CHAPTER 61

Genital Cancers, Males, 1940–1990

• Male Genital Cancers include prostate and testis cancers. For the cancers combined, Column A of Table 61-A shows about a 16% increase in the age-adjusted National MortRate, between 1960 and 1990. Measured separately, age-adjusted MortRates from Prostate Cancers rose during the 1973–1994 period, while age-adjusted MortRates from Testis Cancer fell (SEER 1997, p.45).

• Box 1 shows that while MortRates fell or were steady in the TopTrio, the MortRates INCREASED appreciably in the LowTrio. The observations in Box 1 mean that a carcinogenic co-actor which can contribute to male MortRates, from Genital Cancers, is operating more strongly in the LowTrio than in the TopTrio (Chapter 48, Part 5b). We must match the Census Divisions for this co-actor, whatever its identity. We believe that its identity is smoking.

Table 61-A
Genital Cancers, Males: Fractional Causation by Medical Radiation over Time

Year	Col.A Natl MR	Col.B Frac.C	Col.C R-Sq	Col.D X-Coef	Col.E StdErr	Col.F Coef/SE	Col.G Source
1940	15.2	79%	0.7754	0.0932	0.0190	4.9160	Chap.13
1950	14.9	58%	0.7241	0.0676	0.0158	4.2865	Tab 61-B
1960	14.6	55%	0.7486	0.0628	0.0137	4.5658	Tab 61-C
1970	14.8	52%	0.7840	0.0585	0.0116	5.0402	Tab 61-D
1980	15.0	50%	0.8044	0.0517	0.0096	5.3656	Tab 61-E
1990	16.9	47%	0.7921	0.0498	0.0096	5.1650	Tab 61-F

Box 1, Chap. 61
Genital Cancers, Males: Post-1940 Change in MortRates by Census Trios

1960 vs. 1940, by Trios: Col.D expresses change by ratios. Col.F expresses change by subtraction.
1990 vs. 1940, by Trios: Col.I expresses change by ratios. Col.K expresses change by subtraction.
MRs change inversely with PP. High-PP Trio has lowest growth-ratio. Low-PP Trio has highest growth-ratio.

	Col.A 1940 MortRate Tab 13-A	Col.B 1960 MortRate Tab 13-A	Col.C Ratio Col.B /Col.A	Col.D Input from Col.C	Col.E Diff: Col.B minus A	Col.F Input from Col.E	Col.G 1990 MortRate Tab 13-A	Col.H Ratio Col.G /Col.A	Col.I Input from Col.H	Col.J Diff: Col.G minus A	Col.K Input from Col.J
Pacif	17.2	13.4	0.779	Avg Chg	-3.8	Avg Chg	15.9	0.924	Avg Chg	-1.3	Avg Chg
NewE	18.2	15.7	0.863	TopTrio	-2.5	TopTrio	16.6	0.912	TopTrio	-1.6	TopTrio
MidAtl	15.8	13.6	0.861	0.834	-2.2	-2.8	16.8	1.063	0.967	1.0	-0.6
WNoCen	16.5	15.4	0.933	Avg Chg	-1.1	Avg Chg	16.3	0.988	Avg Chg	-0.2	Avg Chg
ENoCen	15.8	15.1	0.956	MidTrio	-0.7	MidTrio	17.2	1.089	MidTrio	1.4	MidTrio
Mtn	15.8	15.2	0.962	0.950	-0.6	-0.8	16.6	1.051	1.042	0.8	0.7
WSoCen	11.6	14.6	1.259	Avg Chg	3.0	Avg Chg	16.7	1.440	Avg Chg	5.1	Avg Chg
ESoCen	10.4	15.9	1.529	LowTrio	5.5	LowTrio	17.5	1.683	LowTrio	7.1	LowTrio
SoAtl	12.8	14.6	1.141	1.309	1.8	3.4	18.6	1.453	1.525	5.8	6.0

Box 2, Chap. 61
Genital Cancers, Males: Calculation of Adjustment Factor

This adjustment is discussed fully in Chapter 49.

