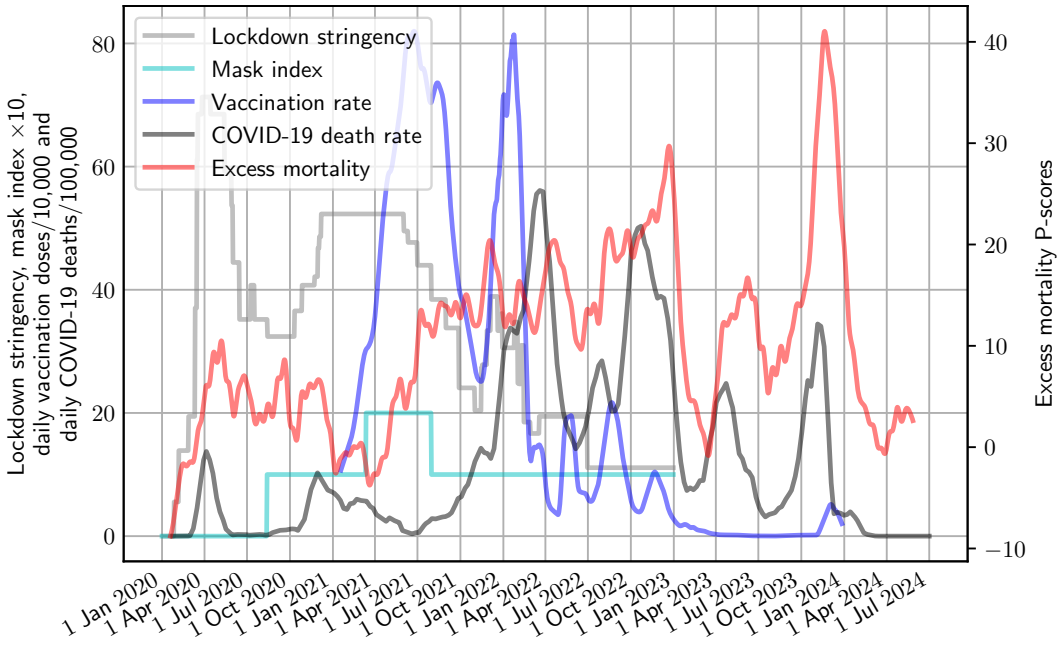

Figure 108: Finland

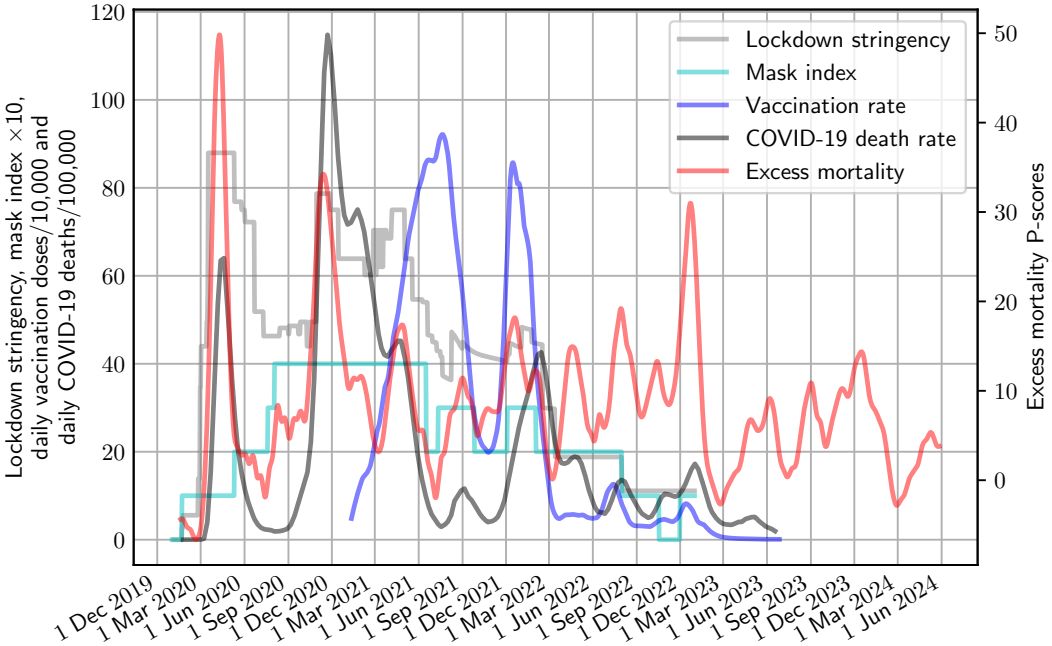

Figure 109: France

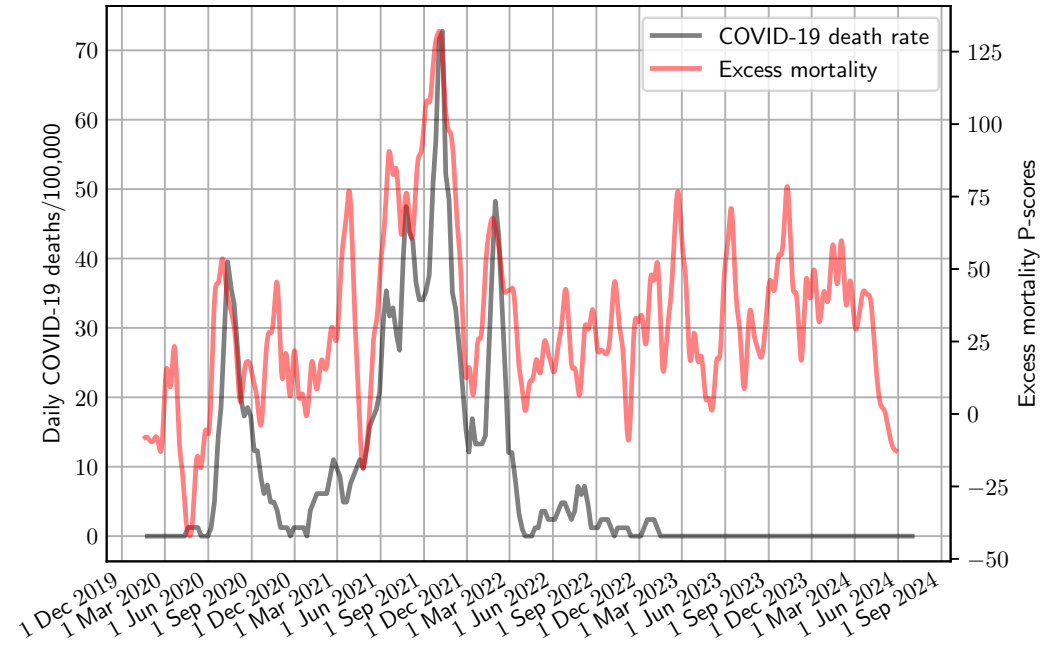

Figure 110: French Guiana

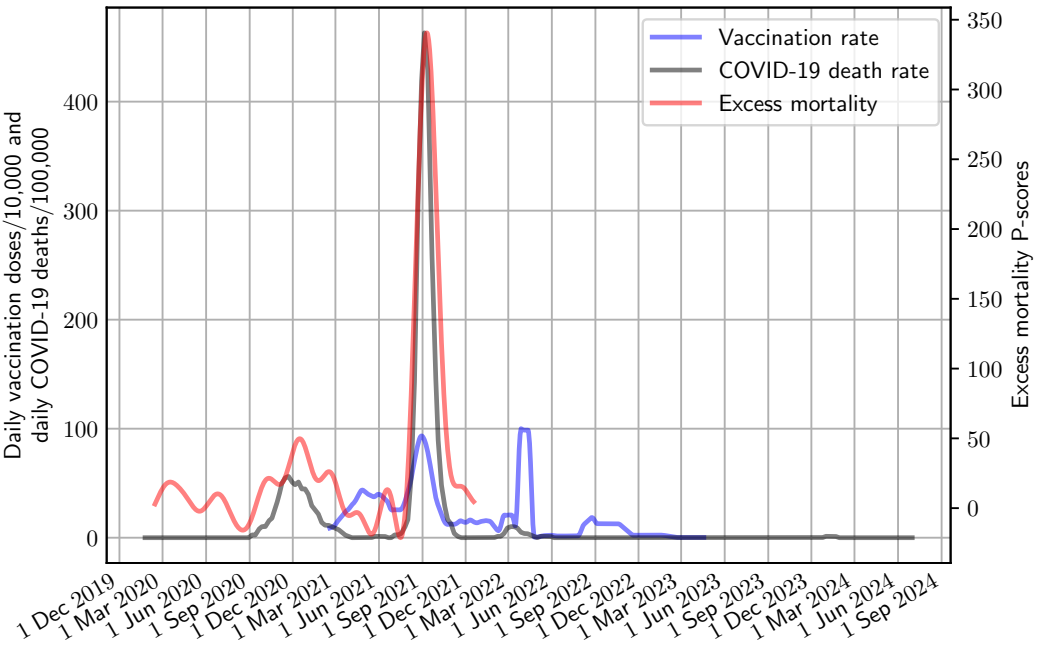

Figure 111: French Polynesia

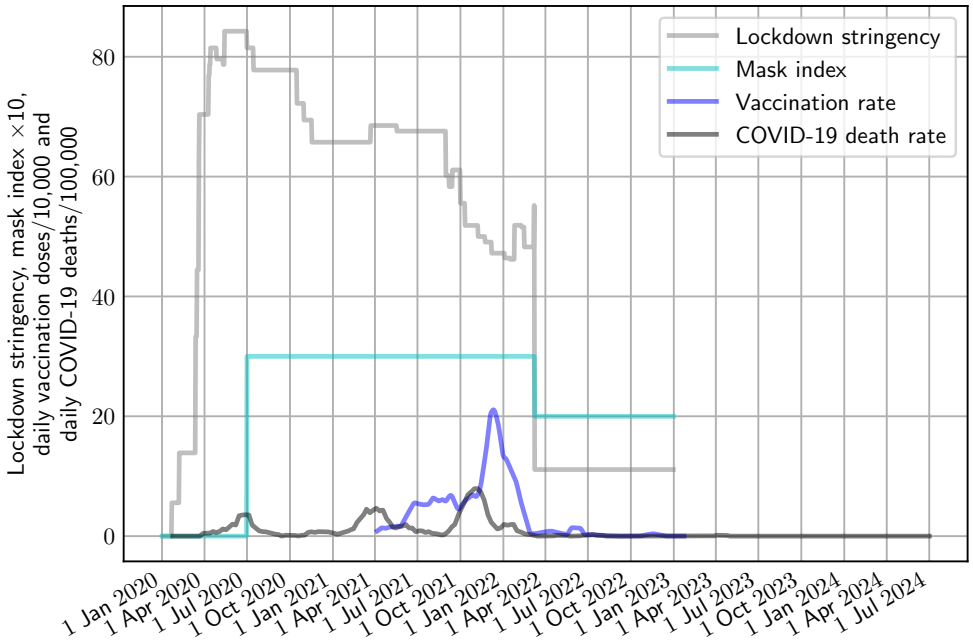

Figure 112: Gabon

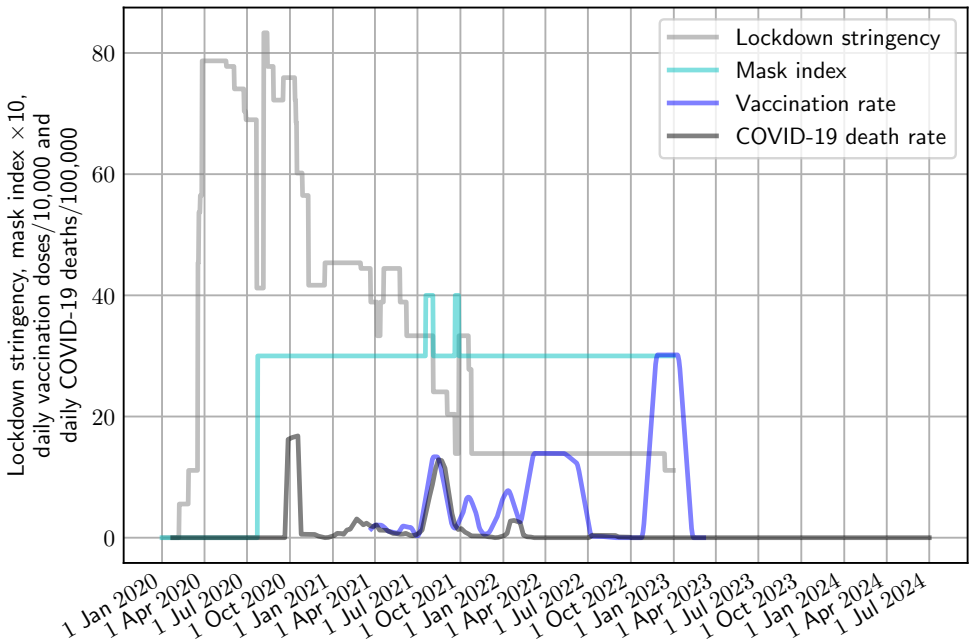

Figure 113: Gambia

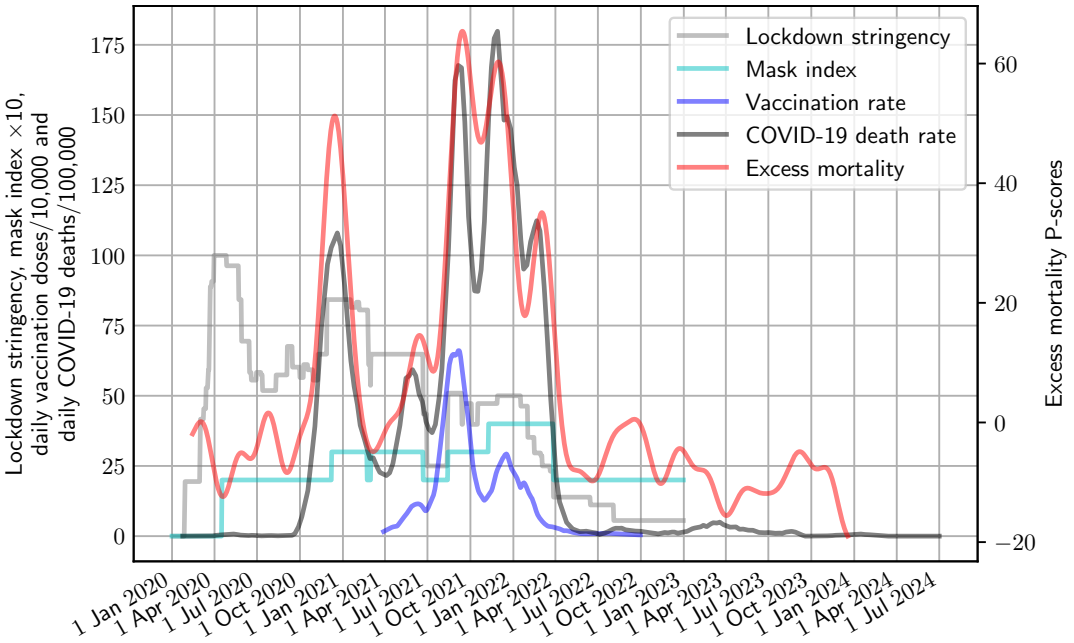

Figure 114: Georgia

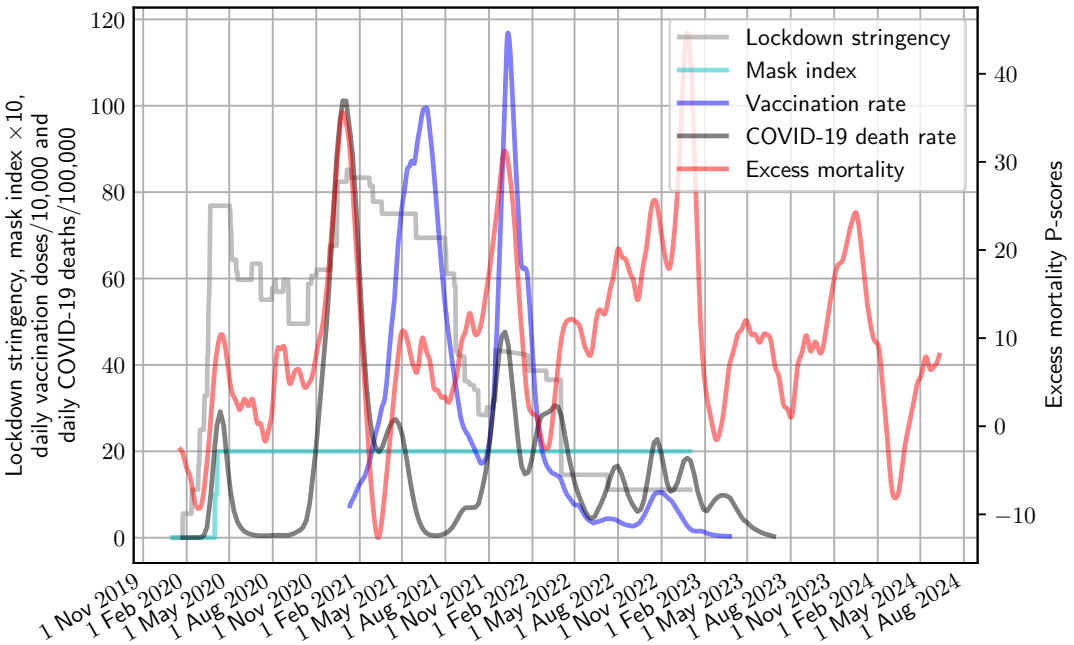

Figure 115: Germany

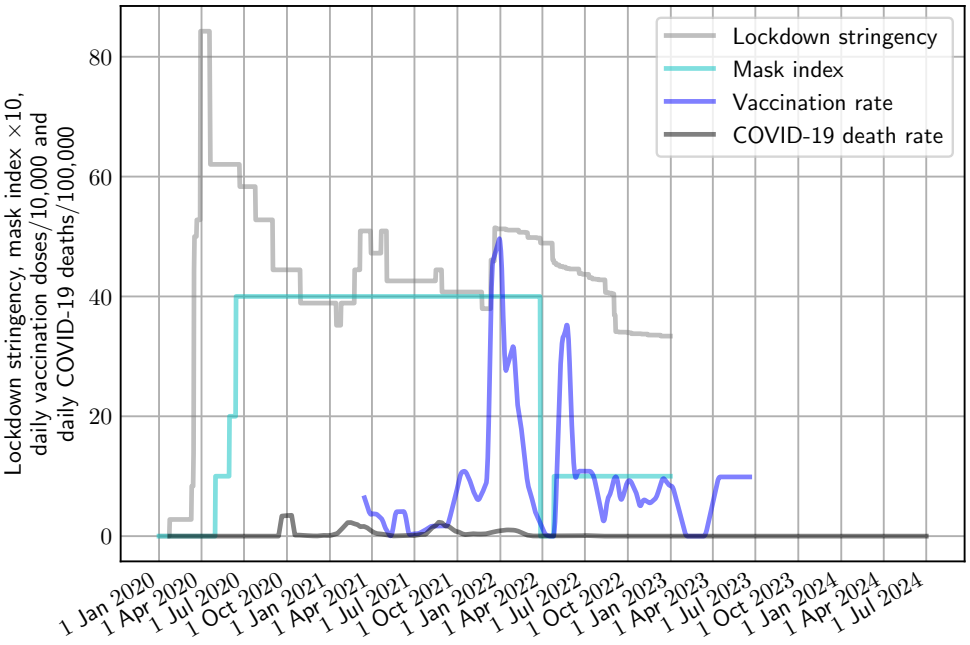

Figure 116: Ghana

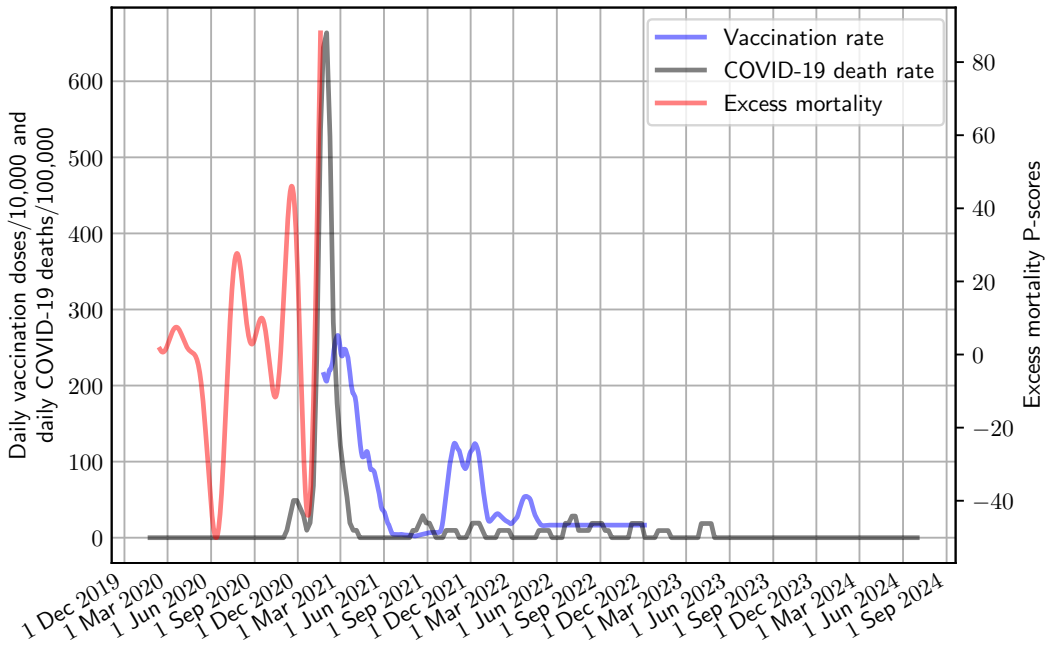

Figure 117: Gibraltar

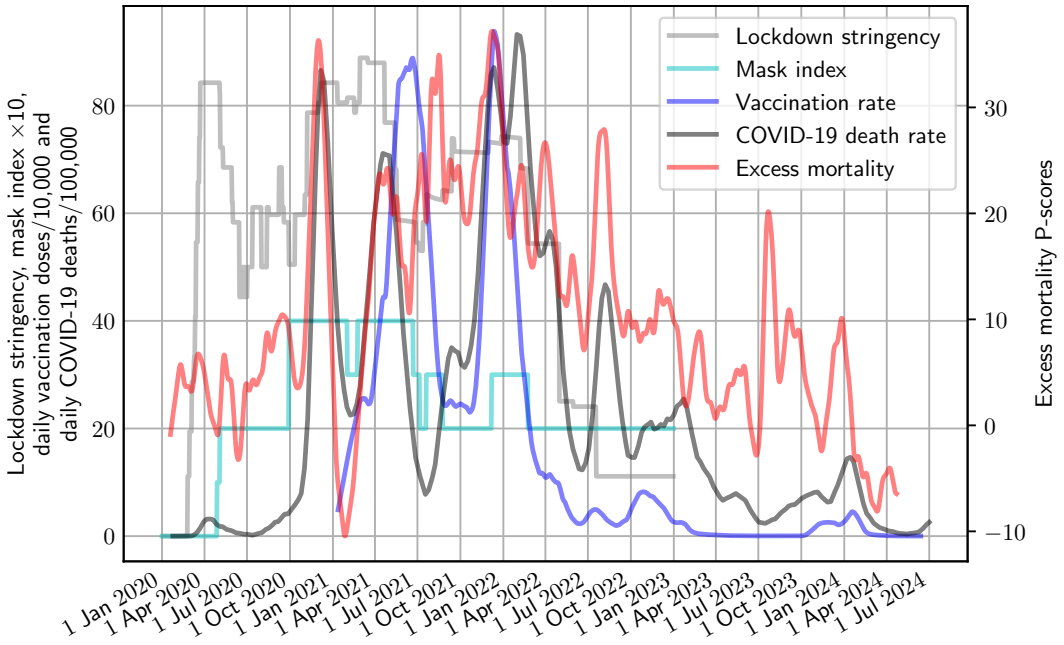

Figure 118: Greece

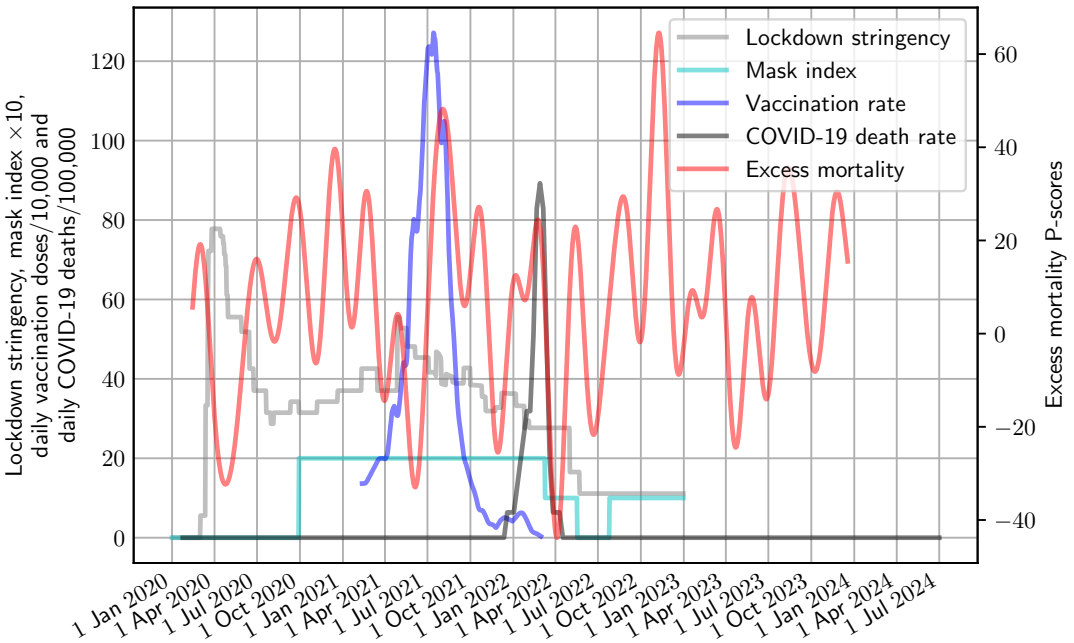

Figure 119: Greenland

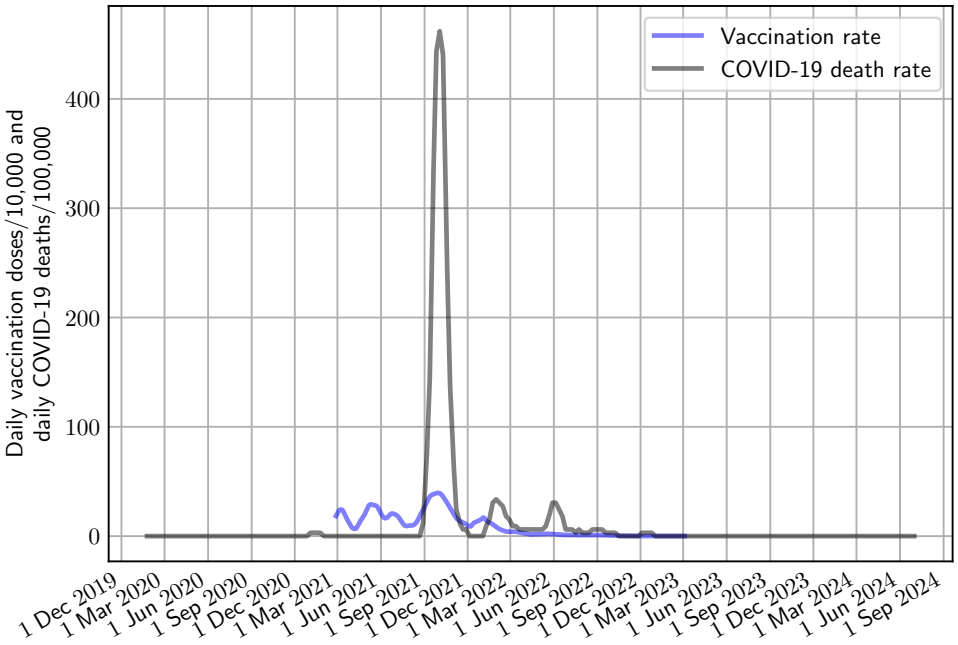

Figure 120: Grenada

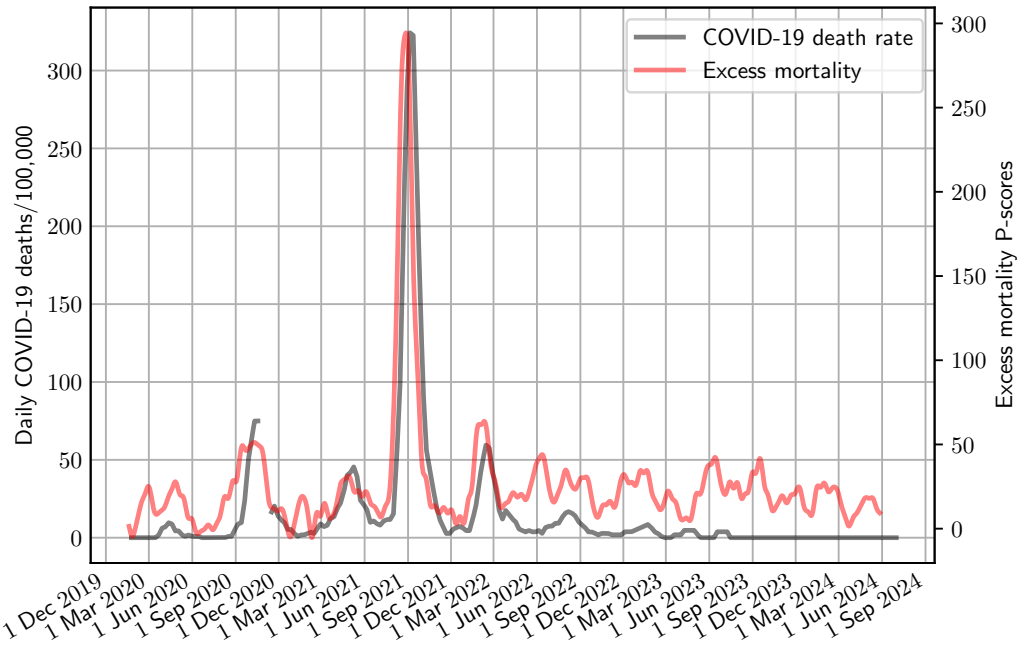

Figure 121: Guadeloupe

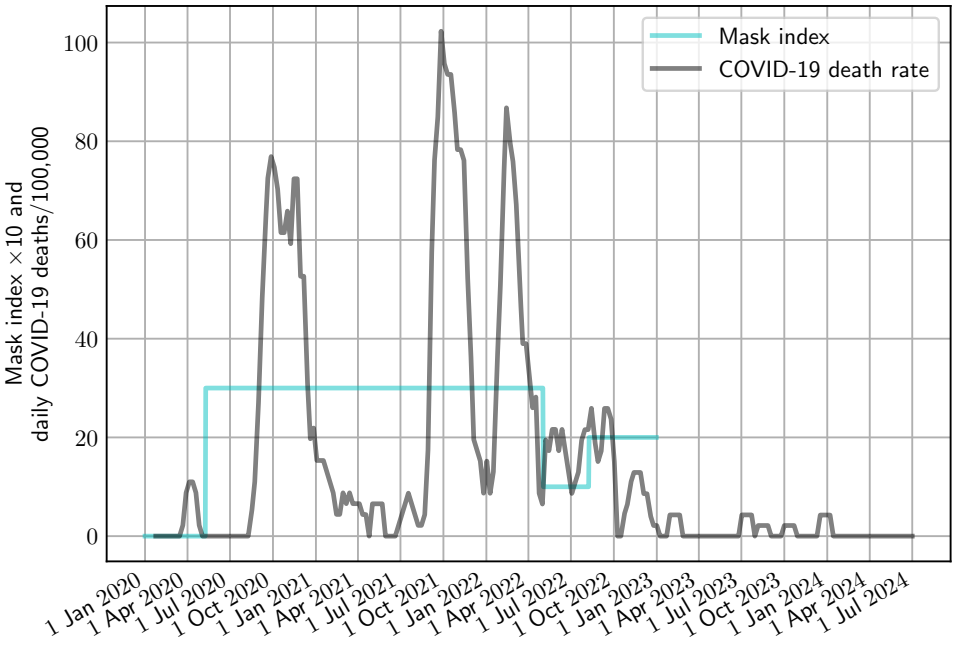

Figure 122: Guam

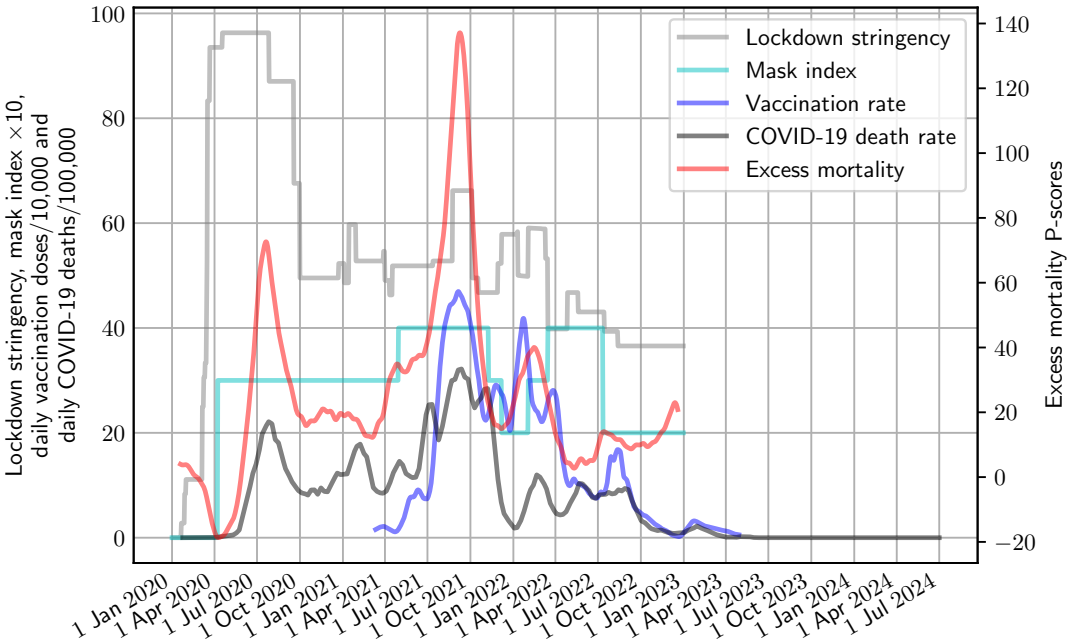

Figure 123: Guatemala

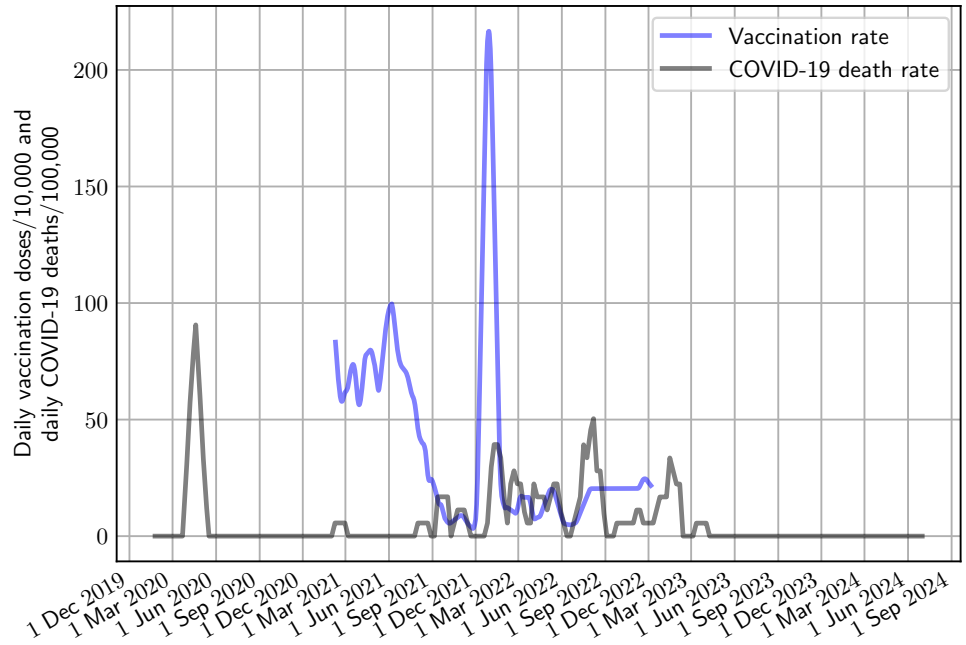

Figure 124: Guernsey

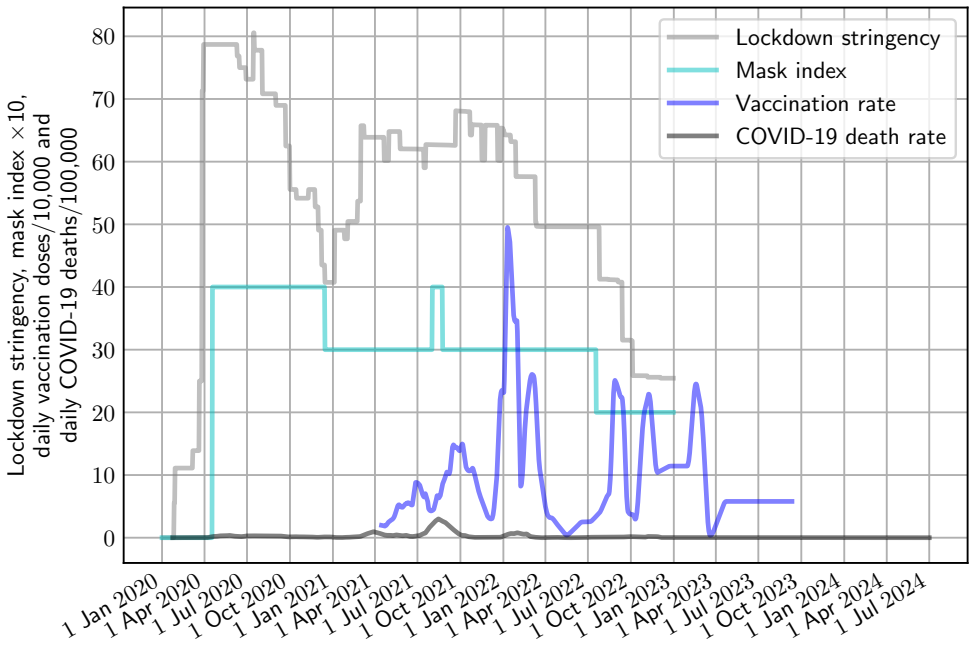

Figure 125: Guinea

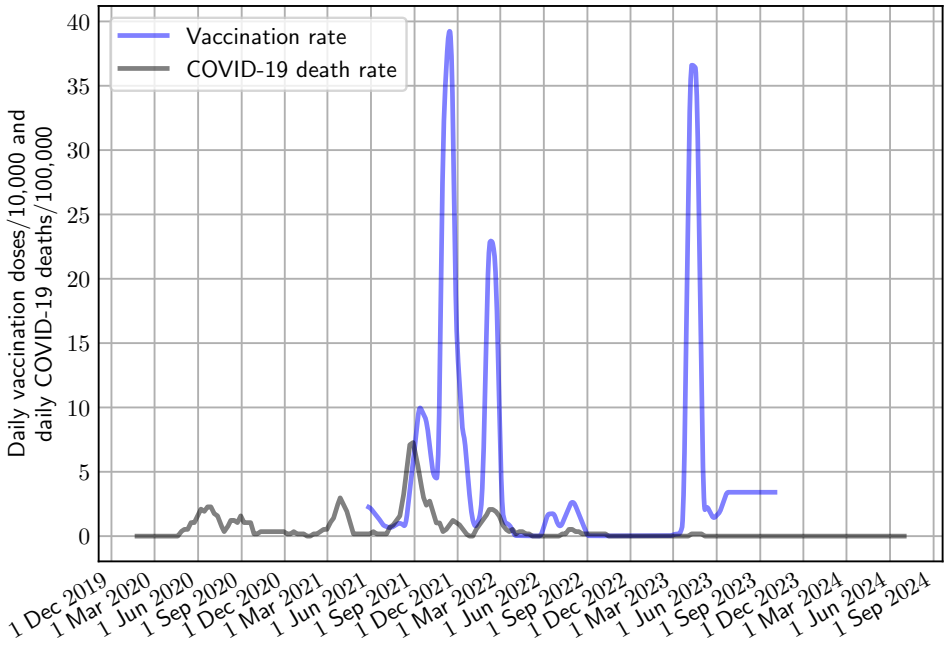

Figure 126: Guinea-Bissau

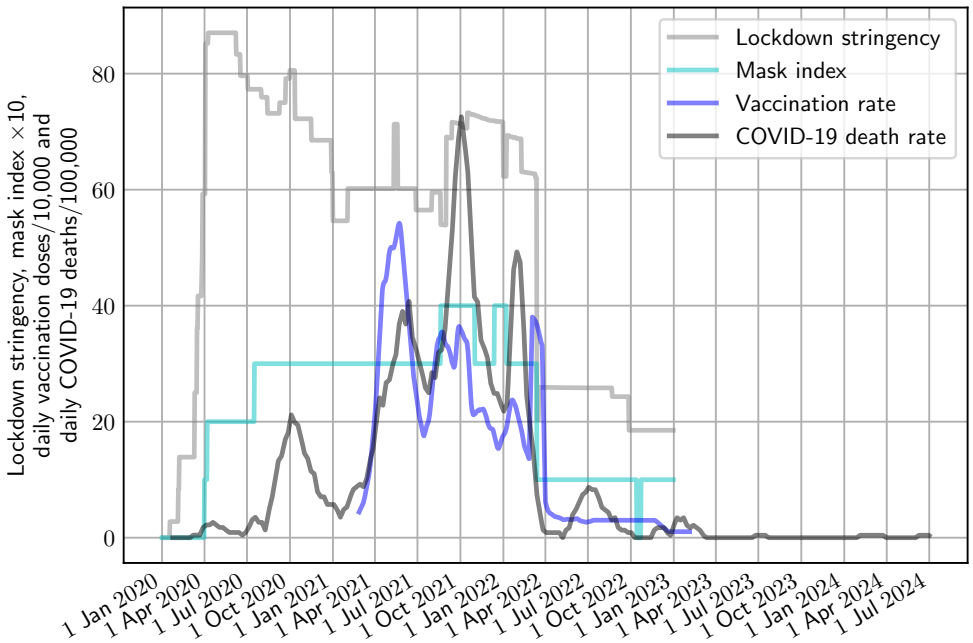

Figure 127: Guyana

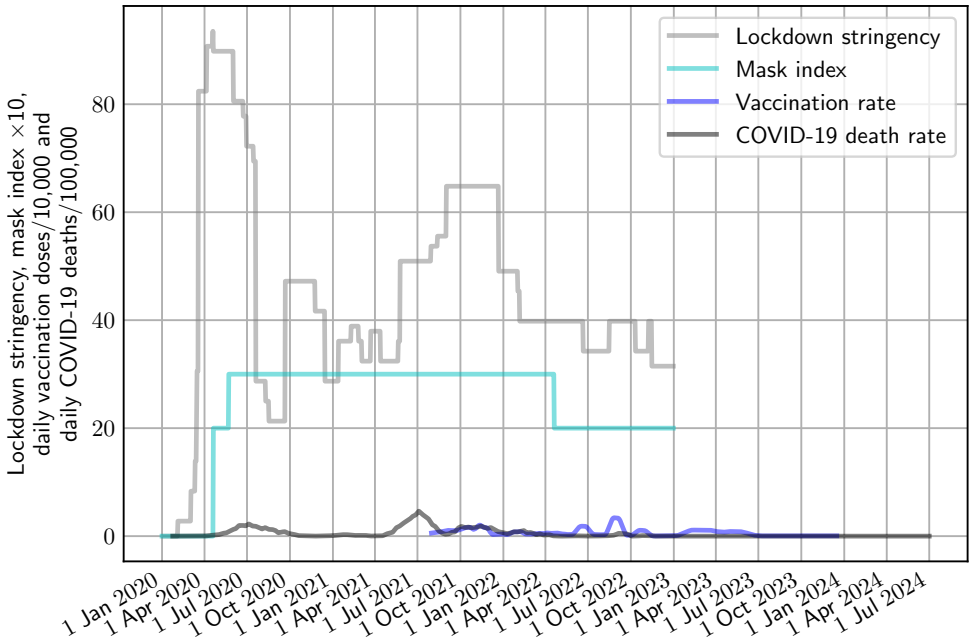

Figure 128: Haiti

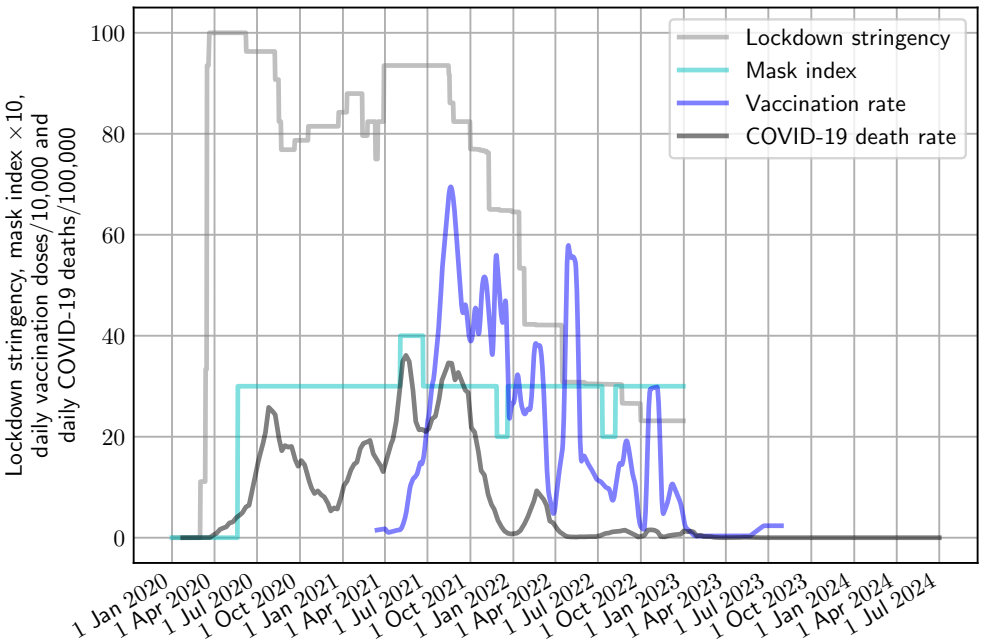

Figure 129: Honduras

