PhysPop Omitted: Correlations between Cancer and IHD MortRates, Past and Present

Various findings in this work stand alone, without any interpretation, as irrefutable. We will add one new set of such findings here.

If medical radiation is an important cause of both Cancer and Ischemic Heart Disease (IHD), then we "predict" that the age-adjusted MortRates for the two diseases should show a PERSISTENT positive correlation with each other over time, by Census Divisions --- and should simultaneously show a distinctly different relationship with MortRates for NonCancer NonIHD causes of death, which are NOT inducible by ionizing radiation.

We start with the knowledge that cigarette smoking is ALSO an important cause of both Cancer and IHD. We return to that in Part 2.

● Part 1. The Findings from Both Smoking-Adjusted and from "Raw" MortRates

Our expectation is very well met, as shown by the nearby Tabulations 1,2,3,4. The regressions were done in the manner shown hundreds of times in this book, using the MortRates from our prior tables. One regression is shown below as a sample, to emphasize that PhysPop values do not participate in any of these regressions. m = male, and f = female.

Census Div. Trio- Sequence	x= 1988 AllCa-m Tab 49-F Col.F	y= 1993 IHD-m Tab 64-E Col.F	1993 IHD MortRates, Male, regressed on 1988 All-Cancer MortRates, Male Regression Output:	
Pacific	148.5	112.4	Constant	17.5269
New England	167.1	117.8	Std Err of Y Est	9.7711
Mid-Atlantic	168.4	147.9	R Squared	0.7961
WestNoCentral	122.0	91.4	No. of Observations	9
EastNoCentral	131.6	103.6	Degrees of Freedom	7
Mountain	109.8	85.9		
WestSoCentral	109.5	94.8	X Coefficient(s)	0.6710
EastSoCentral	92.7	81.3	Std Err of Coef.	0.1284
SouthAtlantic	112.0	102.1	Ratio, Xcoef/SE =	5.2272

A positive correlation between Cancer MortRates and IHD MortRates, by Census Divisions, implies no causation of one disease by the other, of course. It implies that the MortRates of the two diseases each have an independent and positive correlation with a cause which they share in common.

In all of the tabulations, a negative sign on the ratio (X-Coefficient / Std. Error) reflects a negative X-coefficient --- an inverse relationship between the two sets of MortRates. The abbreviation "NonNon" refers to "NonCancer NonIHD." The "NonNon" MortRates come from Table 25-A (where 1980 is the most recent entry). The "year 1990" means, as usual in this monograph, 1988 for Cancer MortRates and 1993 for IHD MortRates (Chapter 4, Part 2b).

Tabulations 1+2: The Smoking Adjusted MortRates for All-Cancers come from Chapters 49,50, for Difference-Cancers from Chapters 53,54, and for Ischemic Heart Disease from Chapters 64,65. We start with 1960, because 1960 is the earliest year for which we have Smoking Adjusted MortRates for IHD. The Smoking Adjusted MortRates mean that smoking-level does NOT vary across the Census Divisions --- but PhysPop-level DOES vary across the Census Divisions. The results are shown in Tabulations 1+2.

Tabulations 3+4: Because we can not rule out a smoking effect on NonCancer NonIHD MortRates, and because we have no Smoking Adjusted MortRates for NonCancer NonIHD causes of death, we also did the entire test with the "raw" MortRates for All-Cancers (from Chapters 6,7), Difference-Cancers (from Chapters 18,19), and IHD (from Chapters 40,41) --- starting with 1950. The results are shown in Tabulations 3+4.

Tabulations 1 through 4

● Tabulation 1, with All-Cancers. MortRate-MortRate Correlations, by Census Divisions.

SmoAdju (Ca,IHD)

x	y		Year	R-sq	Ratio		Year	R-sq	Ratio
AllCa-m	IHD-m		1960	0.93	+9.98		1990	0.80	+5.23
AllCa-f	IHD-f		1960	0.91	+8.61		1990	0.79	+5.16
NonNon-m	IHD-m		1960	0.65	-3.62		1980	0.45	-2.38
NonNon-f	IHD-f		1960	0.35	-1.94		1980	0.32	-1.82
NonNon-m	AllCa-m		1960	0.84	-5.98		1980	0.71	-4.16
NonNon-f	AllCa-f		1960	0.49	-2.61		1980	0.48	-2.52

● Tabulation 2, with Diff-Cancers. MortRate-MortRate Correlations, by Census Divisions.