• Part 1: Calculate average population-weighted MortRate for the combined TopTrio Census Divs.

Census Div.	Col.A 1940 MR Tab 13-A	Col.B 1940 Pop'n Tab 3-B	Col.C 1940 Popn /45,710,039	Col.D Col.A * Col.C
Pacific	17.2	9,733,262	0.2129	3.66
NewEng	18.2	8,437,290	0.1846	3.36
Mid-Atl	15.8	27,539,487	0.6025	9.52
1940		Sum TopTrio 45,710,039	Sum 1.0000	TopTrio 16.541

Census Div.	Col.A 1950 MR Tab 13-A	Col.B 1950 Pop'n Tab 3-B	Col.C 1950 Popn /53,964,513	Col.D Col.A * Col.C
Pacific	14.0	14,486,527	0.2684	3.76
NewEng	16.6	9,314,453	0.1726	2.87
Mid-Atl	14.2	30,163,533	0.5590	7.94
1950		Sum TopTrio 53,964,513	Sum 1.0000	TopTrio 14.561

Census Div.	Col.A 1960 MR Tab 13-A	Col.B 1960 Pop'n Tab 3-B	Col.C 1960 Popn /65,875,863	Col.D Col.A * Col.C
Pacific	13.4	21,198,044	0.3218	4.31
NewEng	15.7	10,509,367	0.1595	2.50
Mid-Atl	13.6	34,168,452	0.5187	7.05
1960		Sum TopTrio 65,875,863	Sum 1.0000	TopTrio 13.871

Census Div.	Col.A 1970 MR Tab 13-A	Col.B 1970 Pop'n Tab 3-B	Col.C 1970 Popn /75,017,000	Col.D Col.A * Col.C
Pacific	13.9	26,087,000	0.3477	4.83
NewEng	15.3	11,781,000	0.1570	2.40
Mid-Atl	14.2	37,149,000	0.4952	7.03
1970		Sum TopTrio 75,017,000	Sum 1.0000	TopTrio 14.268

Census Div.	Col.A 1980 MR Tab 13-A	Col.B 1980 Pop'n Tab 3-B	Col.C 1980 Popn /80,615,000	Col.D Col.A * Col.C
Pacific	14.4	31,523,000	0.3910	5.63
NewEng	14.8	12,322,000	0.1528	2.26
Mid-Atl	14.8	36,770,000	0.4561	6.75
1980		Sum TopTrio 80,615,000	Sum 1.0000	TopTrio 14.644

Census Div.	Col.A 1990 MR Tab 13-A	Col.B 1990 Pop'n Tab 3-B	Col.C 1990 Popn /88,495,000	Col.D Col.A * Col.C
Pacific	15.9	37,837,000	0.4276	6.80
NewEng	16.6	12,998,000	0.1469	2.44
Mid-Atl	16.8	37,660,000	0.4256	7.15
1990		Sum TopTrio 88,495,000	Sum 1.0000	TopTrio 16.386

• Part 2: Take ratios of these TopTrio MortRates, with 1940 as the denominator of each ratio.
Col.D modifies Col.C by separate PhysPop adjustments for MidTrio and LowTrio Census Divisions.

