Appendix I

The first page of this appendix gives a brief explanation of the SEER program as administered by the National Cancer Institute. It is a high quality National database that is of great value to public health institutions because it allows epidemiologists and cancer researchers to see trends in cause, incidence, diagnosis, and therapy over a relatively long time span.

The following several pages are taken directly from the most recent data release from the National Cancer Institute. They have been selected to emphasize that pollutants, toxins, and endocrine disruptors continue to exist as an increasing threat to all citizens (i.e. page I b nicely demonstrates the points emphasized in the cover letter to this body of information). Except for the significant peak in prostate cancer seen over the decade from 1983 to 1993 (the PSA test) these data on increasing cancer incidence are not due to better diagnosis. Clearly, however, the improvement in mortality rates is due to earlier detection and better clinical therapy.

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About SEER

The Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute is an authoritative source of information on cancer incidence and survival in the United States. SEER began collecting data on cases on January 1, 1973, in the states of Connecticut, Iowa, New Mexico, Utah, and Hawaii and the metropolitan areas of Detroit and San Francisco-Oakland. In 1974-1975, the metropolitan area of Atlanta and the 13-county Seattle-Puget Sound area were added. In 1978, 10 predominantly black rural counties in Georgia were added, followed in 1980 by the addition of American Indians residing in Arizona. Three additional geographic areas participated in the SEER program prior to 1990: New Orleans, Louisiana (1974-1977, rejoined 2001); New Jersey (1979-1989, rejoined 2001); and Puerto Rico (1973-1989). The National Cancer Institute also funds a cancer registry that, with technical assistance from SEER, collects information on cancer cases among Alaska Native populations residing in Alaska. In 1992, the SEER Program was expanded to increase coverage of minority populations, especially Hispanics, by adding Los Angeles County and four counties in the San Jose-Monterey area south of San Francisco. In 2001, the SEER Program expanded coverage to include Kentucky and Greater California; in addition, New Jersey and Louisiana once again became participants.

The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the US population. Information on more than 3 million in situ and invasive cancer cases is included in the SEER database, and approximately 170,000 new cases are added each year within the SEER coverage areas. The SEER Registries routinely collect data on patient demographics, primary tumor site, morphology, stage at diagnosis, first course of treatment, and follow-up for vital status. The SEER Program is the only comprehensive source of population-based information in the United States that includes stage of cancer at the time of diagnosis and survival rates within each stage. The mortality data reported by SEER are provided by the National Center for Health Statistics.

For the expansion registries (Kentucky, Greater California, New Jersey, and Lousiana), NCI funds are combined with funding from the Centers for Disease Control and Prevention through the National Program of Cancer Registries as well as funding from the states. NCI staff work with the North American Association of Central Cancer Registries to guide all state registries to achieve data content and compatibility acceptable for pooling data and improving national estimates. The SEER team is developing computer applications to unify cancer registration systems and to analyze and disseminate population-based data. Use of surveillance data for research is being improved through Web-based access to the data and analytic tools, and linking with other national data sources. For example, a new Web-based tool for public health officials and policy makers, State Cancer Profiles, provides a user-friendly interface for finding cancer statistics for specific states and counties.

The SEER Program is considered the standard for quality among cancer registries around the world. Quality control has been an integral part of SEER

Appendix I

Table I-15

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site, Race and Sex

12 SEER Areas, 1999-2001

Site	All Races		Whites		Blacks	
	Males	Females	Males	Females	Males	Females
All Sites	45.59	38.18	46.02	39.55	42.45	31.76
Invasive and In Situ	46.82	41.53	47.39	43.07	42.80	33.98
Oral cavity and Pharynx	1.37	0.67	1.38	0.68	1.32	0.50
Esophagus	0.77	0.26	0.79	0.25	0.76	0.36
Stomach	1.23	0.77	1.07	0.63	1.27	0.99
Colon and Rectum	5.90	5.54	5.95	5.52	4.92	5.39
Invasive and In Situ	6.23	5.79	6.26	5.76	5.25	5.68
Liver and Intrahepatic bile duct	0.88	0.42	0.72	0.35	0.91	0.36
Pancreas	1.24	1.23	1.25	1.20	1.25	1.35
Larynx	0.63	0.16	0.64	0.16	0.88	0.22
Invasive and In Situ	0.69	0.17	0.70	0.17	0.92	0.23
Lung and Bronchus	7.63	5.71	7.63	5.99	8.20	5.29
Melanoma of skin	1.89	1.28	2.27	1.55	0.10	0.06
Invasive and In Situ	3.02	2.06	3.59	2.48	0.12	0.10
Breast	0.12	13.39	0.12	14.21	0.16	9.99
Invasive and In Situ	0.13	15.96	0.14	16.88	0.18	12.02
Cervix uteri	-	0.77	-	0.74	-	0.95
Corpus and Uterus, NOS	-	2.62	-	2.82	-	1.74
Invasive and In Situ	-	2.66	-	2.87	-	1.76
Ovary	-	1.48	-	1.60	-	0.91
Prostate	17.81	-	17.58	-	20.58	-
Testis	0.35	-	0.42	-	0.10	-
Urinary bladder(Invasive and In Situ)	3.56	1.13	3.97	1.22	1.42	0.81
Kidney and Renal pelvis	1.49	0.90	1.57	0.93	1.35	0.92
Brain and Other nervous system	0.67	0.51	0.75	0.57	0.33	0.28
Thyroid	0.33	0.90	0.35	0.94	0.16	0.49
Hodgkin lymphoma	0.23	0.19	0.25	0.21	0.21	0.14
Non-Hodgkin lymphoma	2.18	1.80	2.31	1.91	1.21	1.04
Multiple myeloma	0.66	0.55	0.65	0.51	0.92	0.93
Leukemia	1.47	1.04	1.58	1.11	0.88	0.79
Acute Lymphocytic Leukemia	0.12	0.10	0.13	0.11	0.05	0.06
Chronic Lymphocytic Leukemia	0.50	0.31	0.55	0.34	0.28	0.20
Acute Myeloid Leukemia	0.45	0.35	0.47	0.36	0.30	0.29
Chronic Myeloid Leukemia	0.20	0.14	0.20	0.14	0.14	0.10