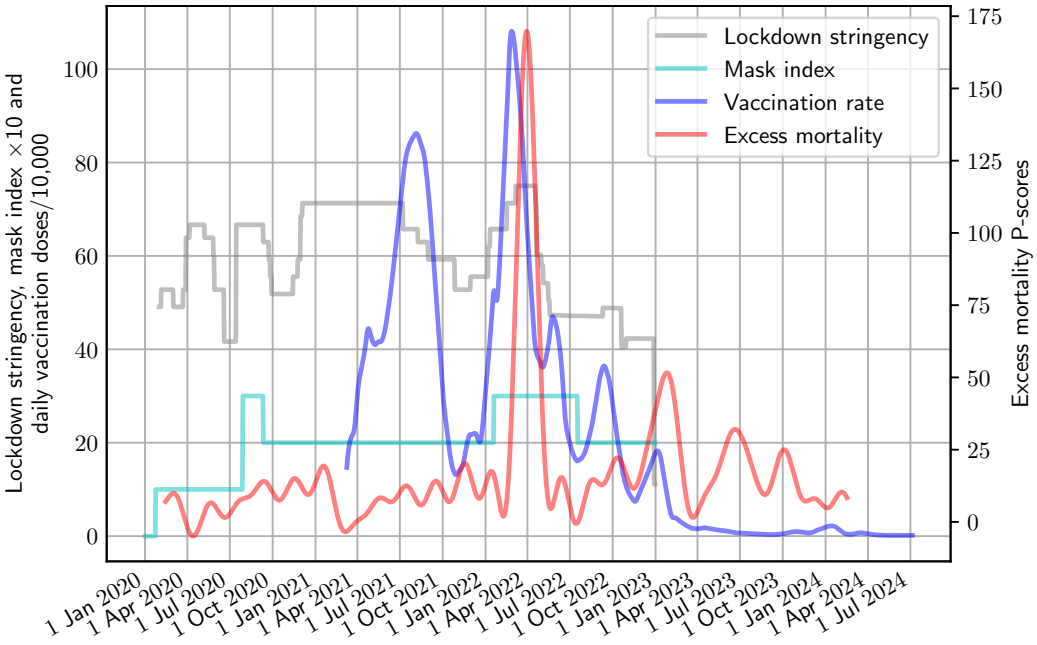

Figure 130: Hong Kong

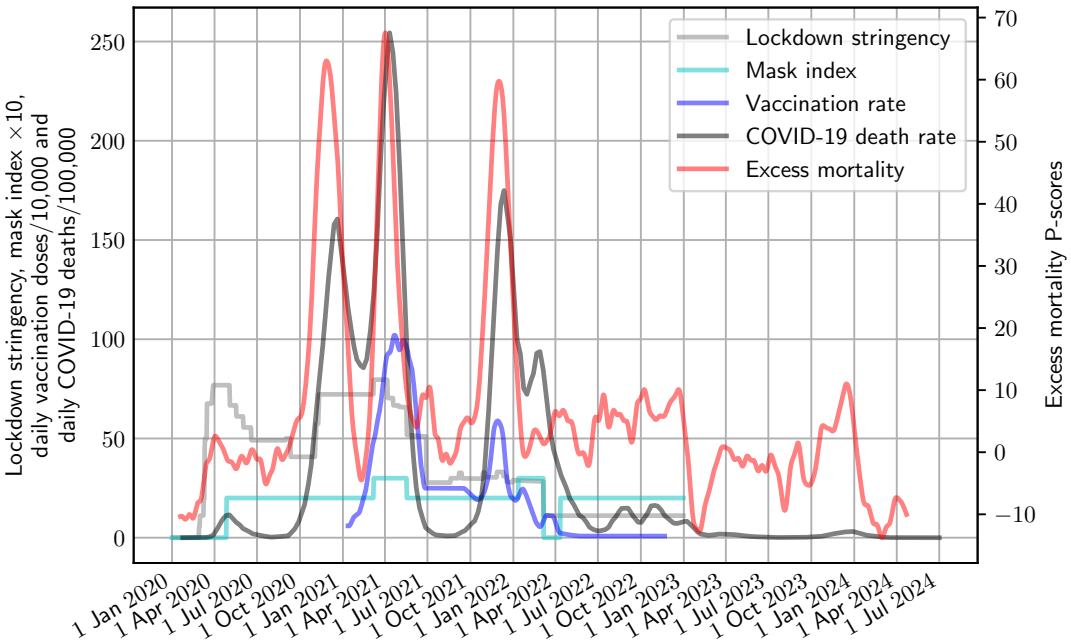

Figure 131: Hungary

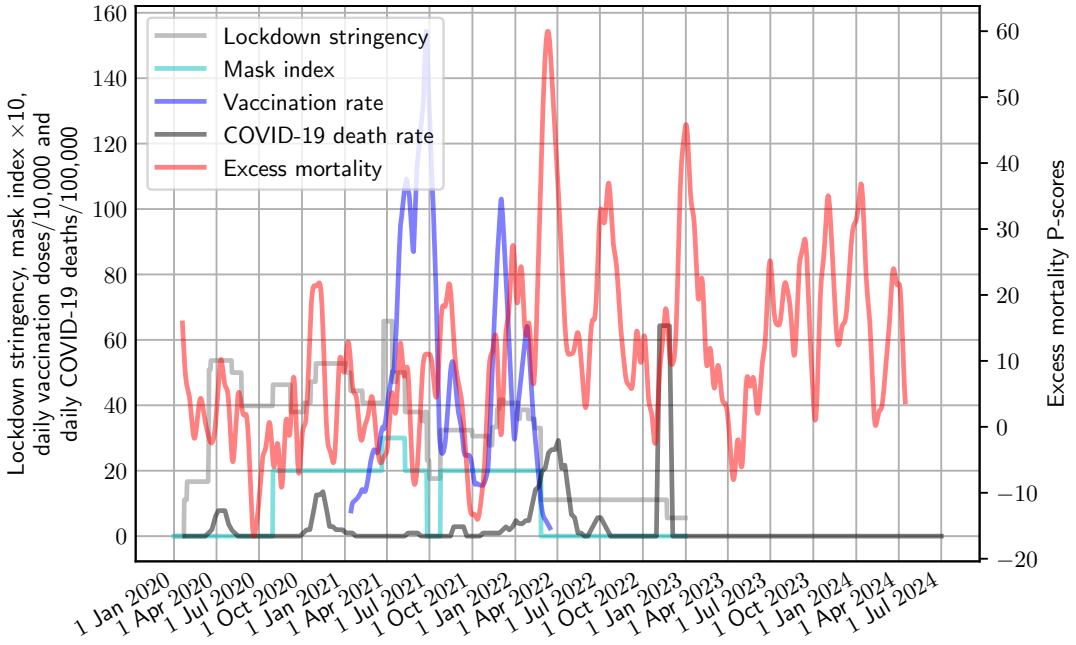

Figure 132: Iceland

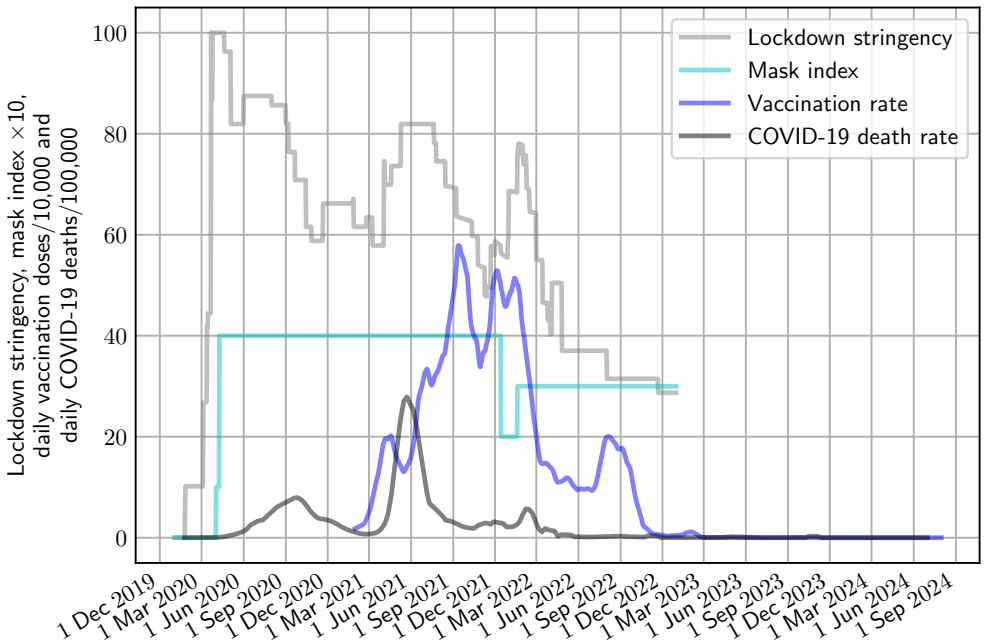

Figure 133: India

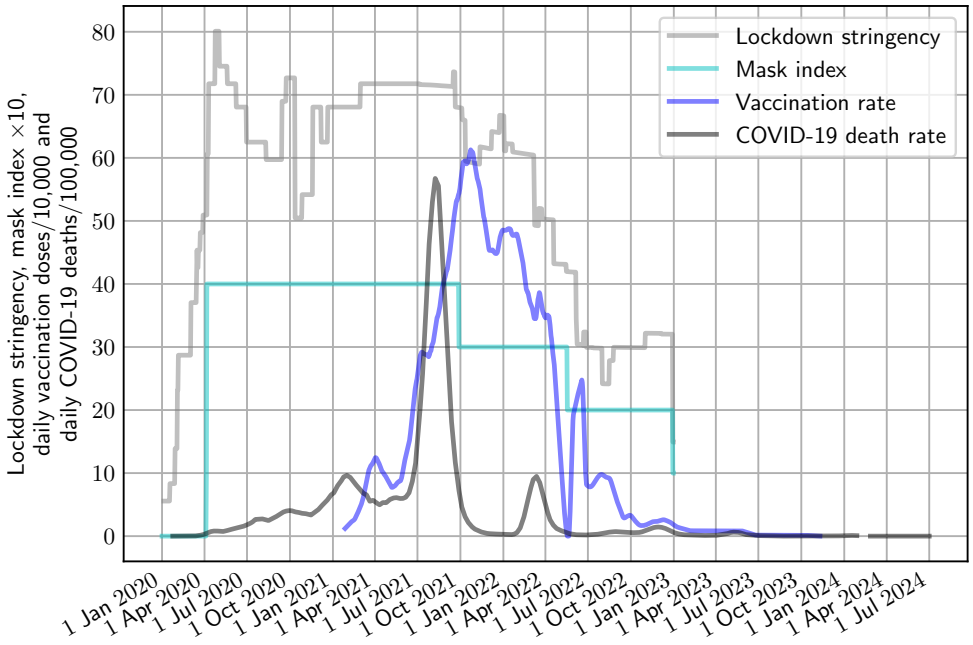

Figure 134: Indonesia

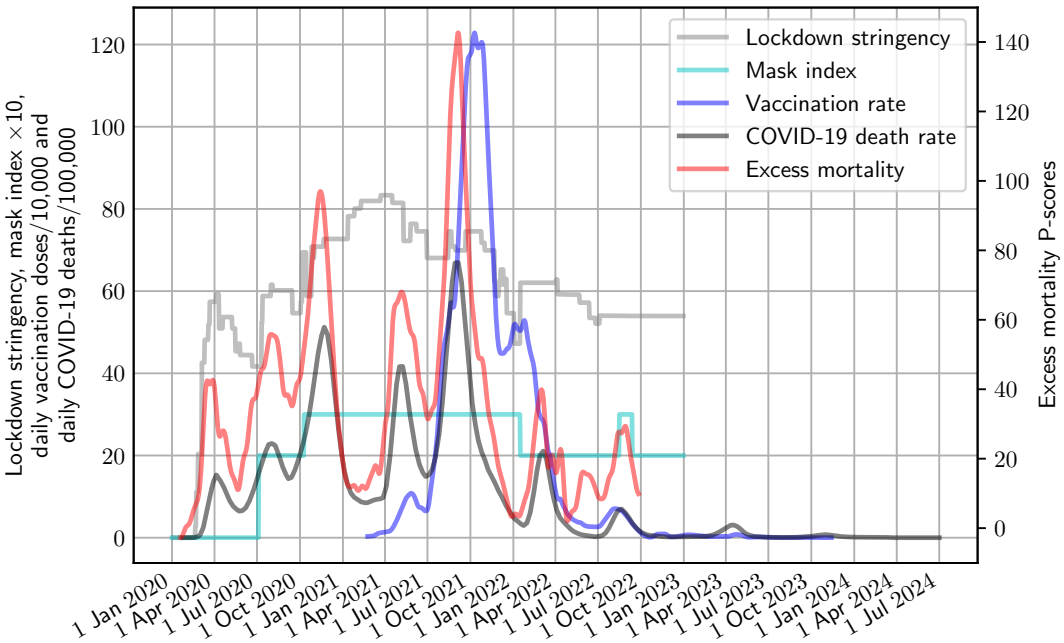

Figure 135: Iran

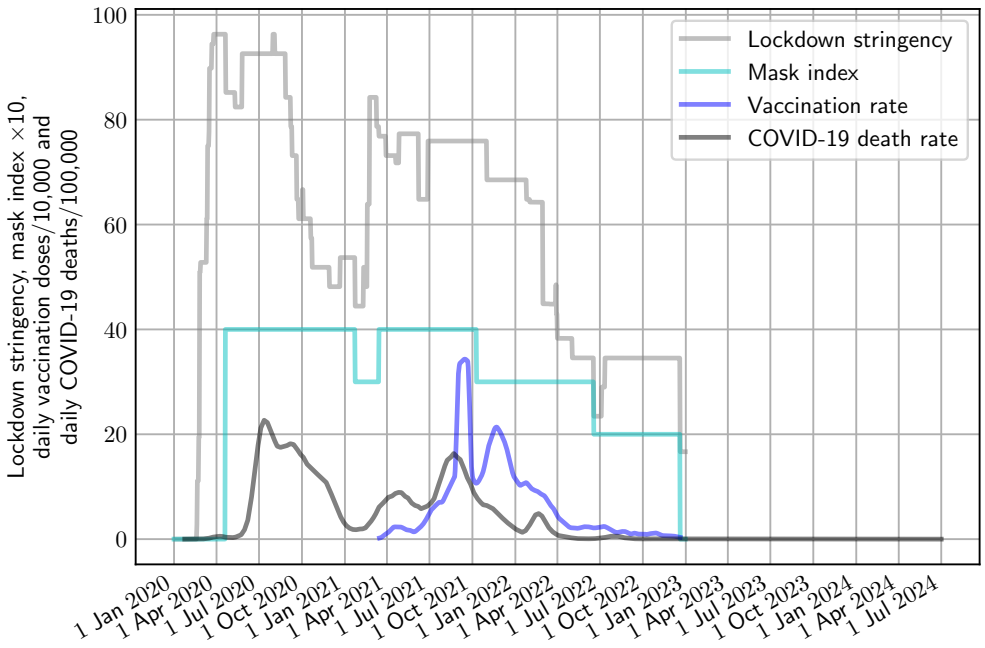

Figure 136: Iraq

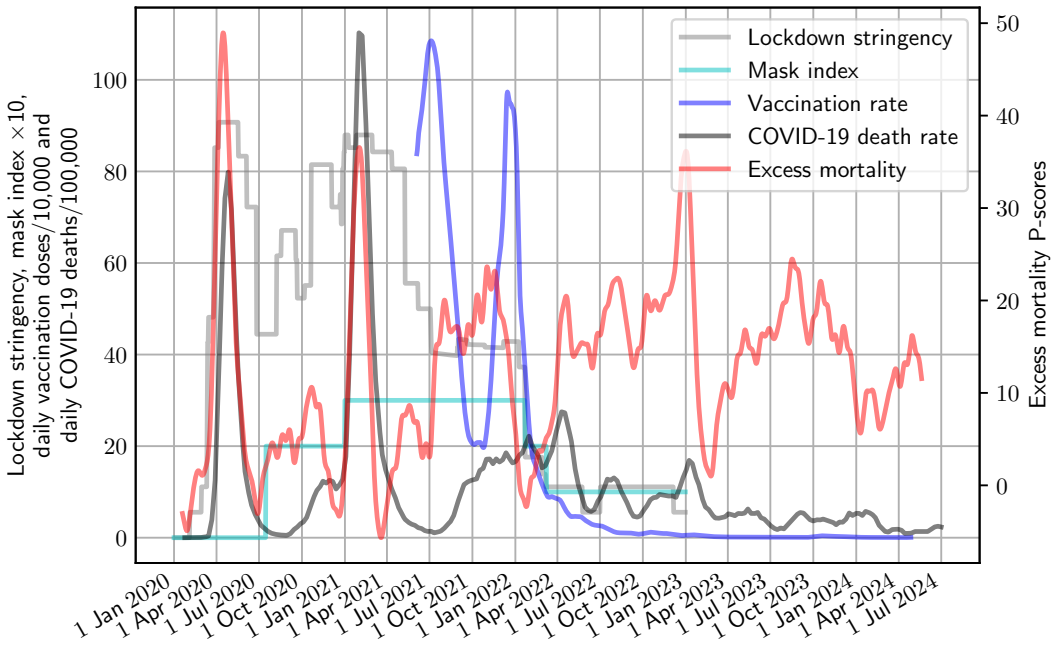

Figure 137: Ireland

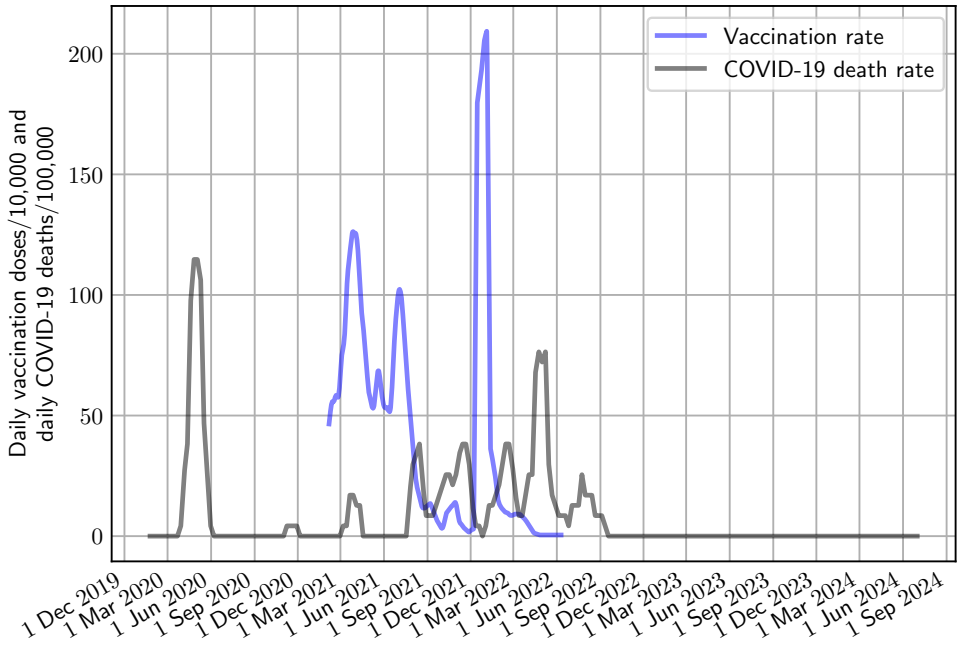

Figure 138: Isle of Man

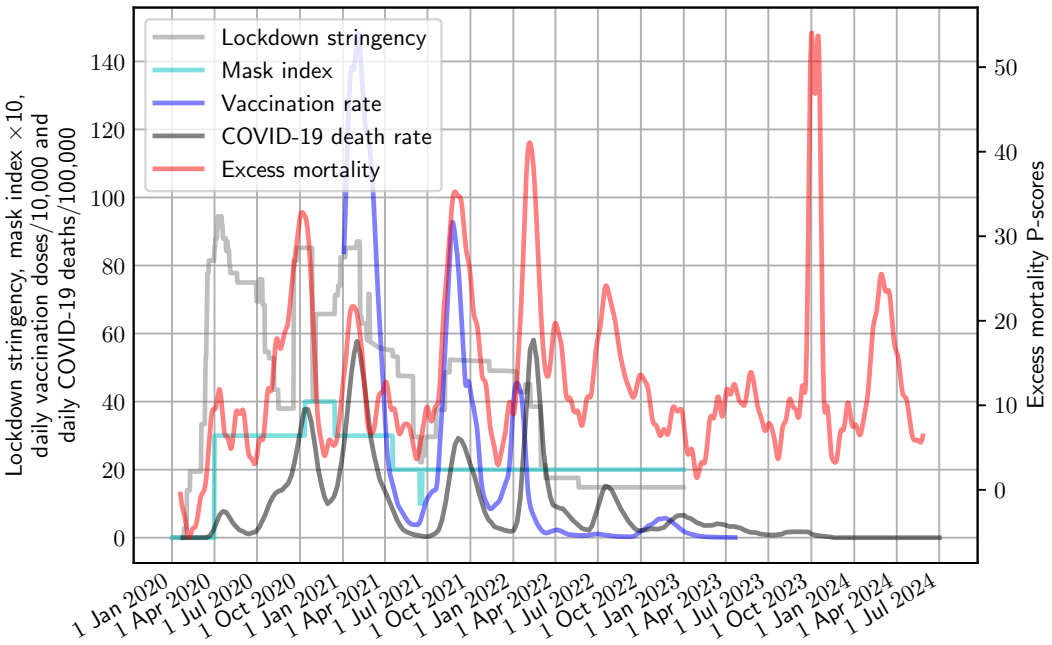

Figure 139: Israel

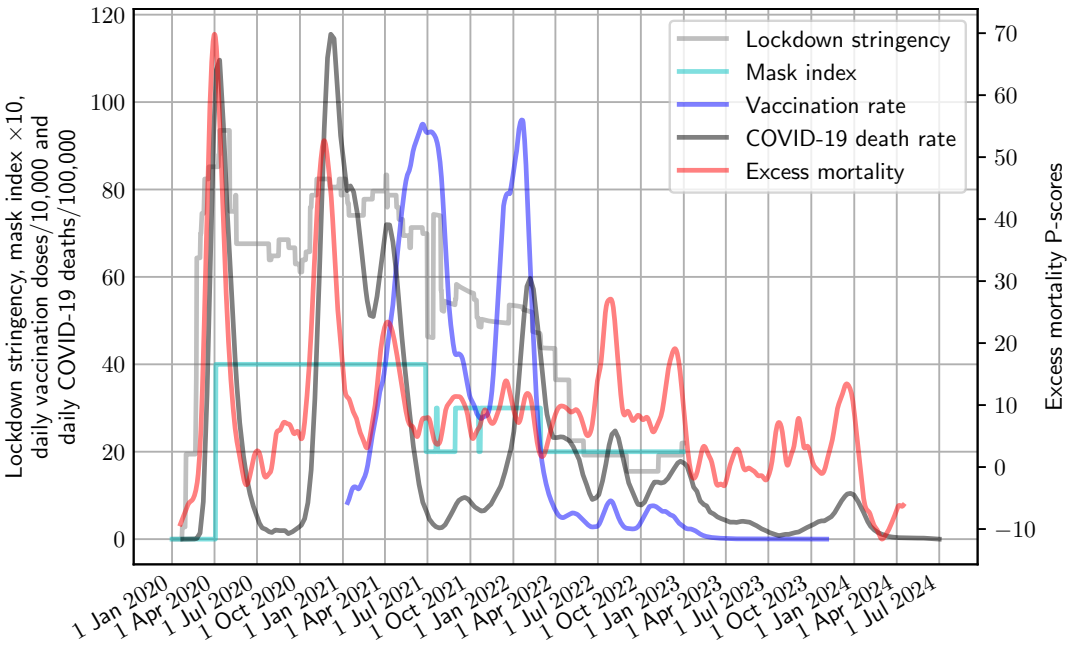

Figure 140: Italy

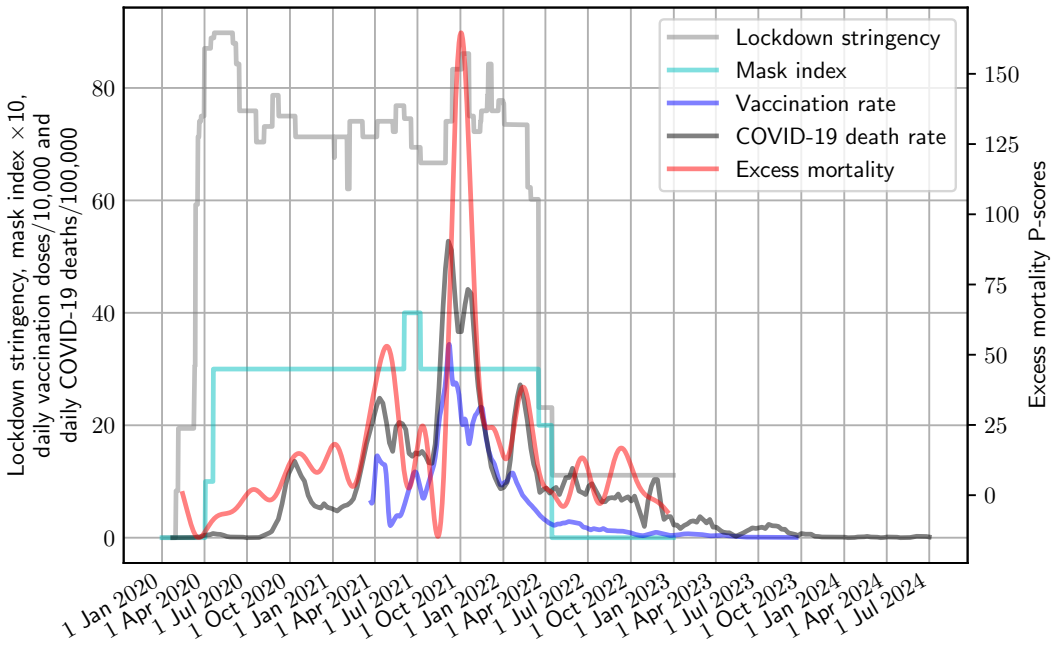

Figure 141: Jamaica

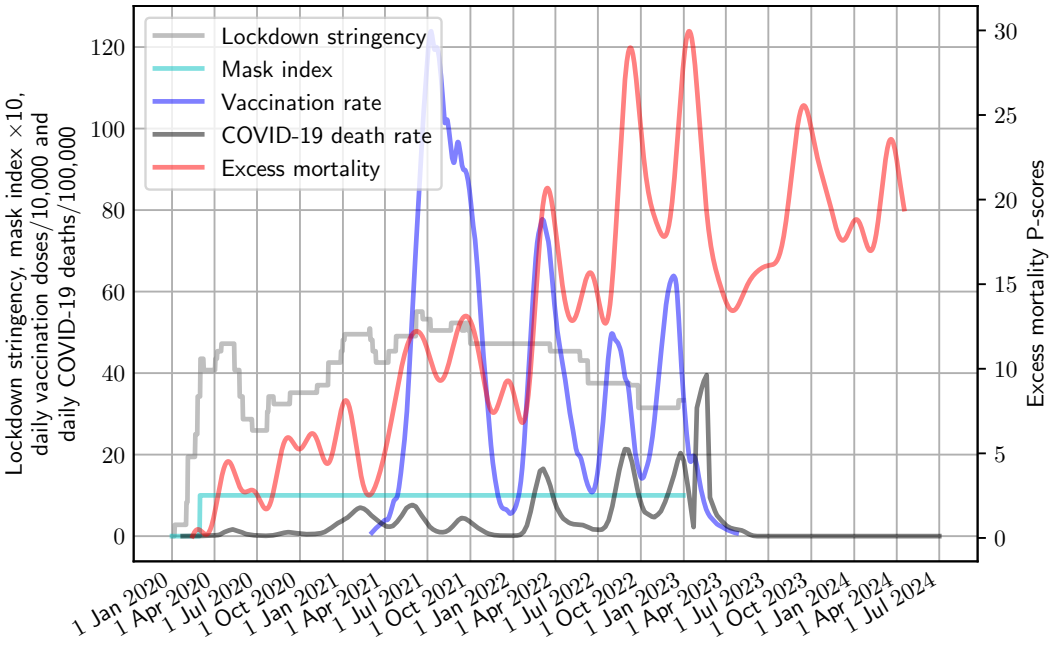

Figure 142: Japan

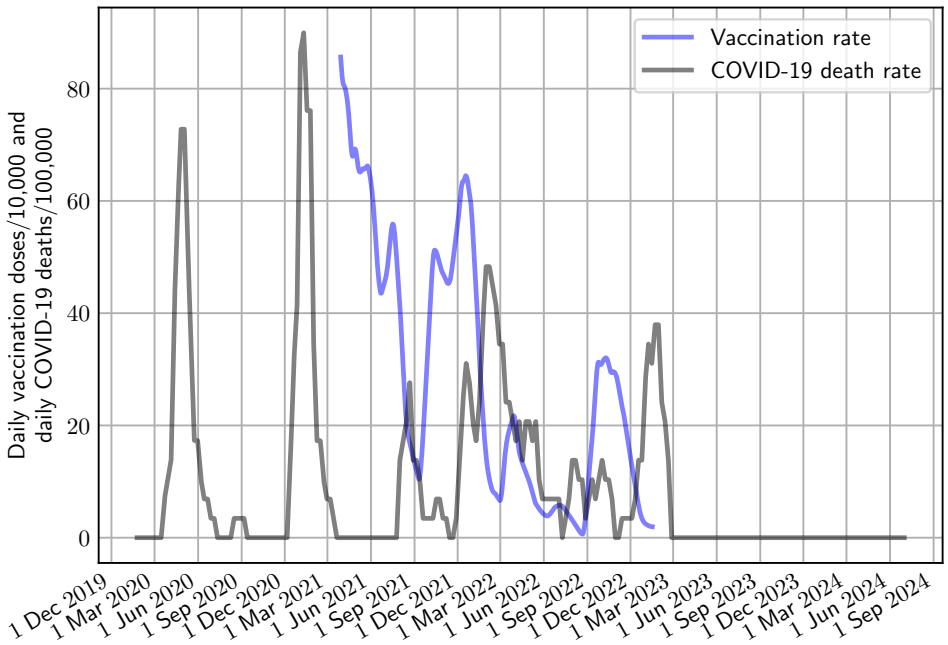

Figure 143: Jersey

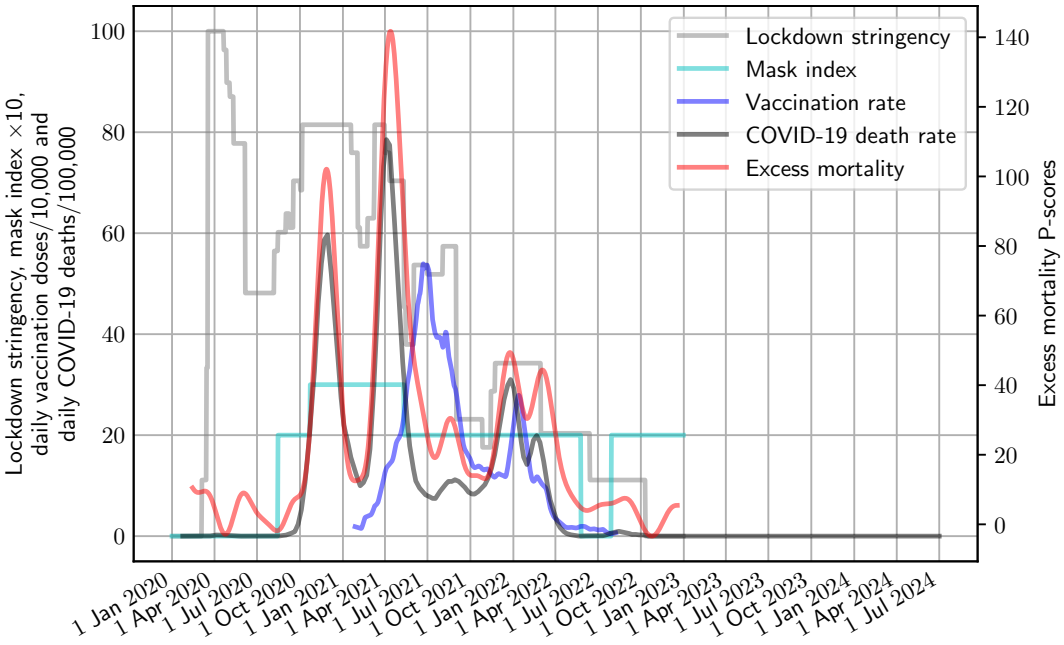

Figure 144: Jordan

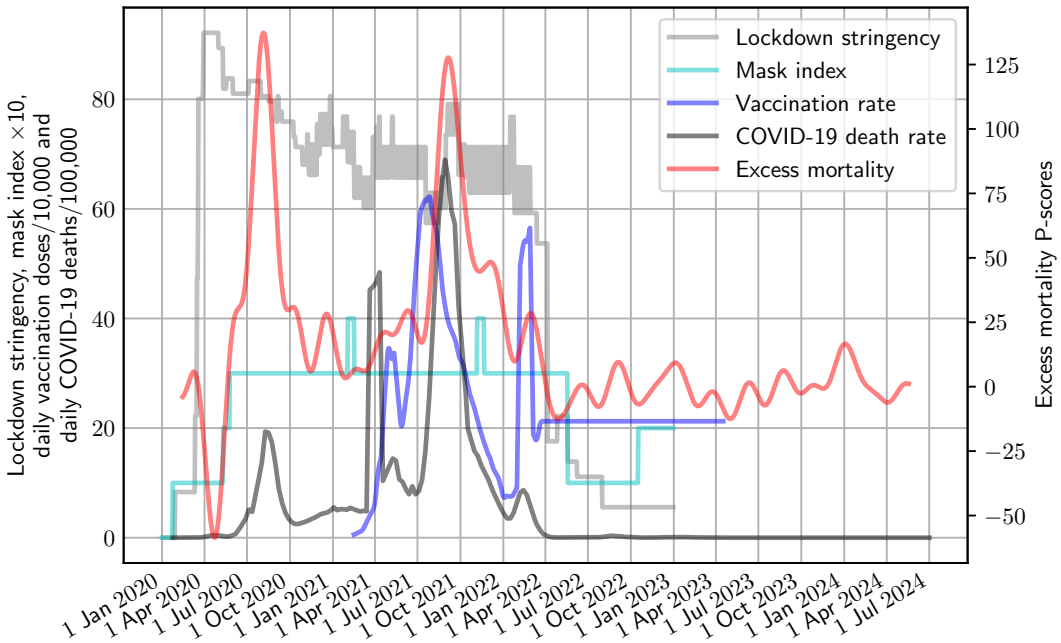

Figure 145: Kazakhstan

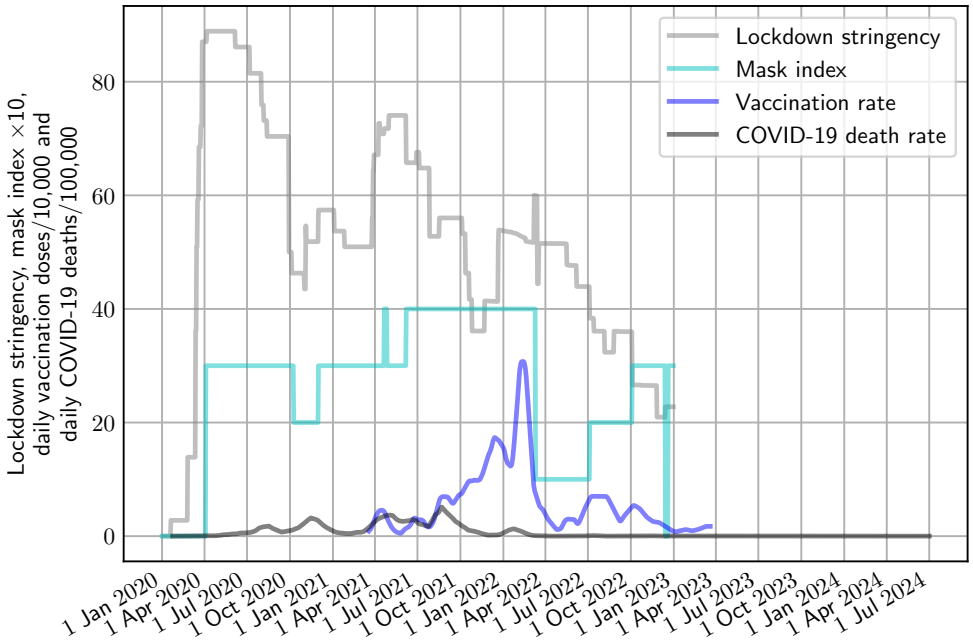

Figure 146: Kenya

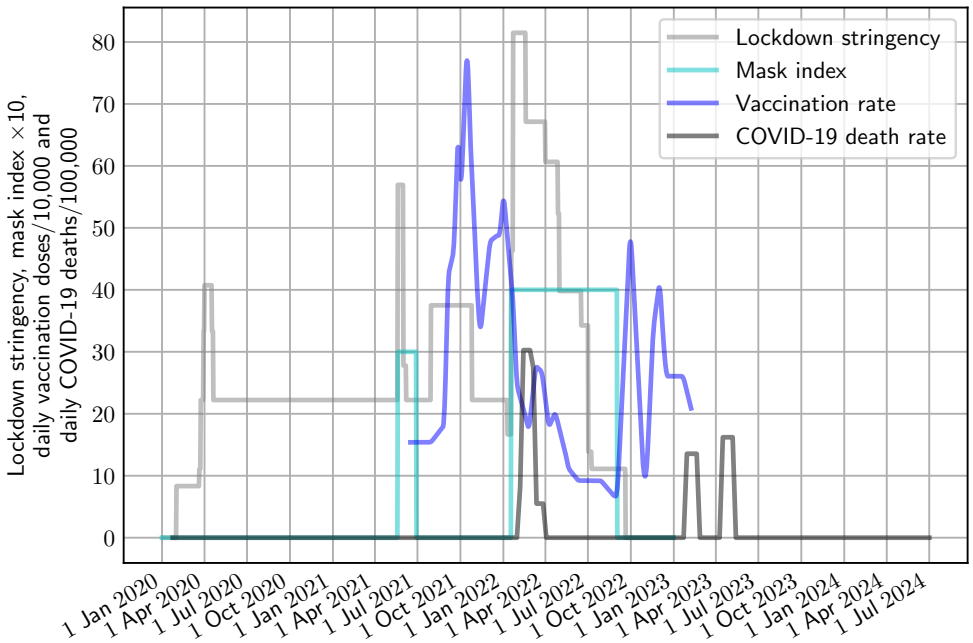

Figure 147: Kiribati

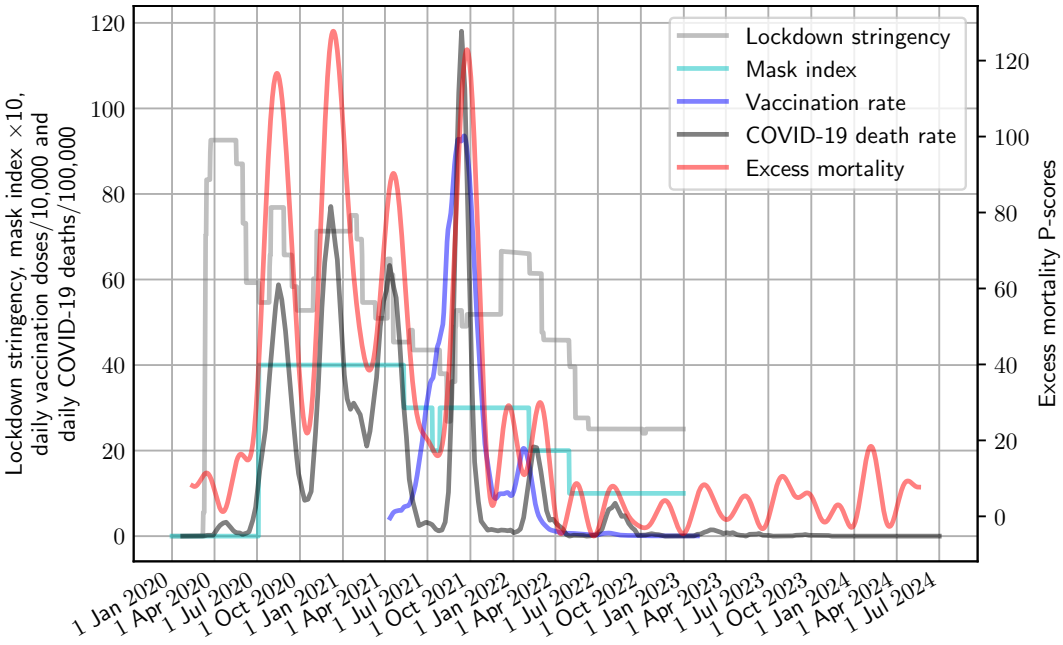

Figure 148: Kosovo

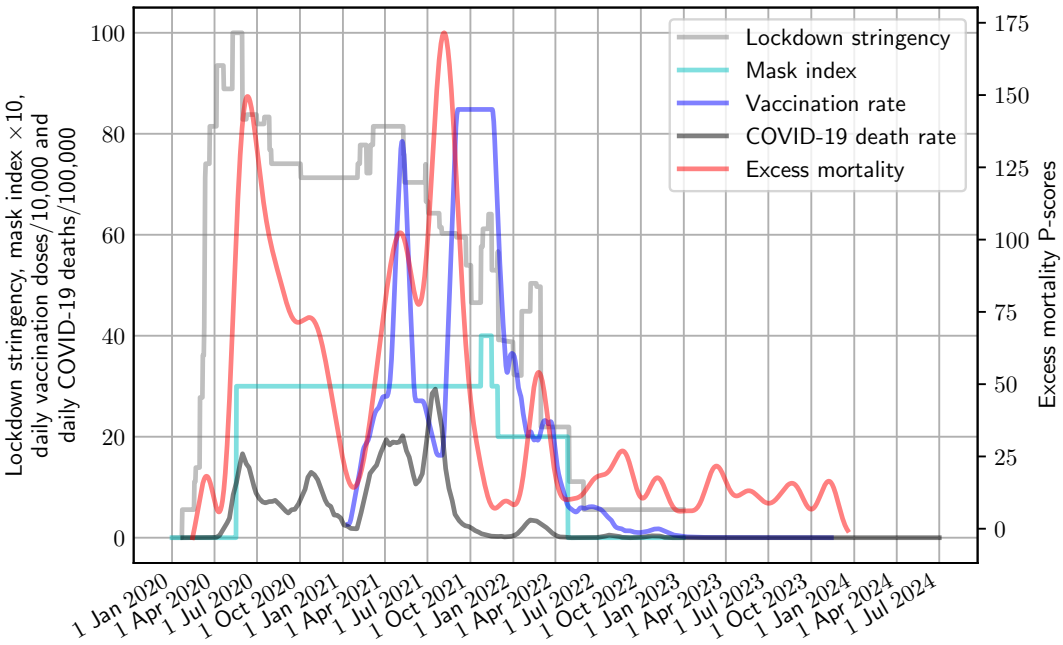

Figure 149: Kuwait

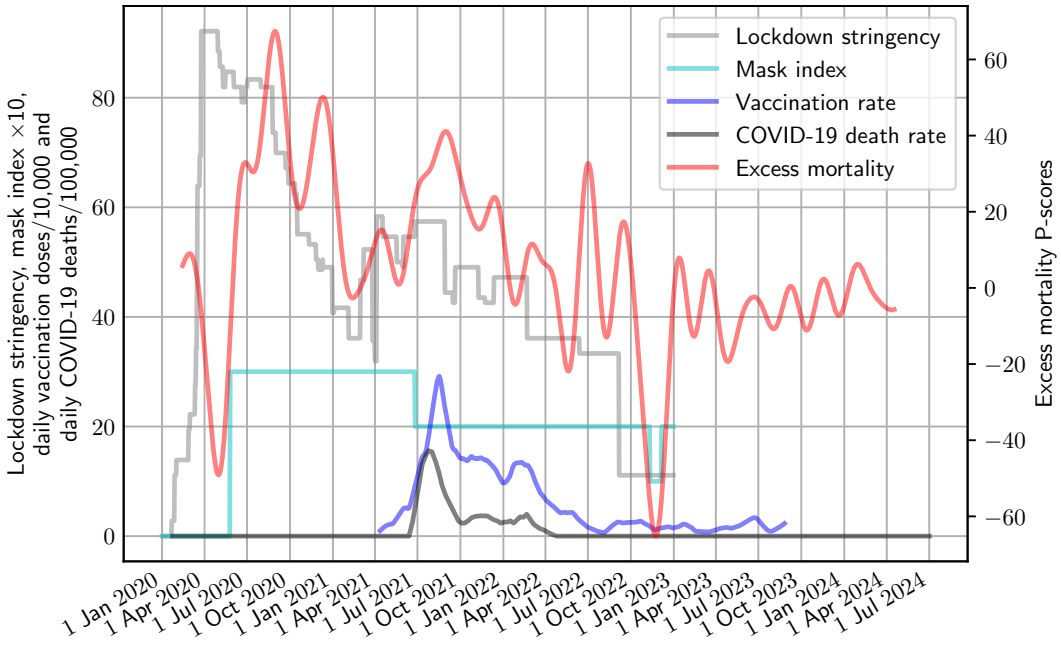

Figure 150: Kyrgyzstan

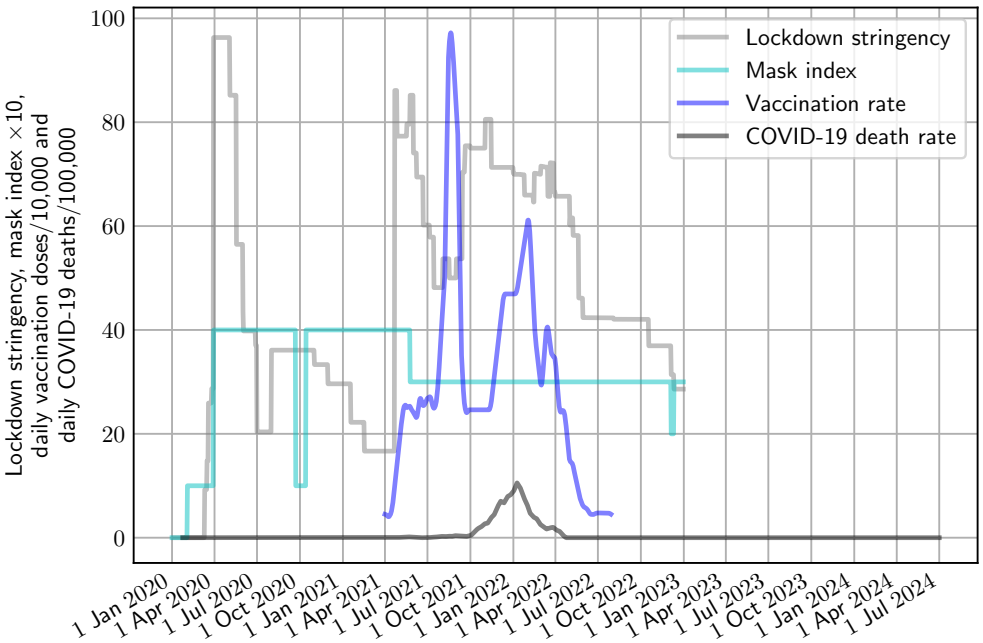

Figure 151: Laos