SmoAdju (Ca,IHD)

x	y		Year	R-sq	Ratio		Year	R-sq	Ratio
Diff-m	IHD-m		1960	0.92	+8.78		1990	0.76	+4.76
Diff-f	IHD-f		1960	0.93	+9.67		1990	0.83	+5.90
NonNon-m	IHD-m		1960	0.65	-3.62		1980	0.45	-2.38
NonNon-f	IHD-f		1960	0.35	-1.94		1980	0.32	-1.82
NonNon-m	Diff-m		1960	0.85	-6.37		1980	0.75	-4.59
NonNon-f	Diff-f		1960	0.46	-2.44		1980	0.49	-2.57

● Tabulation 3, with All-Cancers. MortRate-MortRate Correlations, by Census Divisions.

"Raw" MortRates

x	y		Year	R-sq	Ratio		Year	R-sq	Ratio
AllCa-m	IHD-m		1950	0.86	+6.63		1990	0.66	+3.72
AllCa-f	IHD-f		1950	0.89	+7.60		1990	0.57	+3.06
NonNon-m	IHD-m		1950	0.71	-4.13		1980	0.06	-0.67
NonNon-f	IHD-f		1950	0.37	-2.03		1980	0.06	-0.68
NonNon-m	AllCa-m		1950	0.66	-3.72		1980	0.01	+0.32
NonNon-f	AllCa-f		1950	0.23	-1.47		1980	0.25	-1.55

● Tabulation 4, with Diff-Cancers. MortRate-MortRate Correlations, by Census Divisions.

"Raw" MortRates

x	y		Year	R-sq	Ratio		Year	R-sq	Ratio
Diff-m	IHD-m		1950	0.81	+5.54		1990	0.53	+2.81
Diff-f	IHD-f		1950	0.90	+7.79		1990	0.59	+3.16
NonNon-m	IHD-m		1950	0.71	-4.13		1980	0.06	-0.67
NonNon-f	IHD-f		1950	0.37	-2.03		1980	0.06	-0.68
NonNon-m	Diff-m		1950	0.70	-4.04		1980	0.12	-0.97
NonNon-f	Diff-f		1950	0.25	-1.52		1980	0.34	-1.91

In all four tabulations, the MortRates for Cancer and for IHD show a persistent, significant, positive correlation with each OTHER, by Census Divisions, over time --- and simultaneously show a distinctly DIFFERENT relationship with NonCancer NonIHD causes of death, which are NOT inducible by ionizing radiation.

● **Part 2.   What Is a Reasonable Interpretation of These Additional Observations?**

The findings in Part 1 are free from interpretation. Tabulations 3 and 4 do not even use smoking-adjusted MortRates. These findings are facts which "demand" an explanation. The Law of Minimum Hypotheses says that the explanation is staring at us: Medical radiation is an important cause not only of Cancer, but also of Ischemic Heart Disease.

Although cigarette smoking is ALSO a cause shared by Cancer and IHD, smoking is not an adequate explanation for these correlations. If we seek the entries (in the tabulations) which would reflect the LEAST possible impact from cigarette smoking, we must look at Tabulations 2 and 4, because Difference-Cancers exclude Respiratory-System Cancers. And in Tabulations 2 and 4, we must look at the earliest entries for FEMALES, because (a) the percentage of female-smokers used to be far lower than for males, and the smoking-intensity by females used to be much lower than for males (Chapter 48, Part 3), (b) the cancer-impact of smoking appears to be far lower upon females than upon males (Chapter 48, Box 2), and (c) females did not used to smoke cigars or chew tobacco.

For females in 1950, Tabulation 4 shows the correlation between female MortRates from Difference-Cancers and female MortRates from Ischemic Heart Disease, by Census Divisions. The R-squared value is 0.90 (with +7.79 as the ratio of X-Coefficient over its Standard Error) --- a very high positive correlation, indeed.

WHY? What is the explanation? Such things do not happen by accident. Such evidence points to medical radiation, rather than smoking, as the correct explanation. And if medical radiation is the correct explanation for the 1950 female correlation (1950 MortRates for Diff-Ca with 1950 MortRates for IHD), it would be irrational to assume --- in the absence of evidence --- that something ELSE explains the later correlations and the male correlations.

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