Devcan Version 5.2, April 2004, National Cancer Institute (http://srab.cancer.gov/devcan/).

Note: Invasive cancer only unless specified otherwise.

Appendix Ia

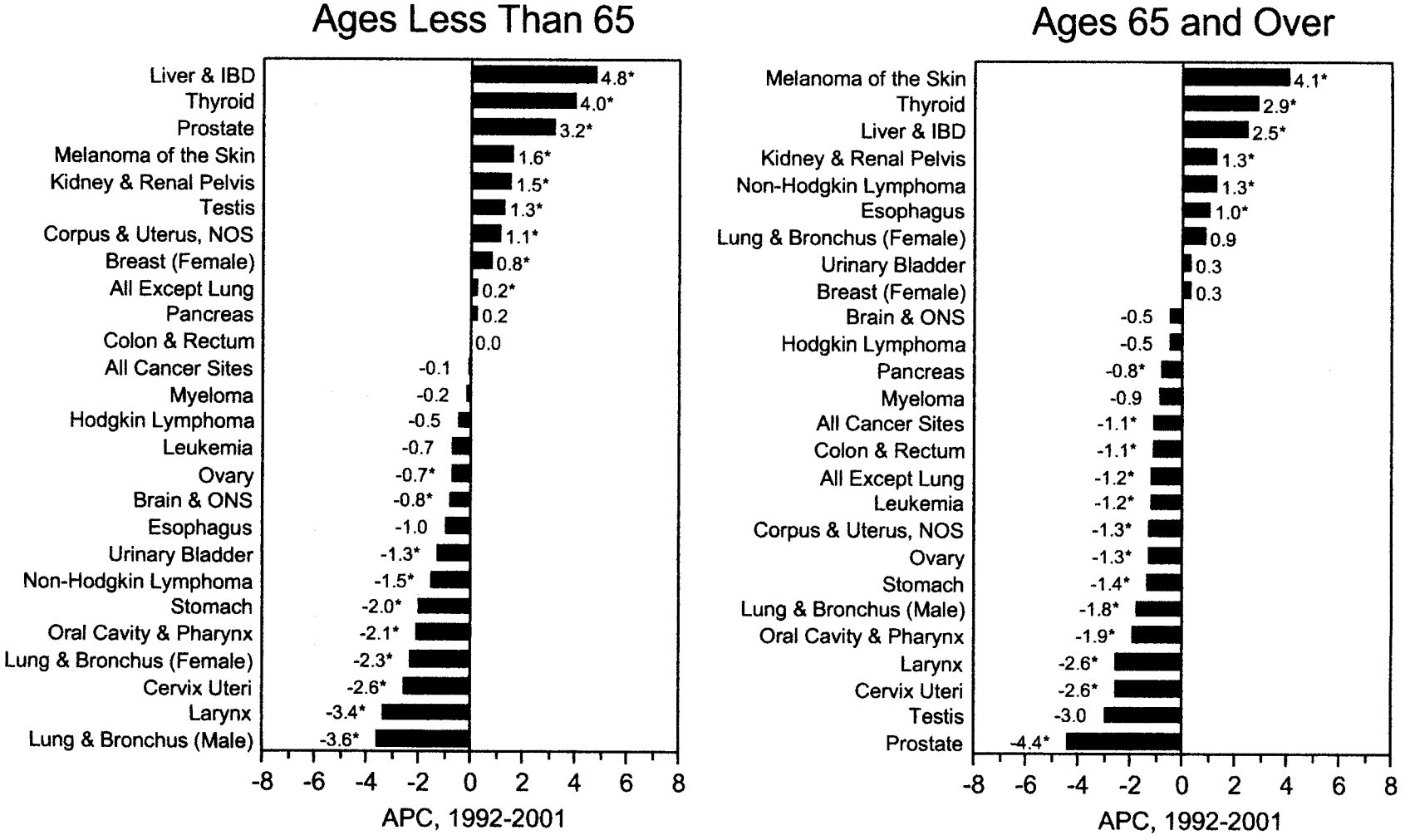
Lifetime Probability of Developing Cancer, By Site, Men, US, 1999-2001