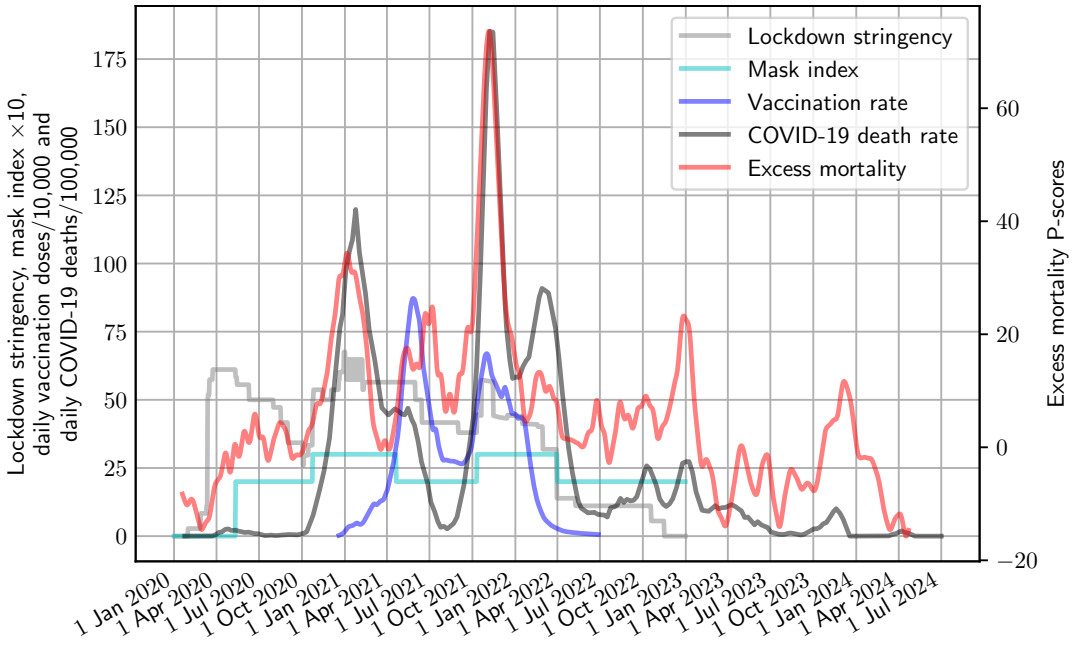

Figure 152: Latvia

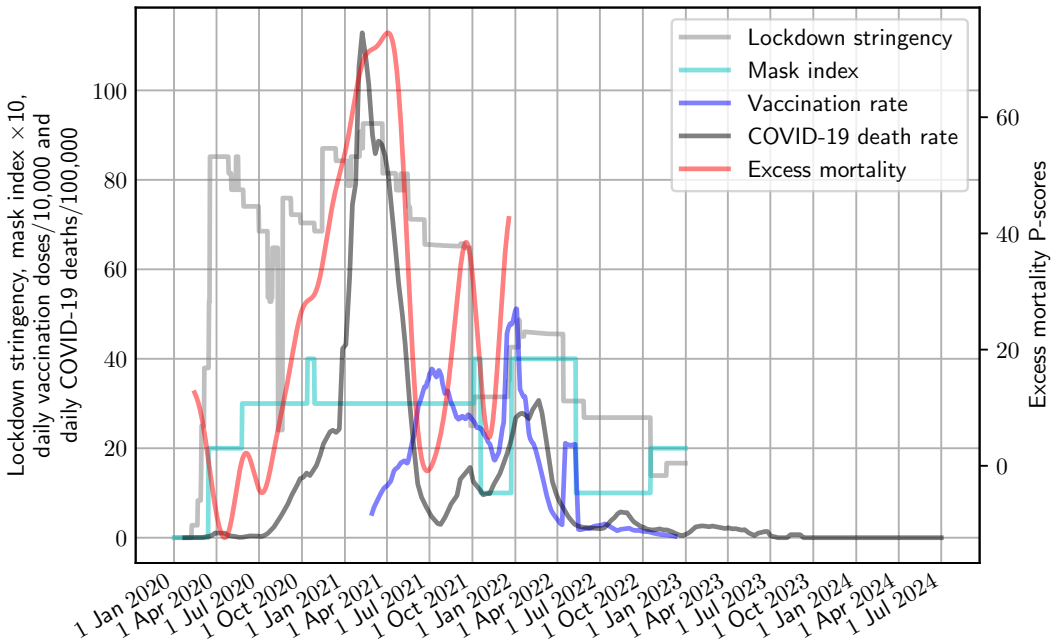

Figure 153: Lebanon

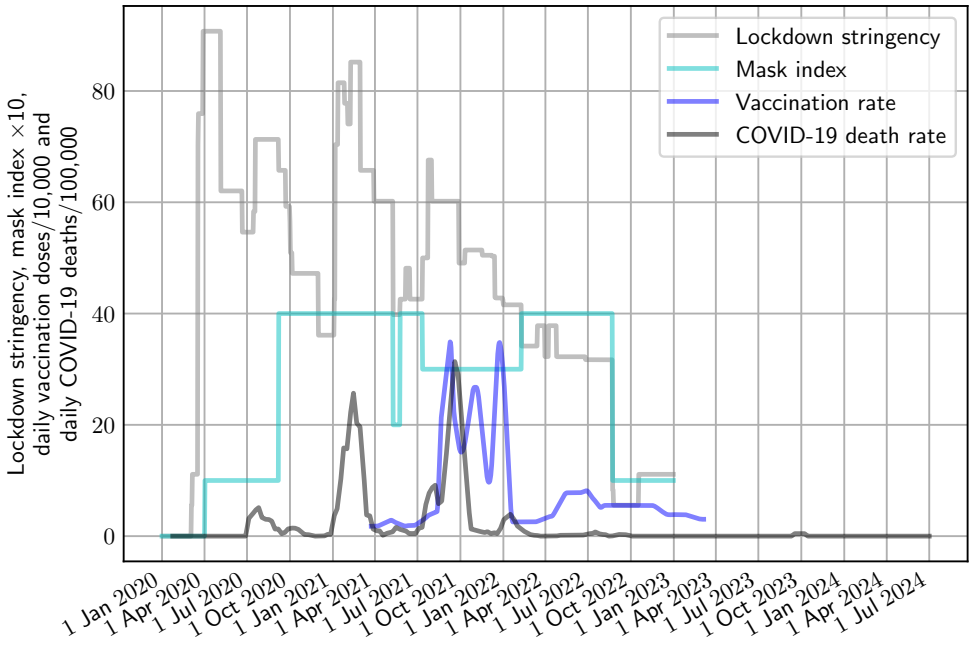

Figure 154: Lesotho

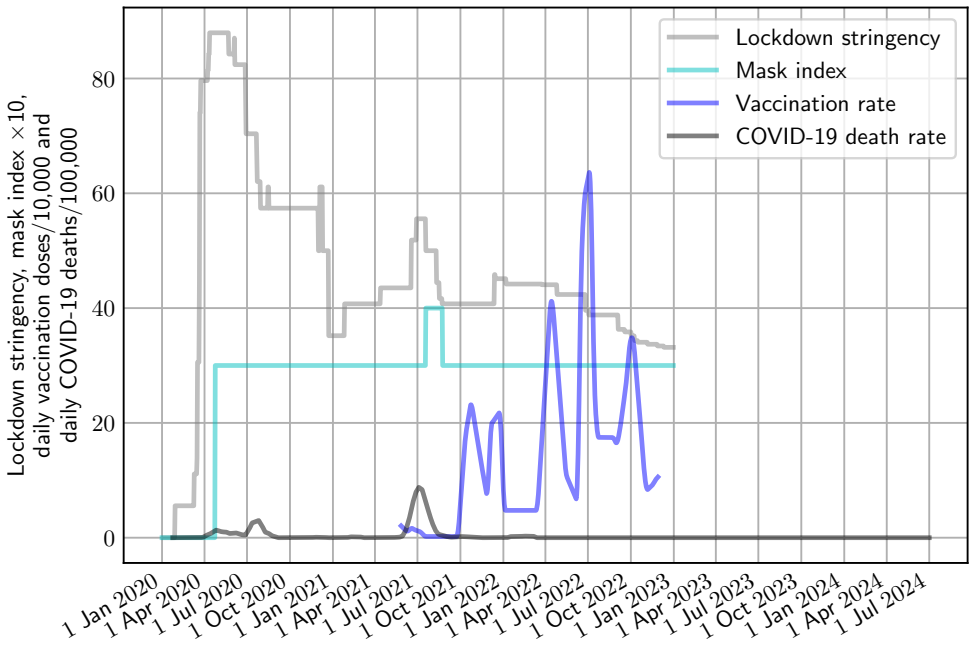

Figure 155: Liberia

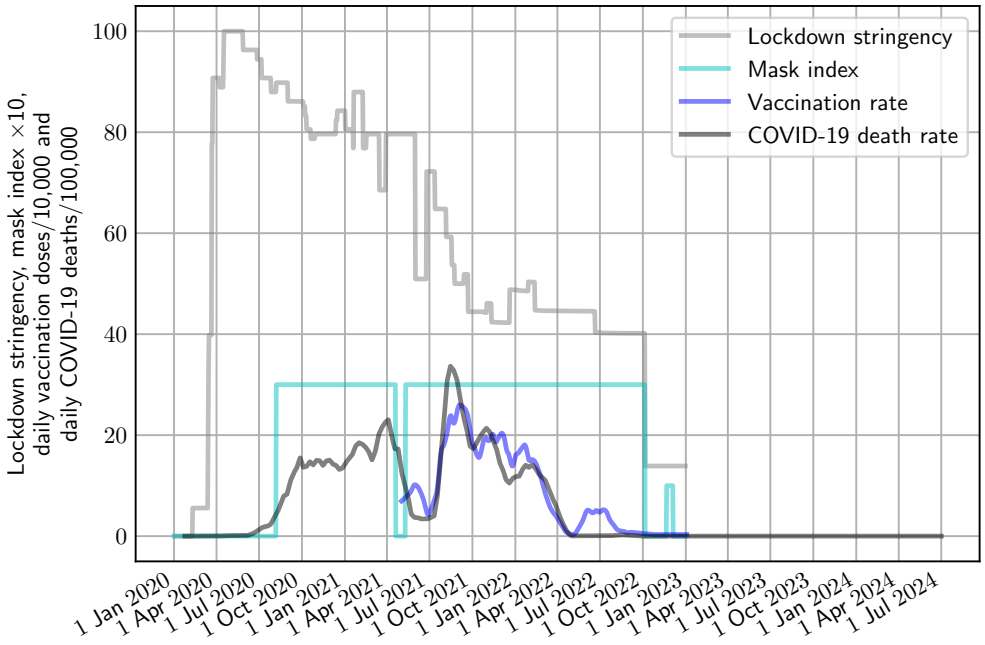

Figure 156: Libya

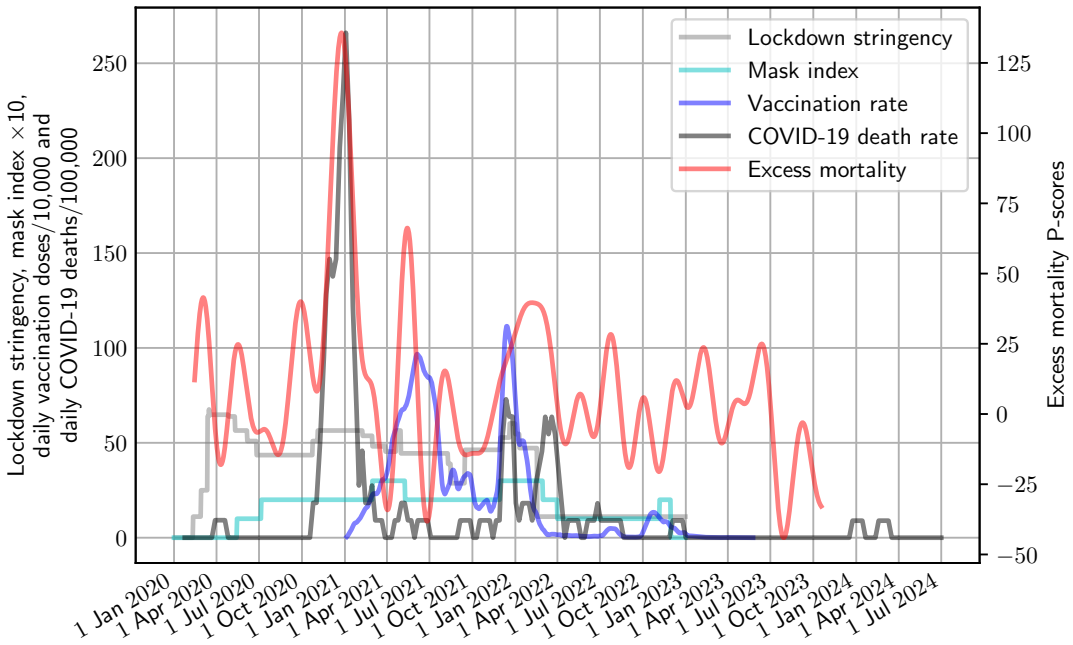

Figure 157: Liechtenstein

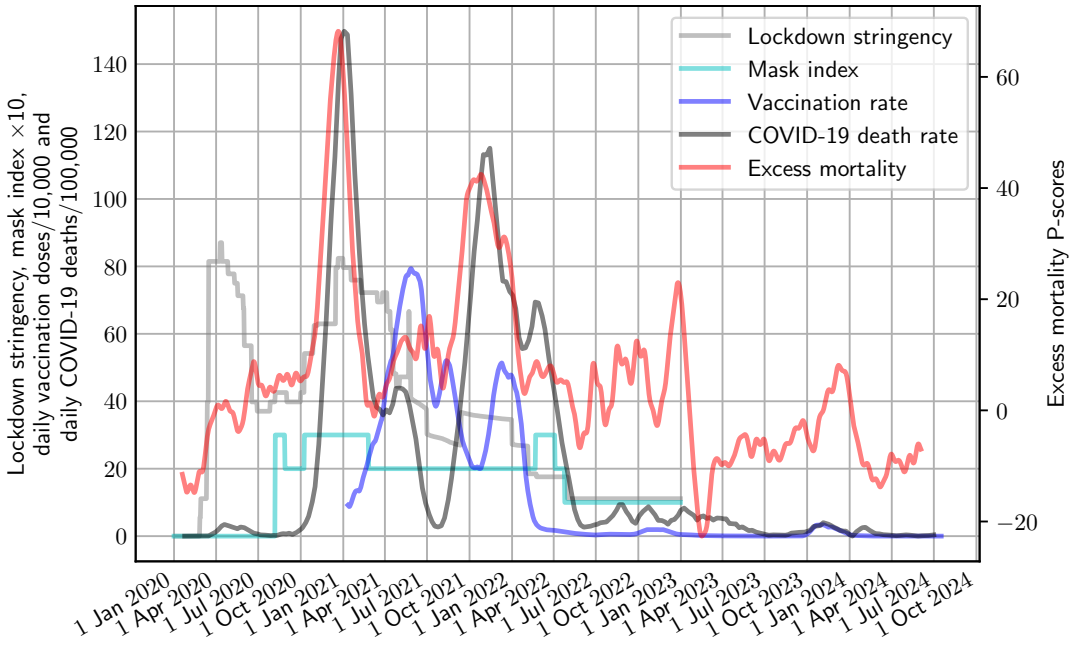

Figure 158: Lithuania

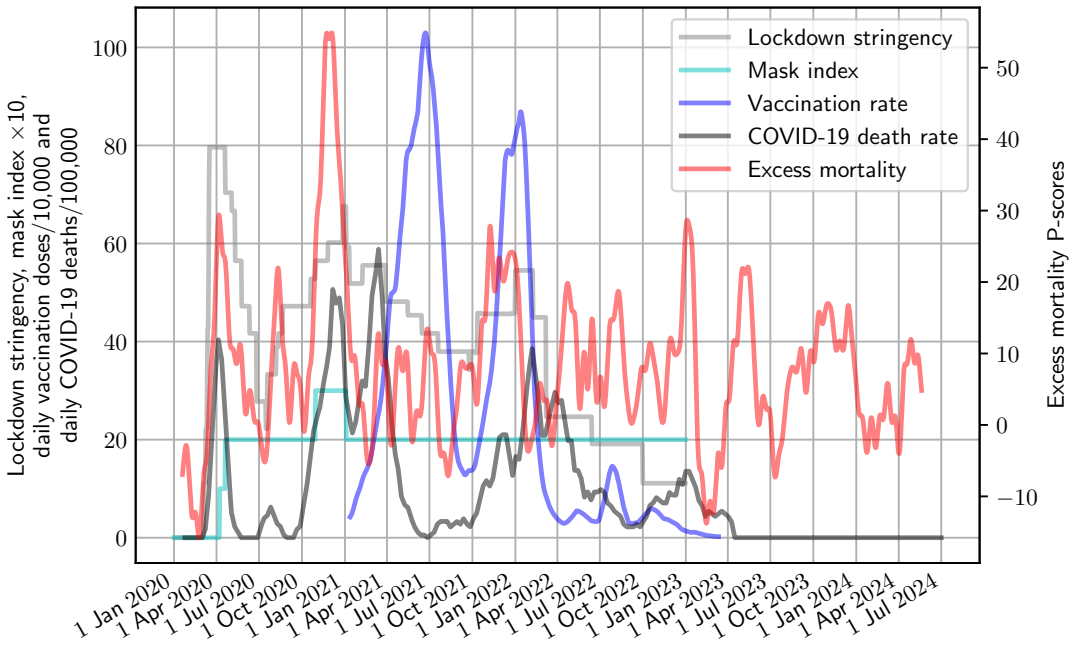

Figure 159: Luxembourg

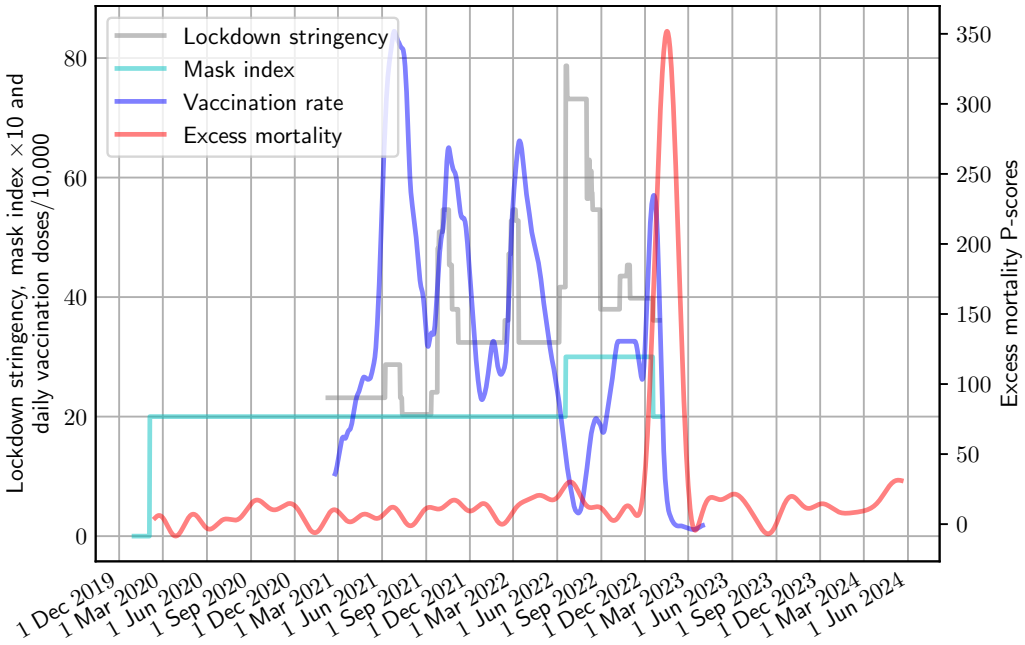

Figure 160: Macao

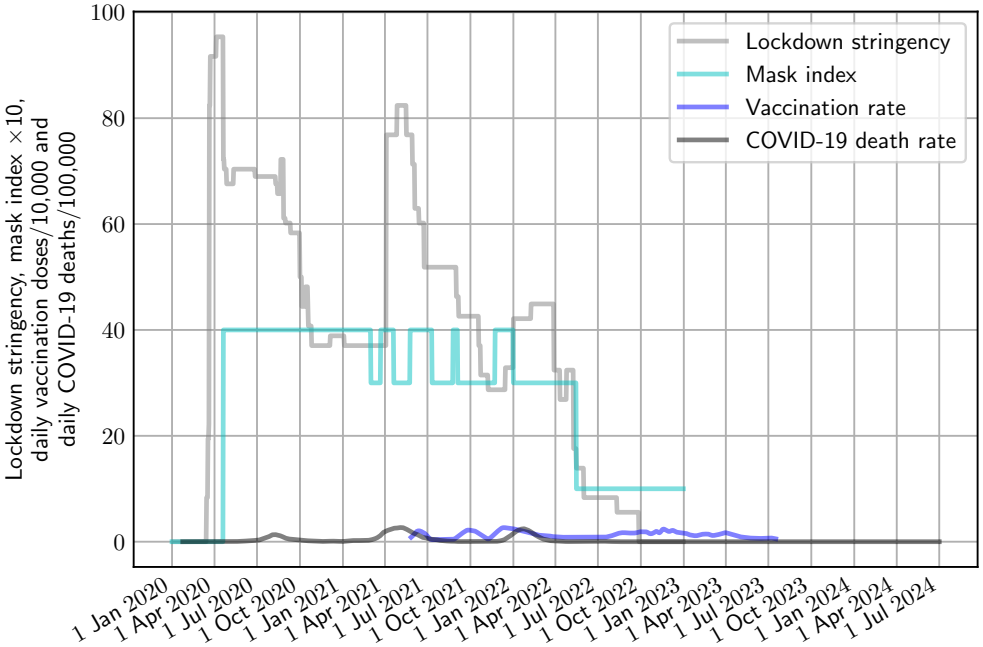

Figure 161: Madagascar

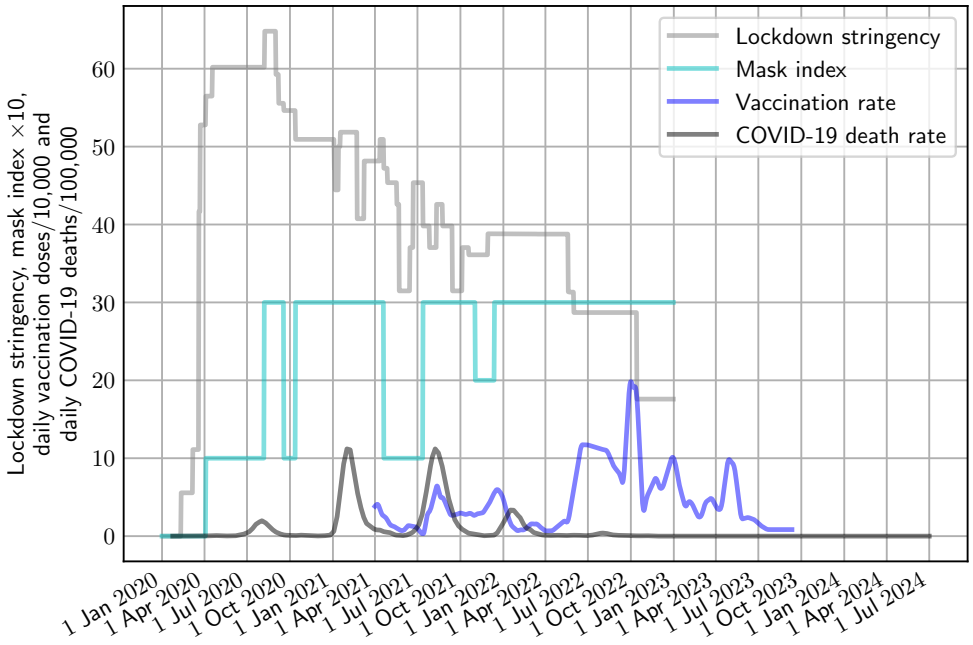

Figure 162: Malawi

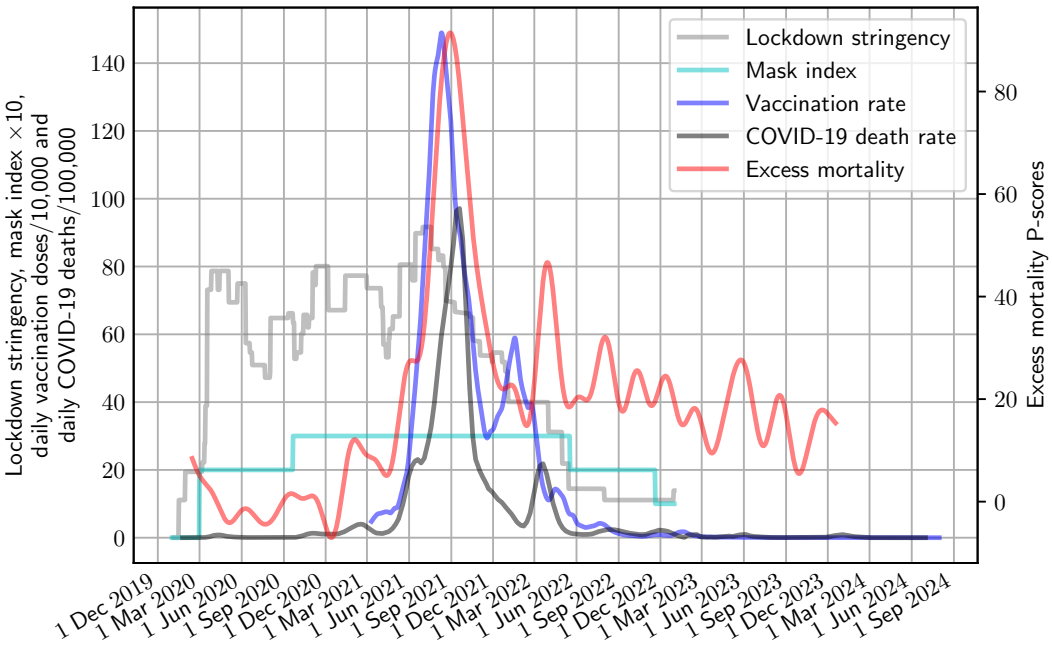

Figure 163: Malaysia

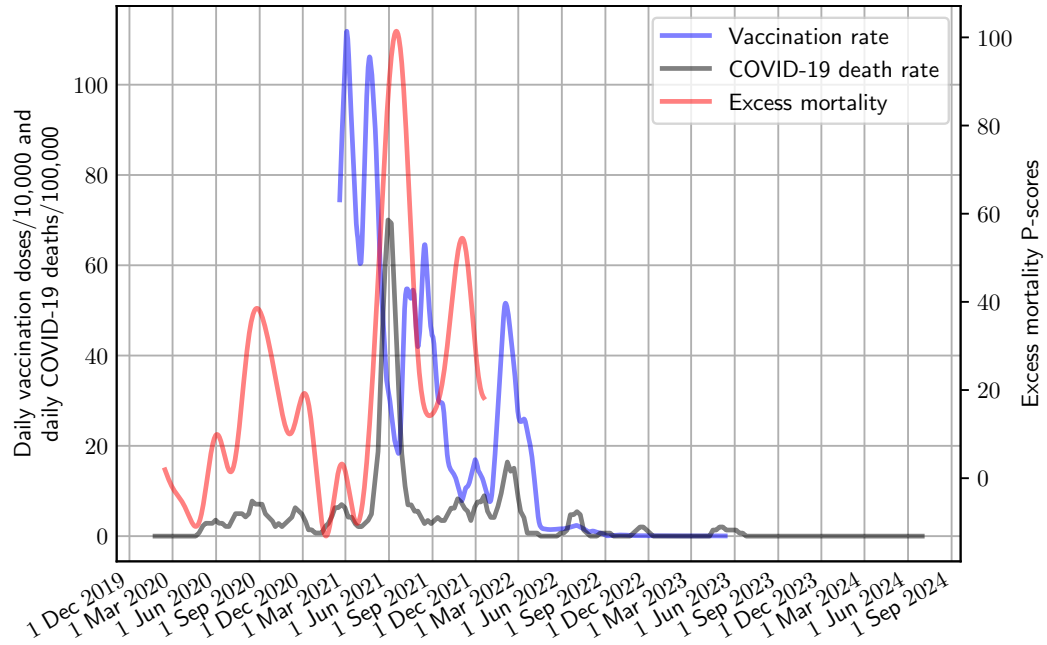

Figure 164: Maldives

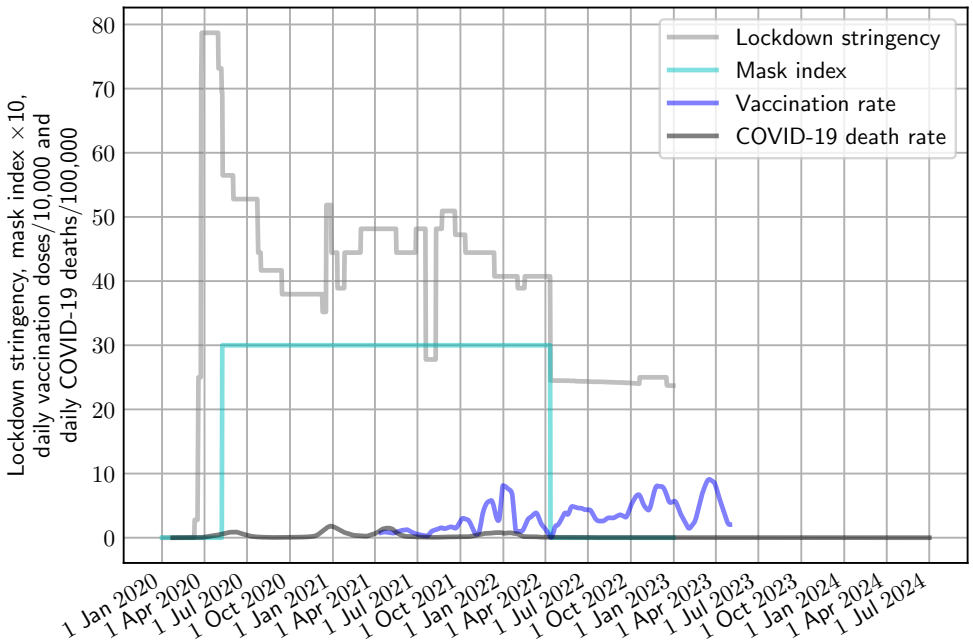

Figure 165: Mali

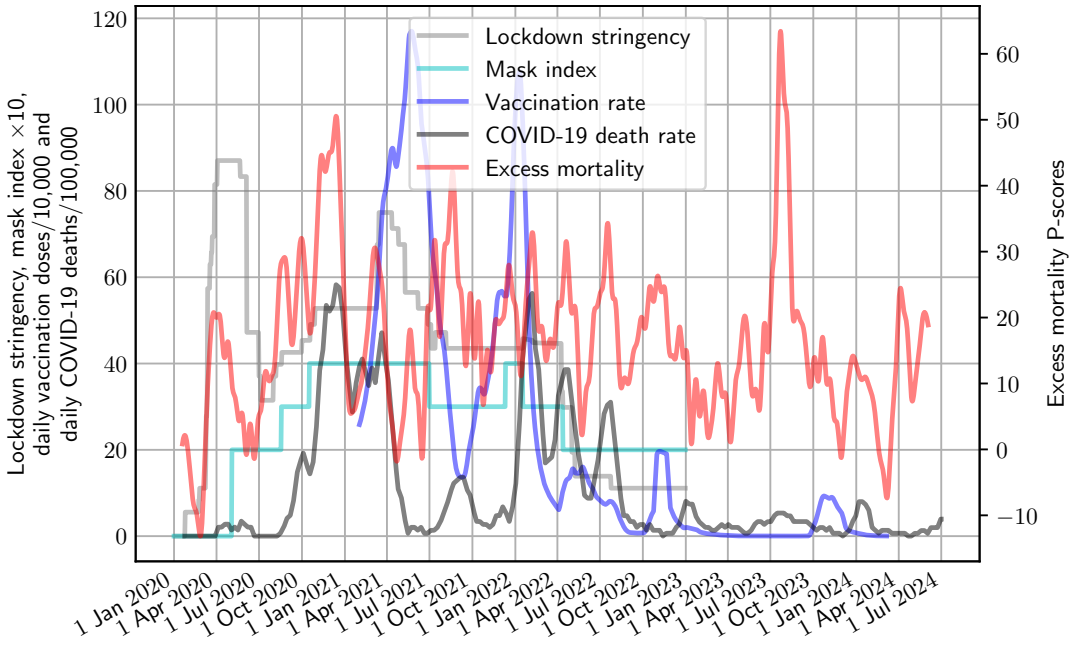

Figure 166: Malta

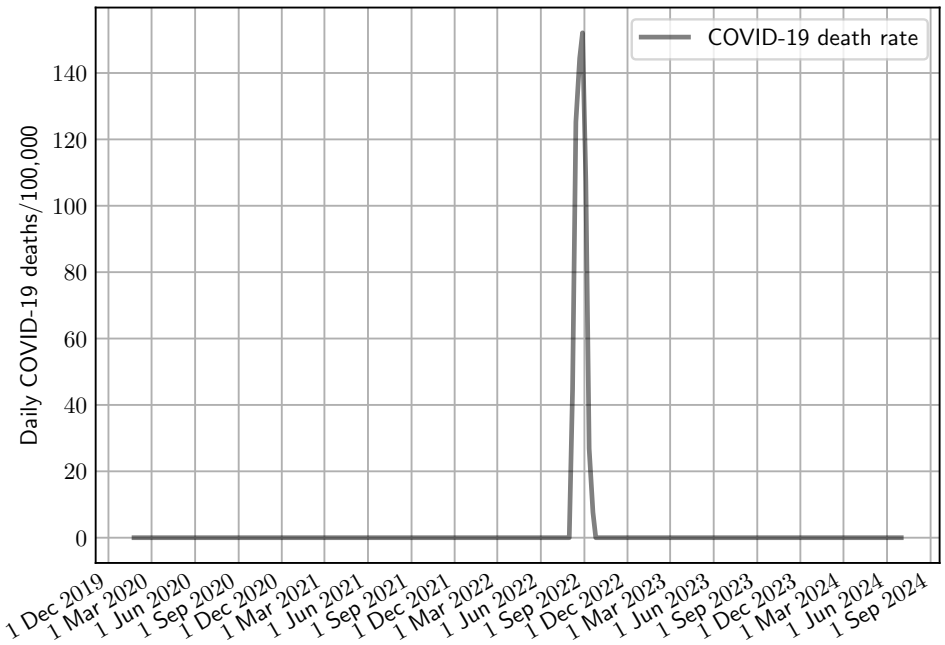

Figure 167: Marshall Islands

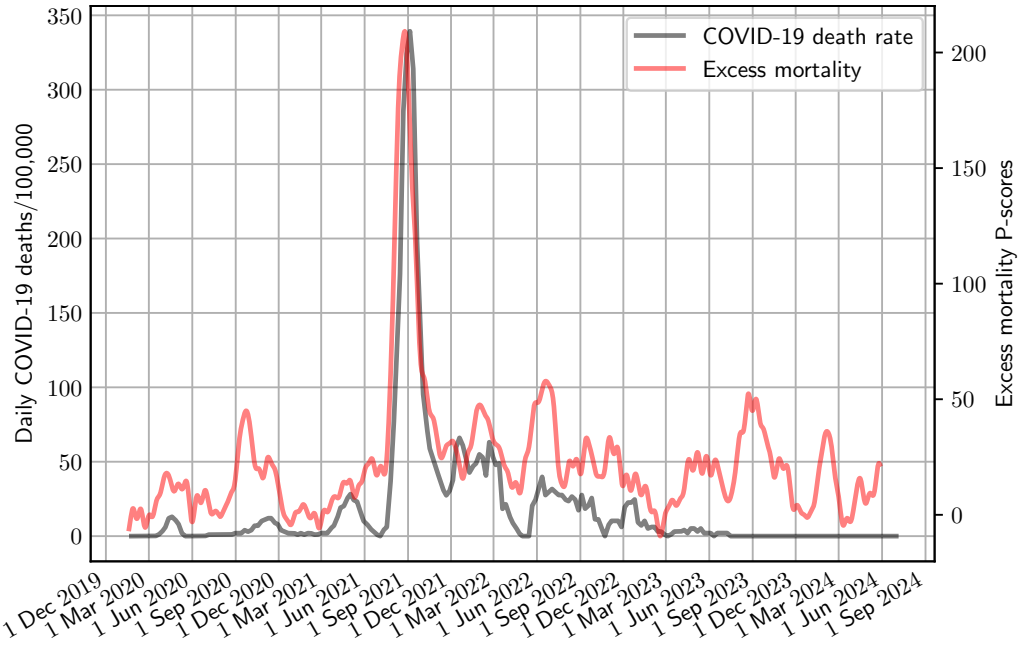

Figure 168: Martinique

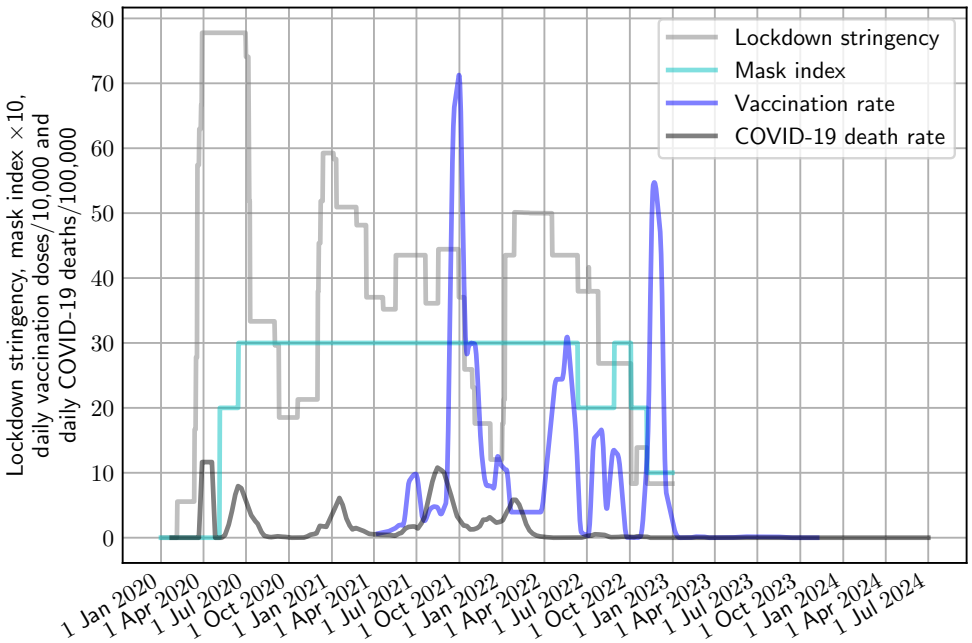

Figure 169: Mauritania

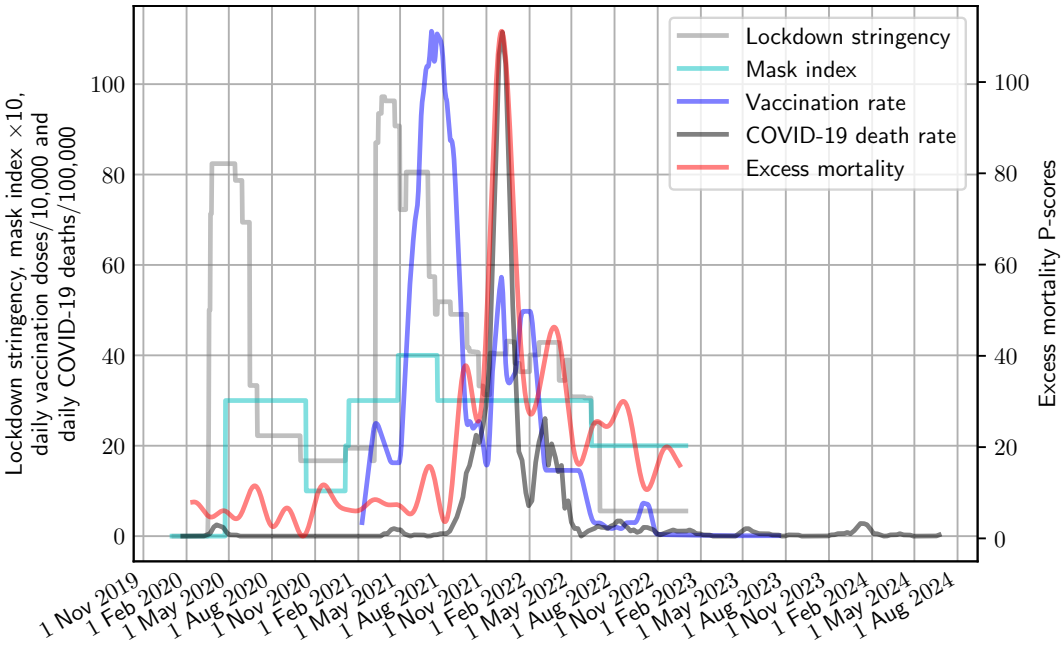

Figure 170: Mauritius

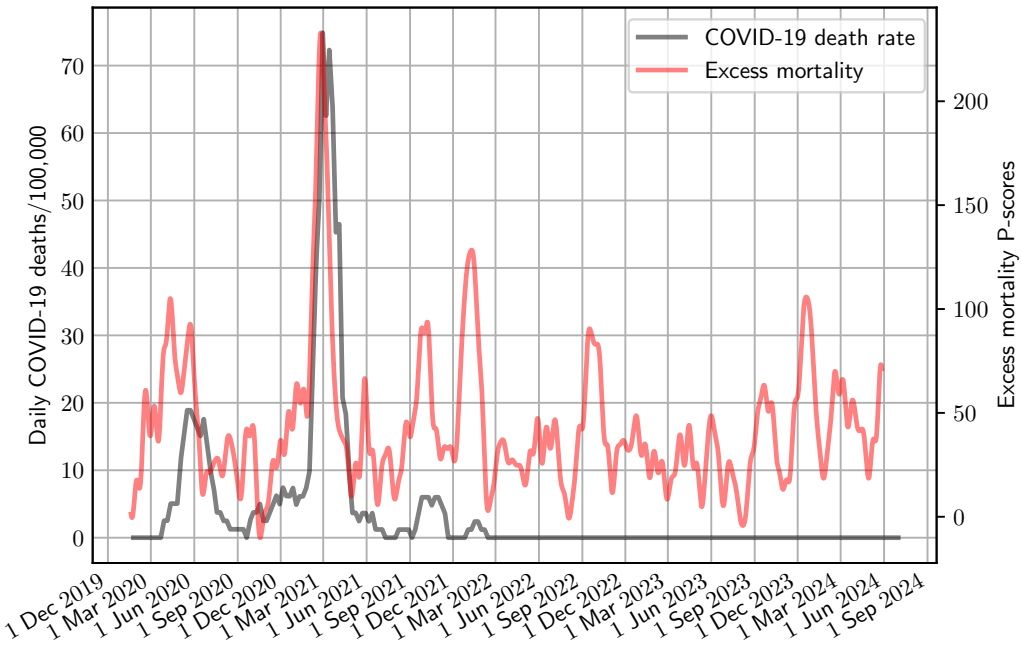

Figure 171: Mayotte

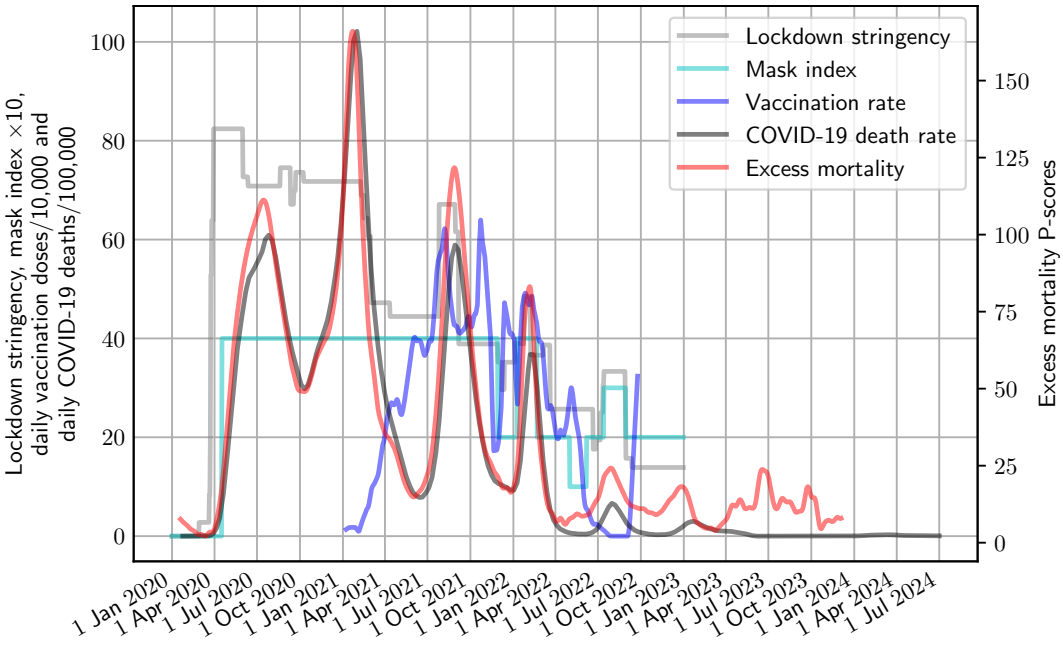

Figure 172: Mexico

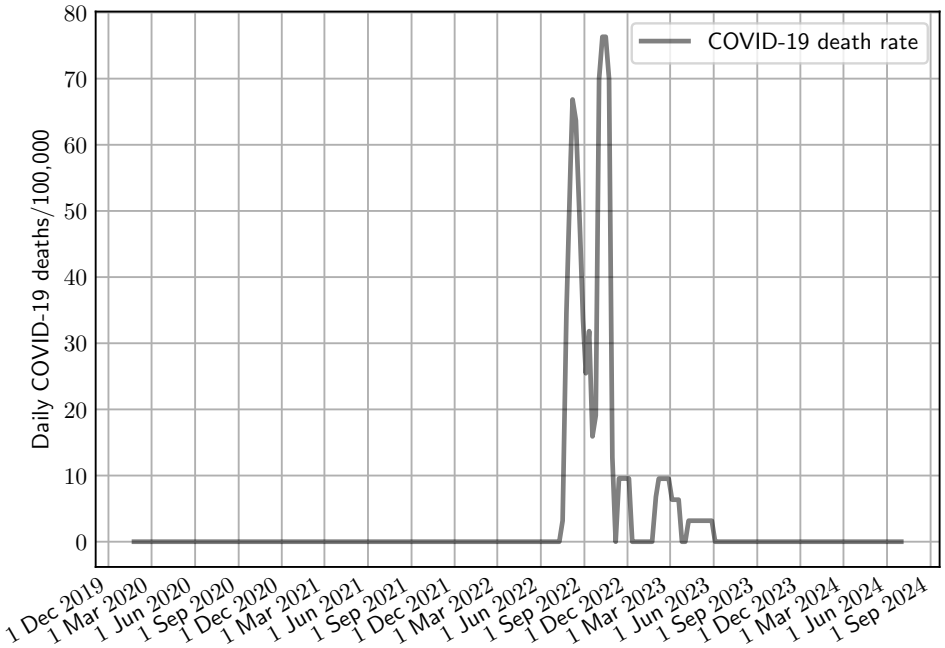

Figure 173: Micronesia (country)