	Col.A TopTrio Mean MR	Col.B 1940 TopTrio Mean MR	Col.C = Col.A / Col.B	Col.D ppAdju Tab 47-B	Col.E = Col.C * Col.D	GENITAL CANCERS. Males.
				MidTrio		
1950	14.561	16.541	0.880	0.99	0.87	= MidTrio Adjustment Factor, 1950
1960	13.871	16.541	0.839	0.97	0.81	= MidTrio Adjustment Factor, 1960
1970	14.268	16.541	0.863	0.95	0.82	= MidTrio Adjustment Factor, 1970
1980	14.644	16.541	0.885	0.94	0.83	= MidTrio Adjustment Factor, 1980
1990	16.386	16.541	0.991	0.94	0.93	= MidTrio Adjustment Factor, 1990
				LowTrio		
1950	14.561	16.541	0.880	1.00	0.88	= LowTrio Adjustment Factor, 1950
1960	13.871	16.541	0.839	1.01	0.85	= LowTrio Adjustment Factor, 1960
1970	14.268	16.541	0.863	1.02	0.88	= LowTrio Adjustment Factor, 1970
1980	14.644	16.541	0.885	1.04	0.92	= LowTrio Adjustment Factor, 1980
1990	16.386	16.541	0.991	1.07	1.06	= LowTrio Adjustment Factor, 1990

Table 61-B

Genital Cancers, Males: Fractional Causation in 1950

Part 1.

Calculation of the 6 Adjusted MortRates (Col.F) and the National Adjusted MortRate (Col.G).
The last six entries in Part 1, Col.F, are the products of (Col.D * Col.E), as discussed in Chap. 49.

Trio-Sequence	Col.A 1950 PopFrac Tab 3-B	Col.B 1950 Obs MR Tab 13-A	Col.C A * B	Col.D 1940 MR Mid,Low Tab 13-A	Col.E AdjuFact Bx2,Pt2 Col.E	Col.F 1950 Adju MortRates	Col.G A * F
Pacific	0.0961	14.0	1.345			14.0	1.345
New England	0.0618	16.6	1.026			16.6	1.026
Mid-Atlantic	0.2002	14.2	2.843			14.2	2.843
WestNoCentral	0.0933	16.6	1.549	16.5	0.87	14.36	1.339
EastNoCentral	0.2017	15.1	3.046	15.8	0.87	13.75	2.773
Mountain	0.0337	13.6	0.458	15.8	0.87	13.75	0.463
WestSoCentral	0.0965	13.3	1.283	11.6	0.88	10.21	0.985
EastSoCentral	0.0762	14.7	1.120	10.4	0.88	9.15	0.697
SouthAtlantic	0.1406	14.7	2.067	12.8	0.88	11.26	1.584
		Sum =	14.7				Sum =
1950 Observed MR from Table 13-B			14.9	1950 Natl Adjusted MR =			13.0554

Part 2.

Trio-Seq.	Col.A Mean1940 thru1950 PPs from Tab 47-A x'	Col.B 1950 Adju MRs from Col.F Part 1 y
Pac	154.16	14.0
NewEng	162.03	16.6
MidAtl	169.24	14.2
WNoCen	121.60	14.36
ENoCen	128.53	13.75
Mtn	119.64	13.75
WSoCen	102.64	10.21
ESoCen	84.44	9.15
SoAtl	99.91	11.26

Col.C — Genital Ca. Males 1950 Adjusted MortRates regressed on Mean 1940 thru 1950 PPs

Regression Output:	
Constant	4.4558
Std Err of Y Est	1.3162
R Squared	0.7241
No. of Observation	9
Degrees of Freedom	7
X Coefficient(s)	0.0676
Std Err of Coef.	0.0158
XCoef / S.E. =	4.2865

Col.D — 1940 PPs from Table 3-A (TrioSeq) x''

159.72
161.55
169.76
123.14
133.36
119.89
103.94
85.83
100.74

Col.E — Genital Ca. Males: 1950 Adjusted MortRates regressed on 1940 PhysPops

Regression Output:	
Constant	4.4912
Std Err of Y Est	1.3483
R Squared	0.7105
No. of Observation	9
Degrees of Freedom	7
X Coefficient(s)	0.0664
Std Err of Coef.	0.0160
XCoef / S.E.	4.1447

Part 3-A.
Calculation of Fractional Causation from Averaged PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.C) = 4.4558