Site	Risk
All sites	1 in 2
Prostate	1 in 6
Lung and bronchus	1 in 13
Colon and rectum	1 in 17
Urinary bladder	1 in 28
Non-Hodgkin lymphoma	1 in 46
Melanoma	1 in 53
Kidney	1 in 67
Leukemia	1 in 68
Oral Cavity	1 in 73
Stomach	1 in 81

Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 5.2 Statistical Research and Applications Branch, NCI, 2004. http://srab.cancer.gov/devcan

Appendix I-5

Trends in SEER Incidence Rates by Primary Cancer Site 1992-2001



Source: SEER 12 areas. Rates are per 100,000 and age-adjusted to the 2000 US standard population by 5-year age groups.
The APC is the Annual Percent Change over the time interval.
* The APC is significantly different from zero ($p<.05$).

Figure I-5

Table I-3

SUMMARY OF CHANGES IN CANCER INCIDENCE AND MORTALITY, 1950-2001 AND

5-YEAR RELATIVE SURVIVAL RATES, 1950-2000

Males and Females, By Primary Cancer Site

Primary Site	All Races		Whites					
			Percent Change 1950-2001[c]				5-Year Relative Survival Rates (Percent)[e]	
			Incidence[d]		U.S. Mortality[b]			
	Estimated Cancer Cases in 2001[a]	Actual Cancer Deaths in 2001[b]	Total	APC	Total	APC	1950-54	1995-00
Oral cavity and Pharynx	30,100	7,701	-33.0	-0.5	-48.9	-1.2	46	60.9
Esophagus	13,200	12,529	21.2	0.7	27.2	0.6	4	15.8
Stomach	21,700	12,319	-75.8	-2.2	-84.0	-3.5	12	21.5
Colon and Rectum	135,400	56,887	17.5	0.1	-40.9	-1.0	37	64.1
Colon	98,200	47,860	38.2	0.4	-28.6	-0.6	41	63.8
Rectum	37,200	9,027	-16.7	-0.5	-68.7	-2.6	40	64.6
Liver and Intrahep	16,200	16,952	234.3	2.5	27.4	0.6	1	8.0
Pancreas	29,200	29,802	35.9	0.3	21.2	0.1	1	4.2
Larynx	10,000	3,797	17.8	0.0	-25.8	-0.5	52	67.4
Lung and Bronchus	169,500	156,380	290.1	2.2	265.4	2.2	6	15.4
Males	90,700	90,660	203.5	1.2	197.5	1.6	5	13.7
Females	78,800	65,720	685.0	4.2	608.1	4.3	9	17.4
Melanoma of the skin	51,400	7,542	690.2	4.3	165.6	1.7	49	90.7
Breast(females)	192,200	41,394	90.0	1.5	-22.2	-0.3	60	88.9
Cervix uteri	12,900	4,092	-77.7	-2.3	-79.5	-3.5	59	74.0
Corpus and Uterus, NOS	38,300	6,783	14.9	-0.2	-68.0	-2.0	72	86.1
Ovary	23,400	14,800	2.6	-0.1	3.8	-0.2	30	44.0
Prostate	198,100	30,719	286.2	3.3	-8.8	0.3	43	100.0
Testis	7,200	335	143.4	2.1	-73.3	-3.0	57	96.2
Urinary bladder	54,300	12,538	97.1	1.2	-31.6	-0.9	53	82.7
Kidney and Renal pelvis	30,800	12,372	181.7	2.1	42.8	0.7	34	63.9
Brain and Other nervous	17,200	12,609	135.6	1.3	54.9	0.8	21	32.2
Thyroid	19,500	1,354	257.6	2.2	-44.3	-1.5	80	96.8
Hodgkin lymphoma	7,400	1,323	13.2	0.1	-75.3	-3.3	30	85.9
Non-Hodgkin lymphoma	56,200	22,123	248.9	3.0	140.9	1.7	33	60.3
Myeloma	14,400	10,795	272.6	1.9	252.0	1.9	6	31.9
Leukemia	31,500	21,451	33.0	0.4	7.9	-0.2	10	47.8
Childhood(0-14 yrs)	8,600	1,494	67.1	0.9	-70.0	-2.8	20	80.1
All Sites	1,268,000	553,760	85.9	1.5	-1.5	0.1	35	65.5

[a] The APC is the Annual Percent Change over the time interval. Rates used in the calculation of the APC are age-adjusted to the 1970 U.S. standard population.

[b] Facts and Figures, 2001. American Cancer Society, Atlanta, Georgia, 2001.
NCHS public use data file for the total US. Due to coding changes throughout the years: Colon excludes other digestive tract; Rectum includes anal canal; Liver & Intrahep includes gallbladder & biliary tract, NOS; Lung & Bronchus includes trachea & pleura; Ovary includes fallopian tube; Urinary bladder includes other urinary organs; Kidney & Renal pelvis includes ureter; NHL and myeloma each include a small number of leukemias; NHL includes a small number of ill-defined sites.