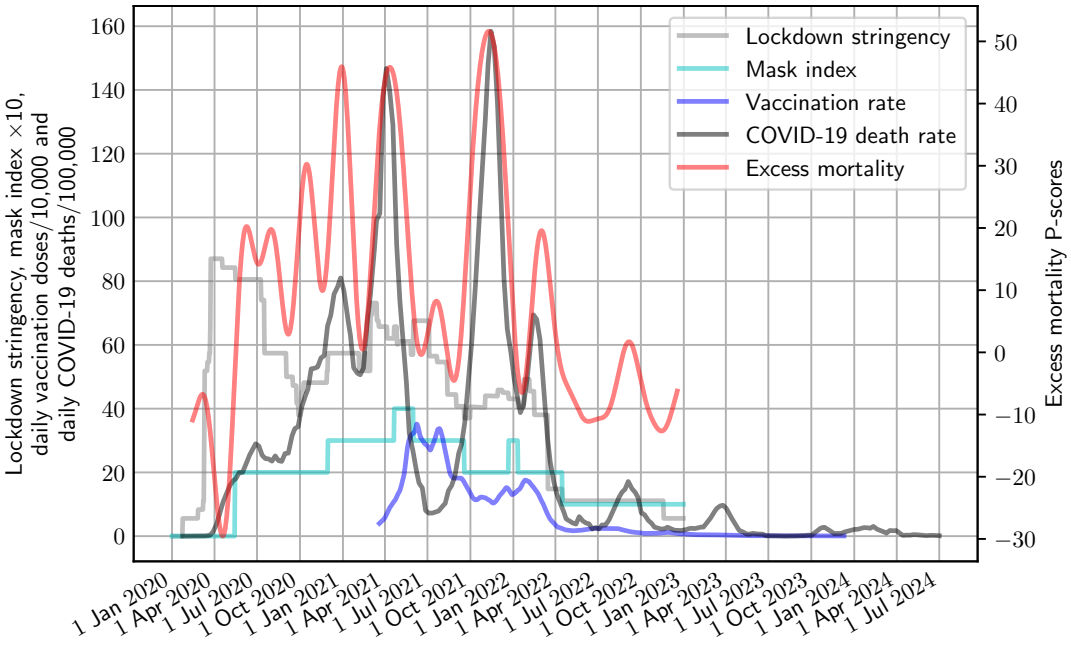

Figure 174: Moldova

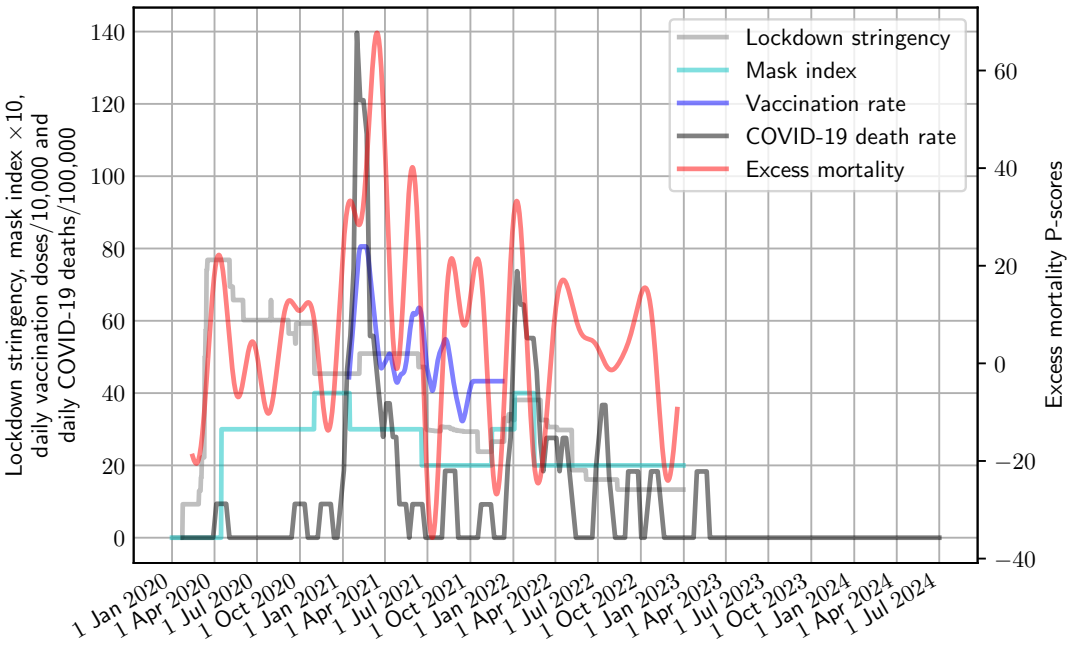

Figure 175: Monaco

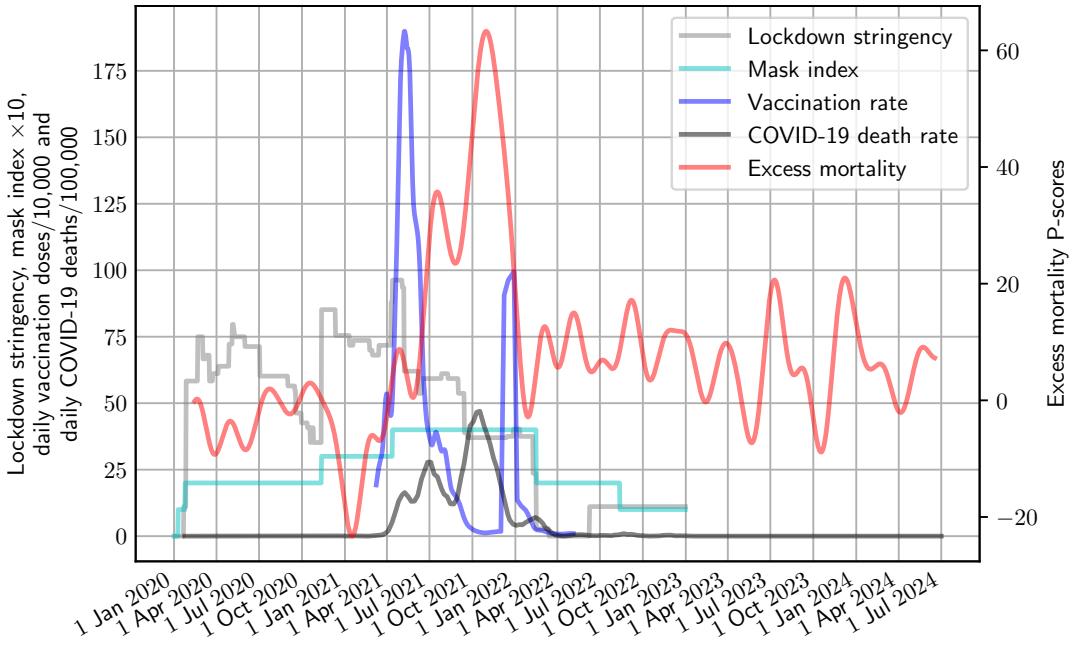

Figure 176: Mongolia

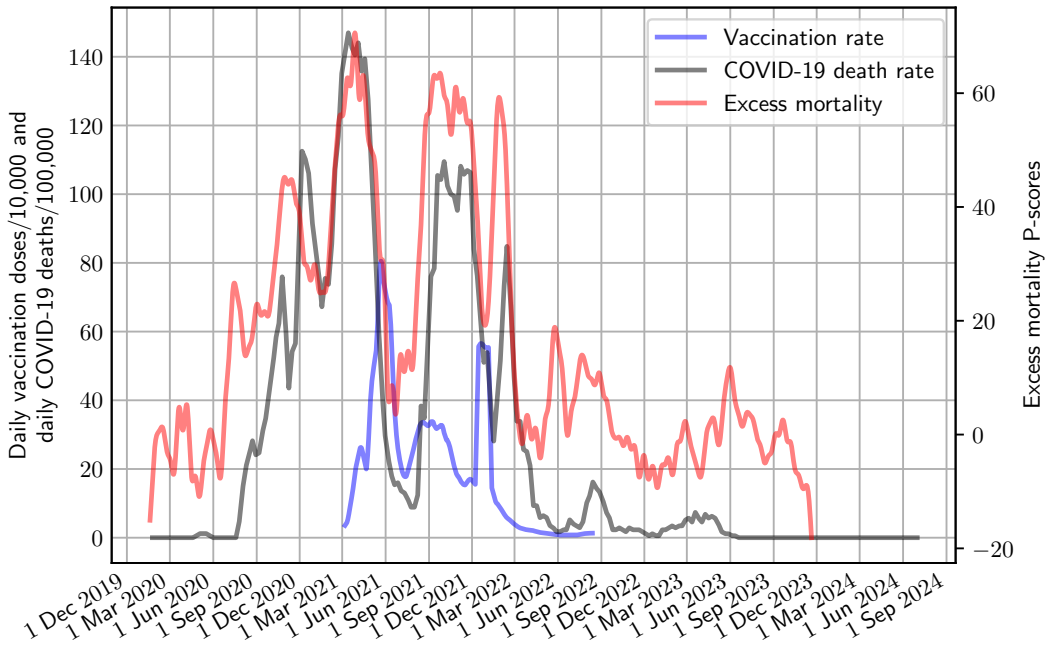

Figure 177: Montenegro

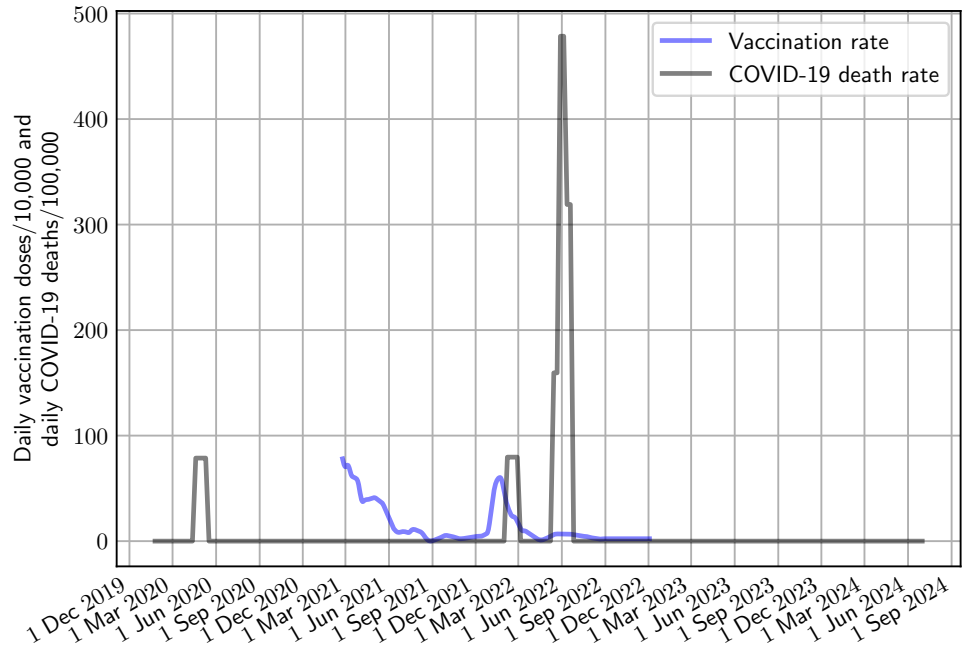

Figure 178: Montserrat

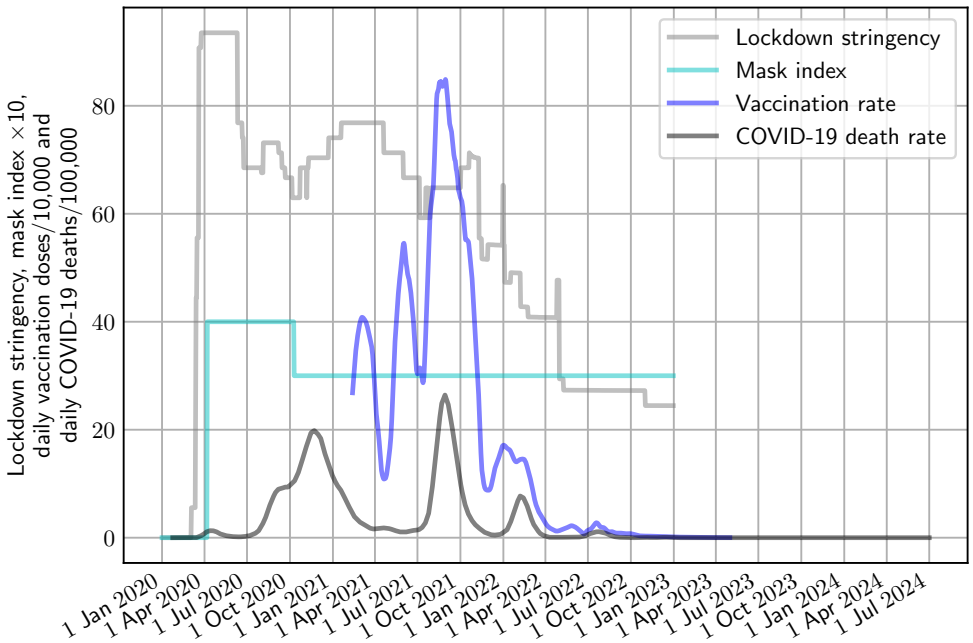

Figure 179: Morocco

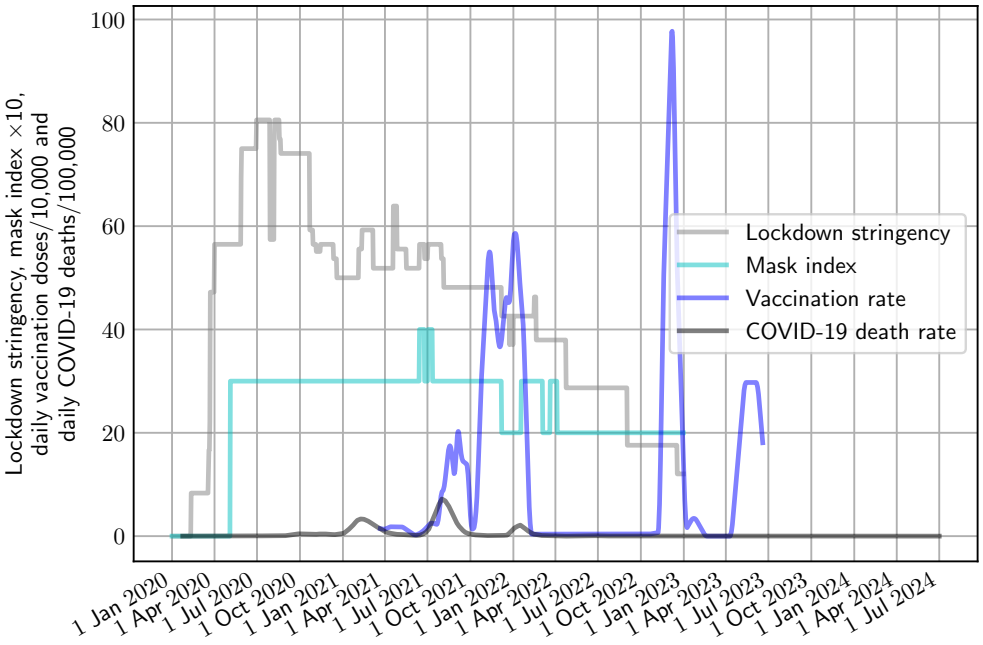

Figure 180: Mozambique

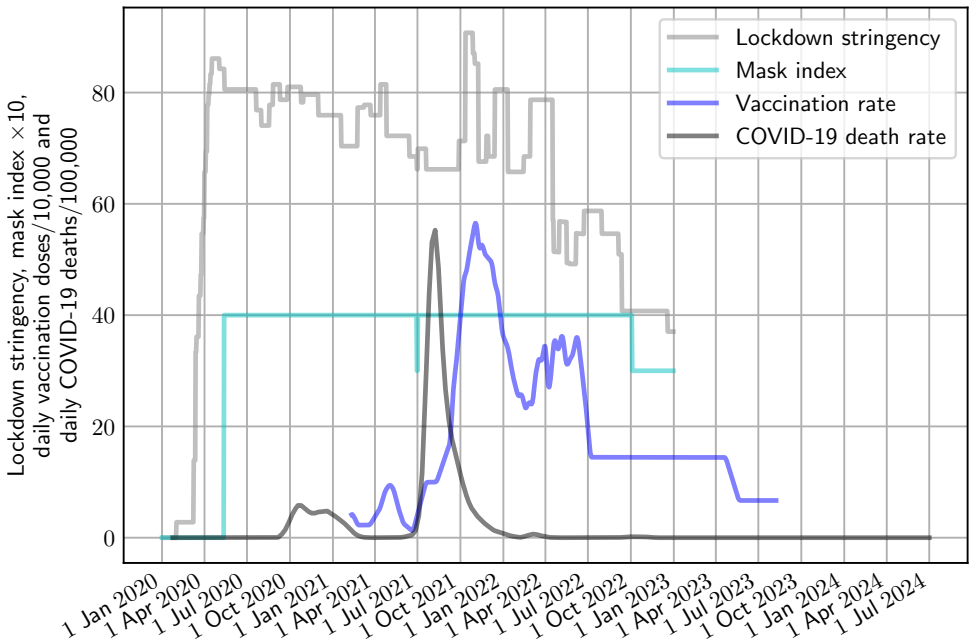

Figure 181: Myanmar

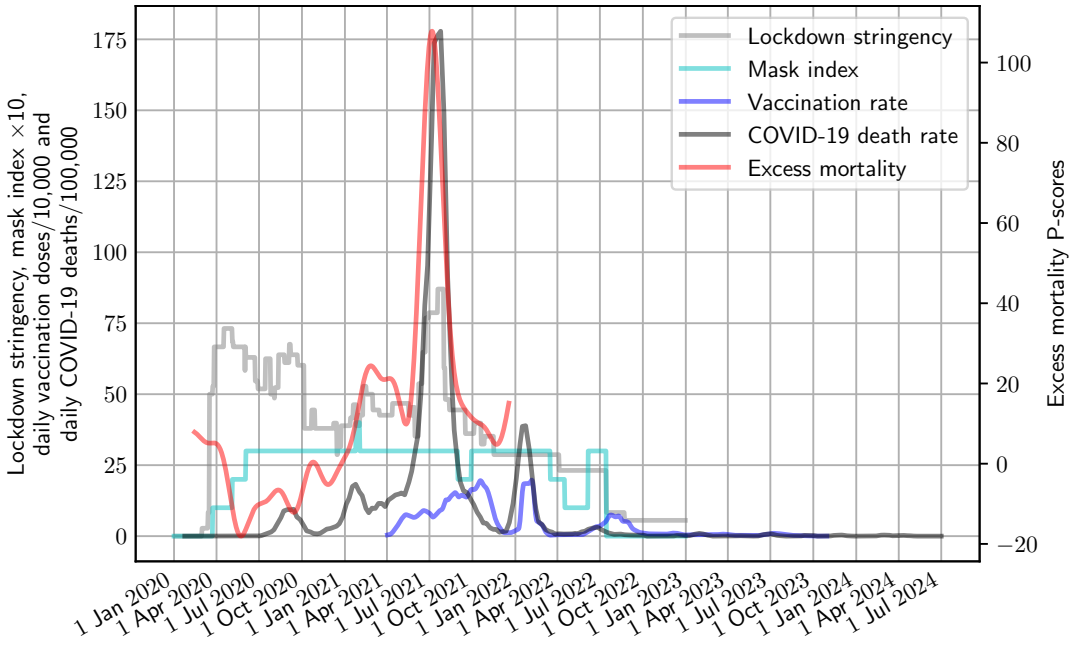

Figure 182: Namibia

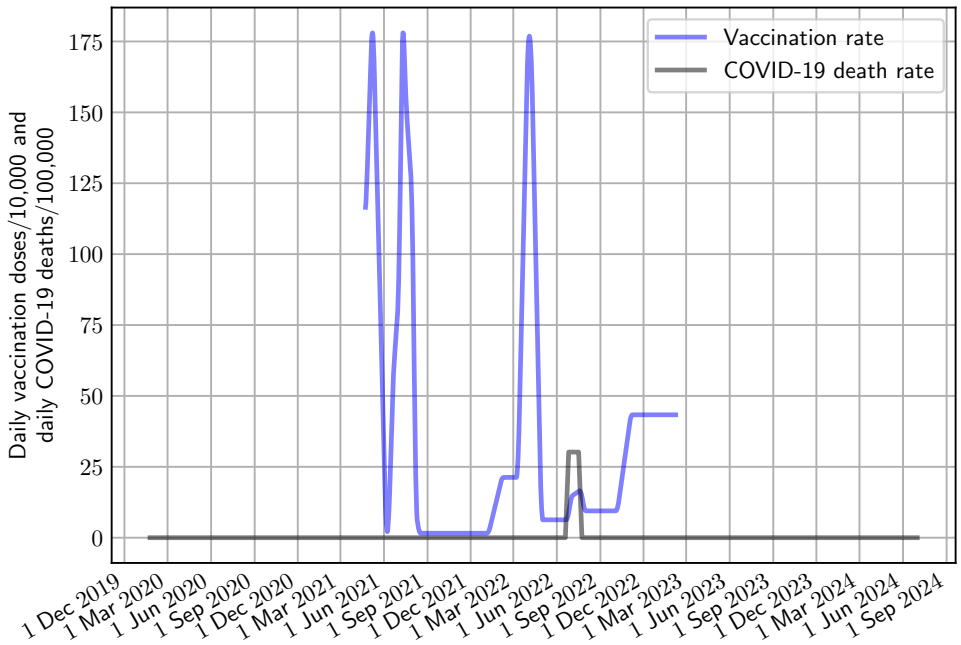

Figure 183: Nauru

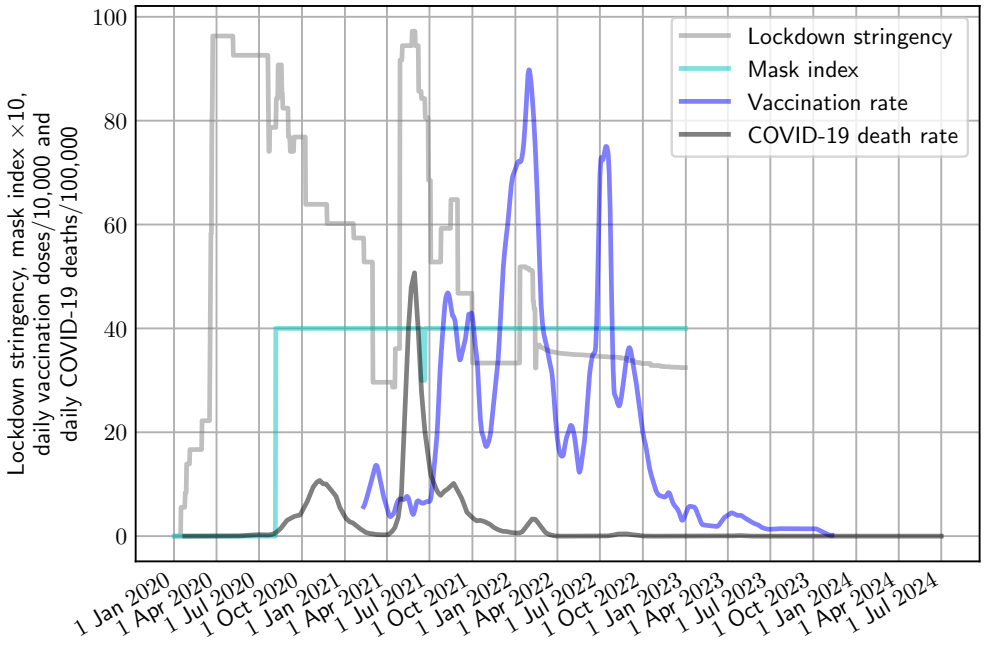

Figure 184: Nepal

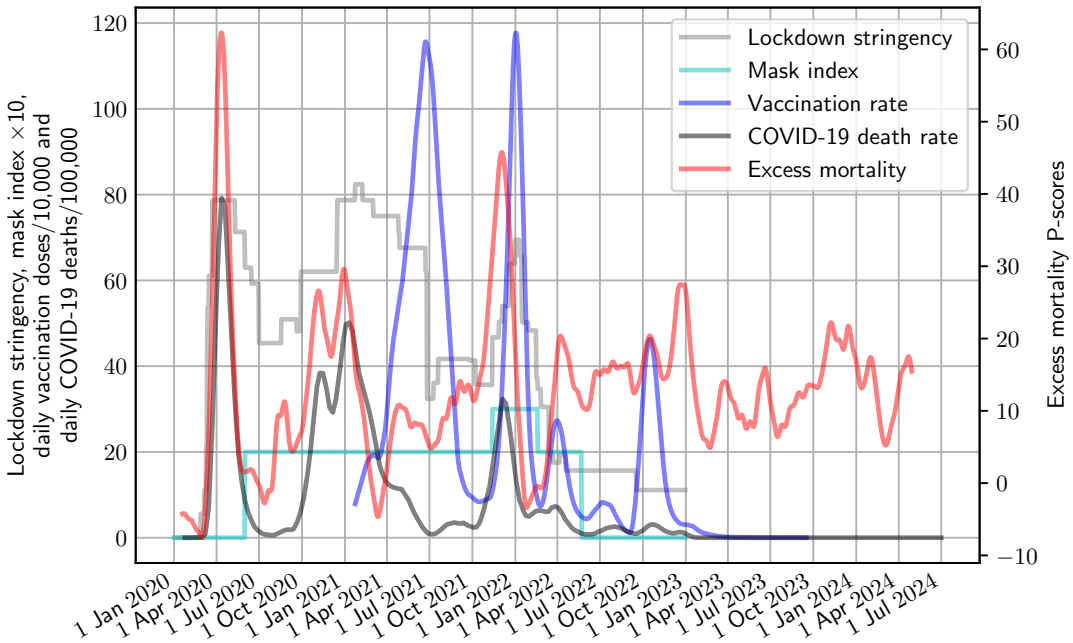

Figure 185: Netherlands

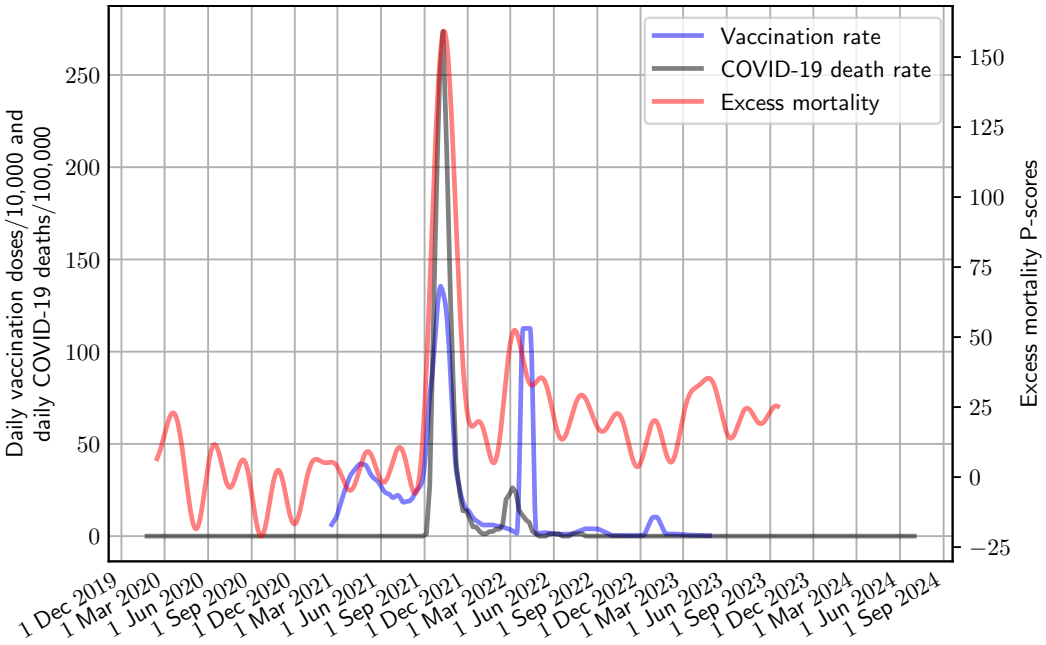

Figure 186: New Caledonia

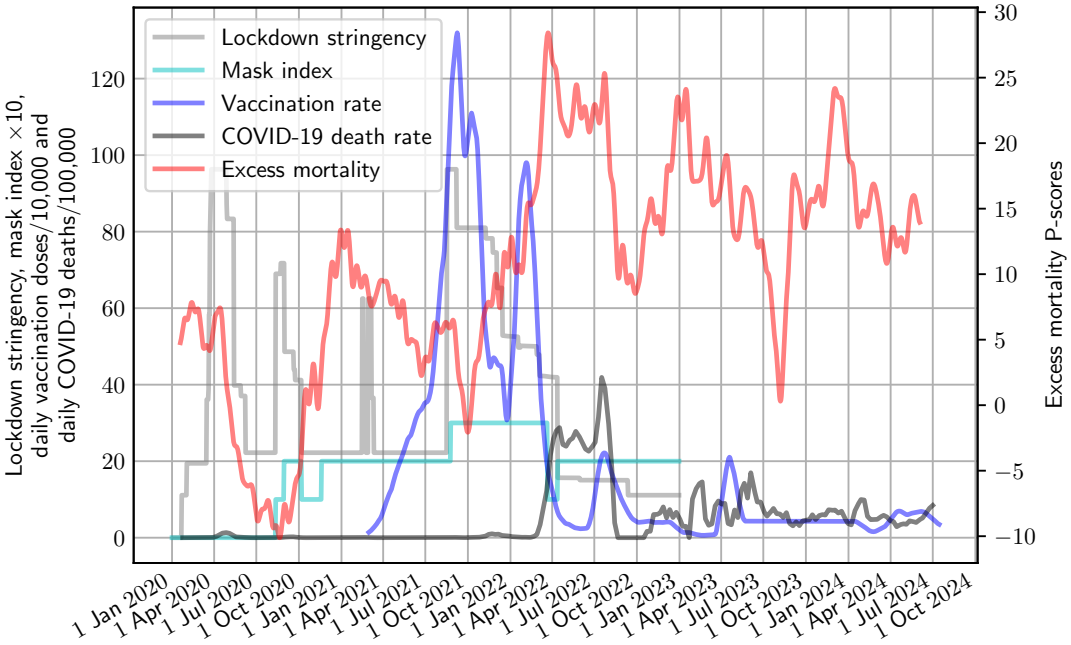

Figure 187: New Zealand

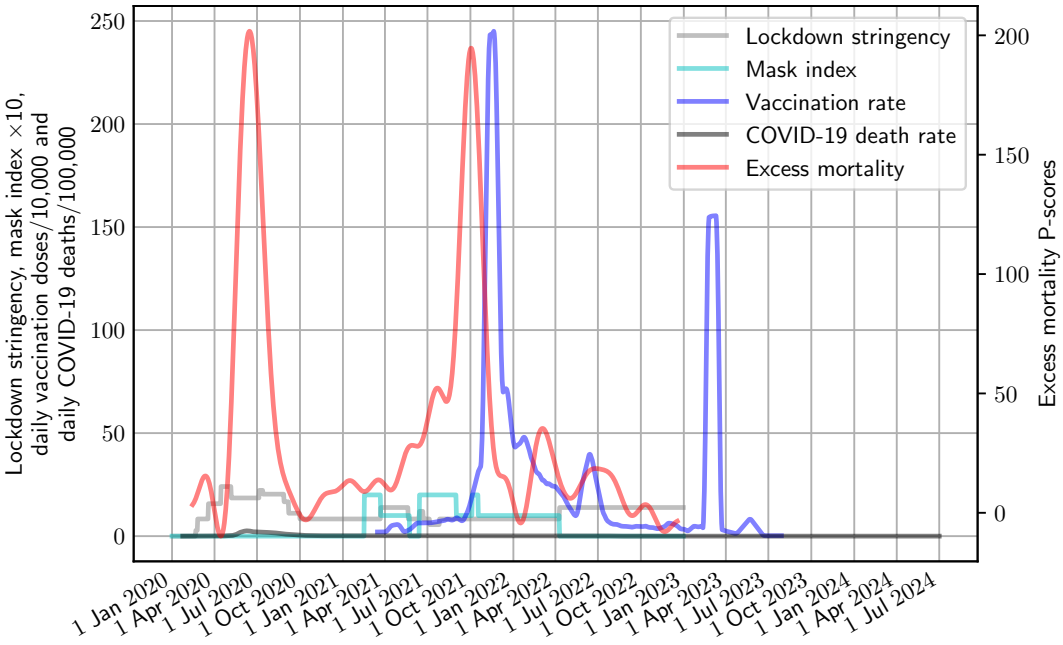

Figure 188: Nicaragua

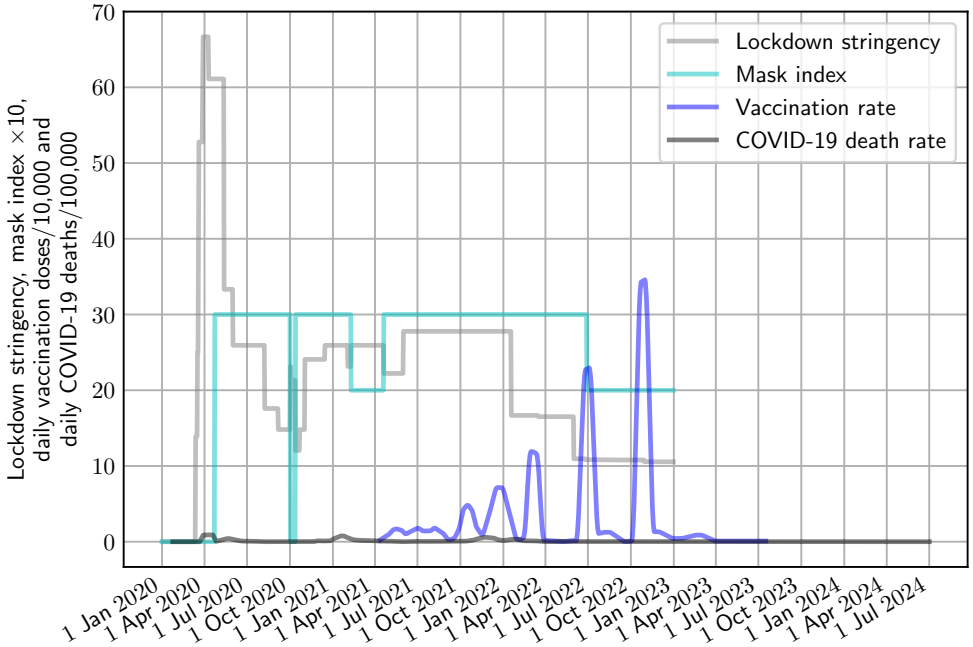

Figure 189: Niger

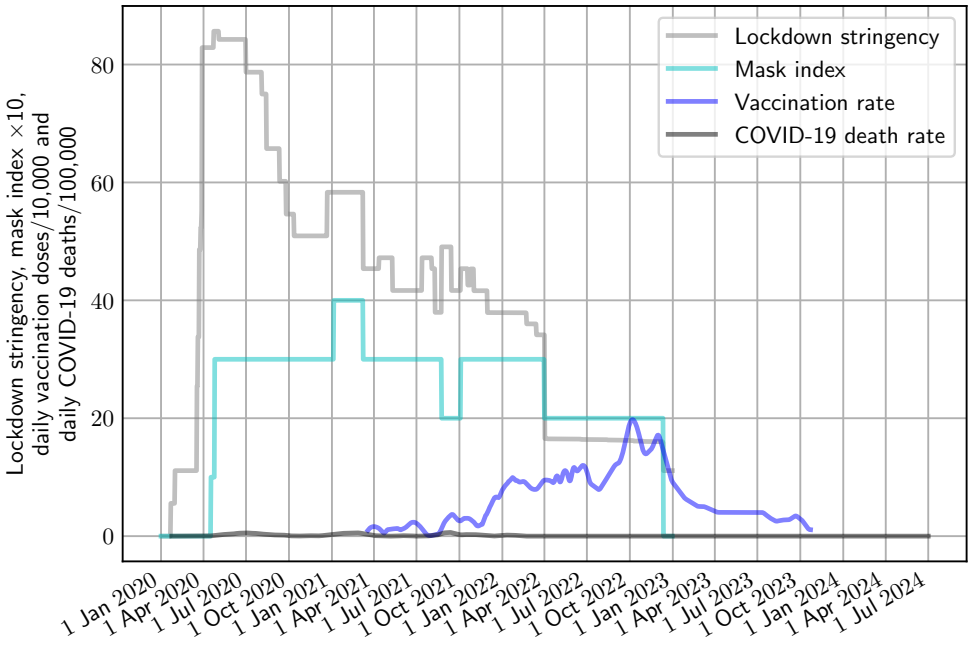

Figure 190: Nigeria

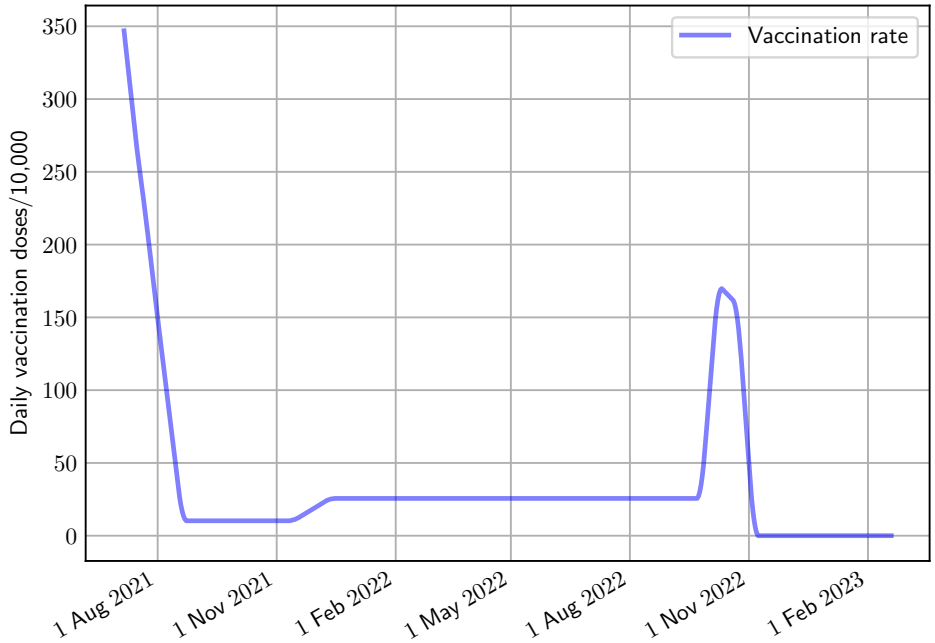

Figure 191: Niue

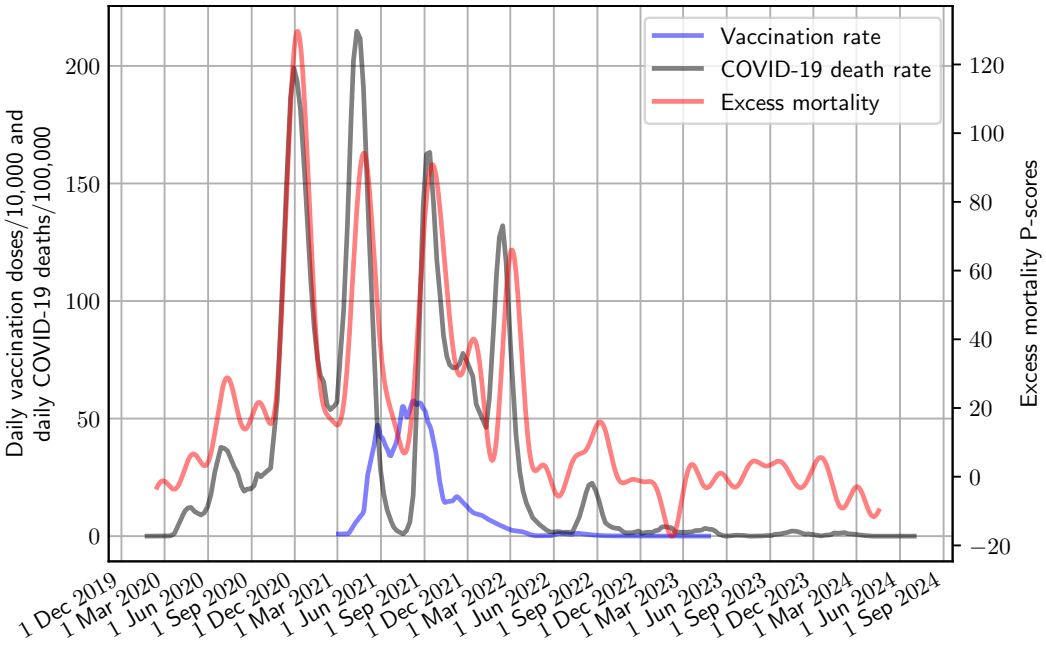

Figure 192: North Macedonia

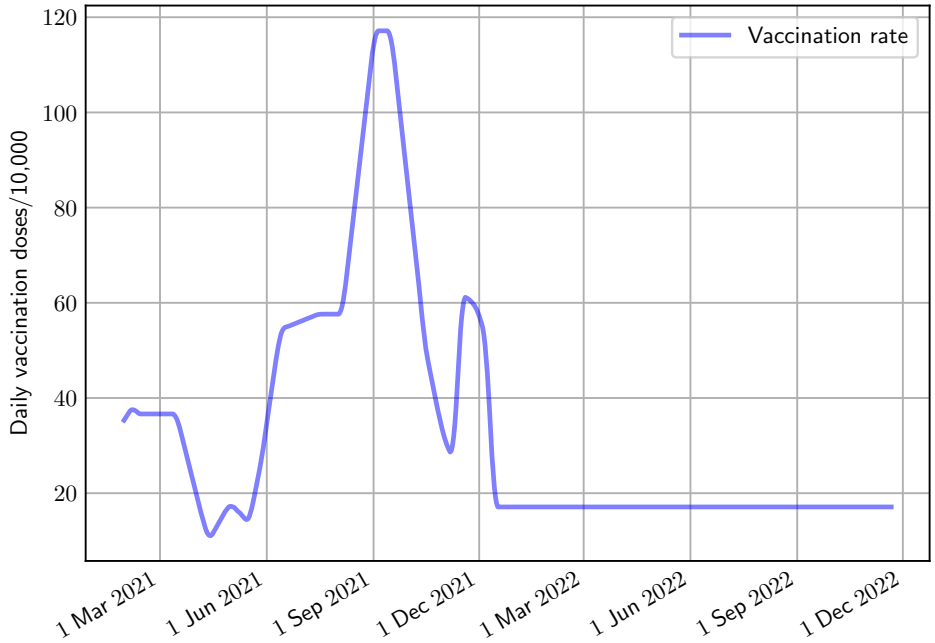

Figure 193: Northern Cyprus

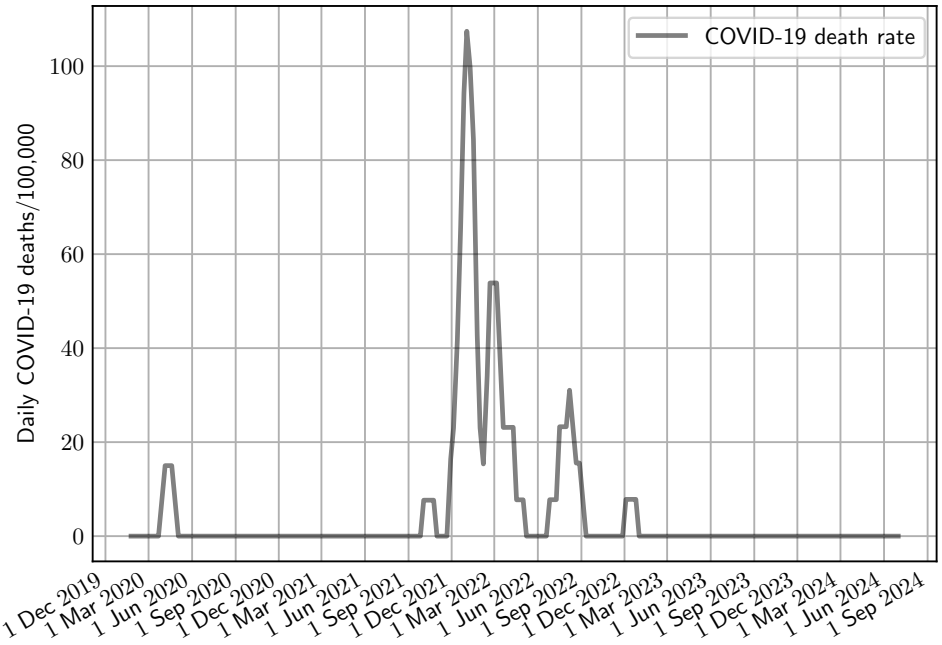

Figure 194: Northern Mariana Islands

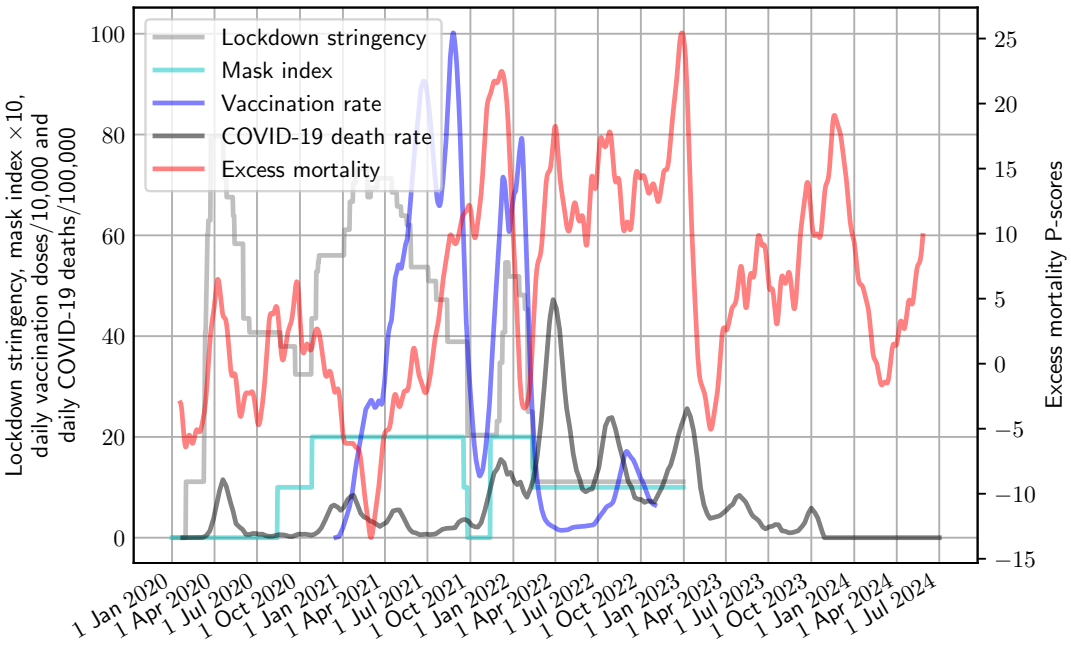

Figure 195: Norway

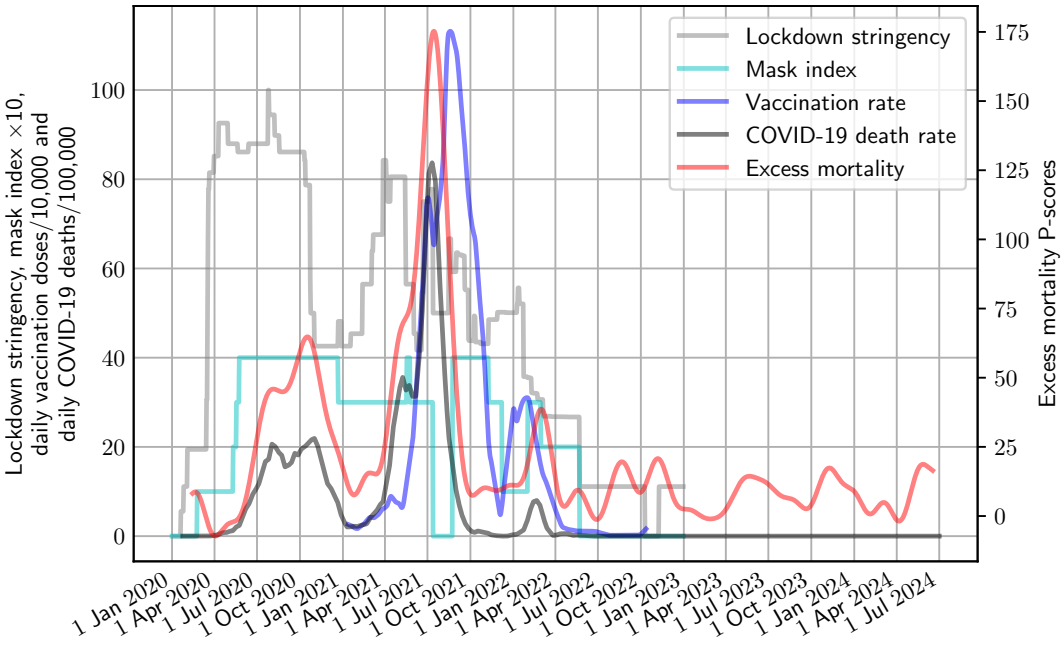