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 13.0554) minus Nonradiation rate (4.4558) = 8.5996

3. 1950 Fractional Causation is radiation rate (8.5996) divided by OBSERVED Natl MR Part 1,Col.C= 14.9 = 0.58

Part 3-B.
Calculation of Fractional Causation from 1940 PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.E) = 4.4912

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 13.0554) minus Nonradiation rate (4.4912) = 8.5642

3. 1950 Fractional Causation is radiation rate (8.5642) divided by OBSERVED Natl MR Part 1, Col.C= 14.9 = 0.57

Table 61-C

Genital Cancers, Males: Fractional Causation in 1960

Part 1.

Calculation of the 6 Adjusted MortRates (Col.F) and the National Adjusted MortRate (Col.G).

The last six entries in Part 1, Col.F, are the products of (Col.D * Col.E), as discussed in Chap. 49.

Trio-Sequence	Col.A 1960 PopFrac Tab 3-B	Col.B 1960 Obs MR Tab 13-A	Col.C A * B	Col.D 1940 MR Mid,Low Tab 13-A	Col.E AdjuFact Bx2,Pt2 Col.E	Col.F 1960 Adju MortRates	Col.G A * F
Pacific	0.1182	13.4	1.584			13.4	1.584
New England	0.0586	15.7	0.920			15.7	0.920
Mid-Atlantic	0.1905	13.6	2.591			13.6	2.591
WestNoCentral	0.0858	15.4	1.321	16.5	0.81	13.37	1.147
EastNoCentral	0.2020	15.1	3.050	15.8	0.81	12.80	2.585
Mountain	0.0382	15.2	0.581	15.8	0.81	12.80	0.489
WestSoCentral	0.0945	14.6	1.380	11.6	0.85	9.86	0.932
EastSoCentral	0.0672	15.9	1.068	10.4	0.85	8.84	0.594
SouthAtlantic	0.1448	14.6	2.114	12.8	0.85	10.88	1.575
		Sum =	14.6				Sum =
1960 Observed MR from Table 13-B			14.6	1960 Natl Adjusted MR =			12.4167

Part 2.

Trio-Seq.	Col.A Mean1940 thru1960 PPs from Tab 47-A x'	Col.B 1960 Adju MRs from Col.F Part 1 y
Pac	155.69	13.4
NewEng	162.81	15.7
MidAtl	167.04	13.6
WNoCen	118.15	13.37
ENoCen	123.87	12.80
Mtn	117.40	12.80
WSoCen	102.31	9.86
ESoCen	85.63	8.84
SoAtl	101.72	10.88

Col.C — Genital Ca. Males 1960 Adjusted MortRates regressed on Mean 1940 thru 1960 PPs

Regression Output:	
Constant	4.4476
Std Err of Y Est	1.1370
R Squared	0.7486
No. of Observation	9
Degrees of Freedom	7
X Coefficient(s)	0.0628
Std Err of Coef.	0.0137
XCoef / S.E. =	4.5658

Col.D — 1940 PPs from Table 3-A (TrioSeq)

Trio-Seq.	x''
Pac	159.72
NewEng	161.55
MidAtl	169.76
WNoCen	123.14
ENoCen	133.36
Mtn	119.89
WSoCen	103.94
ESoCen	85.83
SoAtl	100.74

Col.E — Genital Ca. Males: 1960 Adjusted MortRates regressed on 1940 PhysPops

Regression Output:	
Constant	4.3818
Std Err of Y Est	1.1171
R Squared	0.7574
No. of Observation	9
Degrees of Freedom	7
X Coefficient(s)	0.0620
Std Err of Coef.	0.0133
XCoef / S.E.	4.6744

Part 3-A.

Calculation of Fractional Causation from Averaged PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.C) = 4.4476

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 12.4167) minus Nonradiation rate (4.4476) = 7.9692

3. 1960 Fractional Causation is radiation rate (7.9692) divided by OBSERVED Natl MR Part 1,Col.C= 14.6 = 0.55

Part 3-B.