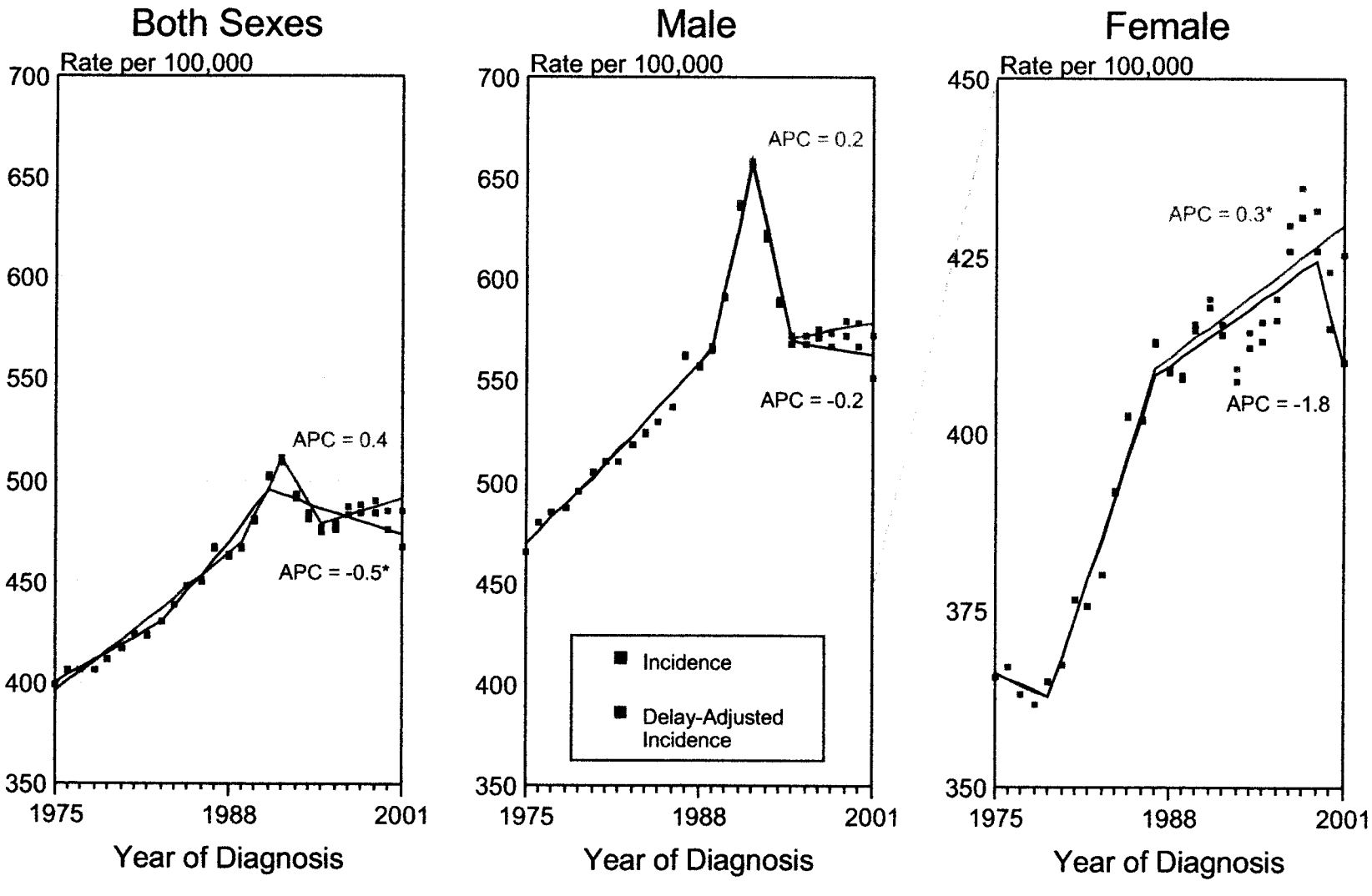
[c] All Sites, Liver & Intrahep, Brain & Other nervous and Childhood cancers are for all races as opposed to whites.

[d] Data prior to 1973 are from Devesa, Silverman, Young, et al. Cancer Incidence and Mortality Trends Among Whites in the United States, 1947-84. JNCI 1987; 79:701-770 with the exception of All Sites, Liver & Intrahep, Brain & Other nervous and Childhood cancers which come from historical Connecticut data. Data for 1973-2001 are from the same areas used in Devesa or the Connecticut registry of the SEER Program.

[e] Rates for 1950-54 are from NCI Survival Report 5 with the exception of All Sites, Oral cavity & Pharynx, Colon & Rectum, Non-Hodgkin lymphomas and Childhood cancers which come from historical Connecticut data. Rates for 1995-2000 are from the SEER Program with the exception of the sites just listed which come from the Connecticut registry of the SEER Program.

Appendix I-2

SEER Incidence and Delay Adjusted Incidence Rates+ All Cancer Sites, By Sex



+ Source: SEER 9 areas. Rates are age-adjusted to the 2000 US standard million population by 5-year age groups.
Regression lines and the APCs are calculated using the Joinpoint Regression Program Version 2.7, September 2003, National Cancer Institute.
The APC is the Annual Percent Change for the regression line segments. The APC shown on the graph is for the most recent trend.

* The APC is significantly different from zero ($p < 0.05$).