Figure 196: Oman

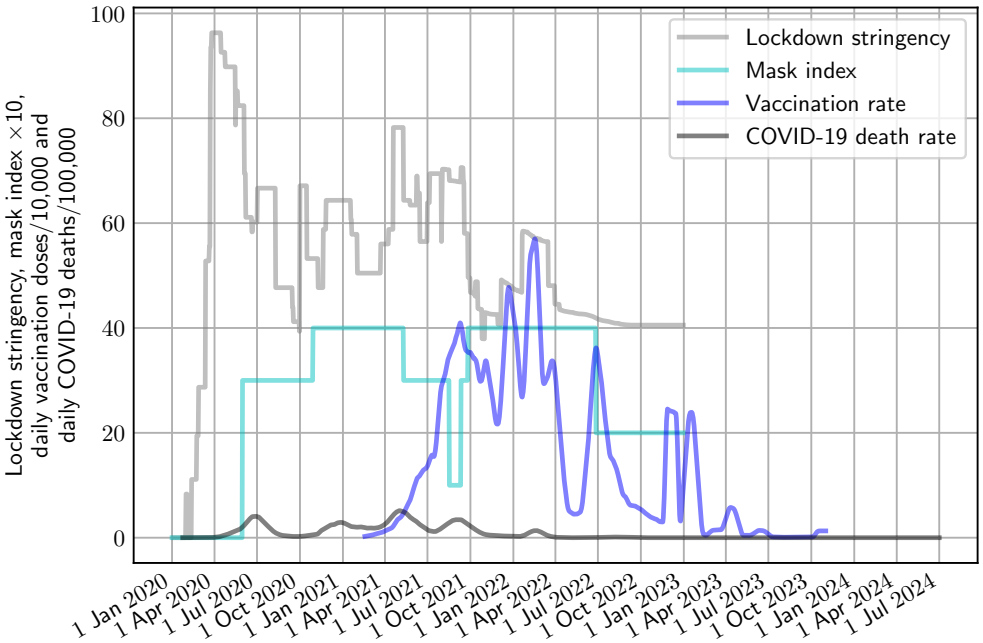

Figure 197: Pakistan

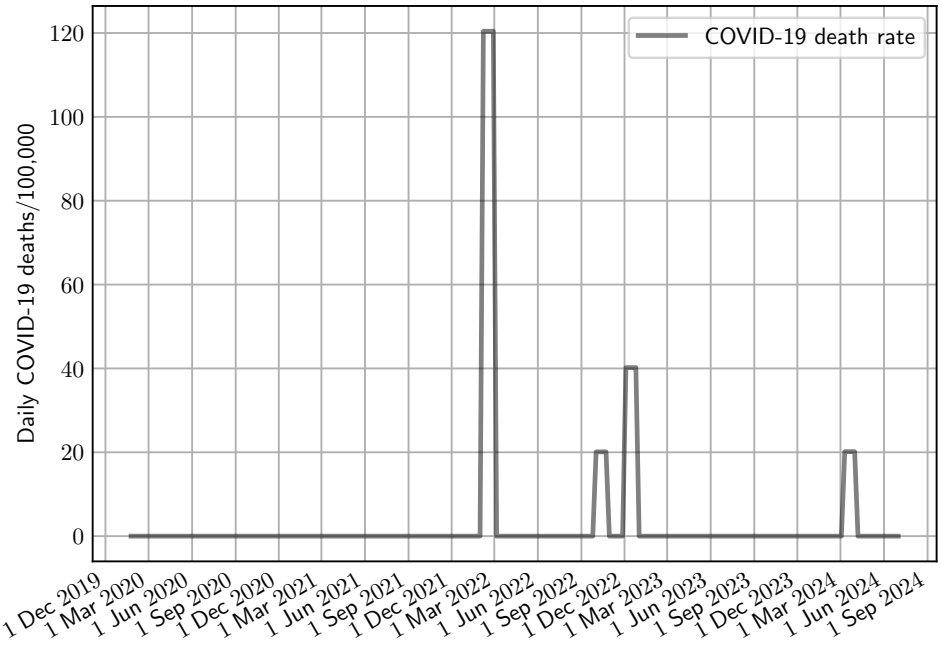

Figure 198: Palau

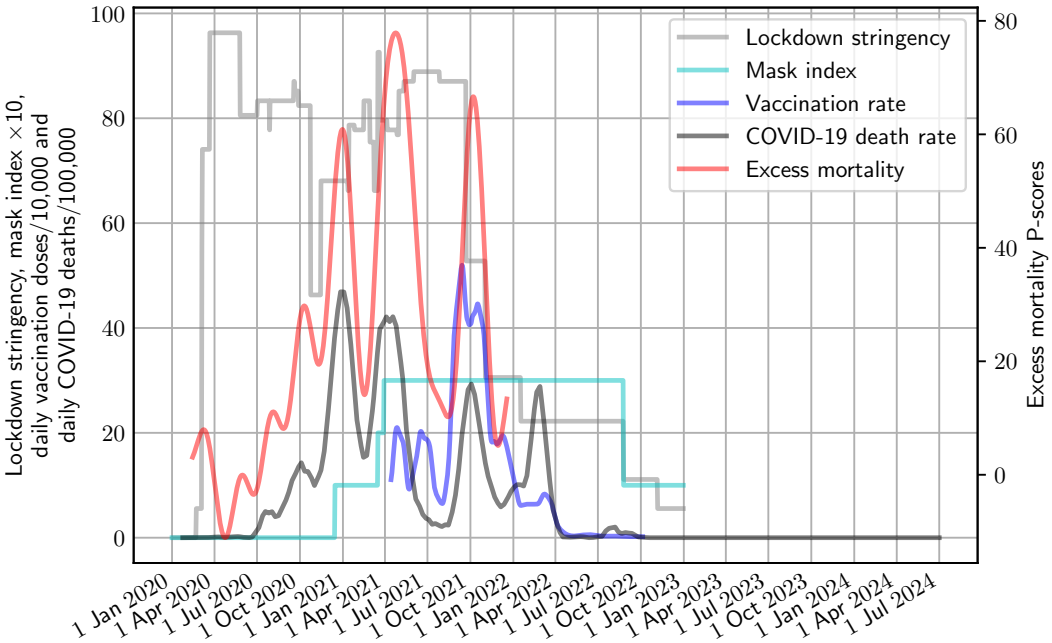

Figure 199: Palestine

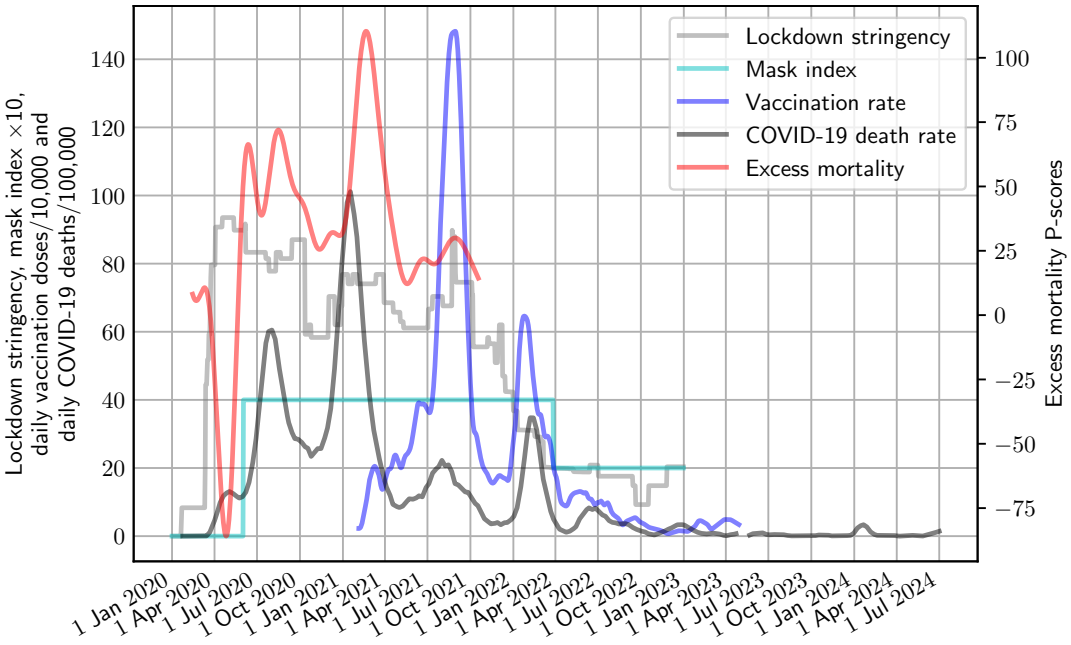

Figure 200: Panama

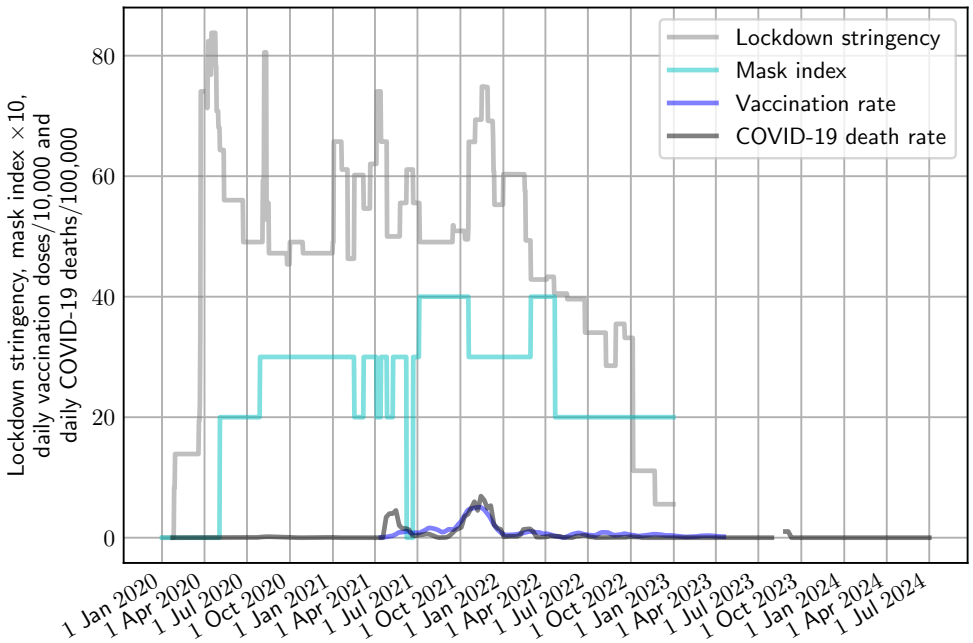

Figure 201: Papua New Guinea

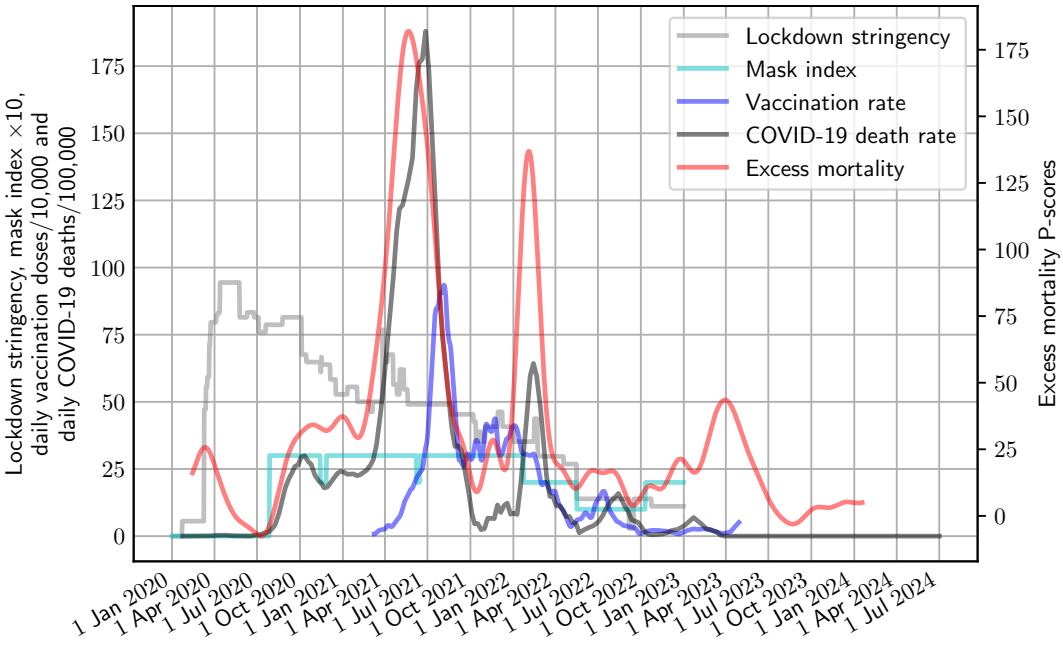

Figure 202: Paraguay

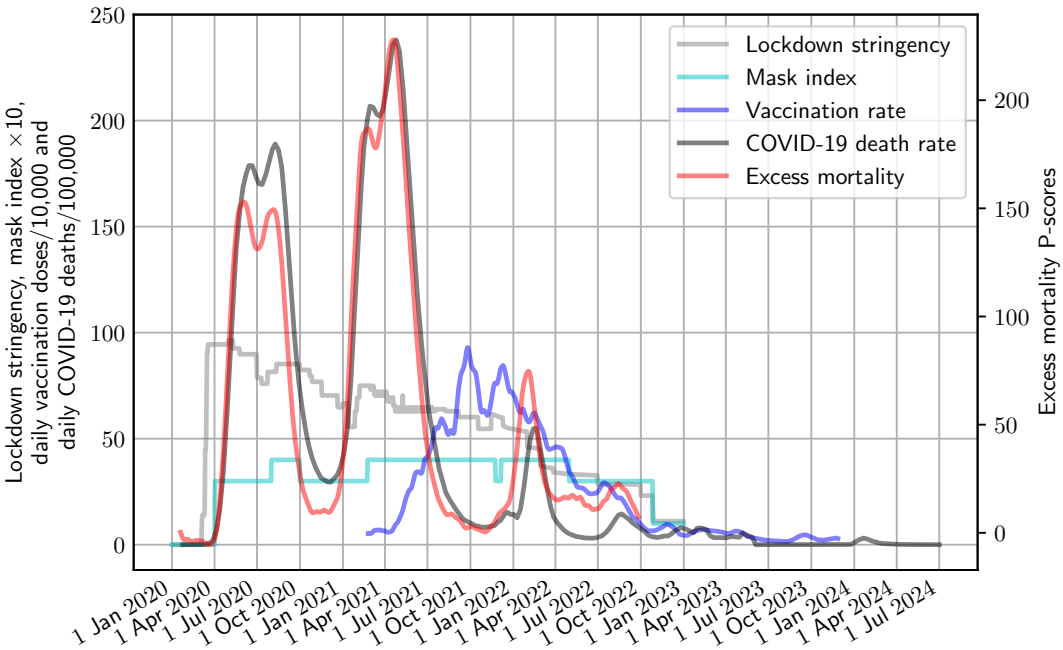

Figure 203: Peru

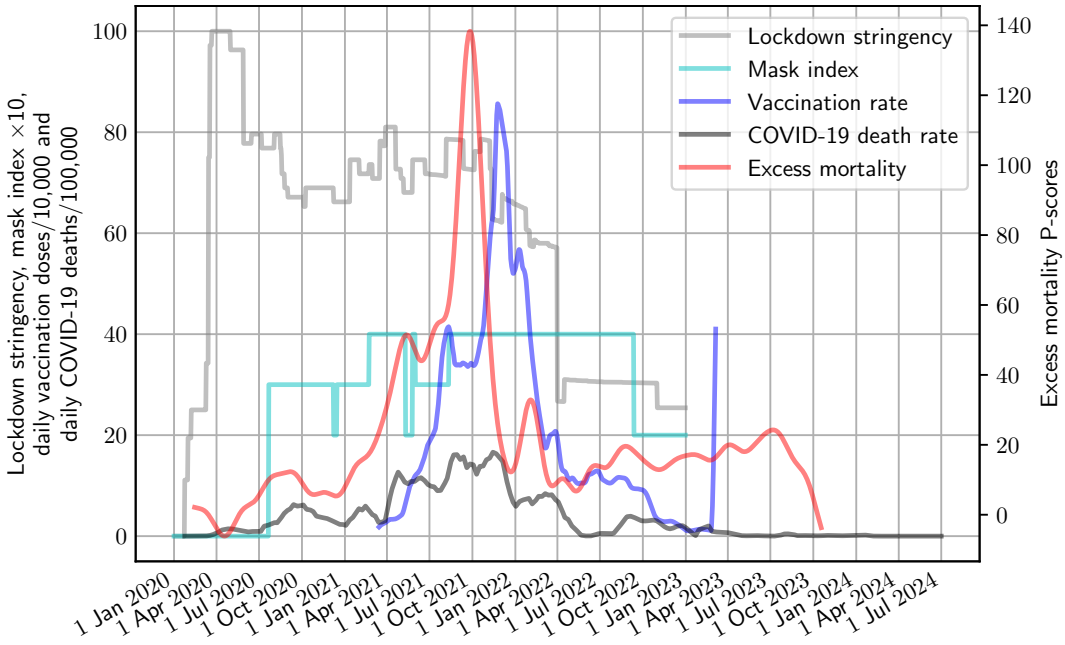

Figure 204: Philippines

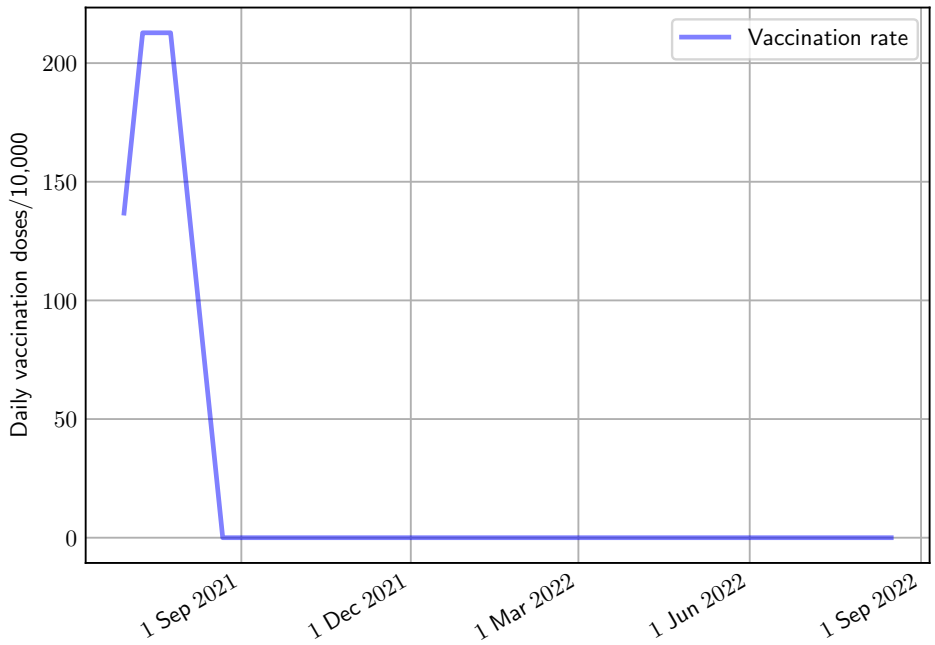

Figure 205: Pitcairn

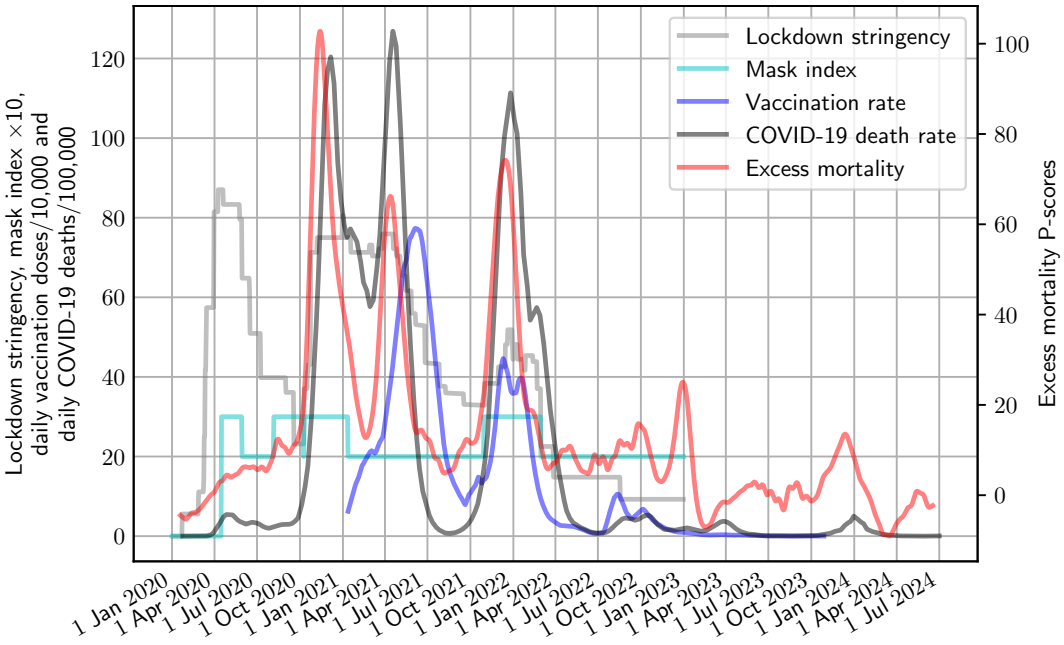

Figure 206: Poland

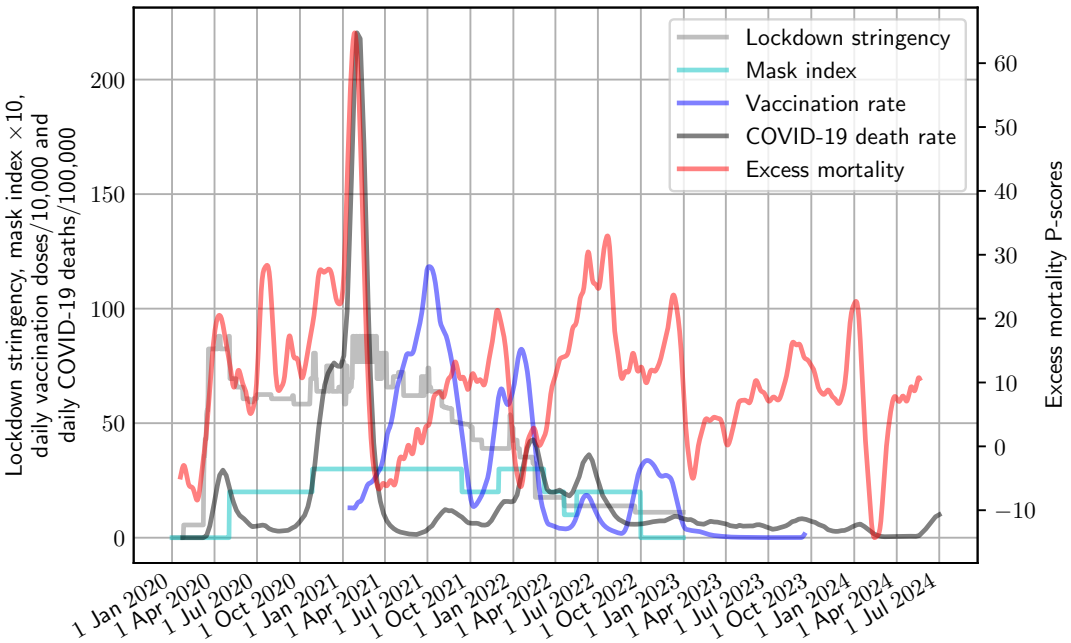

Figure 207: Portugal

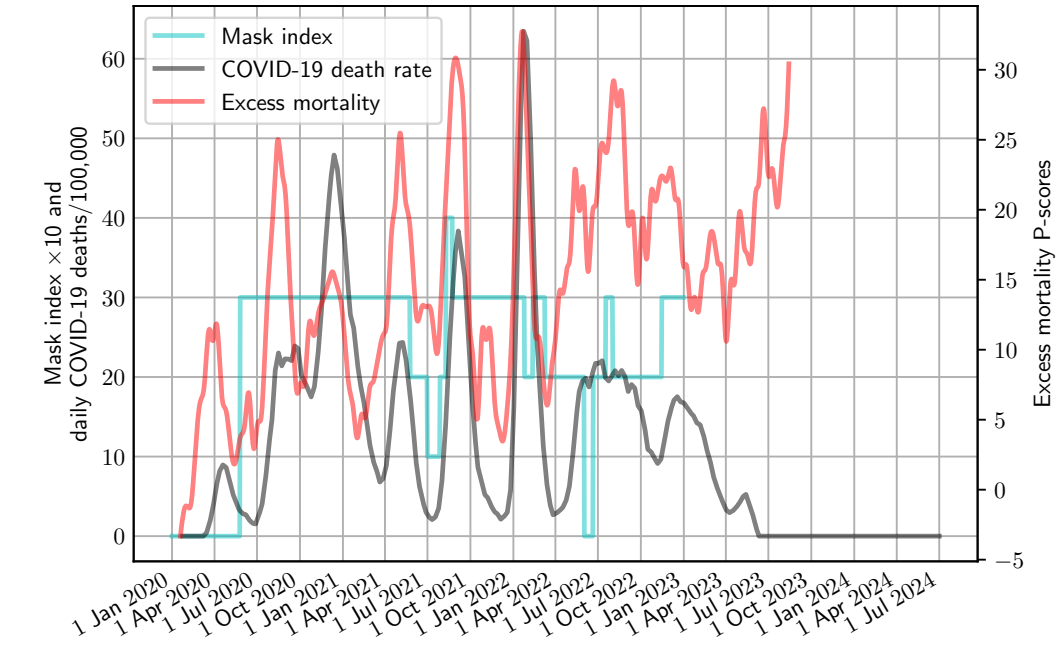

Figure 208: Puerto Rico

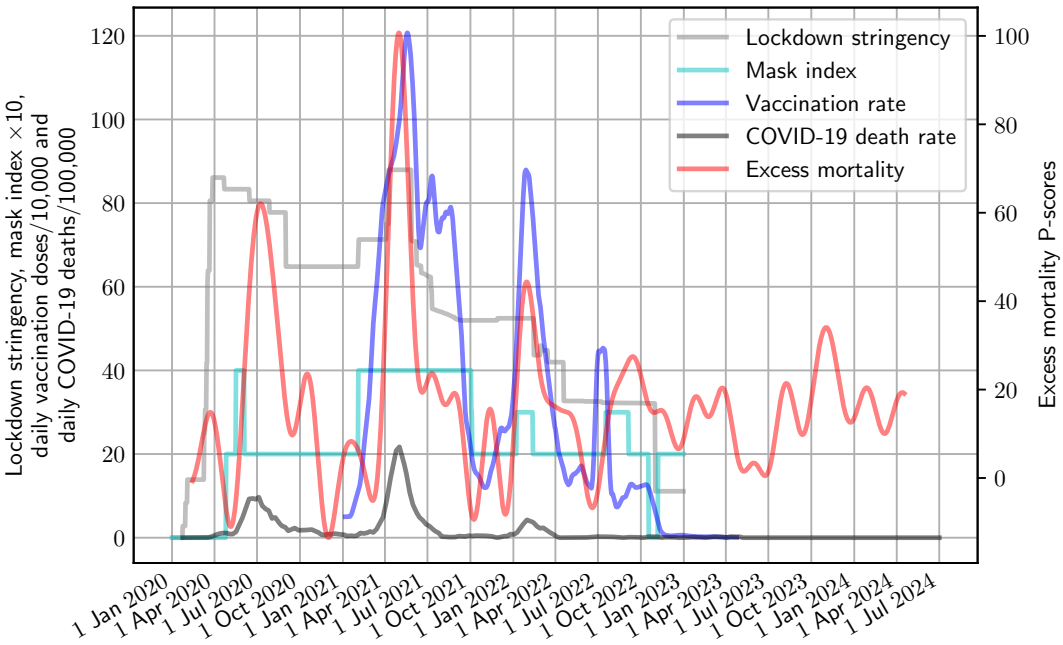

Figure 209: Qatar

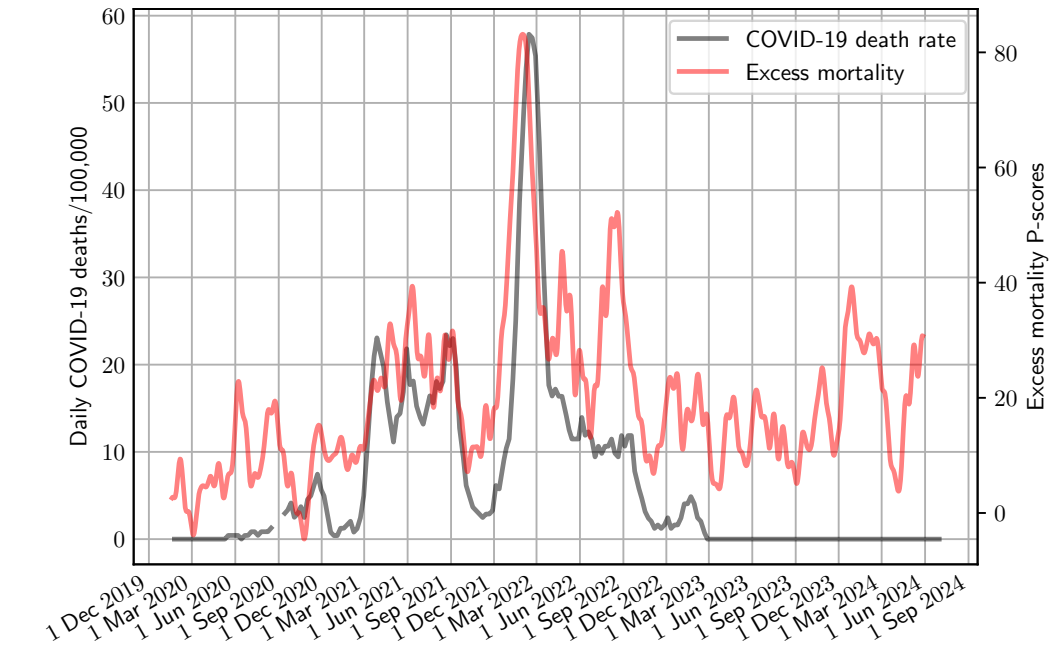

Figure 210: Reunion

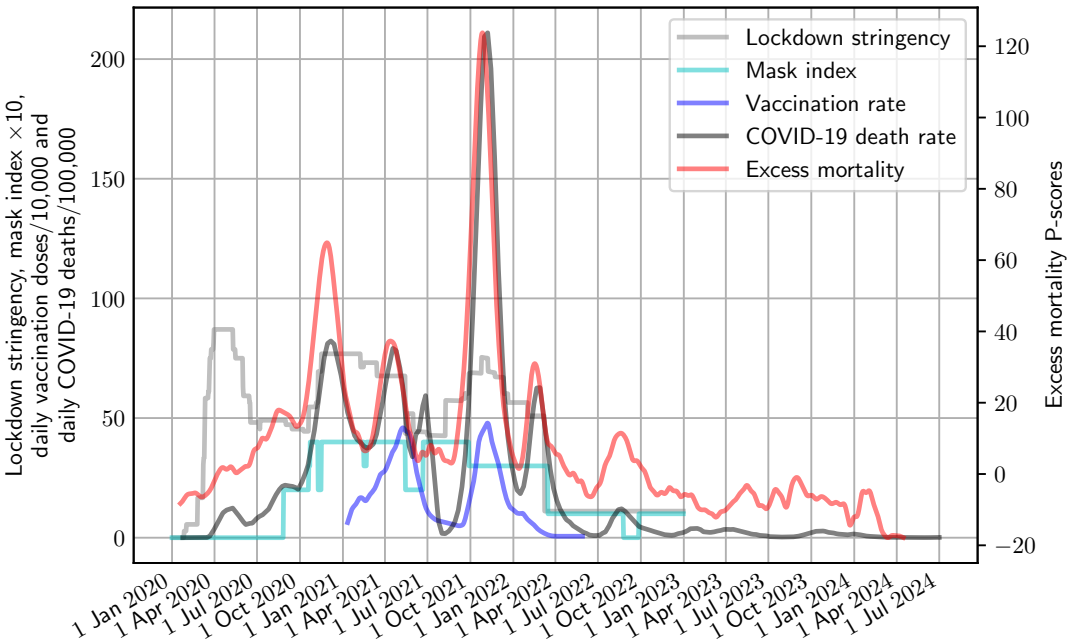

Figure 211: Romania

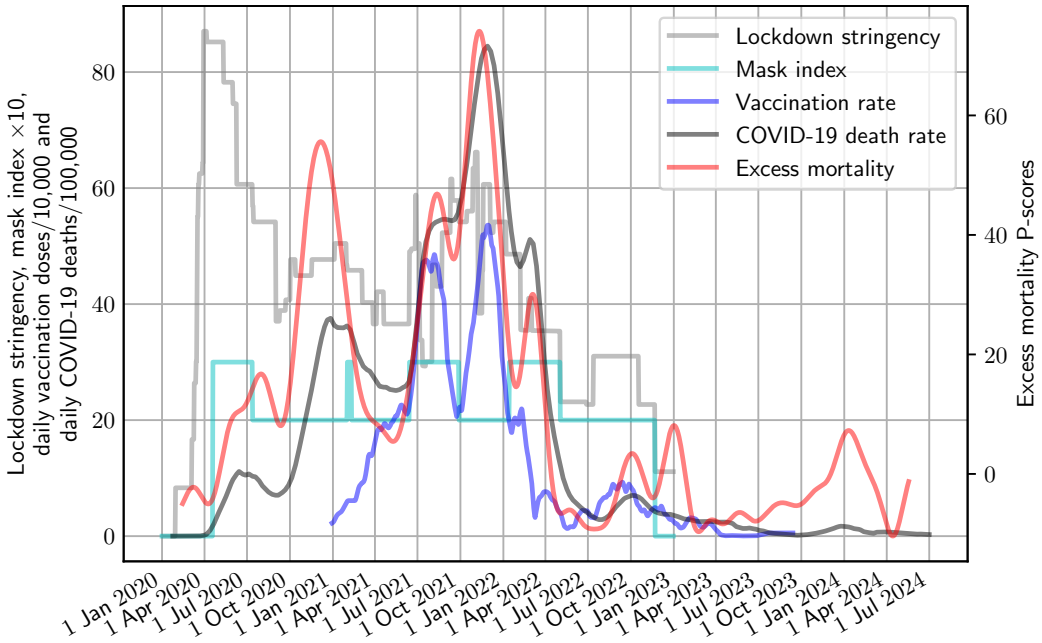

Figure 212: Russia

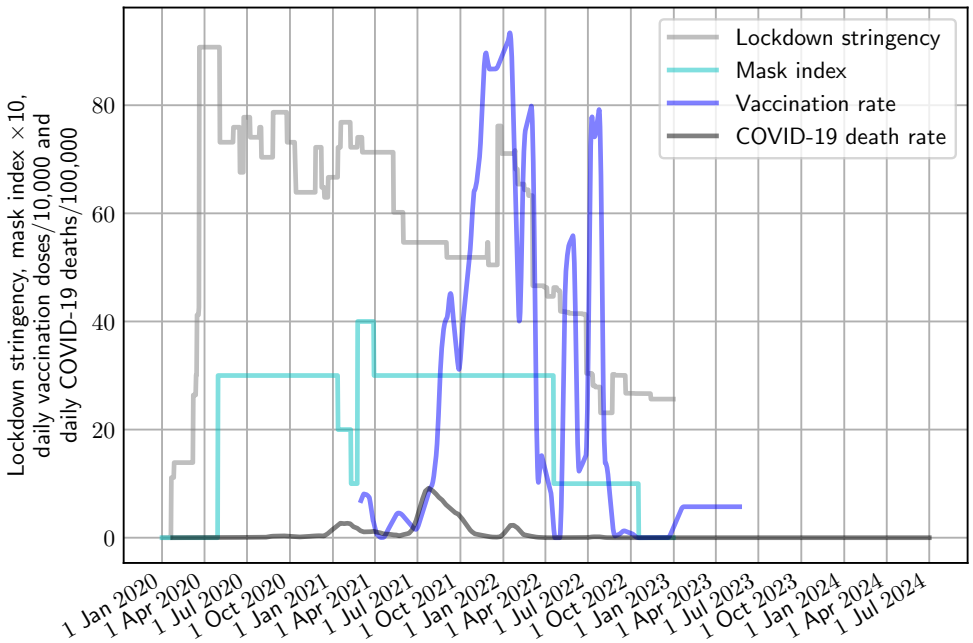

Figure 213: Rwanda

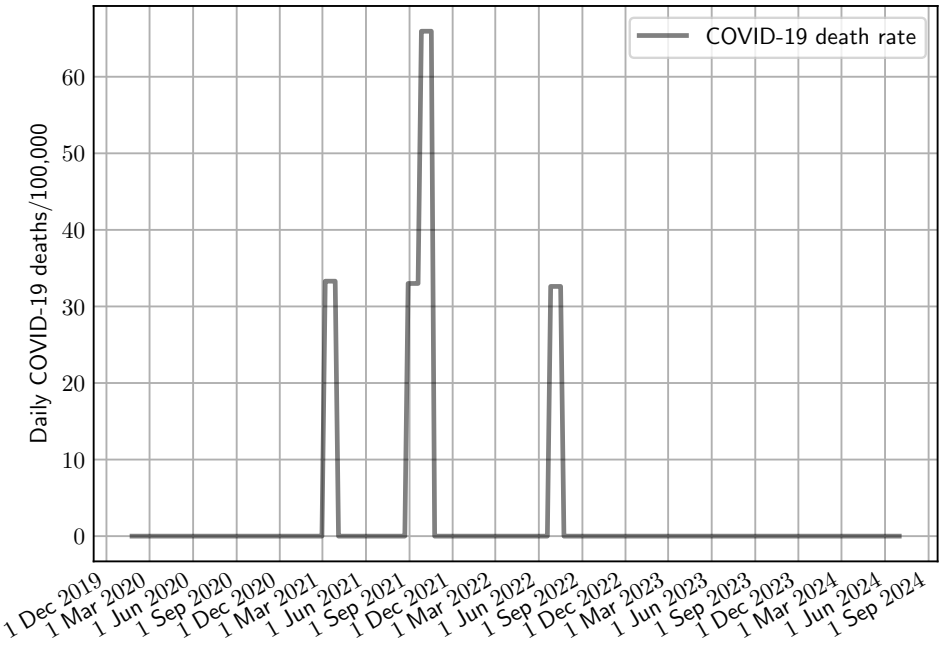

Figure 214: Saint Barthelemy

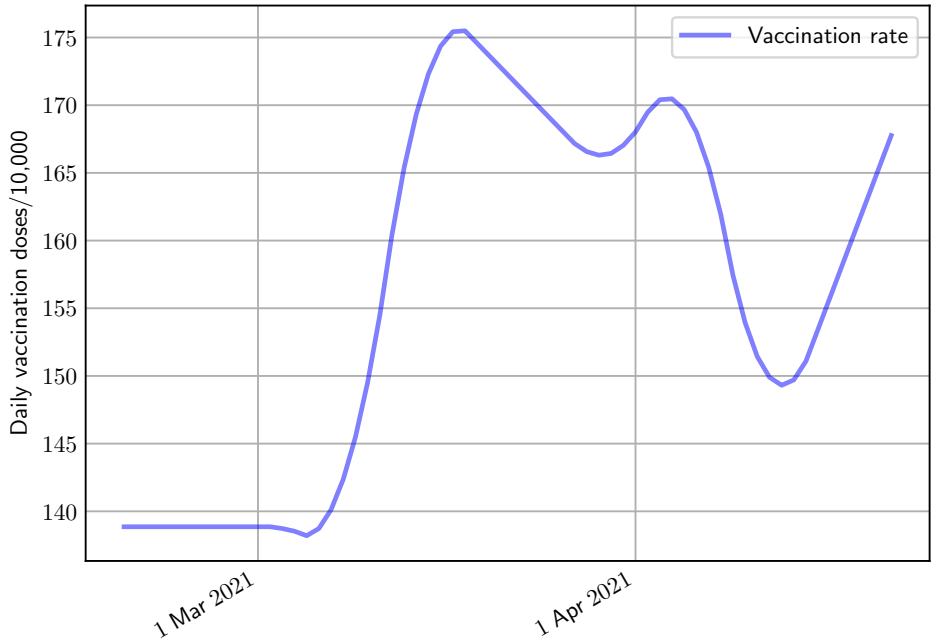

Figure 215: Saint Helena

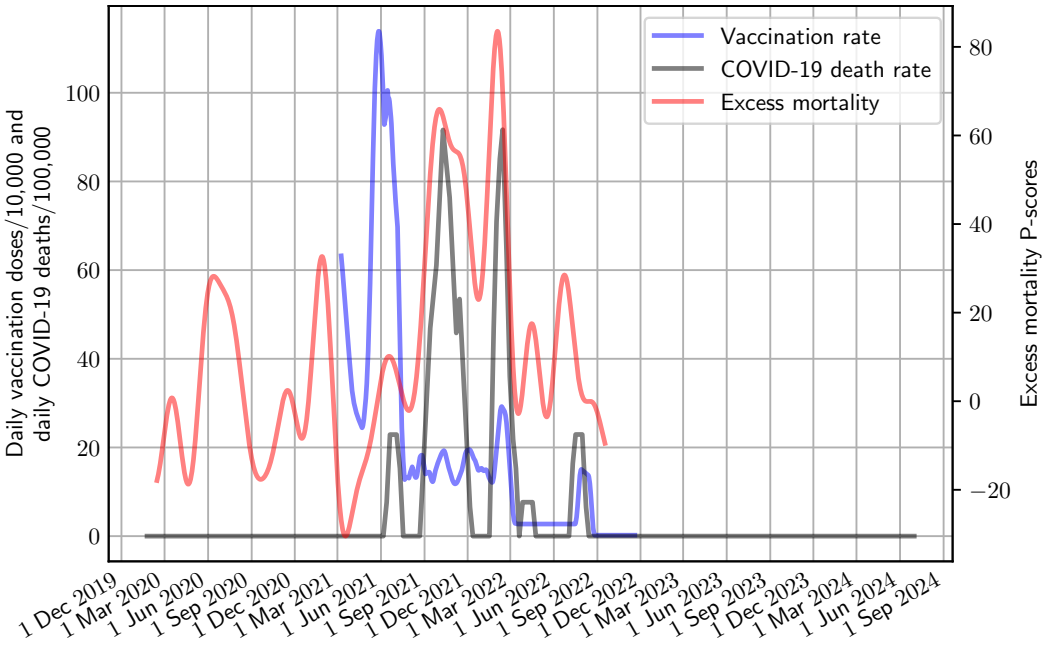

Figure 216: Saint Kitts and Nevis

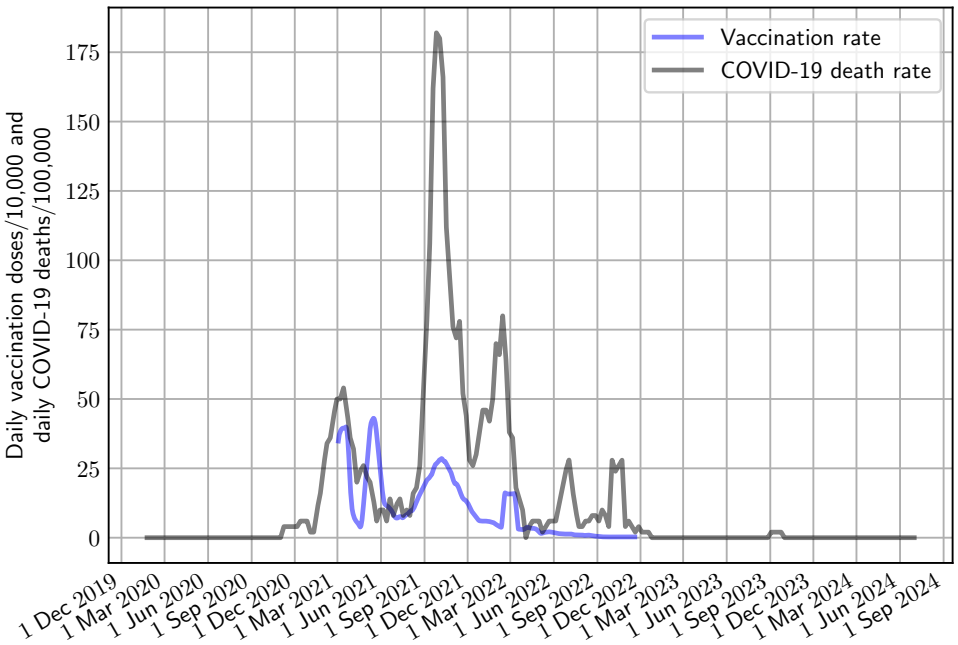

Figure 217: Saint Lucia

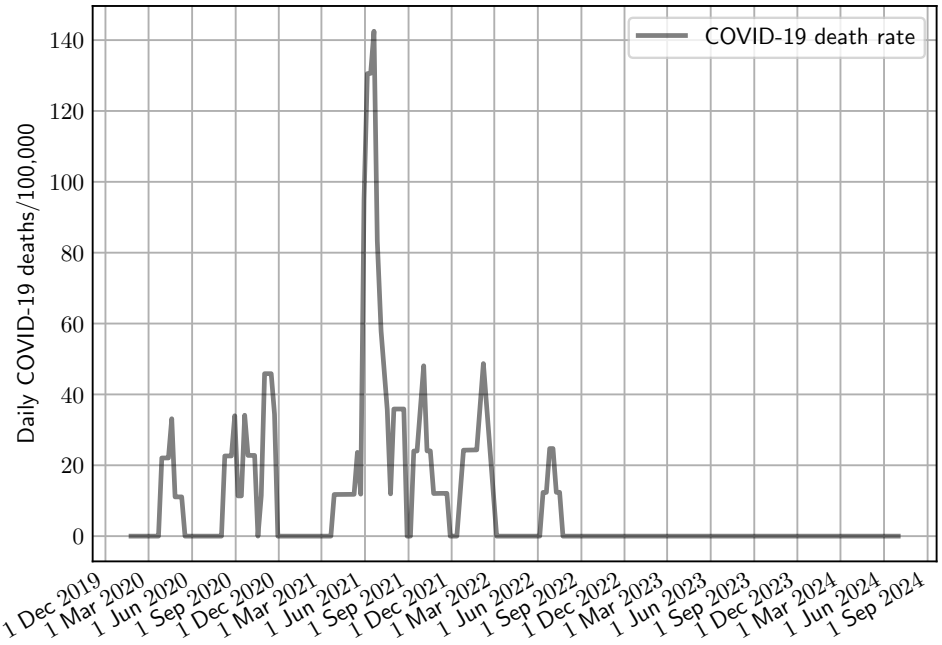

Figure 218: Saint Martin (French part)