Calculation of Fractional Causation from 1940 PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.E) = 4.3818

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 12.4167) minus Nonradiation rate (4.3818) = 8.0350

3. 1960 Fractional Causation is radiation rate (8.0350) divided by OBSERVED Natl MR Part 1, Col.C= 14.6 = 0.55

Table 61-E

Genital Cancers, Males: Fractional Causation in 1980

Part 1.

Calculation of the 6 Adjusted MortRates (Col.F) and the National Adjusted MortRate (Col.G).

The last six entries in Part 1, Col.F, are the products of (Col.D * Col.E), as discussed in Chap. 49.

Trio-Sequence	Col.A 1980 PopFrac Tab 3-B	Col.B 1980 Obs MR Tab 13-A	Col.C A * B	Col.D 1940 MR Mid,Low Tab 13-A	Col.E AdjuFact Bx2,Pt2 Col.E	Col.F 1980 Adju MortRates	Col.G A * F
Pacific	0.1398	14.4	2.013			14.4	2.013
New England	0.0546	14.8	0.808			14.8	0.808
Mid-Atlantic	0.1630	14.8	2.412			14.8	2.412
WestNoCentral	0.0759	14.2	1.078	16.5	0.83	13.69	1.039
EastNoCentral	0.1846	15.3	2.824	15.8	0.83	13.11	2.421
Mountain	0.0502	14.5	0.728	15.8	0.83	13.11	0.658
WestSoCentral	0.1049	14.3	1.500	11.6	0.92	10.67	1.119
EastSoCentral	0.0646	15.4	0.995	10.4	0.92	9.57	0.618
SouthAtlantic	0.1624	16.4	2.663	12.8	0.92	11.78	1.912
		Sum =	15.0				Sum =
1980 Observed MR from Table 13-B			15.0	1980 Natl Adjusted MR =			13.0022

Part 2.

Trio-Seq.	Col.A Mean1940 thru1980 PPs from Tab 47-A x'	Col.B 1980 Adju MRs from Col.F Part 1 y	Col.C Genital Ca. Males 1980 Adjusted MortRates regressed on Mean 1940 thru 1980 PPs Regression Output:		Col.D 1940 PPs from Table 3-A (TrioSeq) x''	Col.E Genital Ca. Males: 1980 Adjusted MortRates regressed on 1940 PhysPops Regression Output:	
Pac	177.35	14.4	Constant	5.5093	159.72	Constant	5.4226
NewEng	185.86	14.8	Std Err of Y Est	0.8769	161.55	Std Err of Y Est	0.7257
MidAtl	186.11	14.8	R Squared	0.8044	169.76	R Squared	0.8660
WNoCen	128.82	13.69	No. of Observation	9	123.14	No. of Observation	9
ENoCen	133.71	13.11	Degrees of Freedom	7	133.36	Degrees of Freedom	7
Mtn	133.45	13.11			119.89		
WSoCen	114.66	10.67	X Coefficient(s)	0.0517	103.94	X Coefficient(s)	0.0580
ESoCen	99.46	9.57	Std Err of Coef.	0.0096	85.83	Std Err of Coef.	0.0086
SoAtl	124.62	11.78	XCoef / S.E. =	5.3656	100.74	XCoef / S.E.	6.7273

Part 3-A.

Calculation of Fractional Causation from Averaged PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.C) = 5.5093

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 13.0022) minus Nonradiation rate (5.5093) = 7.4929

3. 1980 Fractional Causation is radiation rate (7.4929) divided by OBSERVED Natl MR Part 1,Col.C= 15.0 = 0.50

Part 3-B.