Figure I-21

Appendix I-2

SEER Incidence and Delay Adjusted Incidence Rates+ Female Breast Cancer *(In Situ)*, by Race

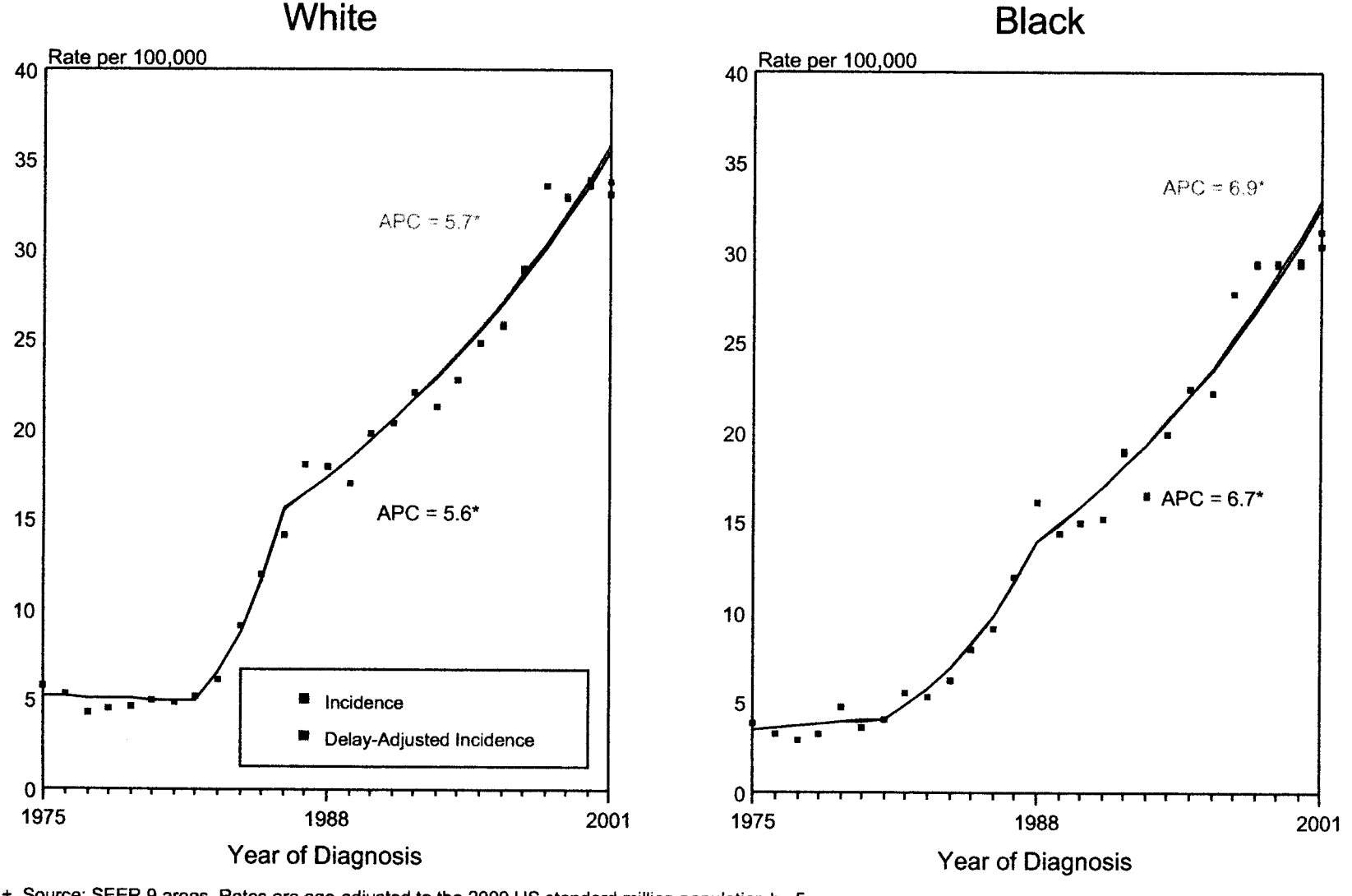


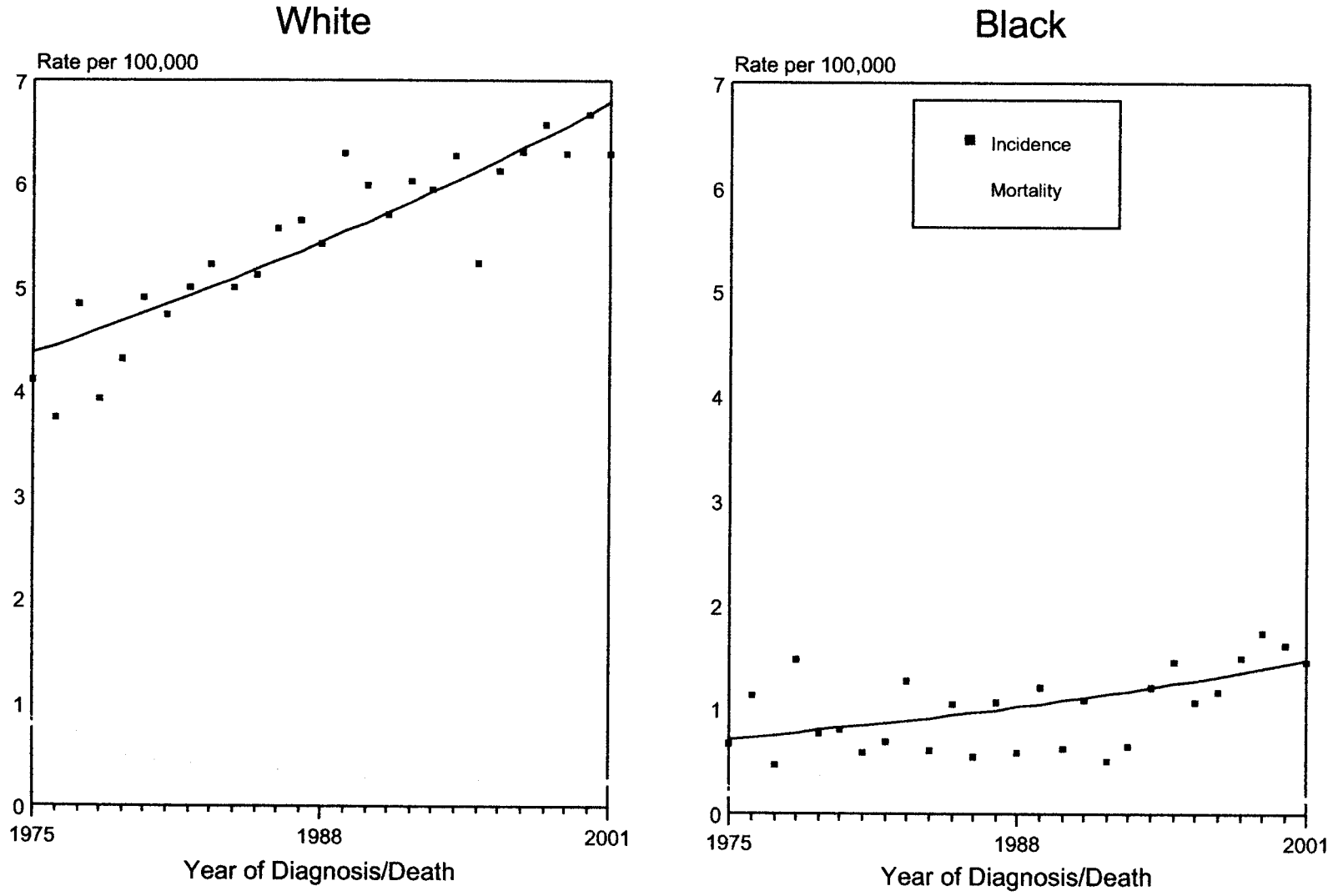
Figure IV-3

+ Source: SEER 9 areas. Rates are age-adjusted to the 2000 US standard million population by 5-year age groups.
Regression lines and APCs are calculated using the Joinpoint Regression Program Version 2.7, September 2003, National Cancer Institute.
The APC is the Annual Percent Change for the regression line segments. The APC shown on the graph is for the most recent trend.

* The APC is significantly different from zero ($p < 0.05$).