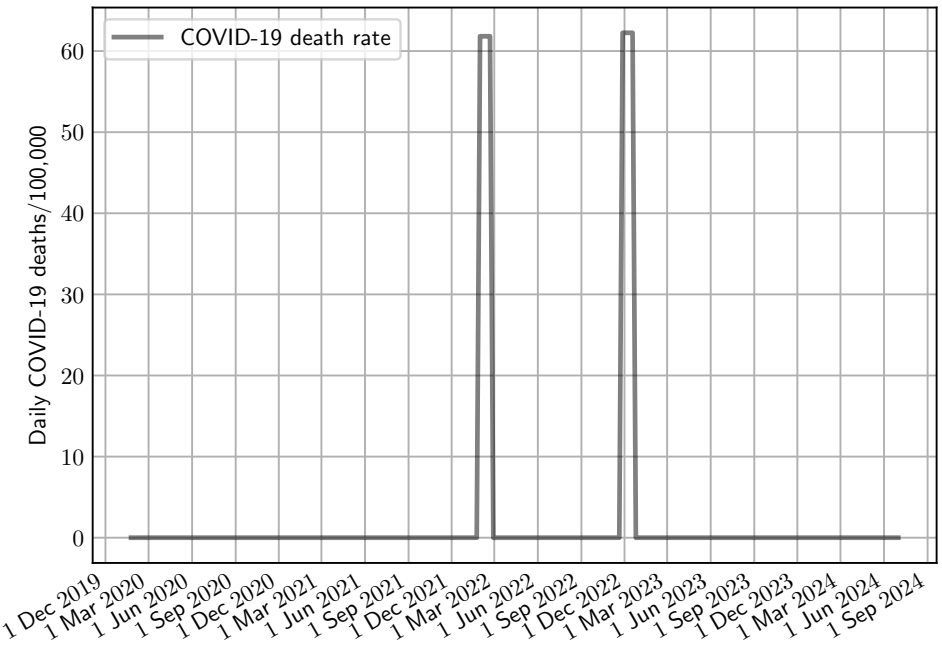

Figure 219: Saint Pierre and Miquelon

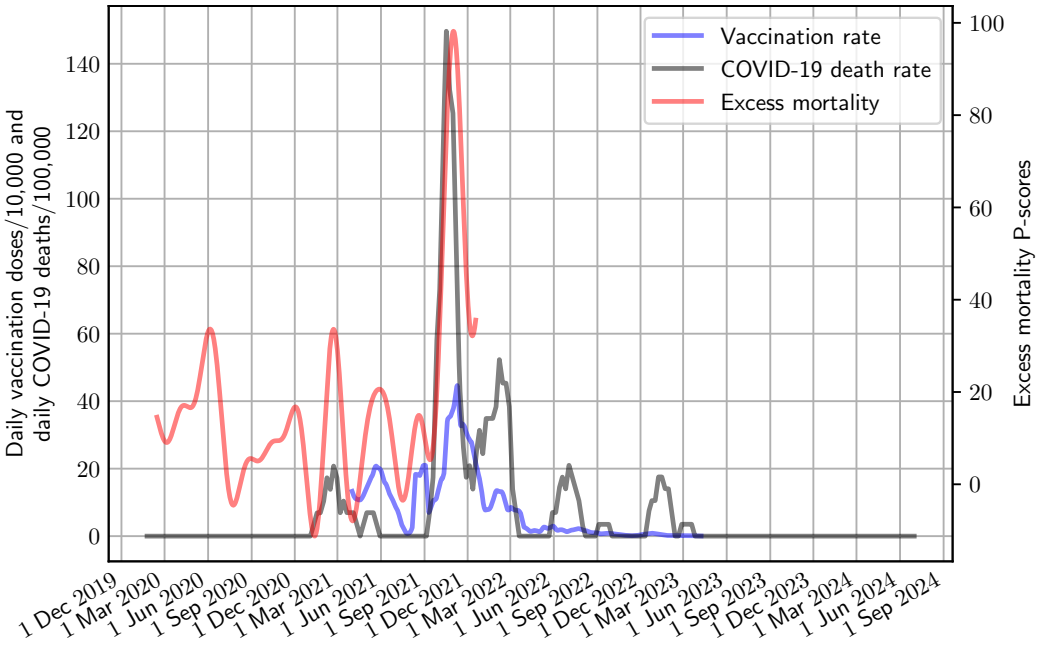

Figure 220: Saint Vincent and the Grenadines

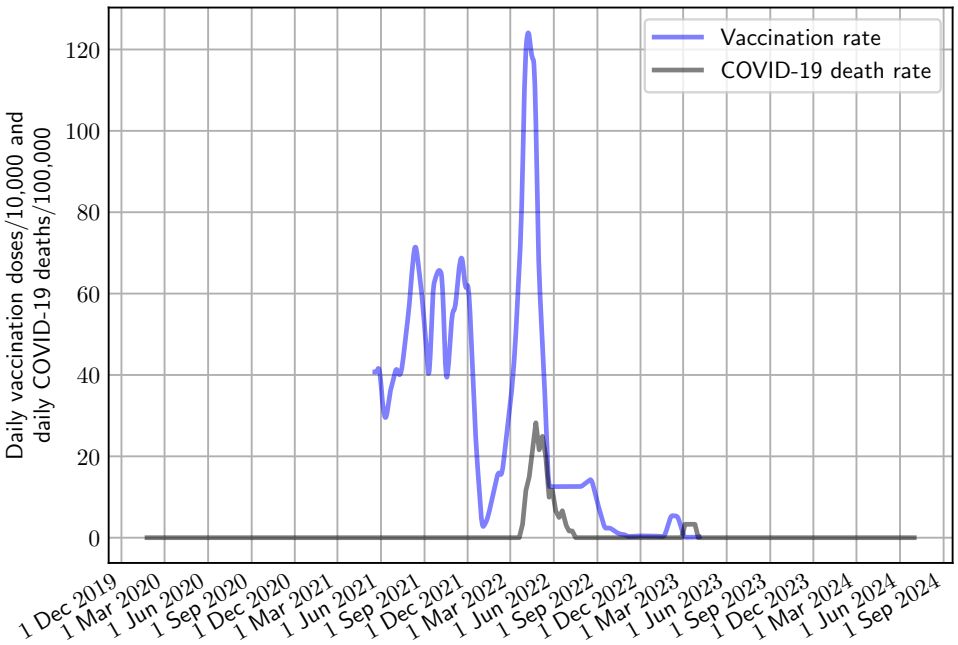

Figure 221: Samoa

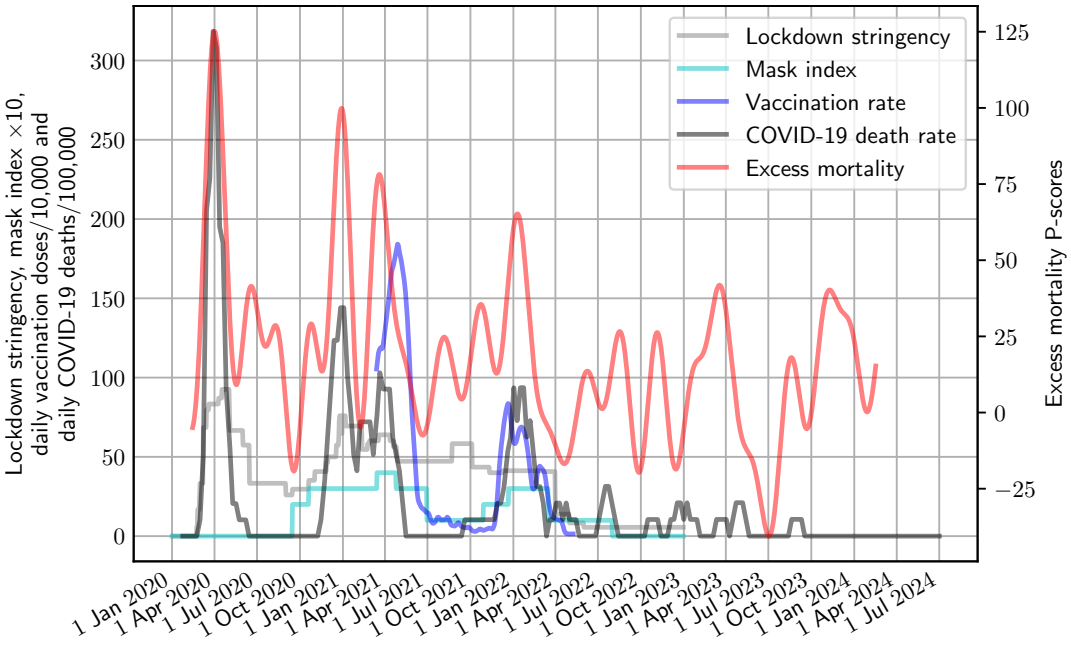

Figure 222: San Marino

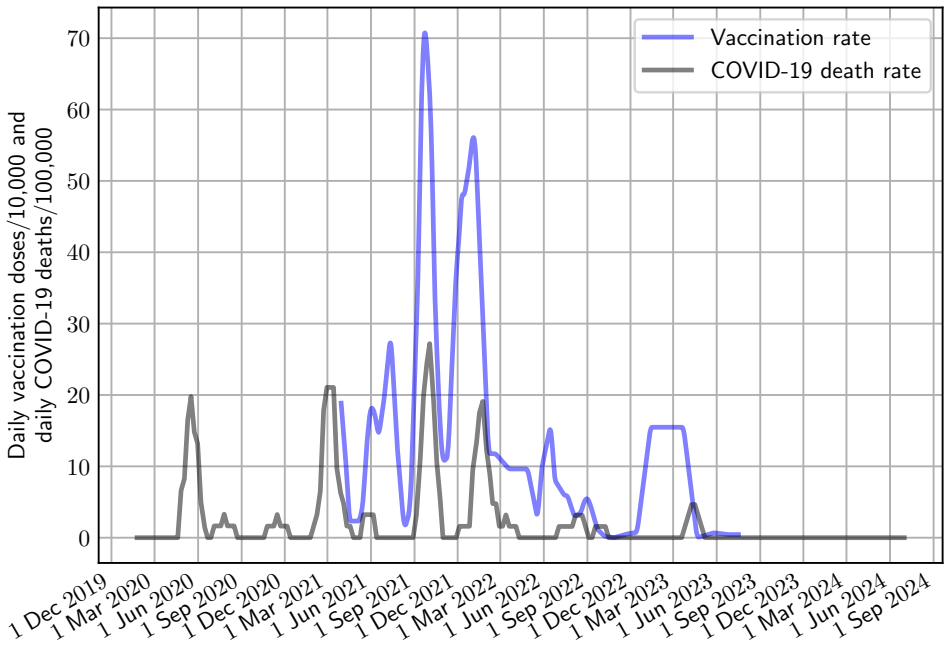

Figure 223: Sao Tome and Principe

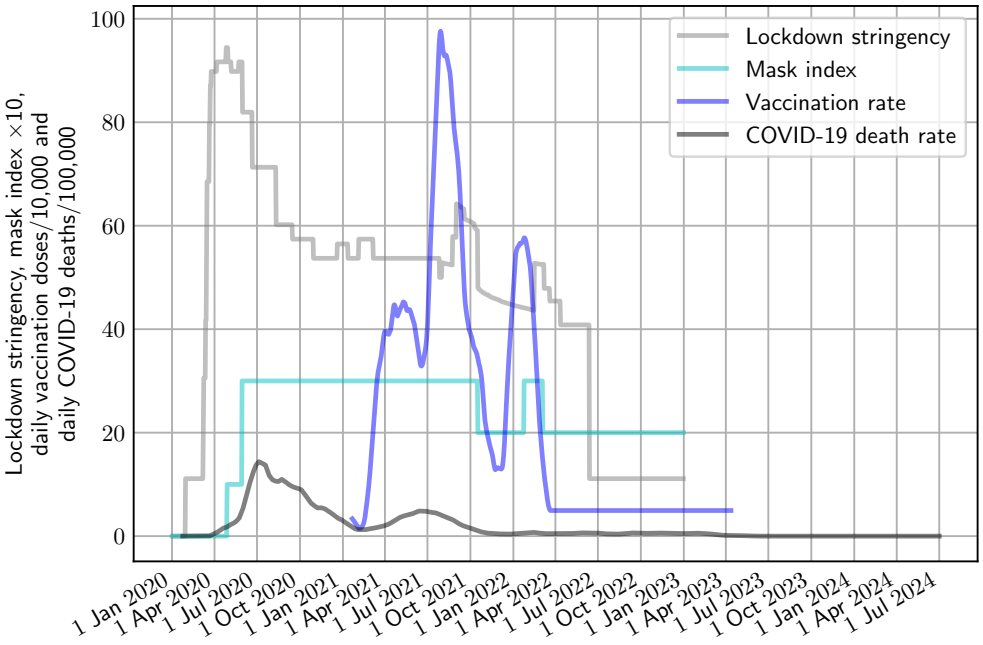

Figure 224: Saudi Arabia

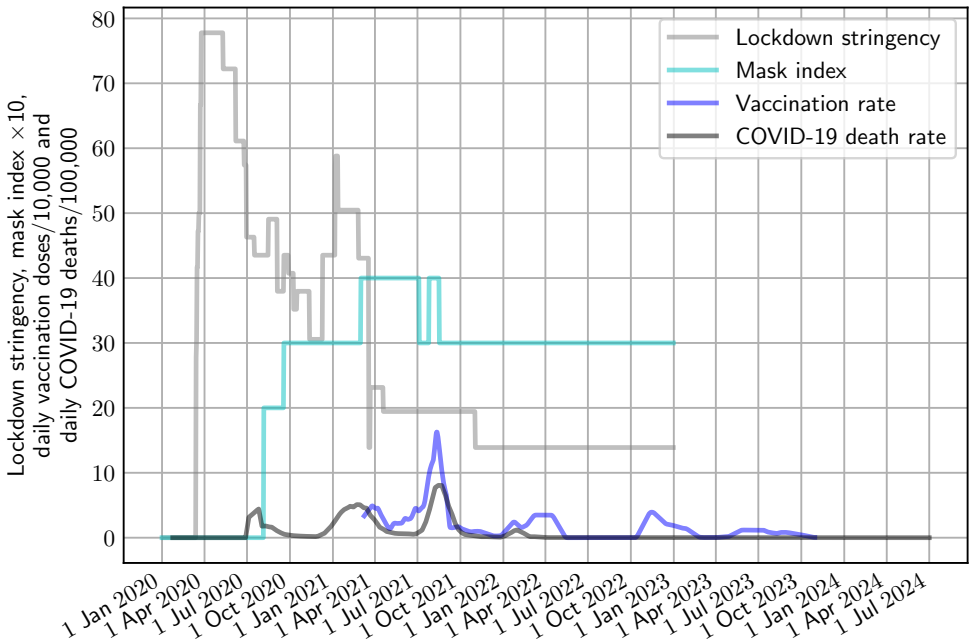

Figure 225: Senegal

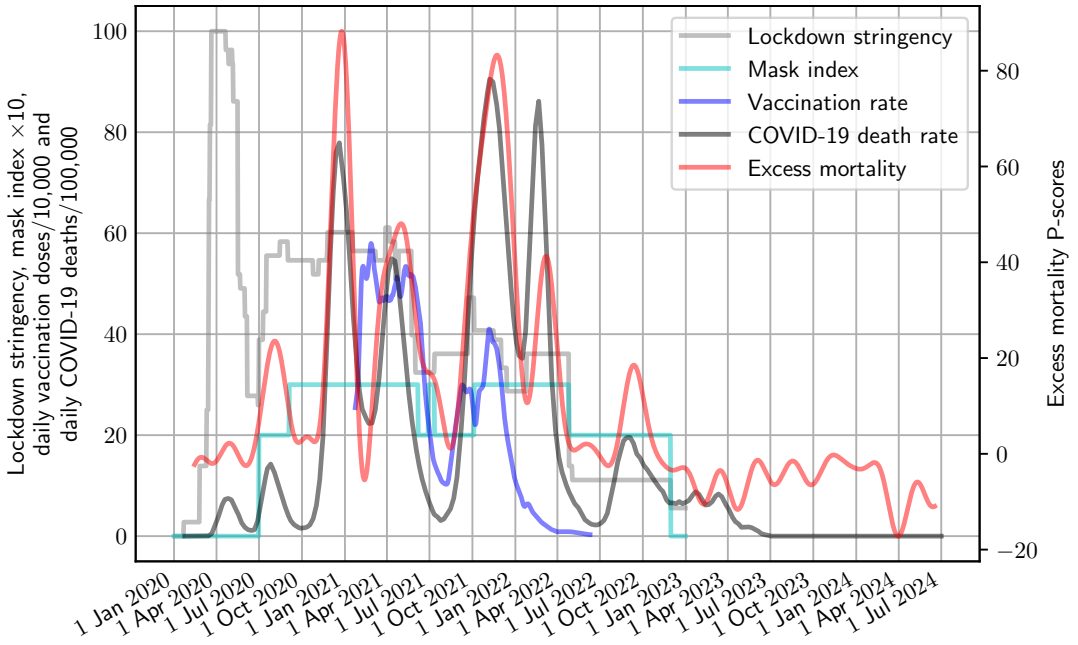

Figure 226: Serbia

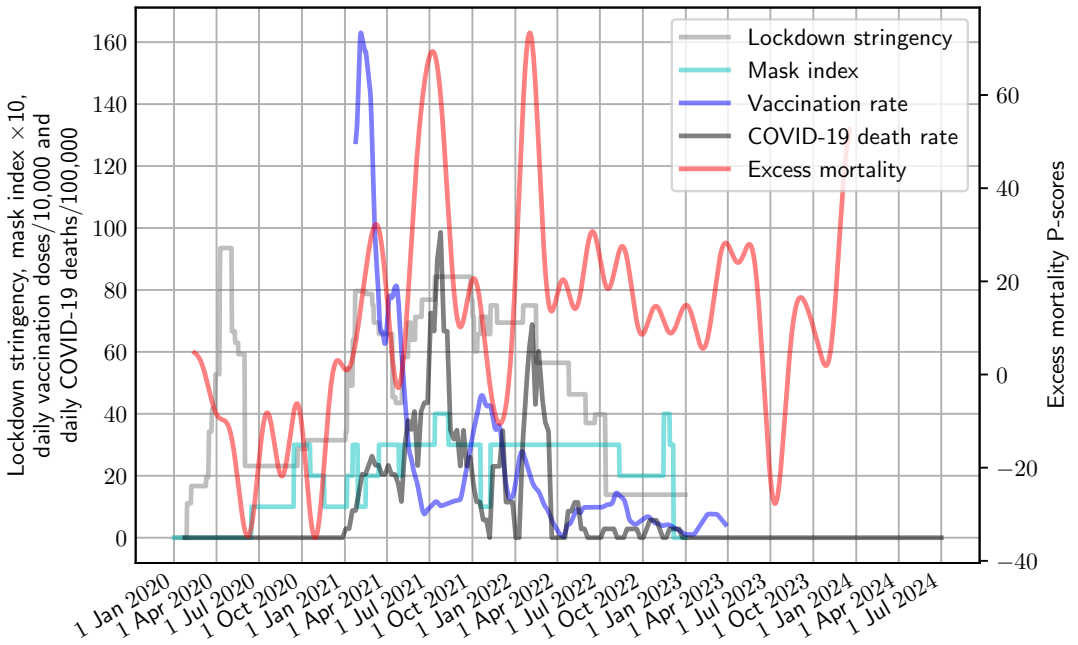

Figure 227: Seychelles

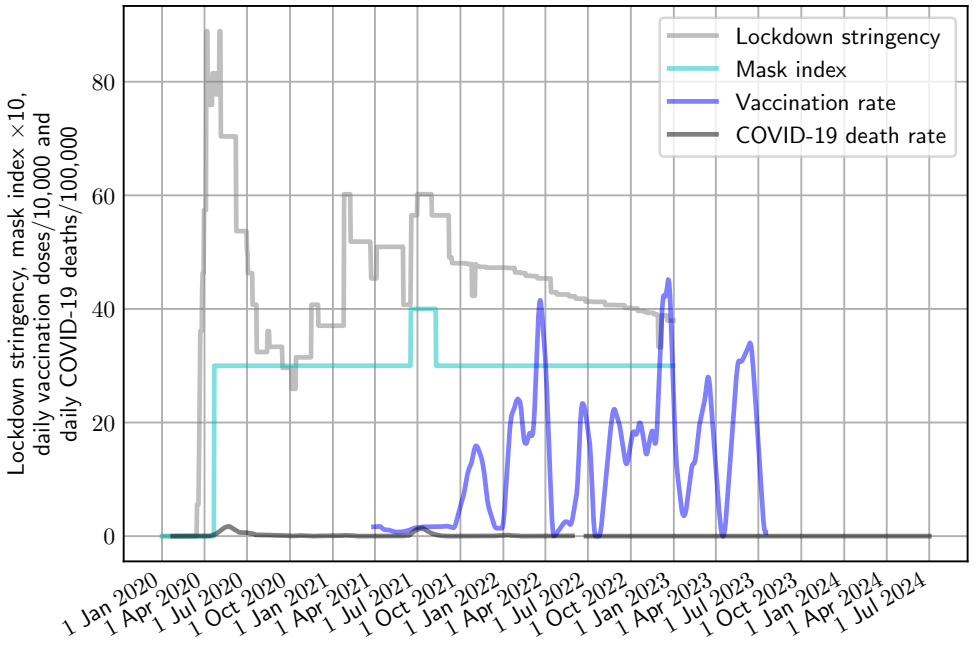

Figure 228: Sierra Leone

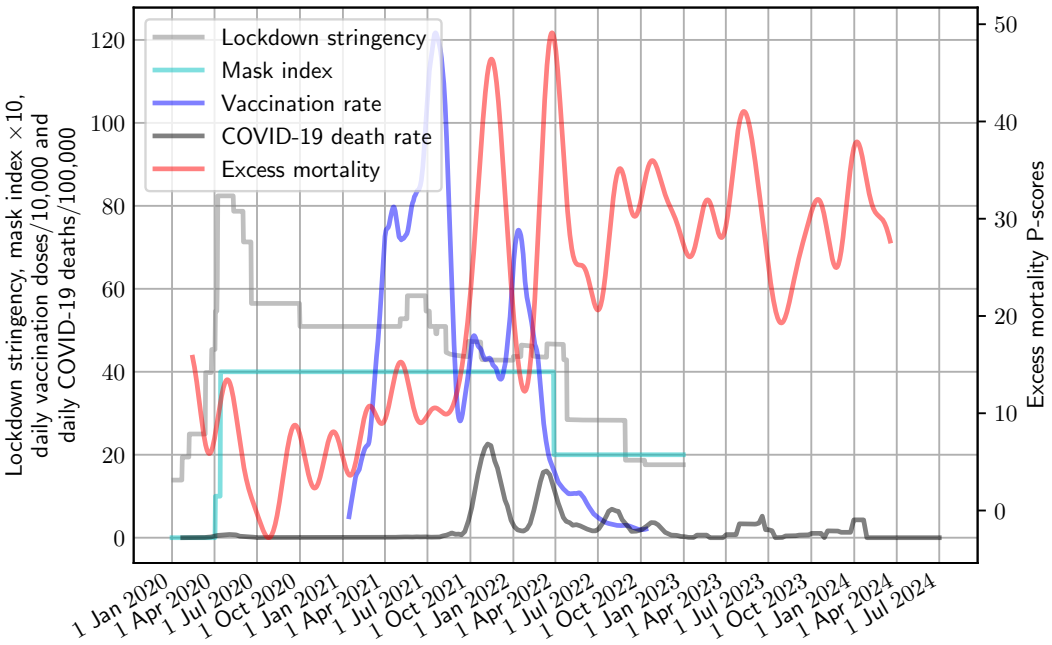

Figure 229: Singapore

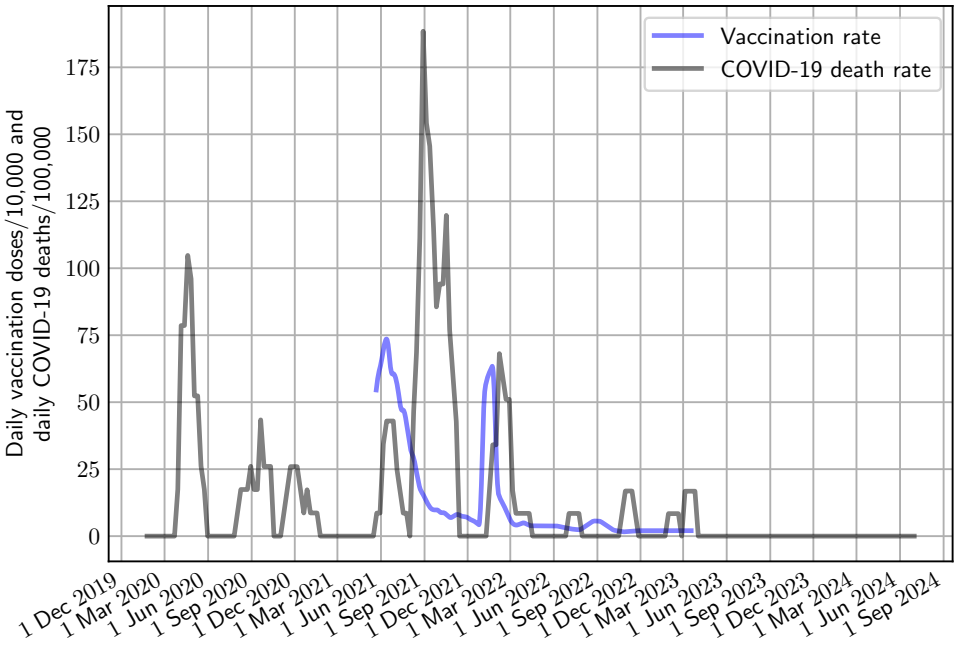

Figure 230: Sint Maarten (Dutch part)