Calculation of Fractional Causation from 1940 PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.E) = 5.4226

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 13.0022) minus Nonradiation rate (5.4226) = 7.5796

3. 1980 Fractional Causation is radiation rate (7.5796) divided by OBSERVED Natl MR Part 1, Col.C= 15.0 = 0.51

Table 61-F

Genital Cancers, Males: Fractional Causation in 1990

Part 1.

Calculation of the 6 Adjusted MortRates (Col.F) and the National Adjusted MortRate (Col.G).

The last six entries in Part 1, Col.F, are the products of (Col.D * Col.E), as discussed in Chap. 49.

Trio-Sequence	Col.A 1990 PopFrac Tab 3-B	Col.B 1990 Obs MR Tab 13-A	Col.C A * B	Col.D 1940 MR Mid,Low Tab 13-A	Col.E AdjuFact Bx2,Pt2 Col.E	Col.F 1990 Adju MortRates	Col.G A * F
Pacific	0.1535	15.9	2.441			15.9	2.441
New England	0.0527	16.6	0.875			16.6	0.875
Mid-Atlantic	0.1527	16.8	2.565			16.8	2.565
WestNoCentral	0.0721	16.3	1.175	16.5	0.93	15.35	1.106
EastNoCentral	0.1713	17.2	2.946	15.8	0.93	14.69	2.517
Mountain	0.0543	16.6	0.901	15.8	0.93	14.69	0.798
WestSoCentral	0.1087	16.7	1.815	11.6	1.06	12.30	1.337
EastSoCentral	0.0621	17.5	1.087	10.4	1.06	11.02	0.685
SouthAtlantic	0.1725	18.6	3.209	12.8	1.06	13.57	2.340
		Sum =	17.0				Sum =
1990 Observed MR from Table 13-B			16.9	1990 Natl Adjusted MR =			14.6638

Part 2.

Trio-Seq.	Col.A Mean1940 thru1990 PPs from Tab 47-A x'	Col.B 1990 Adju MRs from Col.F Part 1 y	Col.C Genital Ca. Males 1990 Adjusted MortRates regressed on Mean 1940 thru 1990 PPs Regression Output:		Col.D 1940 PPs from Table 3-A (TrioSeq) x''	Col.E Genital Ca. Males: 1990 Adjusted MortRates regressed on 1940 PhysPops Regression Output:	
Pac	191.97	15.9	Constant	6.6865	159.72	Constant	6.7256
NewEng	208.20	16.6	Std Err of Y Est	0.9476	161.55	Std Err of Y Est	0.7594
MidAtl	204.72	16.8	R Squared	0.7921	169.76	R Squared	0.8665
WNoCen	141.14	15.35	No. of Observation	9	123.14	No. of Observation	9
ENoCen	146.19	14.69	Degrees of Freedom	7	133.36	Degrees of Freedom	7
Mtn	145.91	14.69			119.89		
WSoCen	126.28	12.30	X Coefficient(s)	0.0498	103.94	X Coefficient(s)	0.0608
ESoCen	113.28	11.02	Std Err of Coef.	0.0096	85.83	Std Err of Coef.	0.0090
SoAtl	142.93	13.57	XCoef / S.E. =	5.1650	100.74	XCoef / S.E.	6.7400

Part 3-A.

Calculation of Fractional Causation from Averaged PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.C) = 6.6865

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 14.6638) minus Nonradiation rate (6.6865) = 7.9773

3. 1990 Fractional Causation is radiation rate (7.9773) divided by OBSERVED Natl MR Part 1,Col.C= 16.9 = 0.47

Part 3-B.

Calculation of Fractional Causation from 1940 PhysPops

1. Nonradiation rate is Adjusted Constant (Part 2, Col.E) = 6.7256

2. Radiation rate is Natl Adjusted MortRate (Part 1, Col.G = 14.6638) minus Nonradiation rate (6.7256) = 7.9382

3. 1990 Fractional Causation is radiation rate (7.9382) divided by OBSERVED Natl MR Part 1, Col.C= 16.9 = 0.47