Appendix I e

SEER Incidence and US Death Rates+
Testis Cancer, by Race

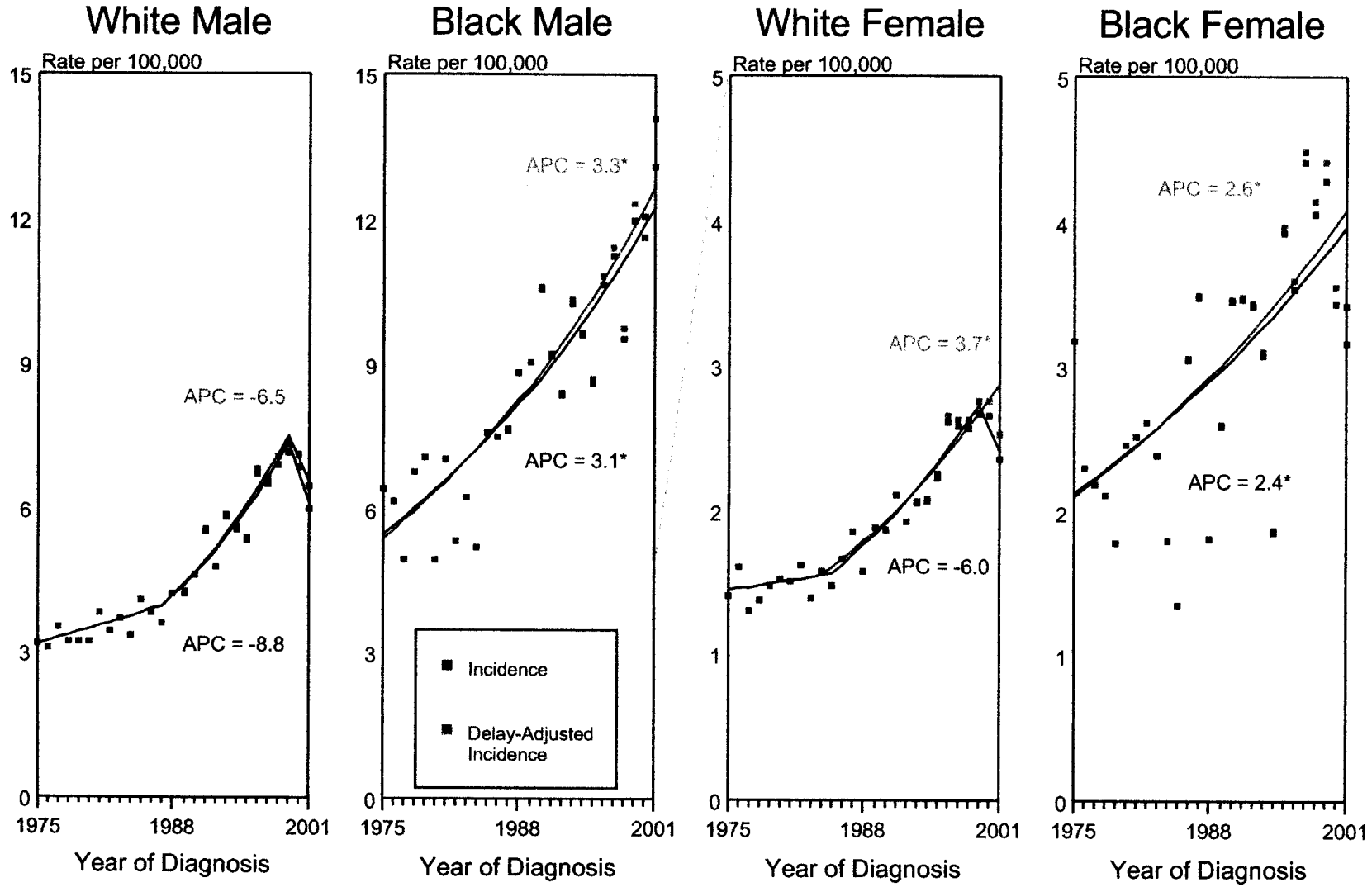


+ Source: SEER 9 areas and NCHS public use data file for the total US. Rates are age-adjusted to the 2000 US standard million population by 5-year age groups. Regression lines are calculated using the Joinpoint Regression Program Version 2.7, September 2003, National Cancer Institute.

Figure XXIV-1

Appendix IE

SEER Incidence and Delay Adjusted Incidence Rates+
Liver and Intrahepatic Bile Duct Cancer, by Race and Sex