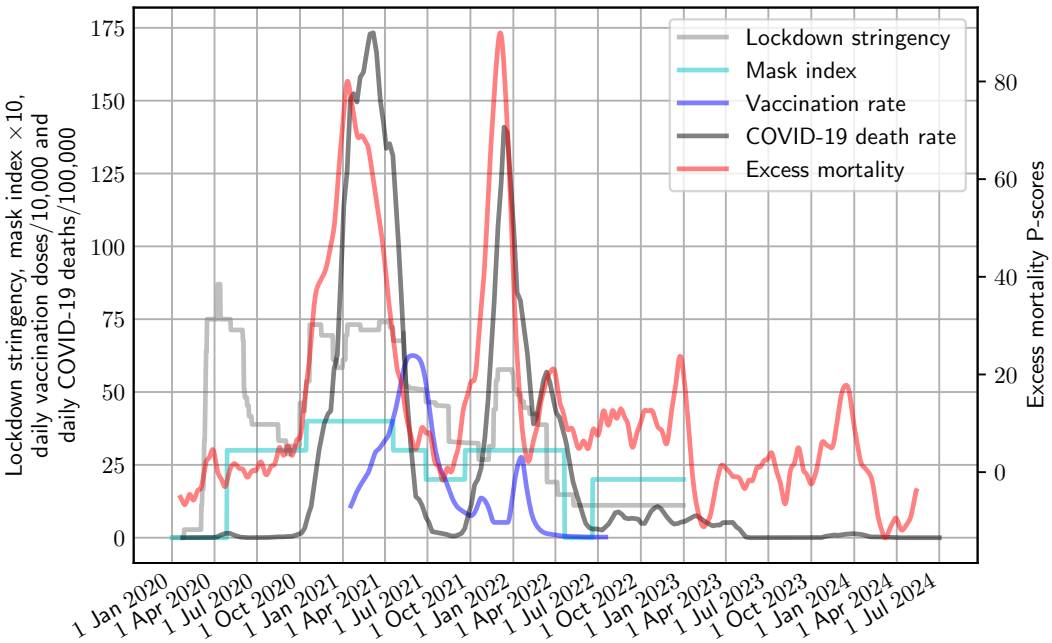

Figure 231: Slovakia

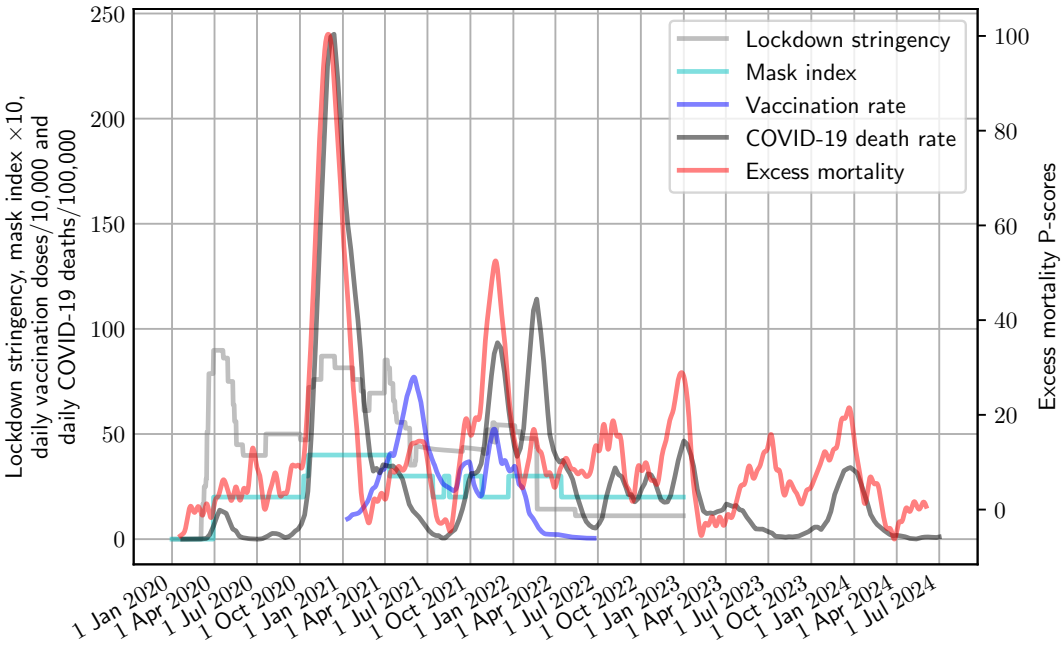

Figure 232: Slovenia

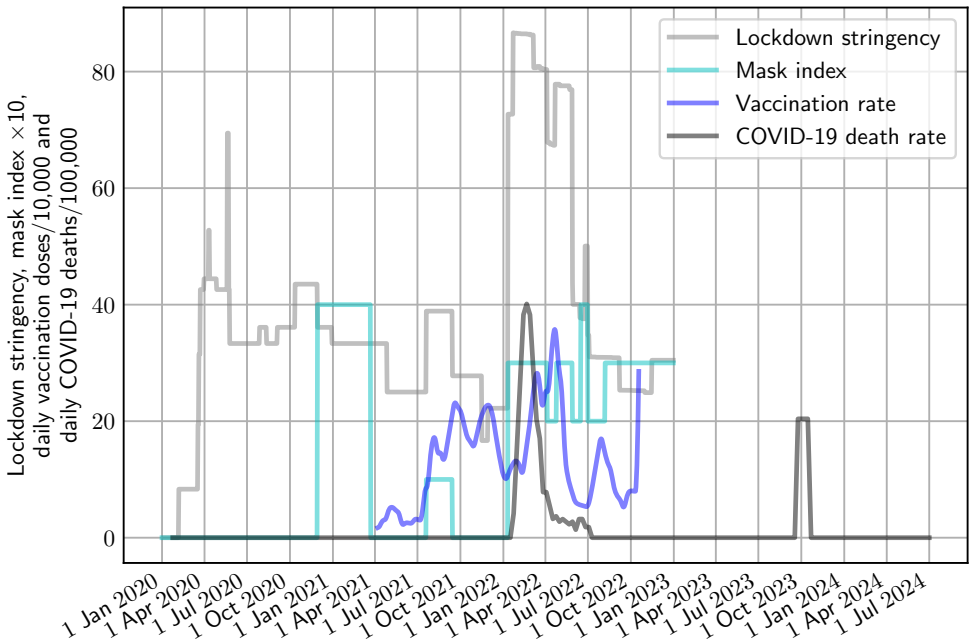

Figure 233: Solomon Islands

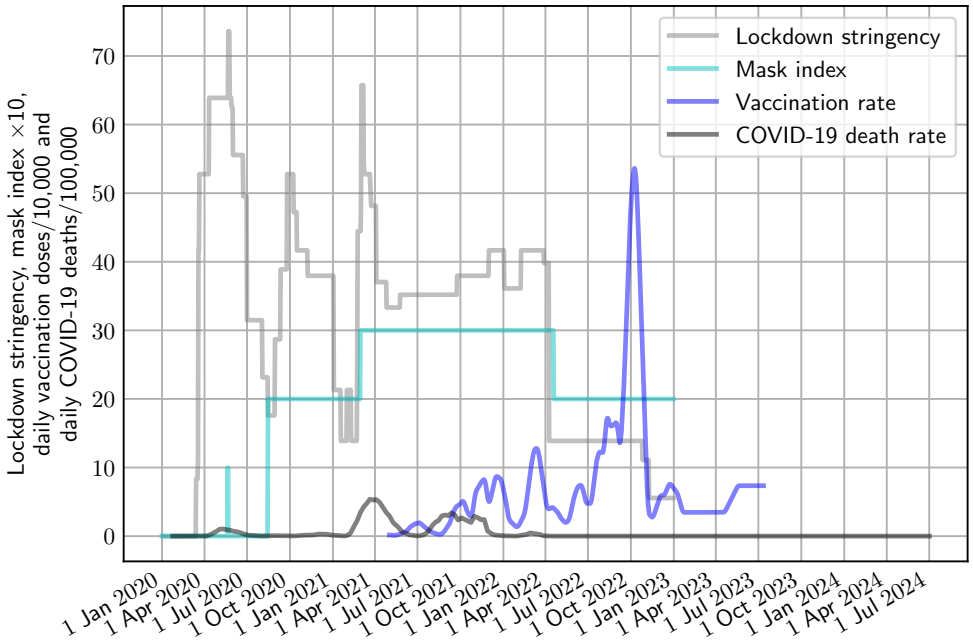

Figure 234: Somalia

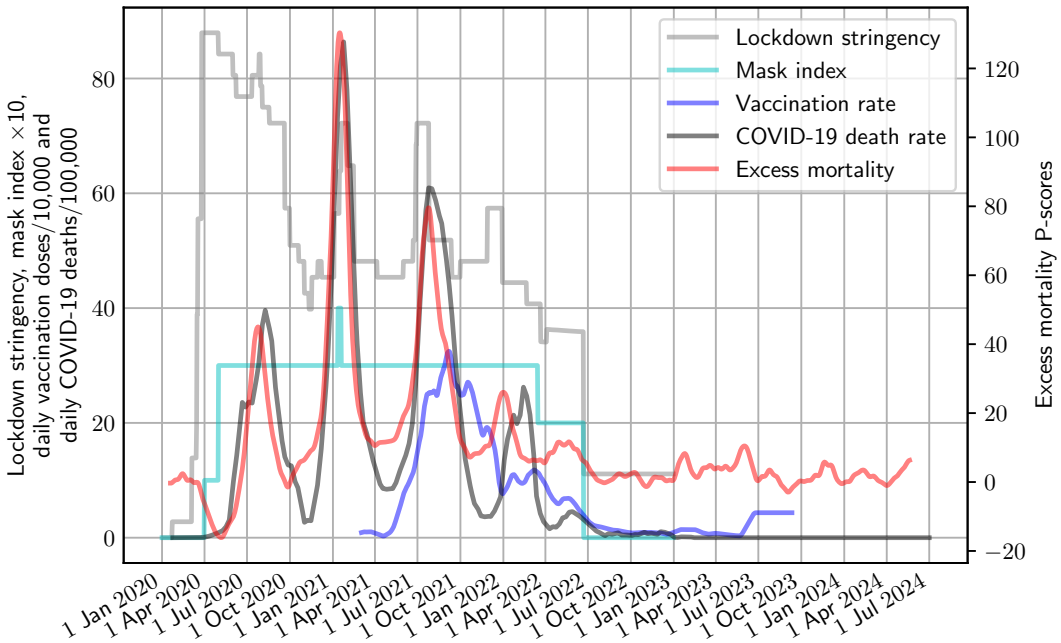

Figure 235: South Africa

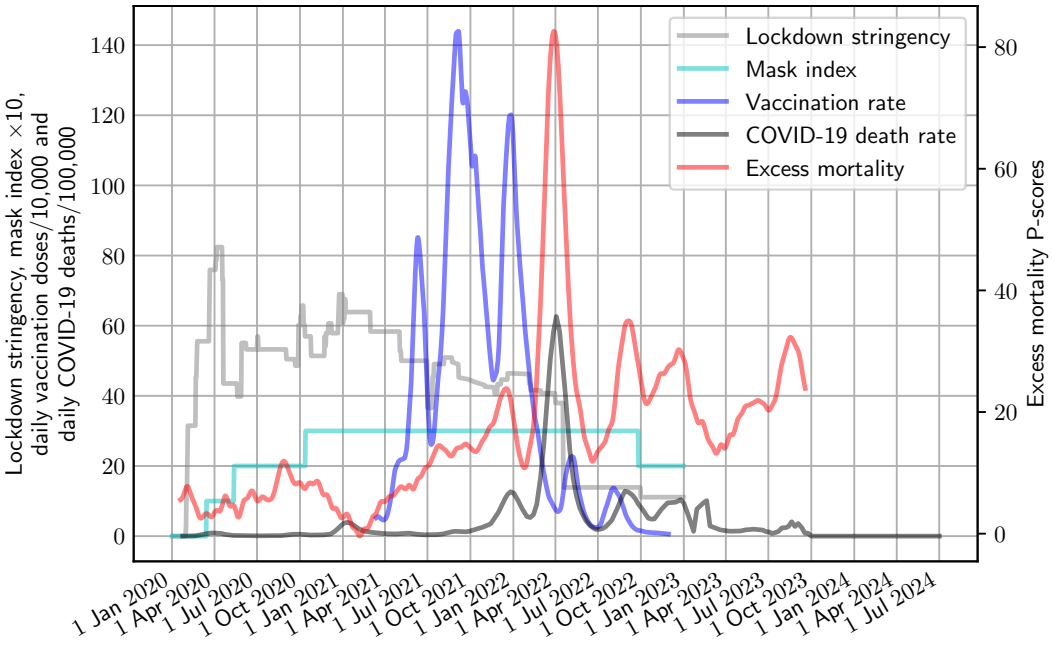

Figure 236: South Korea

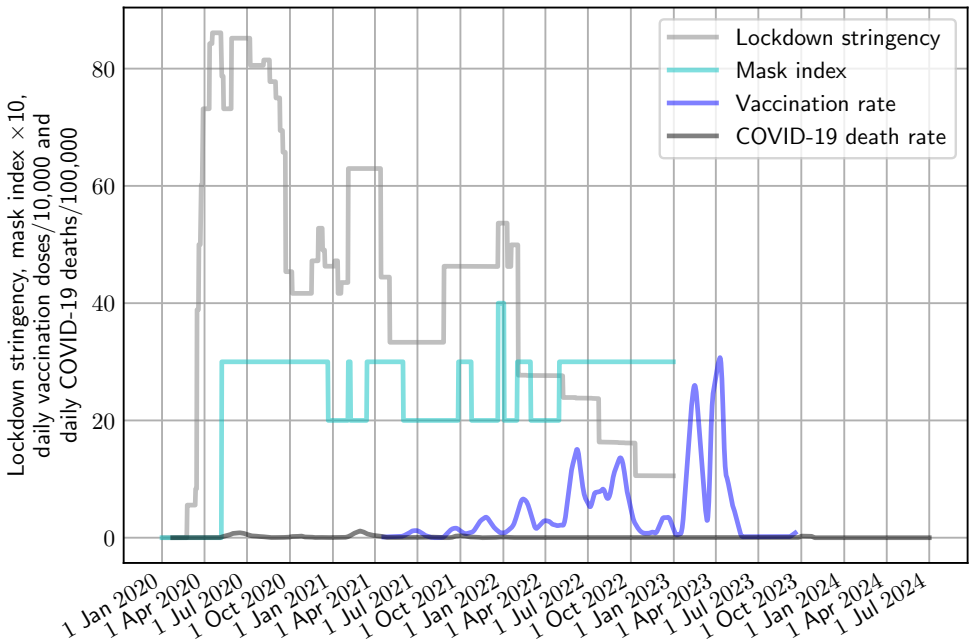

Figure 237: South Sudan

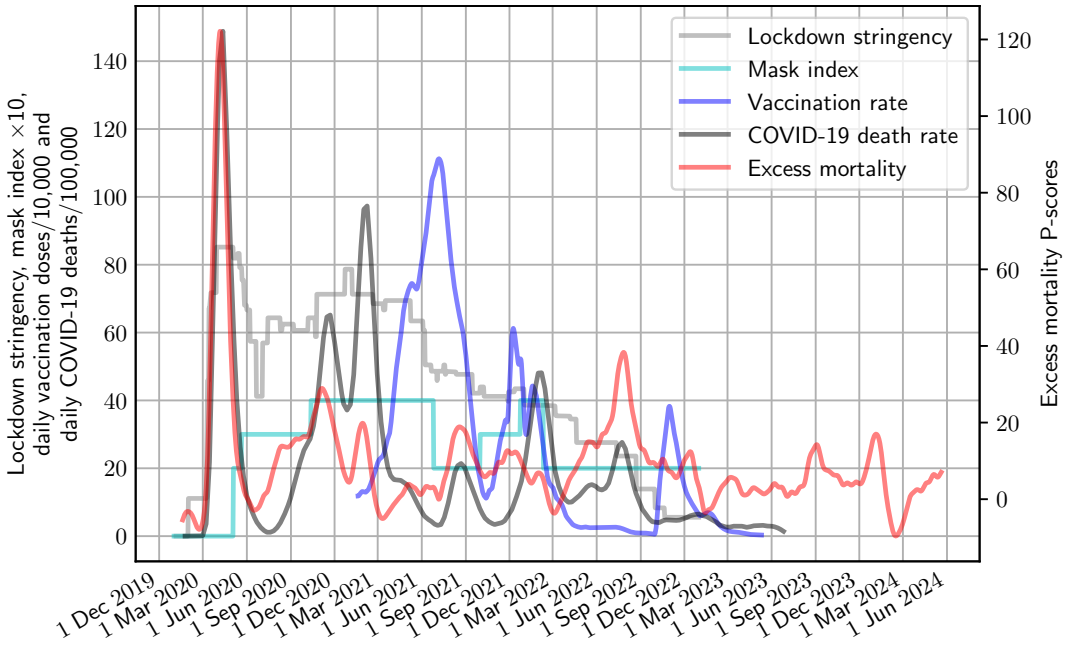

Figure 238: Spain

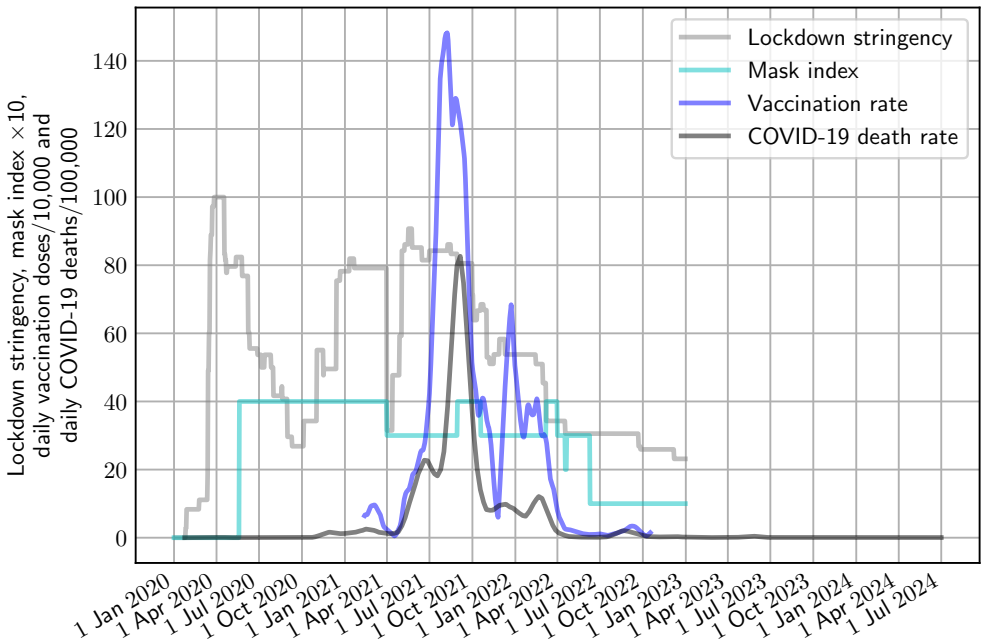

Figure 239: Sri Lanka

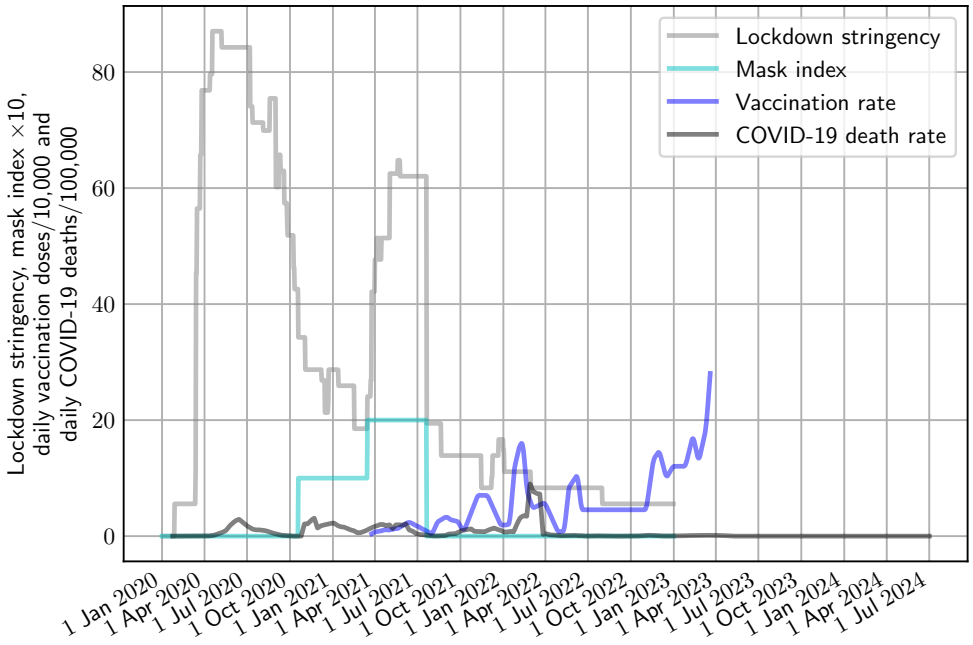

Figure 240: Sudan

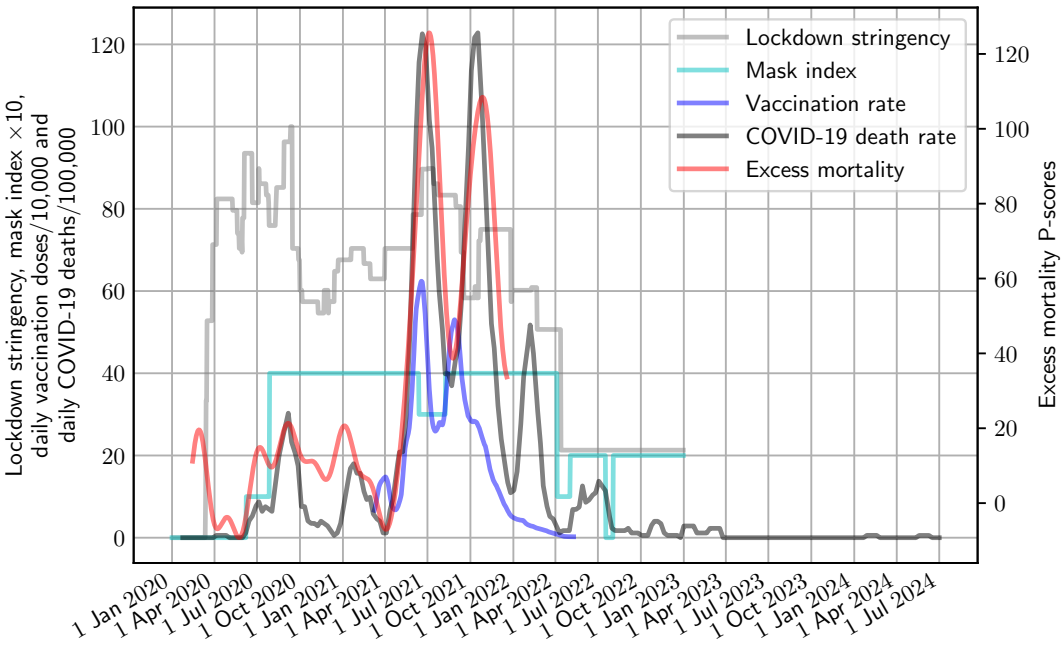

Figure 241: Suriname

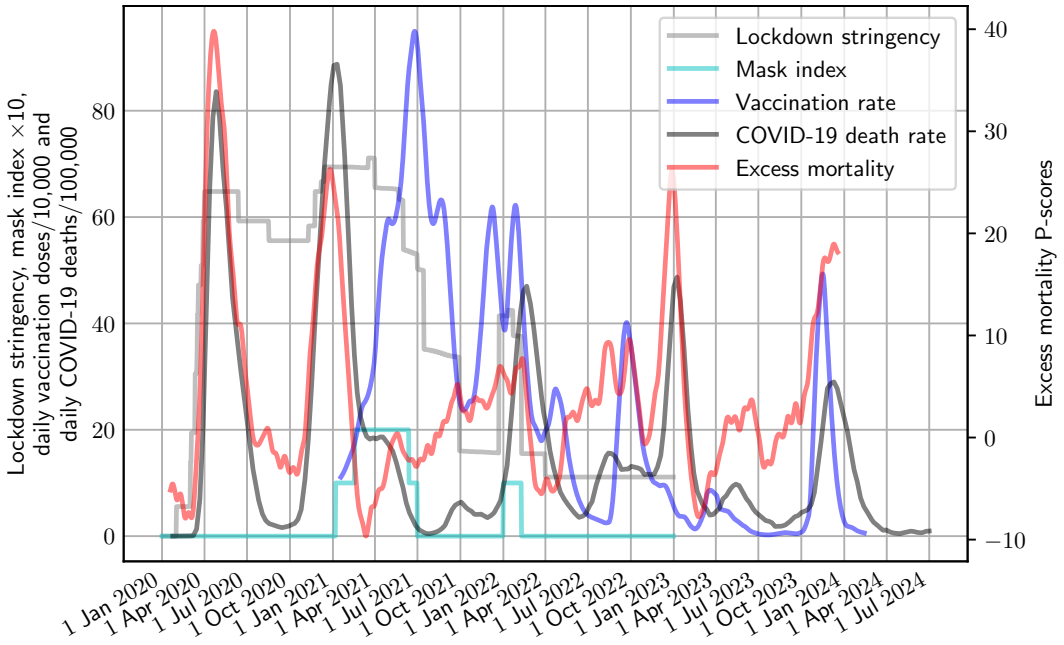

Figure 242: Sweden

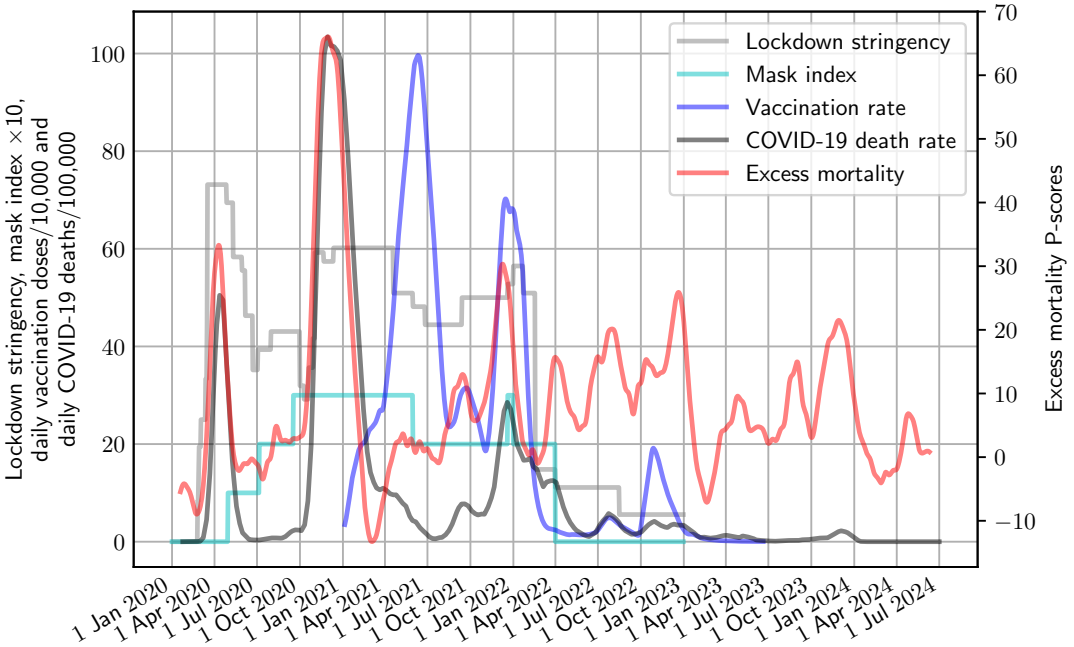

Figure 243: Switzerland

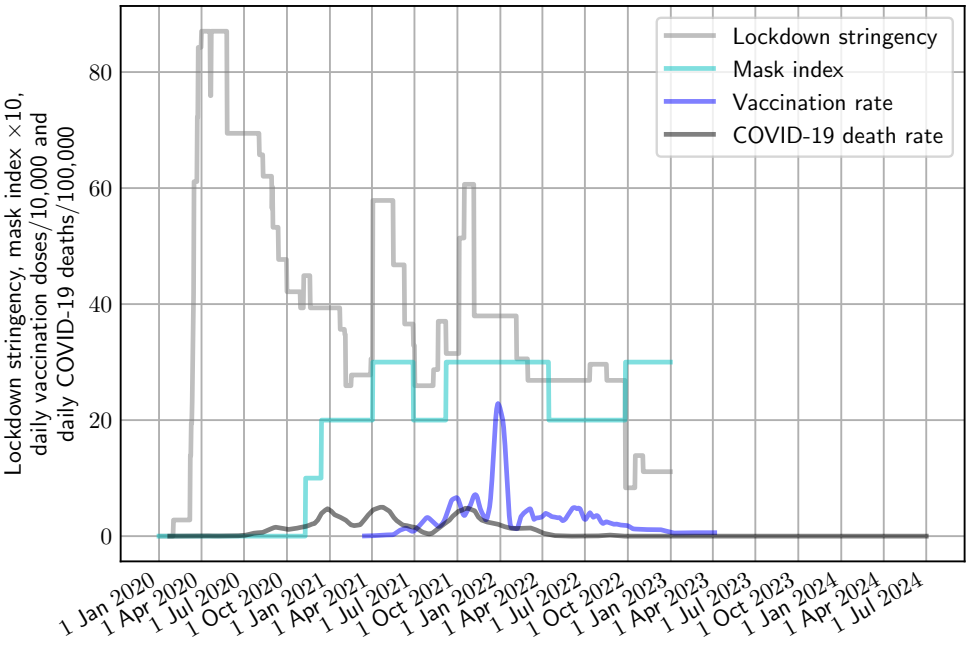

Figure 244: Syria

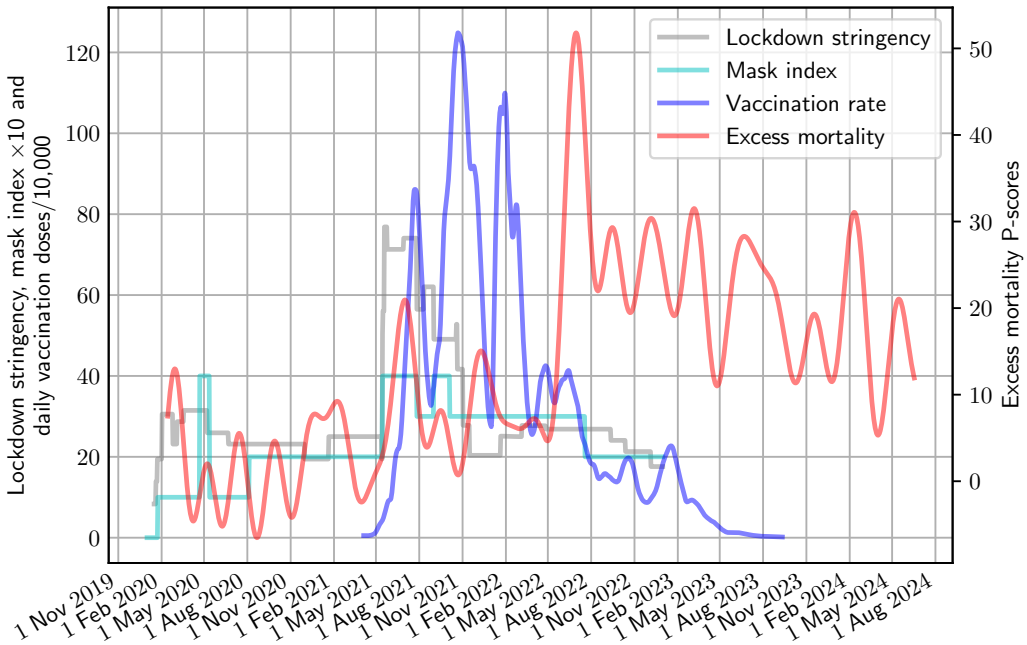

Figure 245: Taiwan

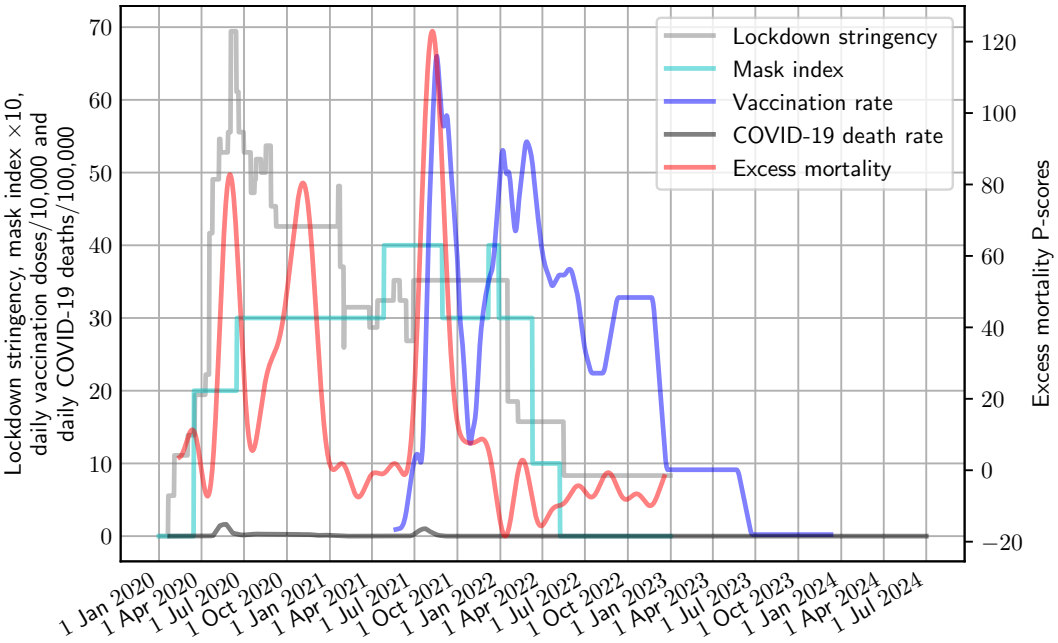

Figure 246: Tajikistan

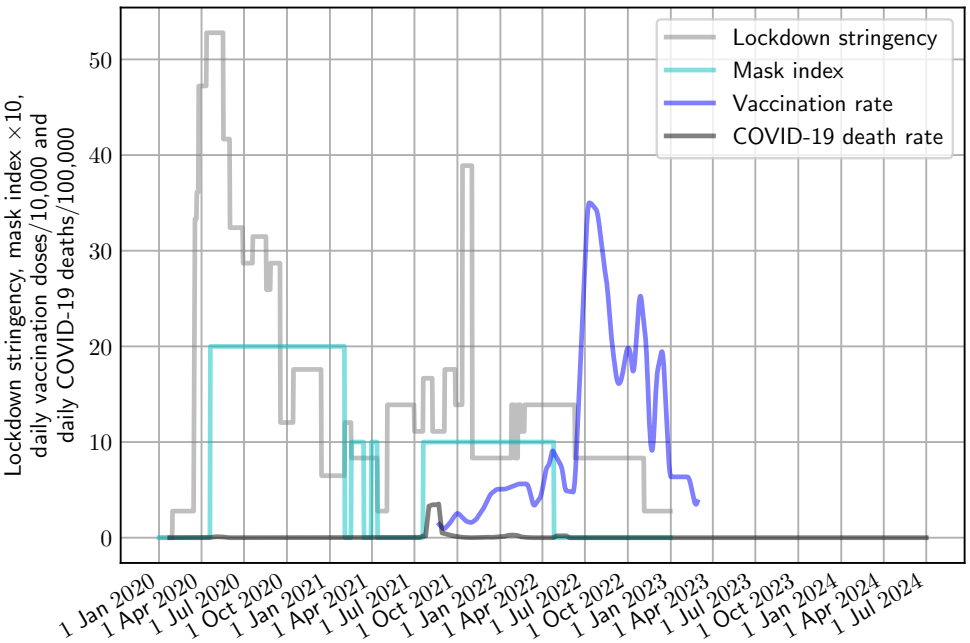

Figure 247: Tanzania

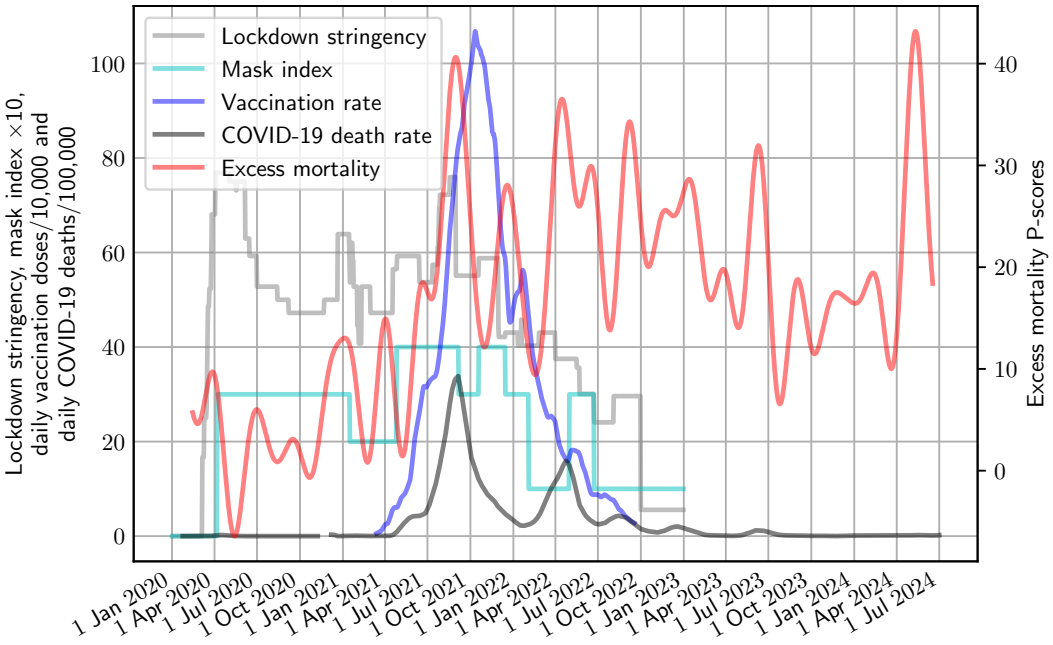

Figure 248: Thailand

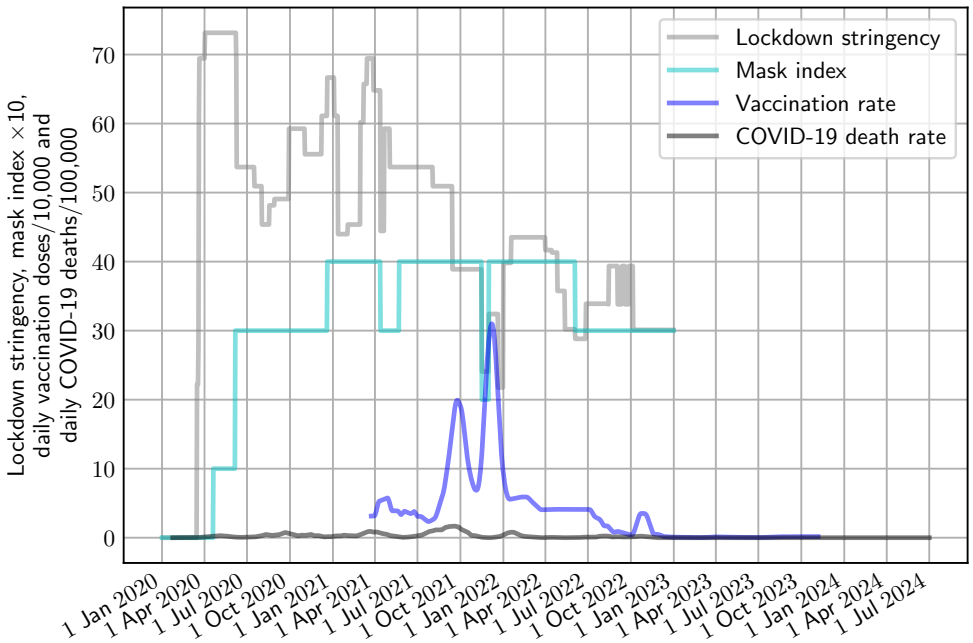

Figure 249: Togo

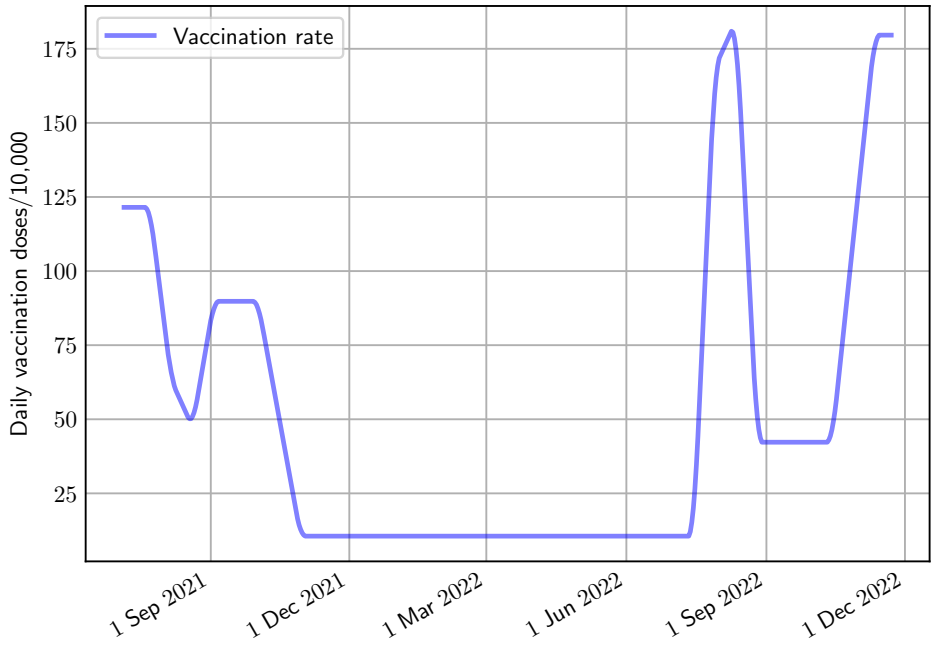

Figure 250: Tokelau

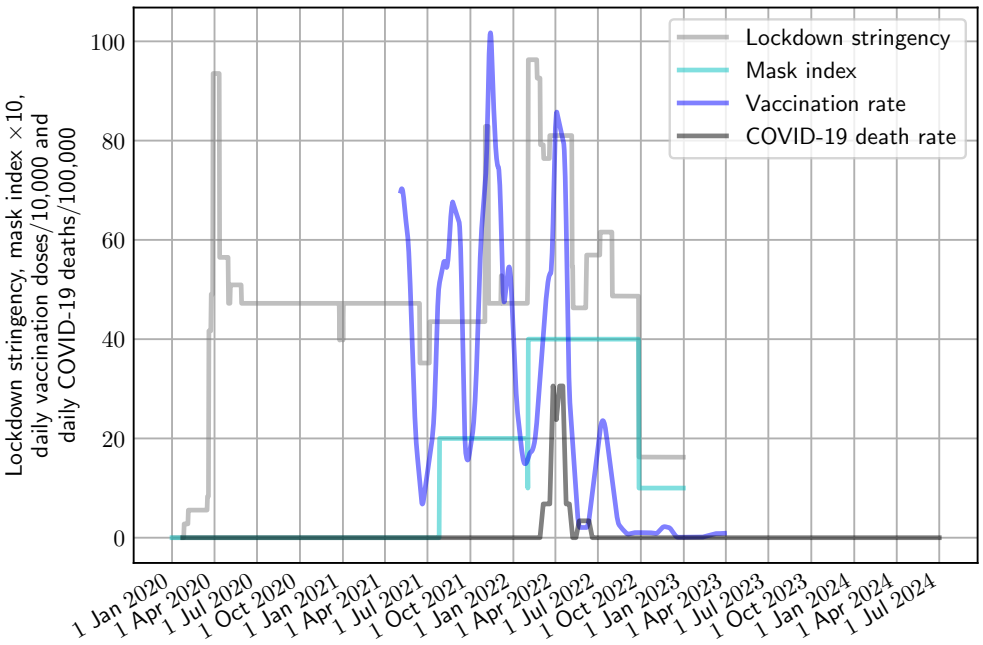

Figure 251: Tonga

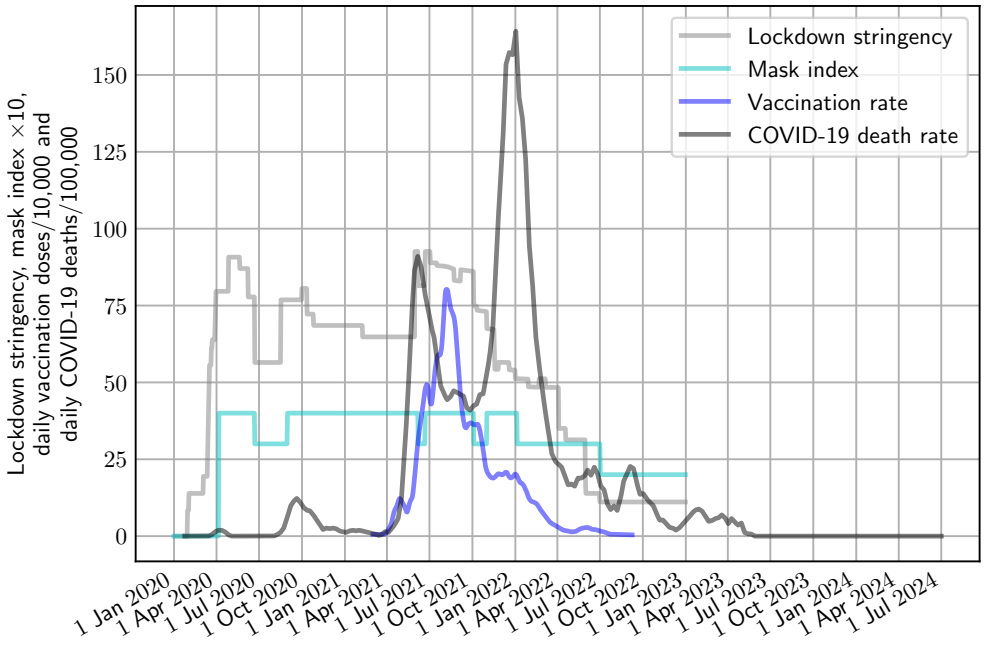

Figure 252: Trinidad and Tobago

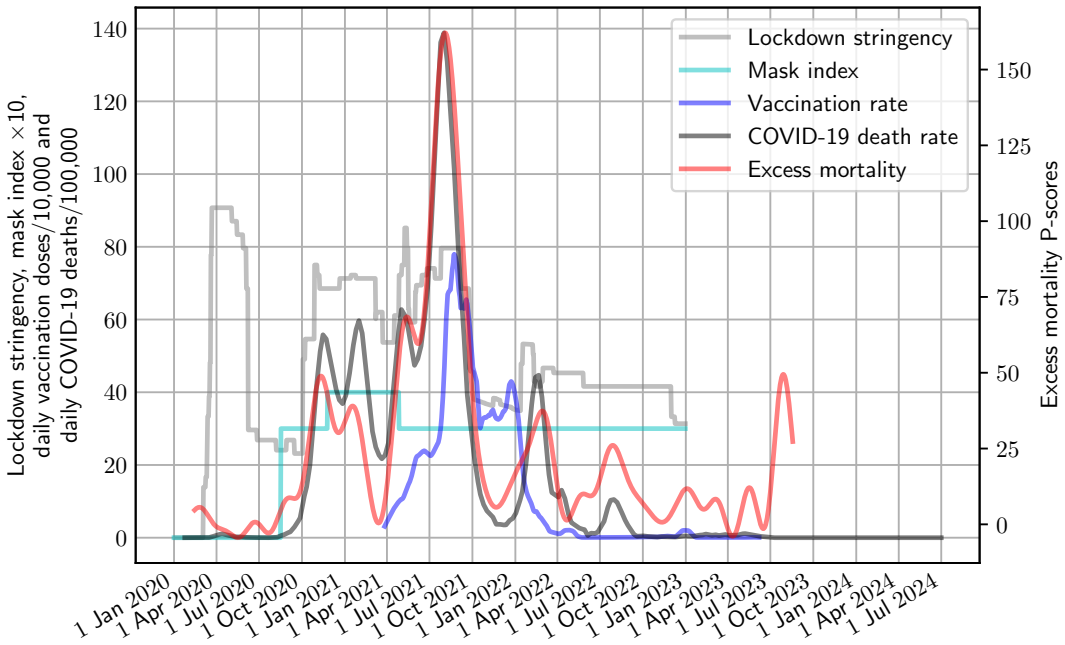

Figure 253: Tunisia

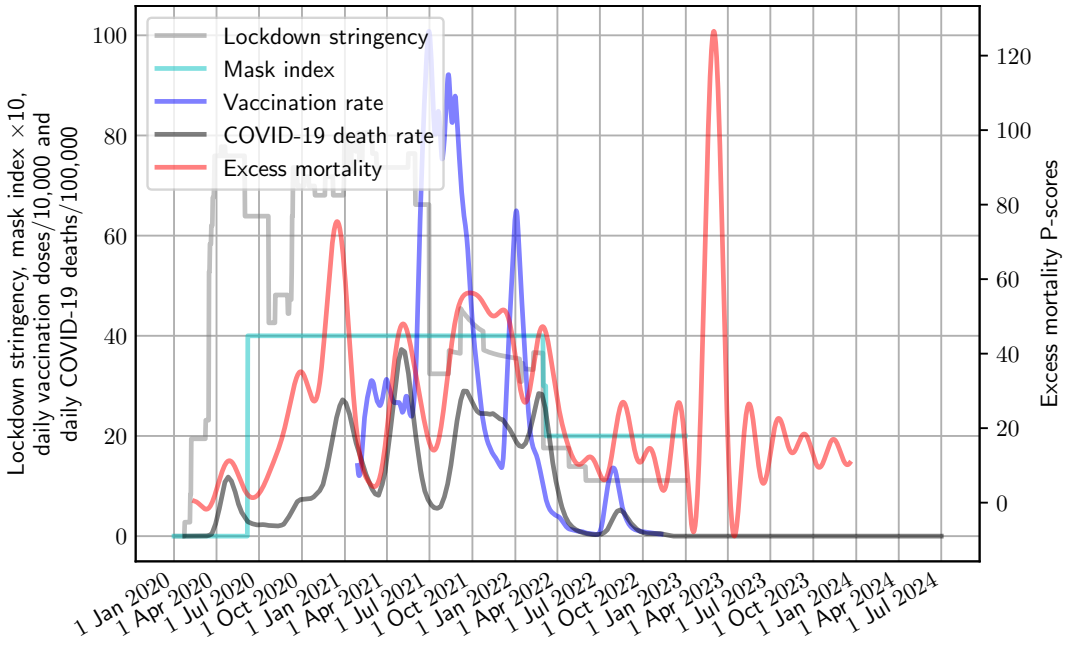

Figure 254: Turkey

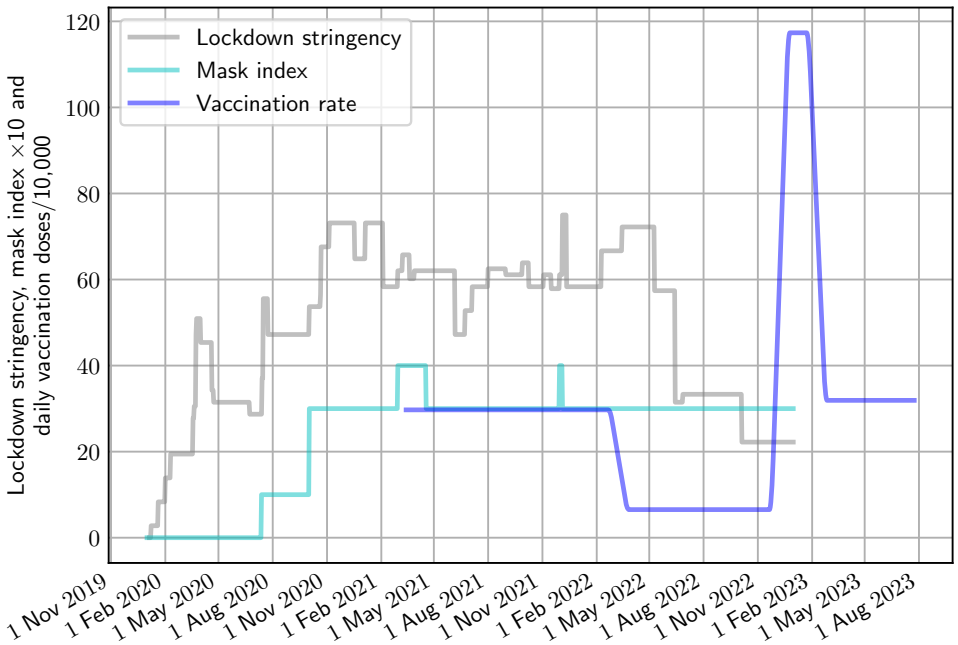

Figure 255: Turkmenistan

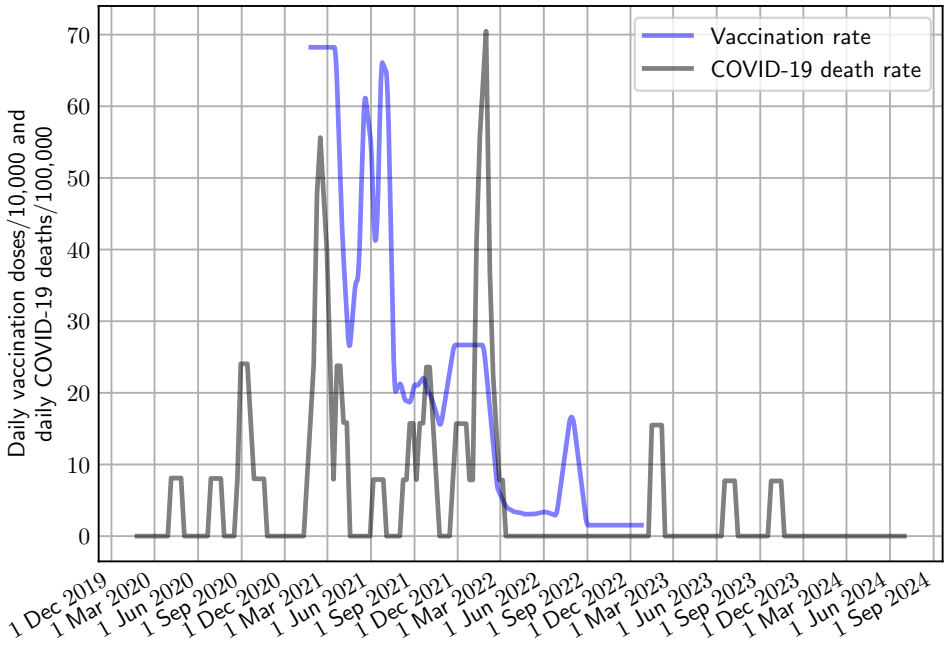

Figure 256: Turks and Caicos Islands

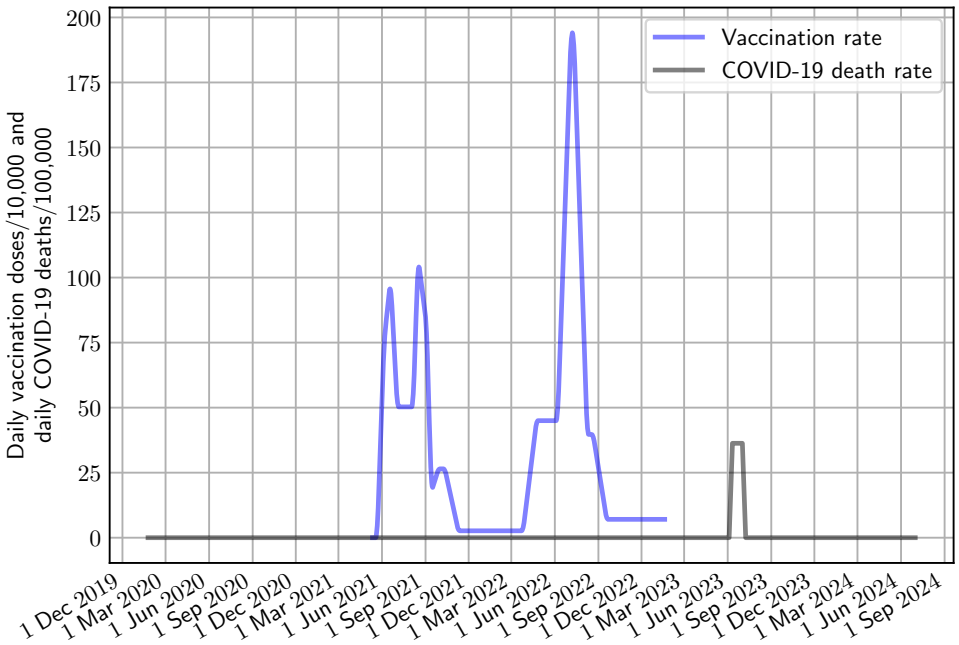

Figure 257: Tuvalu

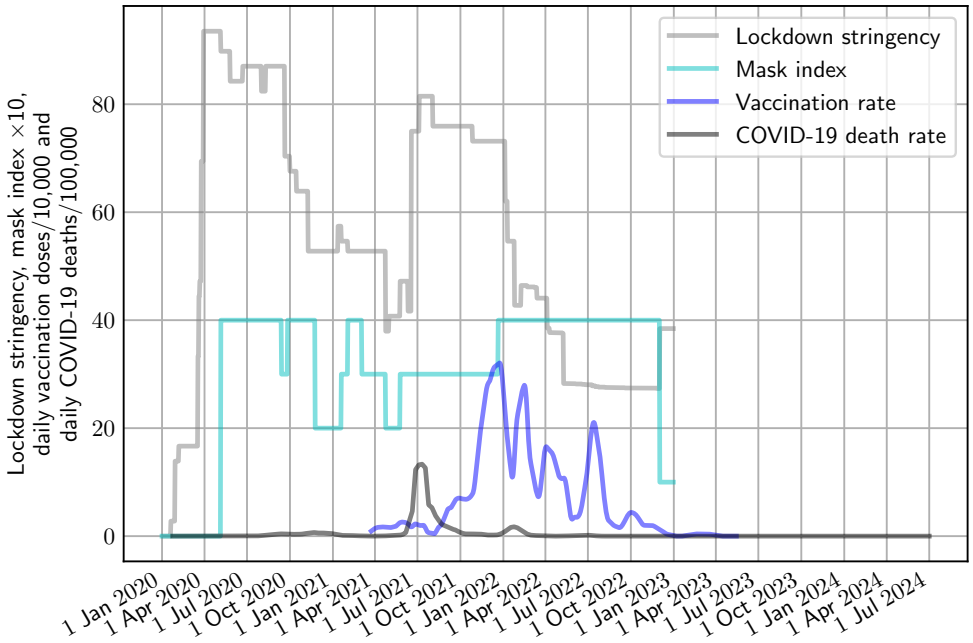

Figure 258: Uganda

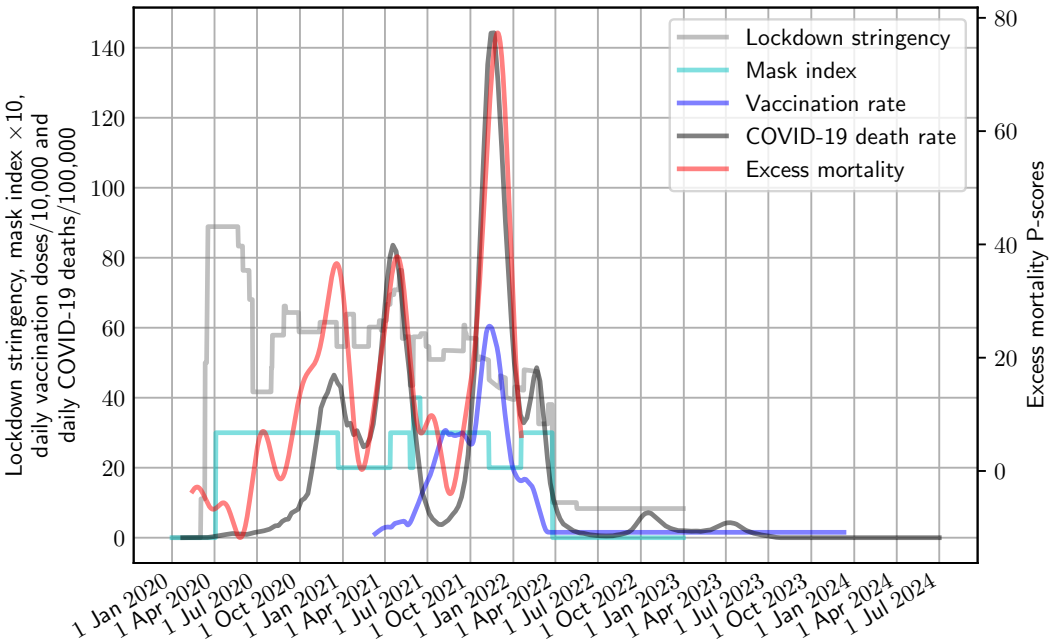

Figure 259: Ukraine

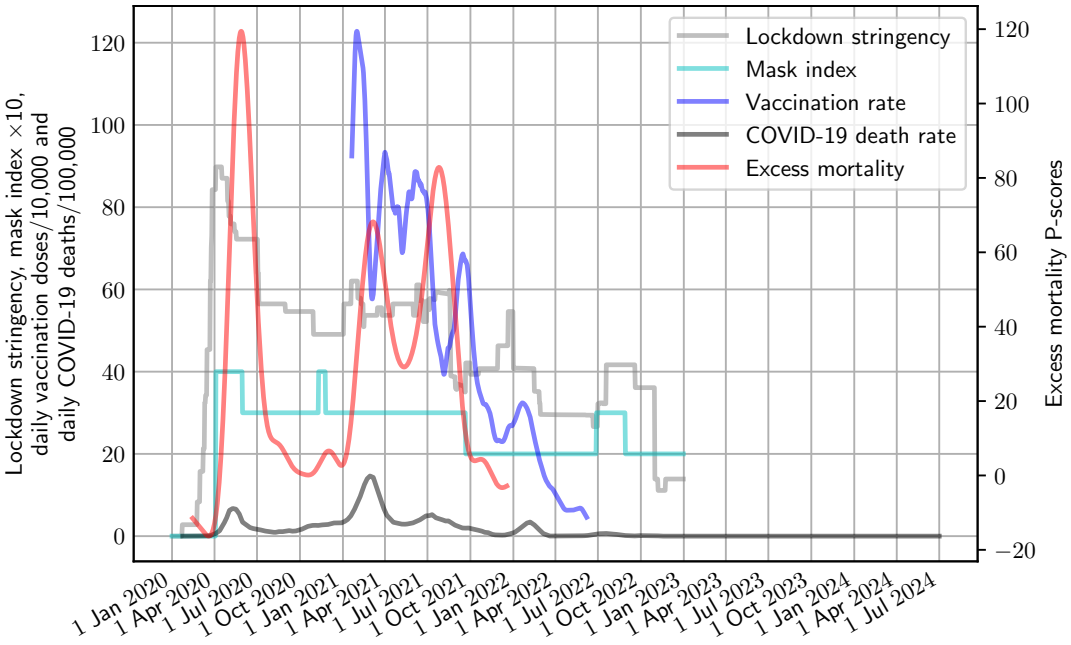

Figure 260: United Arab Emirates

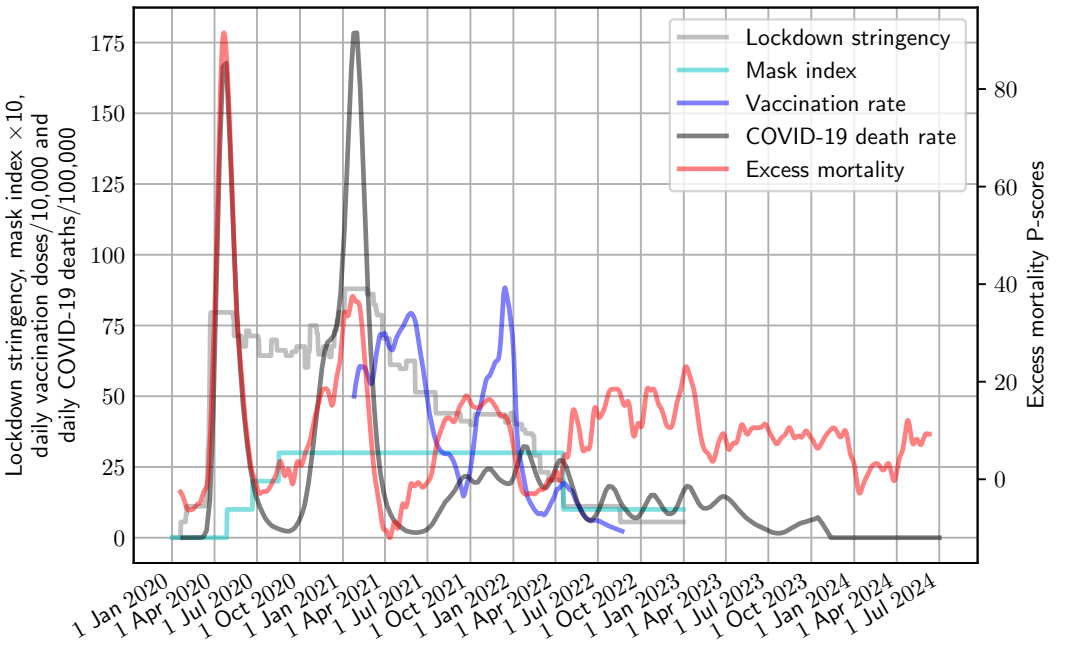

Figure 261: United Kingdom

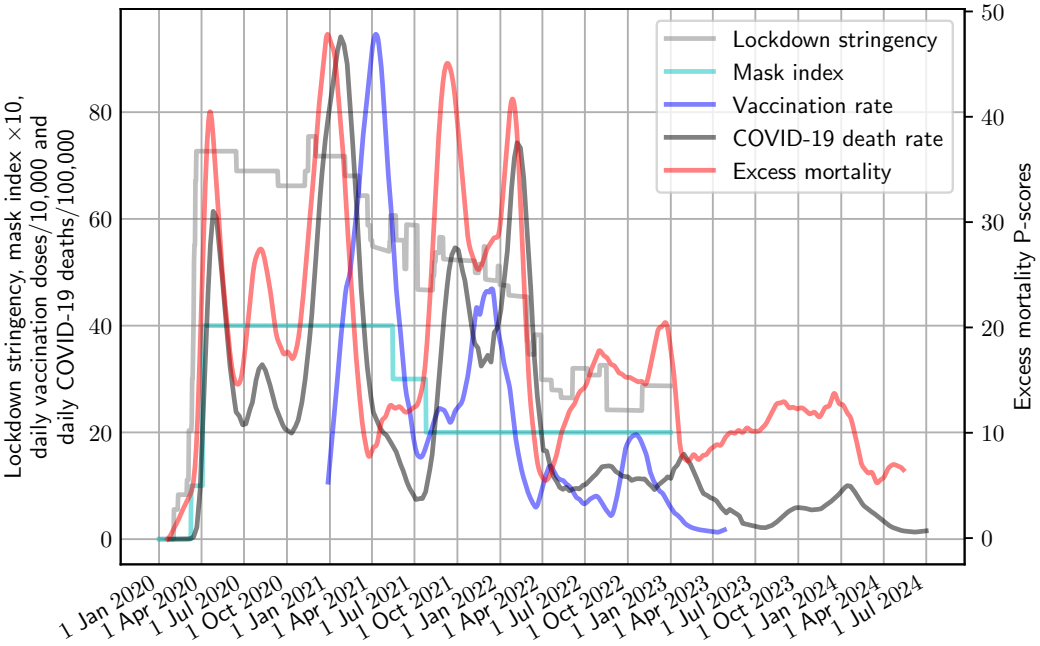

Figure 262: United States

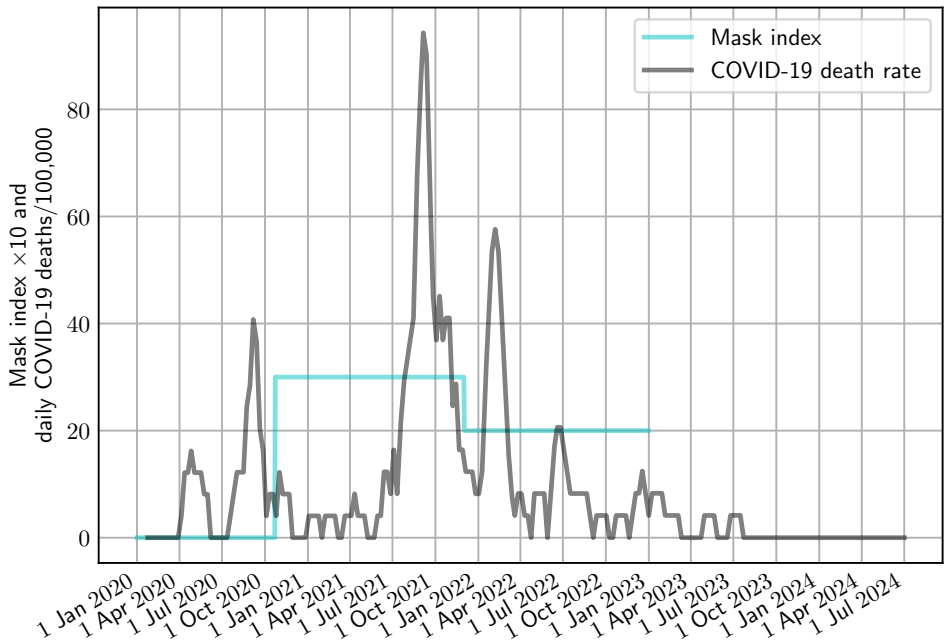

Figure 263: United States Virgin Islands

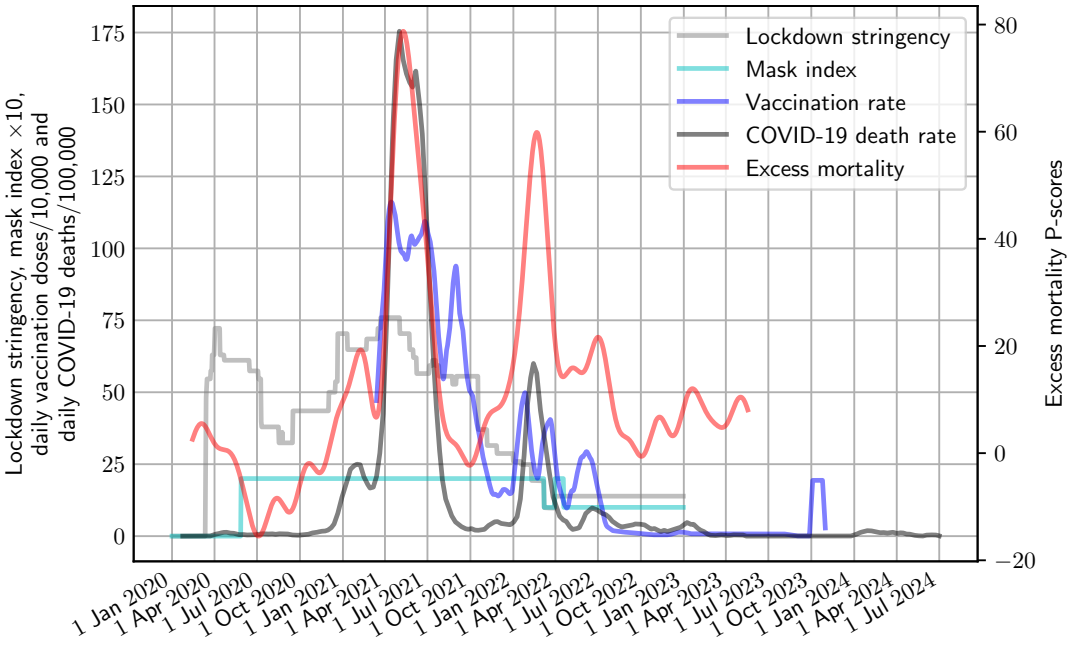

Figure 264: Uruguay

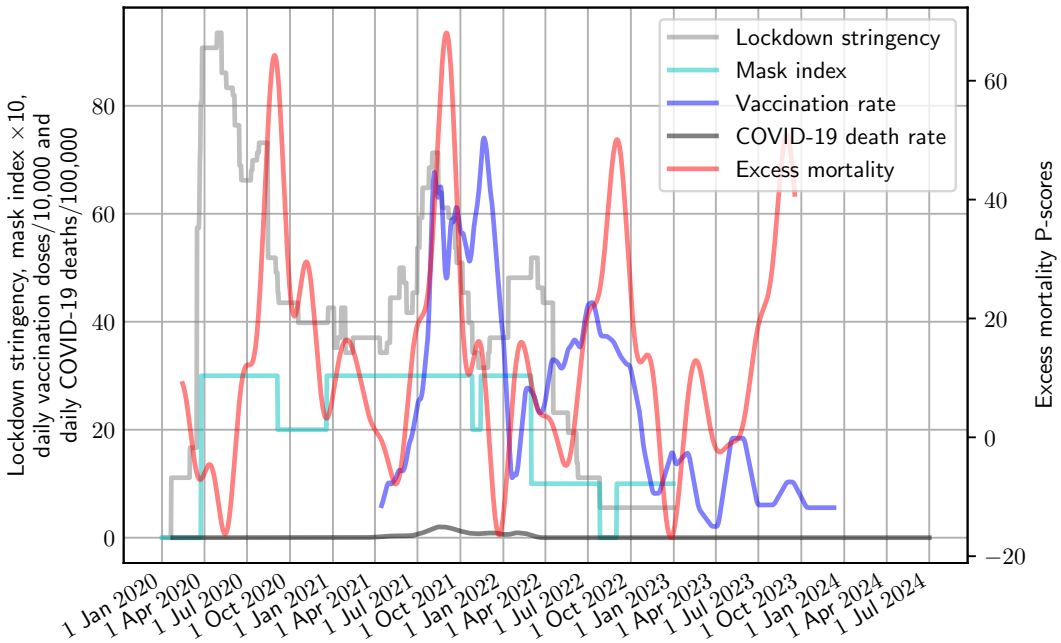

Figure 265: Uzbekistan

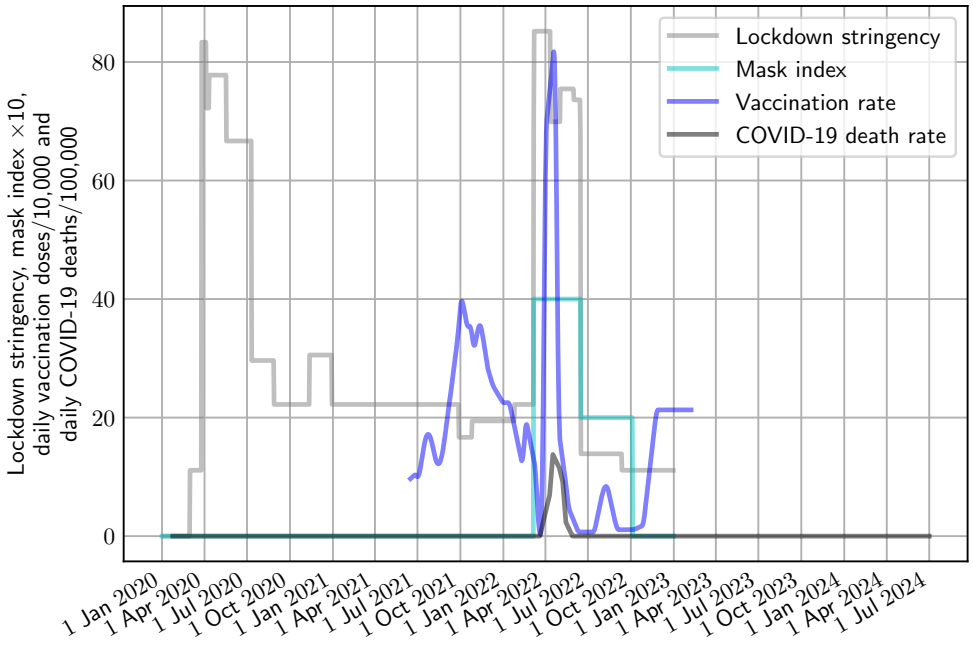

Figure 266: Vanuatu

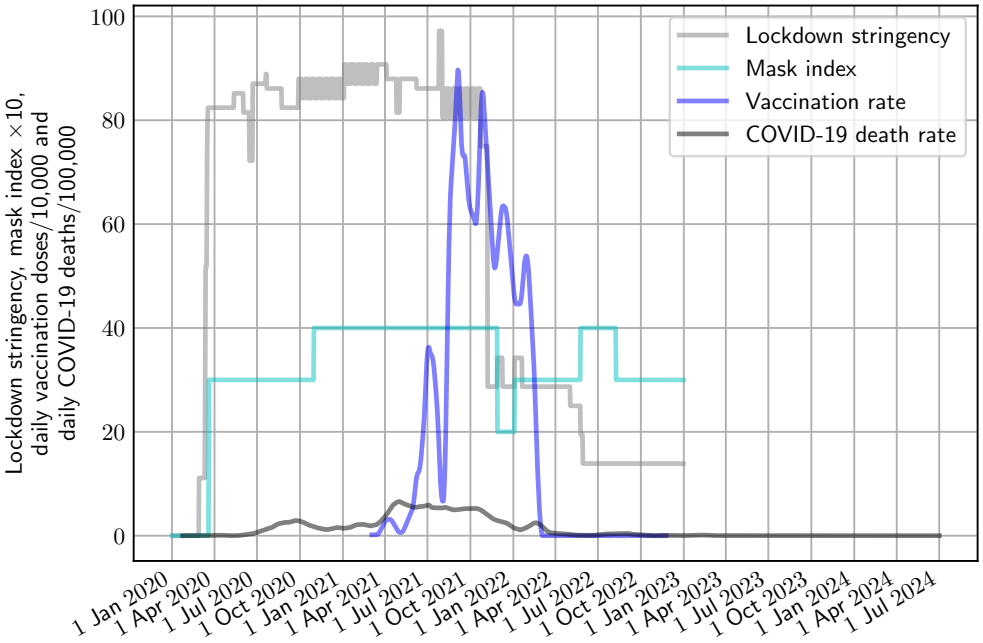

Figure 267: Venezuela

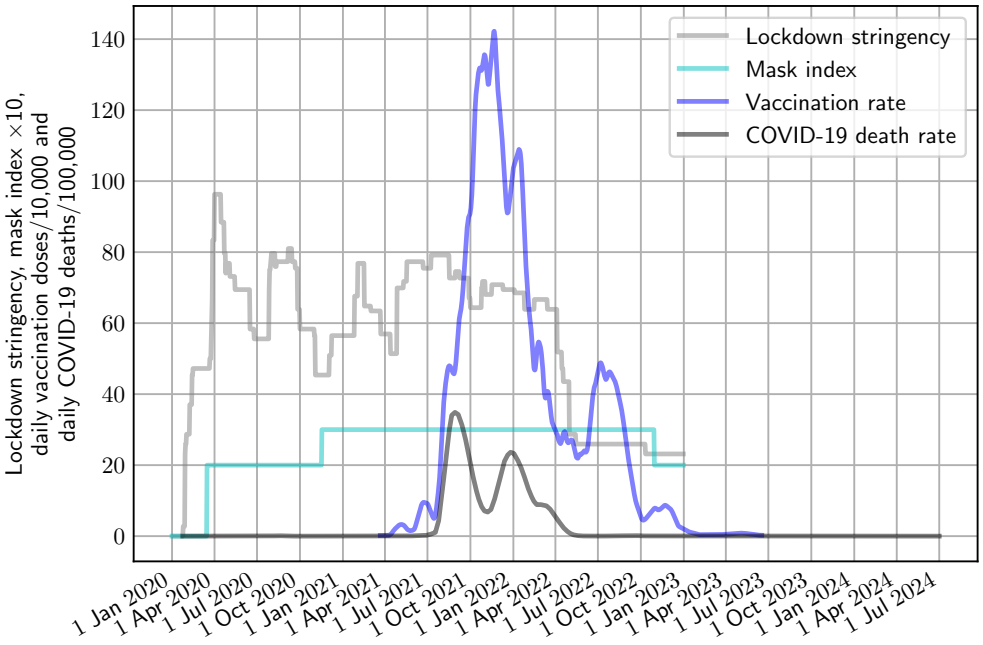

Figure 268: Vietnam

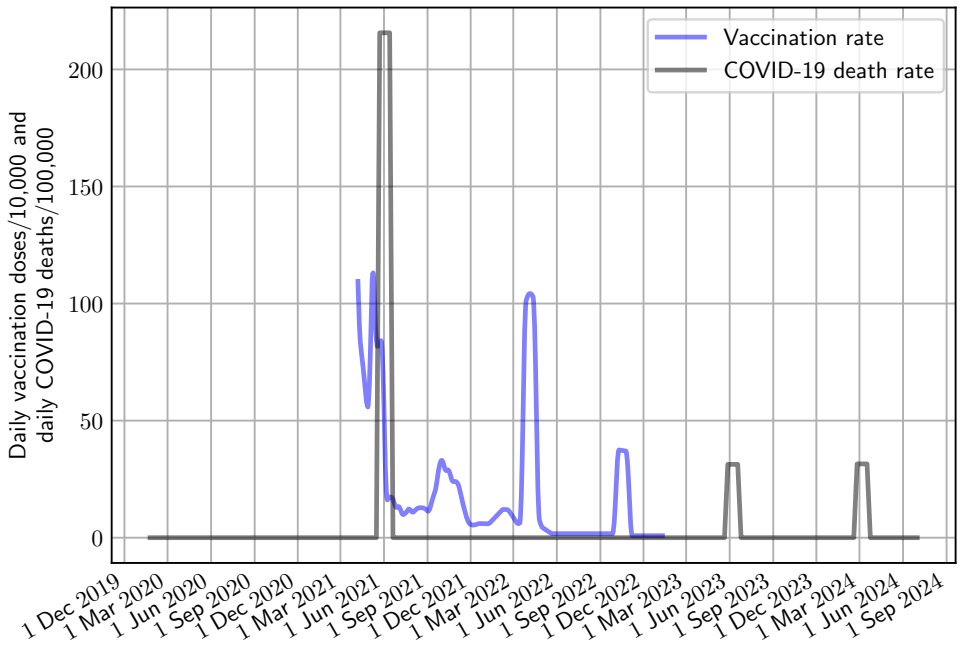

Figure 269: Wallis and Futuna

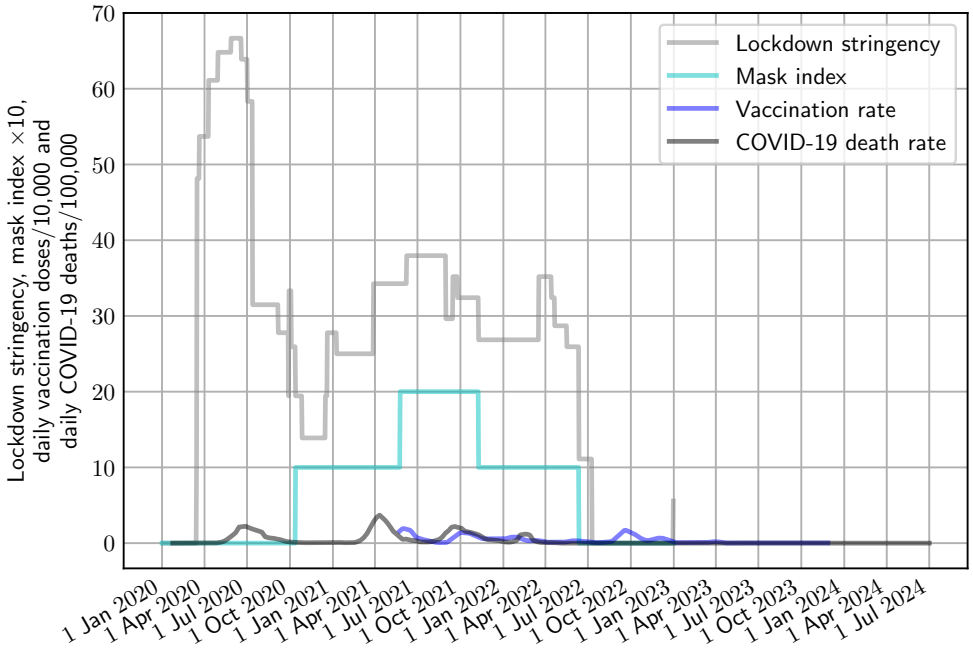

Figure 270: Yemen

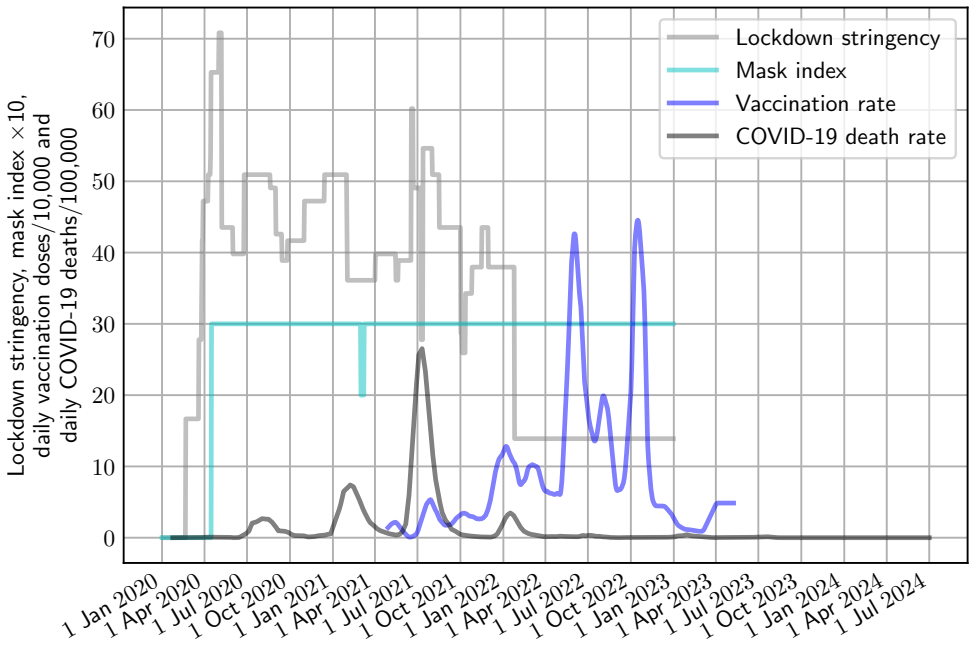

Figure 271: Zambia

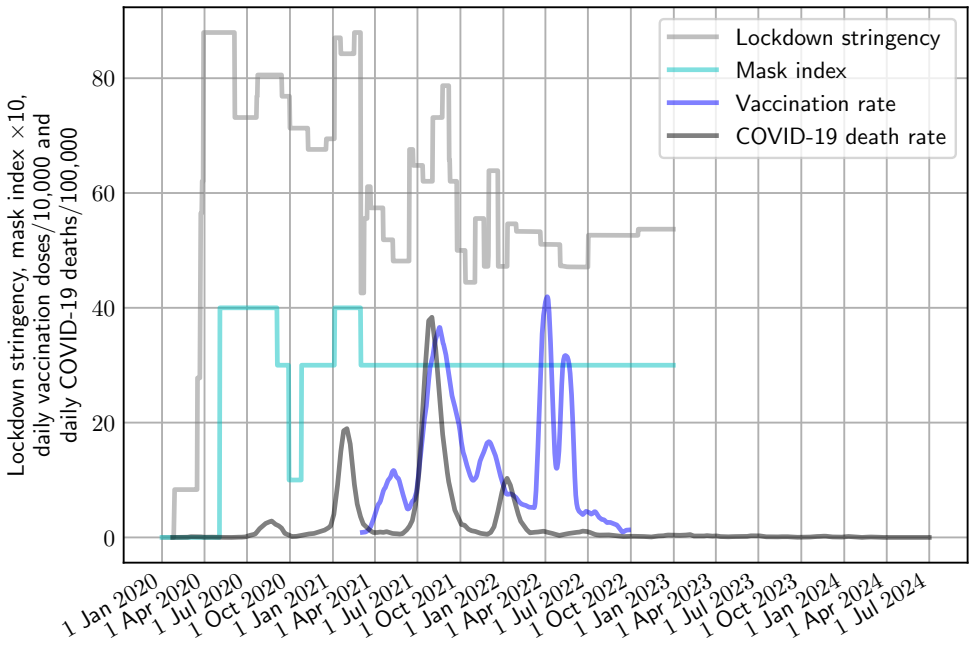

Figure 272: Zimbabwe

B Income

Figures 273 to 276 show COVID-19 death rate for countries with different levels of income.

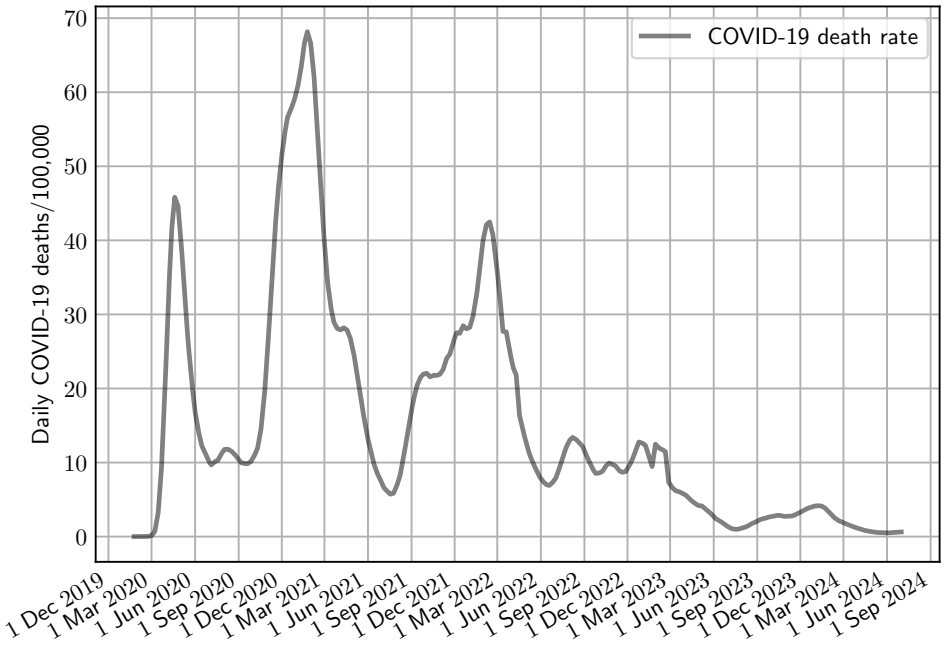

Figure 273: High-income countries

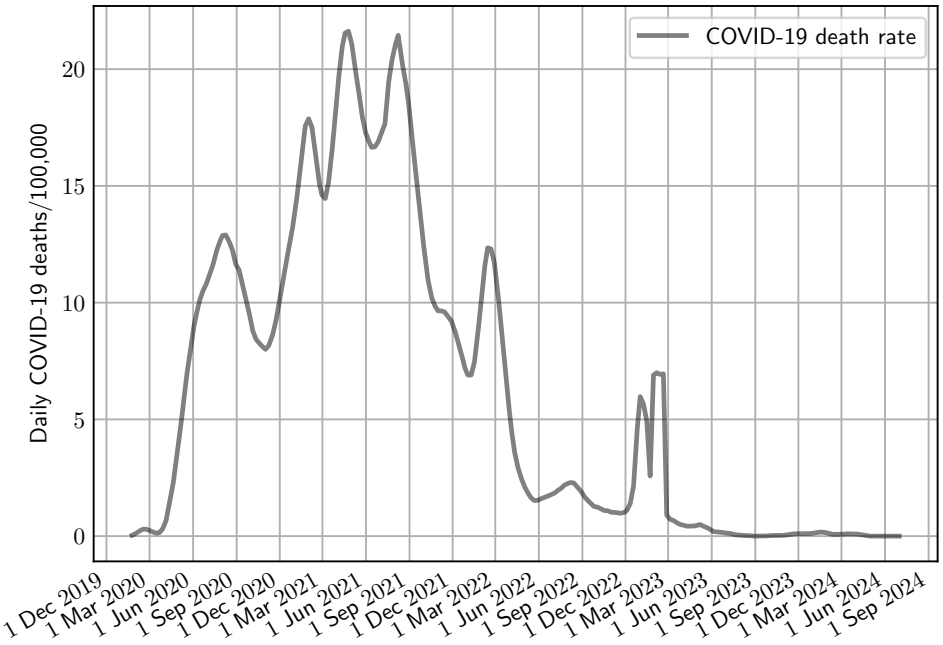

Figure 274: Upper-middle-income countries

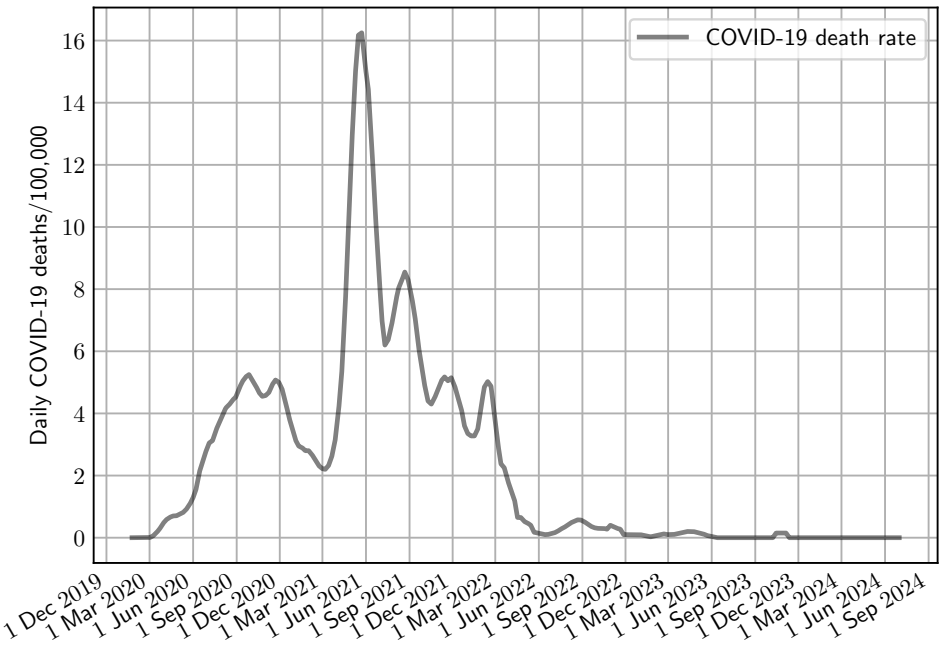

Figure 275: Lower-middle-income countries

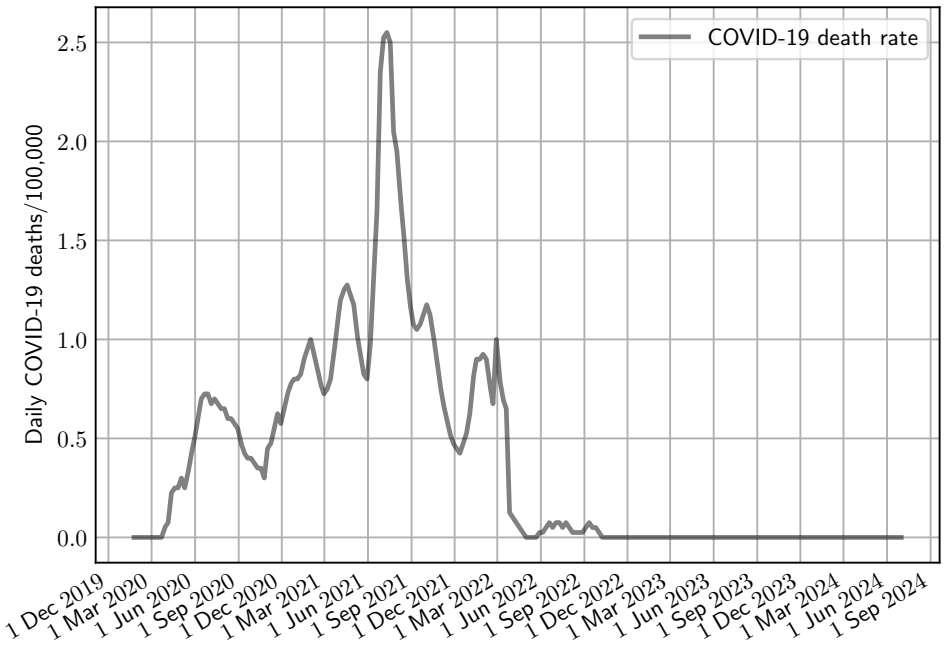

Figure 276: Low-income countries

C Continents

Figures 277 to 282 show COVID-19 death rate for six continents.

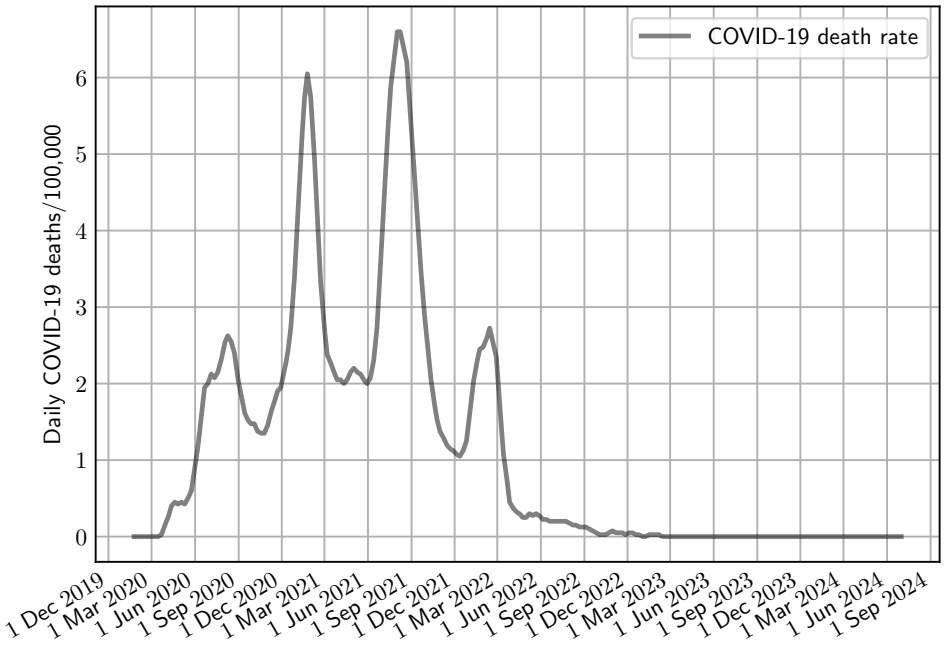

Figure 277: Africa

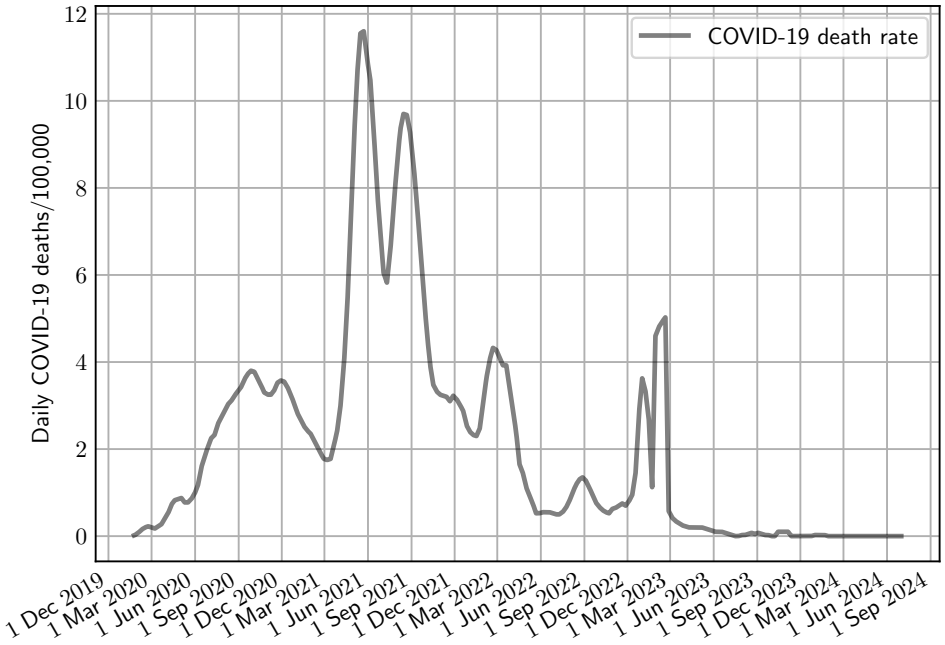

Figure 278: Asia

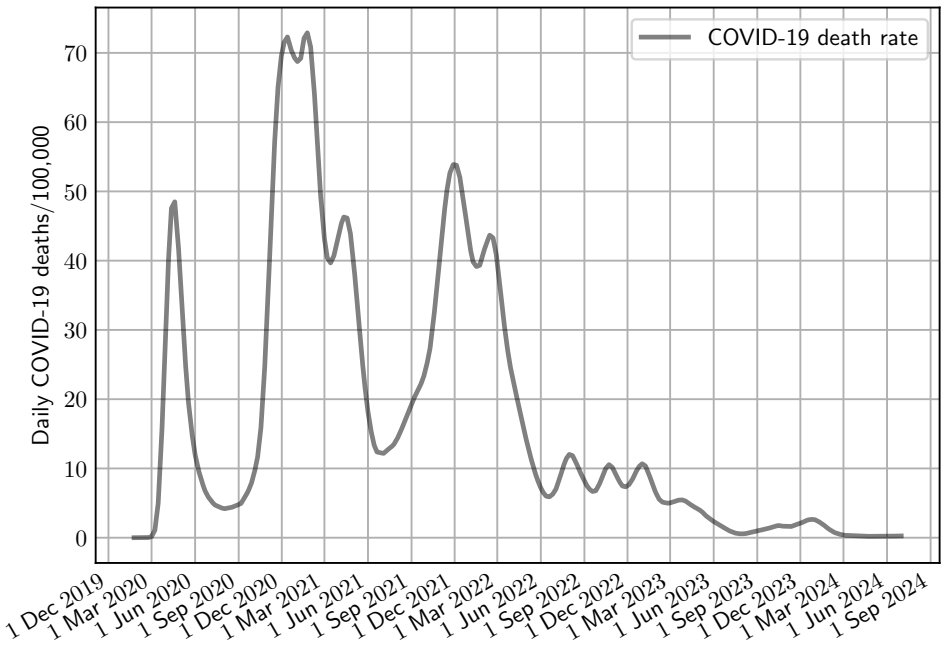

Figure 279: Europe

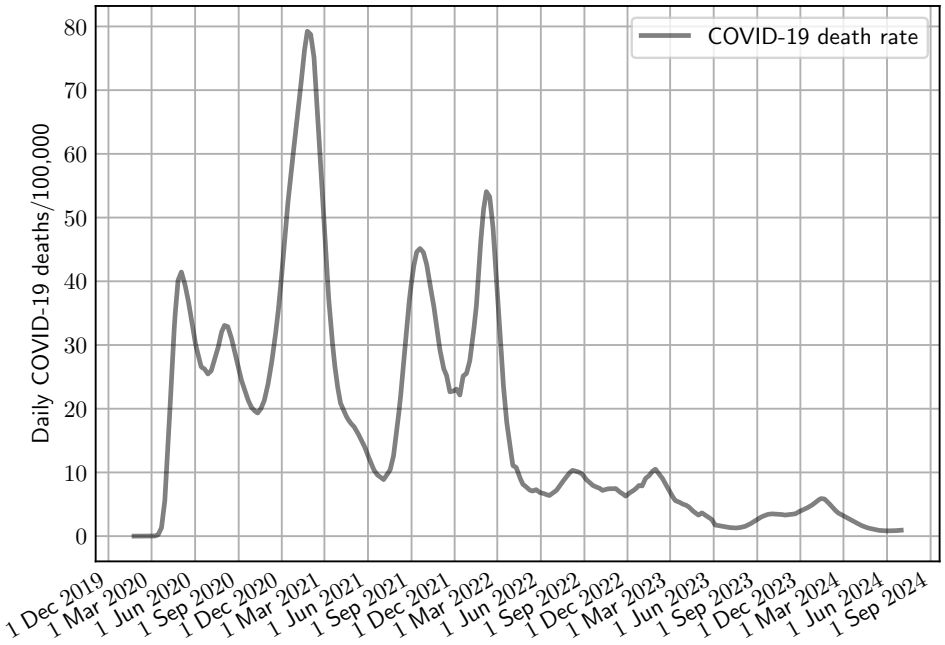

Figure 280: North America

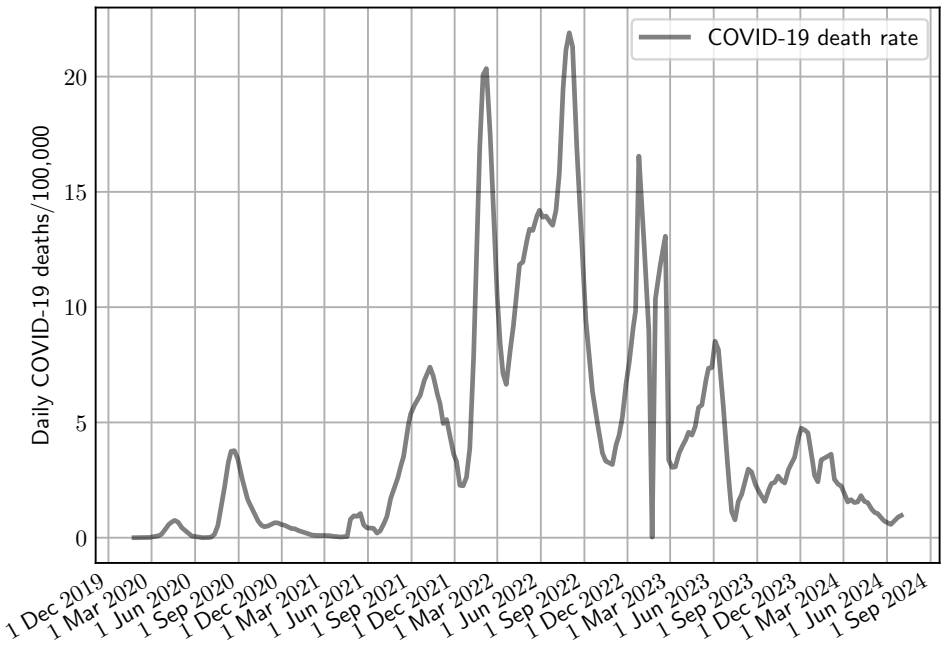

Figure 281: Oceania

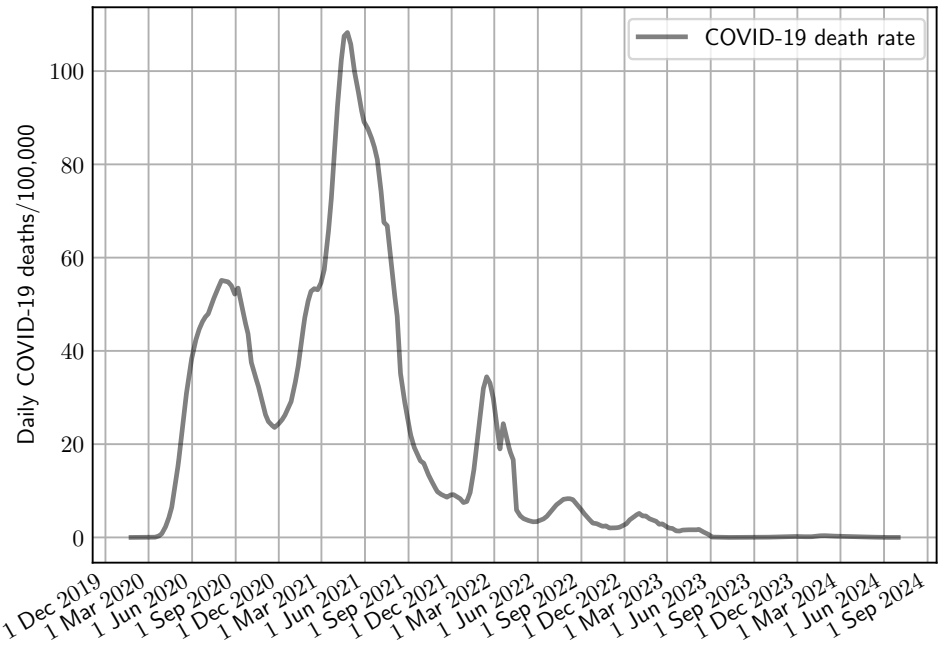

Figure 282: South America

D European Union and World

Figure 283 shows COVID-19 death rate for the European Union and Figure 284 shows vaccination rate and COVID-19 death rate for the World.

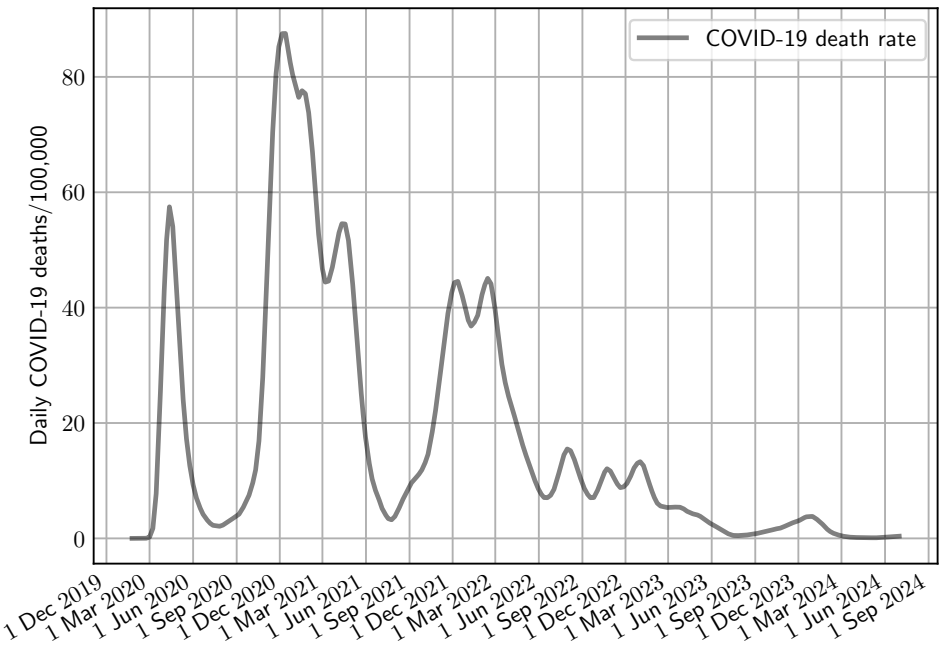

Figure 283: European Union

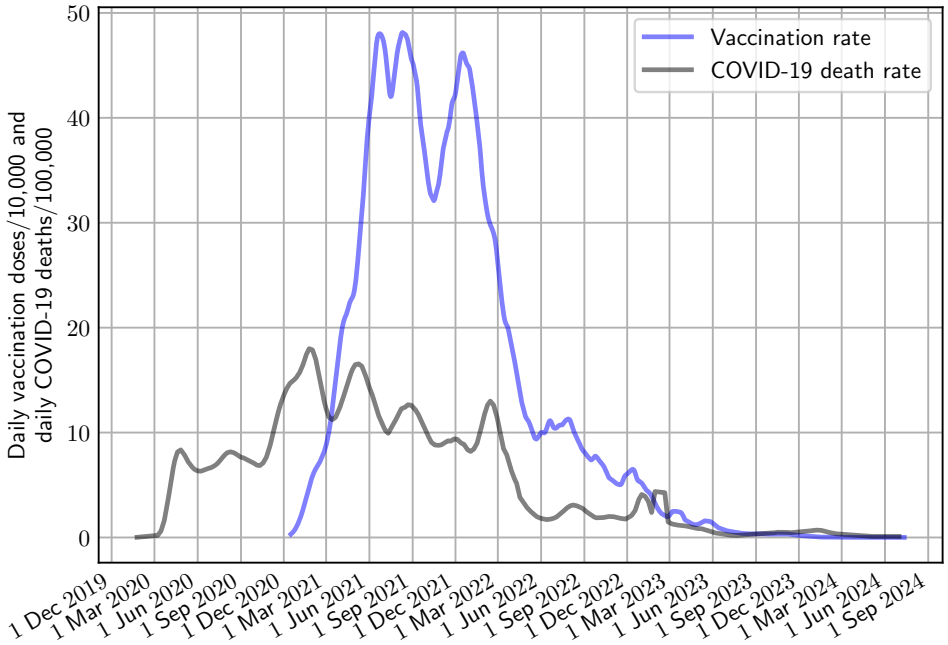

Figure 284: World

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