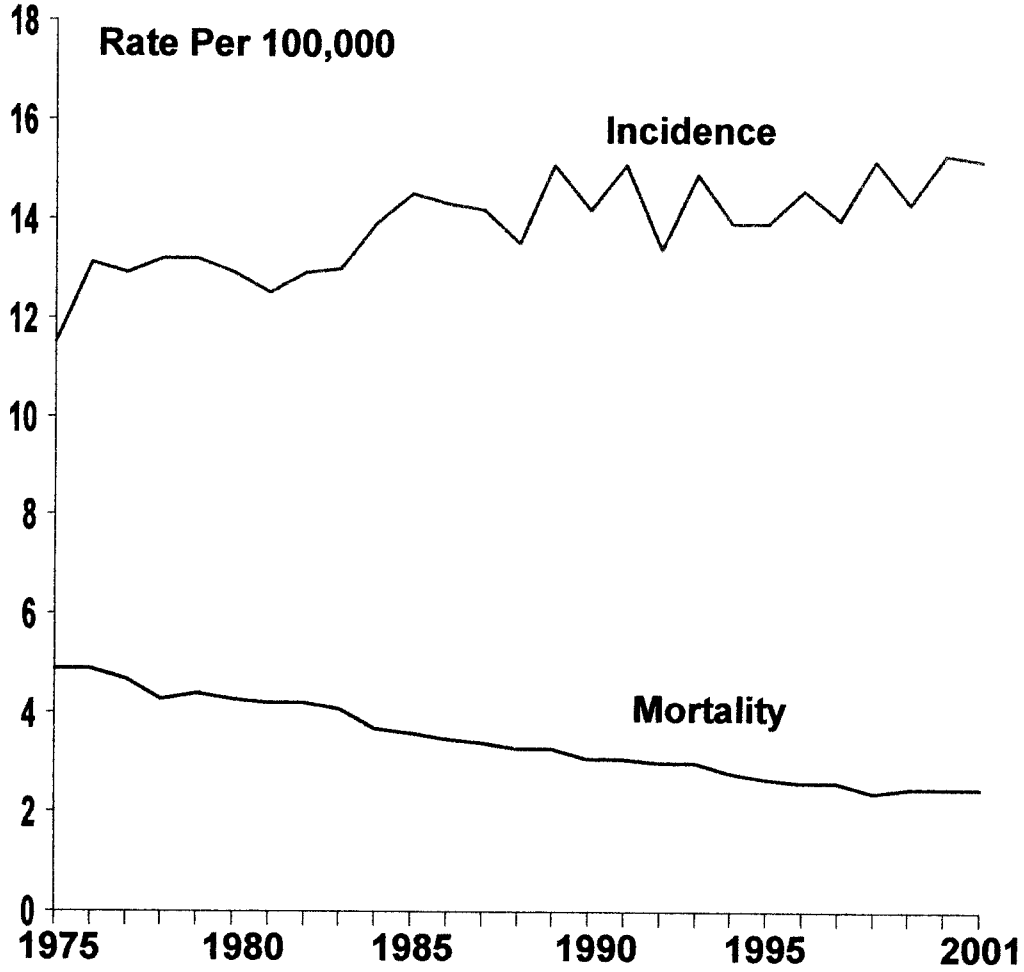


+ Source: SEER 9 areas. Rates are age-adjusted to the 2000 US standard million population by 5-year age groups.
Regression lines and APCs are calculated using the Joinpoint Regression Program Version 2.7, September 2003, National Cancer Institute.
The APC is the Annual Percent Change for the regression line segments. The APC shown on the graph is for the most recent trend.

* The APC is significantly different from zero ($p < 0.05$).

Figure XIV-1

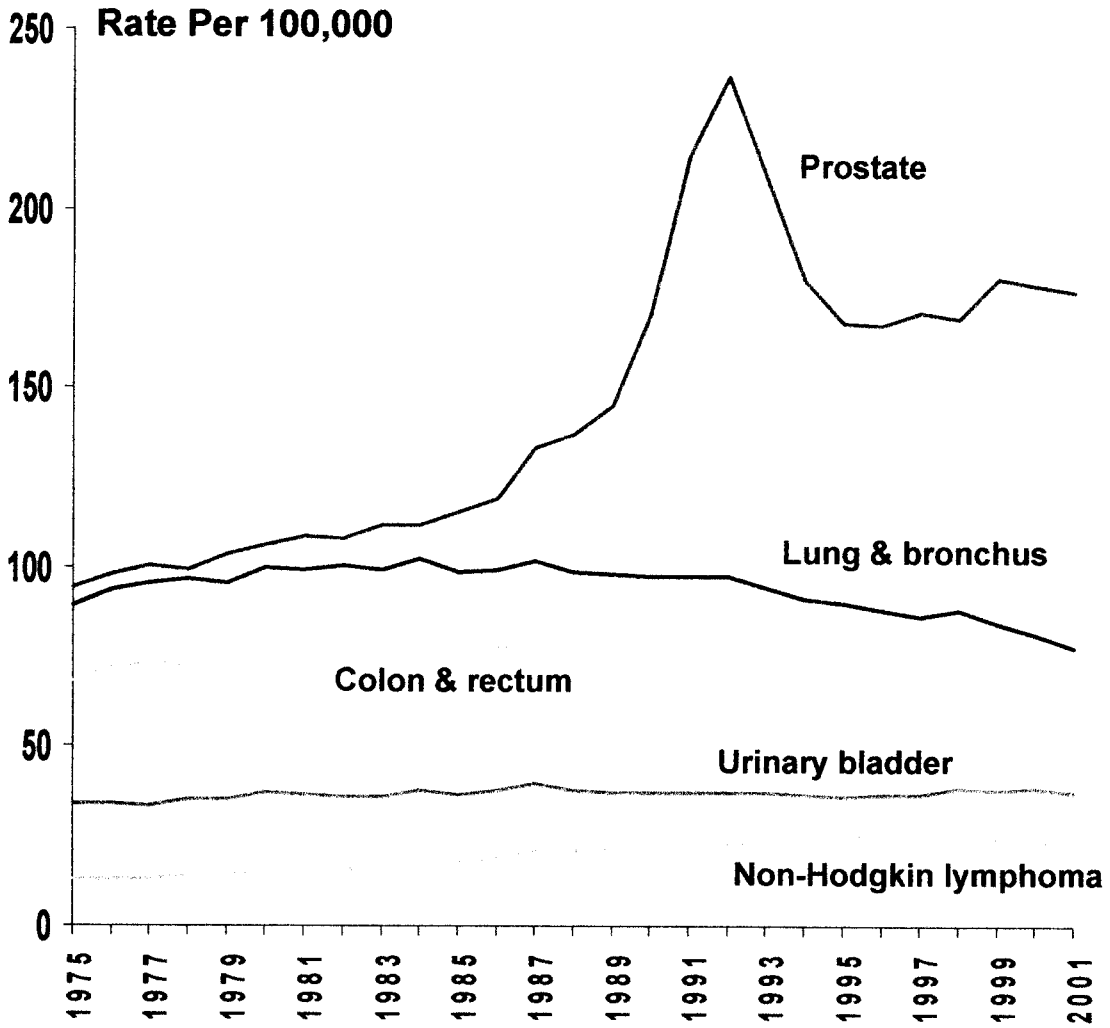
Cancer Incidence & Death Rates* in Children 0-14 Years, 1975-2001



*Age-adjusted to the 2000 Standard population.

Source: Surveillance, Epidemiology, and End Results Program, 1975-2001, Division of Cancer Control and Population Sciences, National Cancer Institute, 2004.

Cancer Incidence Rates* for Men, US, 1975-2001



*Age-adjusted to the 2000 US standard population.

Source: Surveillance, Epidemiology, and End Results Program, 1975-2001, Division of Cancer Control and Population Sciences, National Cancer Institute, 2004.