

# **ILLINOIS CANCER STATISTICS REVIEW**

## **1986-2002**

### **OVERVIEW**

This document is the 12<sup>th</sup> release of the annual Illinois cancer statistics report. Illinois' cancer incidence and mortality for 1986 through 2002 are reported for all races, whites, blacks and Asian/other races. In addition, cancer statistics for 1990 through 2002 among Hispanic and non-Hispanic populations are presented. Pediatric cancer incidence statistics on Illinois' children for 1986 through 2002 are included in a separate section. All rates in this report were age-adjusted to the 2000 U.S. standard million population to be consistent with national guidelines. State-level cancer incidence and cancer death projections are presented for years 2003, 2004, 2005 and 2006.

Cancer group definitions for major and minor sites are those established by the Surveillance, Epidemiology and End Results (SEER) program of the National Cancer Institute (NCI) and are used by the North American Association of Central Cancer Registries (NAACCR). These standardized classification schemes allow direct comparisons of Illinois data with international, national and state publications.<sup>1-5</sup>

In this report, a table contains incidence or mortality data specific to a major or minor cancer site for all six race/ethnic groups. For sites occurring in both genders, separate tables were prepared for both sexes, males and females. Counts, age-adjusted rates, standard errors and 95 percent confidence intervals for rates are displayed for the combined 1986-2002 time period as well as for individual years. Tables for pediatric cancer incidence reflect statistics for all races, both sexes by the six age groups: 0-14, 0-19, 0-4, 5-9, 10-14, and 15-19. The populations used as denominators for all rate calculations are described in Appendix A.

### **HIGHLIGHTS**

#### **Incidence**

- A total of 893,868 cases of invasive cancer among Illinois residents were reported to the Illinois State Cancer Registry (ISCR) from 1986 through 2002, including 59,200 new cases reported in 2002. The race distribution for these cases was 85.8 percent white, 12.1 percent black, 1.3 percent Asian/other races and 0.8 percent unknown race. Among the 715,038 invasive cancer cases diagnosed and reported from 1990 through 2002, 22,439 (3.1 percent) were designated Hispanic and 692,599 (96.9 percent) non-Hispanic.
- Black males had the highest overall age-adjusted invasive cancer incidence rates of all major race/gender groups. In general, males and females of Asian/other races in Illinois had substantially lower cancer incidence rates than their white or black counterparts. Likewise, cancer incidence rates observed for Illinois' Hispanics were lower than those seen among the state's non-Hispanic group.

- Breast cancer was the most commonly diagnosed cancer among Illinois females, accounting for more than 30 percent of 444,050 invasive cancer diagnoses over 1986-2002. The predominance of breast cancer among females persists for all major race and ethnicity groups studied (whites, blacks and Asian/other races as well as in both Hispanic ethnic categories).
- Female breast cancer diagnosed in the *in situ* stage was observed to consistently increase for every race group across 1986-2002 as well as for both Hispanic and non-Hispanic ethnic classifications over the 1990-2002 time frame. These increases suggest greater screening mammography usage and ultimately the earlier detection of breast cancer among Illinois women.
- For Illinois males, prostate cancer was the most frequently diagnosed invasive cancer, accounting for more than 26 percent of 449,818 new cancer diagnoses during 1986-2002. Black males had the highest prostate cancer incidence rates among all race groups, approximately 47 percent higher than those observed for white males and nearly three times those observed for males of Asian/other races in Illinois. Prostate cancer age-adjusted incidence rates for Hispanic males were observed to be about 77 percent of those seen among their non-Hispanic counterparts in Illinois.
- A total of 8,930 new cases of cancer were diagnosed during 1986-2002 among Illinois children ages 0 to 19 years. The three most common diagnostic sites for childhood cancer in Illinois were, in descending order, leukemia, central nervous system and lymphoma.

## **Mortality**

- From 1986 through 2002, there were 416,429 Illinois residents who died from cancer. The race distribution for these deaths was 84.6 percent among whites, 14.6 percent in the black population and the remainder occurring among Asian/other race population group (0.8). Among the 322,798 cancer deaths reported from 1990 through 2002, 6,228 (1.9 percent) were designated Hispanic, 314,264 (97.4 percent) non-Hispanic and 2,306 (0.7 percent) were of unknown Hispanic ethnicity.
- Black males had the highest overall age-adjusted mortality rates from cancer, more than 50 percent higher than the rate for white males and more than three times the rate for males of Asian/other races. Similarly, Illinois' cancer mortality rates for black females exceeded those for white females by about 30 percent and were nearly three times those observed among Asian/other race females in Illinois. In general, age-adjusted cancer mortality rates for Hispanics were about half those observed for their non-Hispanic counterparts in Illinois.
- Based on age-adjusted cancer mortality rates, lung cancer remains the leading cause of death from cancer for both Illinois males and females of all races followed by prostate cancer for males and breast cancer for females. The third

leading cause of cancer death is from cancers of the colon and rectum for both males and females.

## **TECHNICAL NOTES**

### **Data Sources**

#### **Cancer Incidence and Mortality**

Cancer incidence data are from the Illinois Department of Public Health, Illinois State Cancer Registry (ISCR), the only source of population-based cancer incidence data for the state. Newly diagnosed cancer cases among Illinois residents are reported to ISCR by health care facilities in the state where cancer is diagnosed and treated. Central cancer registries and facilities in other states also report data to ISCR on Illinois residents diagnosed and treated for cancer in their states. Most out-of-state cases come from Florida, Indiana, Iowa, Kentucky, Minnesota (Mayo Clinic), Missouri (state registry and St. Louis Barnes/Jewish Hospital) and Wisconsin. In addition, data exchange agreements are in effect with Arkansas, California, Michigan, Mississippi, North Carolina, Washington and Wyoming.<sup>6</sup> For data used in this publication, almost 6 percent of ISCR cases are reported from out-of-state agencies and organizations. A death certificate clearance process involving active follow-back of cancer deaths in an effort to identify missed cases has served as an additional means of case identification since August 1993.

The preparation and release of this report is dependent on the completion of reporting by Illinois facilities for each year. Although case reporting is mandated within six months of diagnosis, it has been the ISCR policy to keep database files open for late reporting of cases and to allow for the two- to four-year lag in case identification of Illinois residents from other state central cancer registries. For this report, the database files reflect the status of ISCR as of November 2004.

The National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program was the source of information on cancer mortality for 1986 through 2002 by race and for 1990 through 2002 by Hispanic ethnicity. The underlying cause of death was provided by the National Center for Health Statistics.

#### **Population Estimates**

Appendix A displays the population estimates of the sex-specific, race and Hispanic ethnic groups in five-year age categories that were used as denominators for rate calculations in this report. SEER population files developed in collaboration with the United States Bureau of the Census for all races, whites, blacks and Asian/other races from 1986 through 2002, as well as for Hispanic and non-Hispanic ethnicity from 1990 through 2002 in Illinois were used. The methodology for these estimates is available at the following Web site: <[www.seer.cancer.gov/popdata/methods.html](http://www.seer.cancer.gov/popdata/methods.html)>.

## Definitions

**Cancer Incidence Sites.** The *International Classification of Diseases for Oncology* version 2 (ICD-O-2, which was used for cancer cases diagnosed prior to 2001)<sup>7</sup> and version 3 (ICD-O-3, which was used for cancer cases diagnosed in 2001 and 2002)<sup>8</sup> codes and the major and minor cancer site groups of the SEER program were used to define cancer sites. In this report, both Kaposi sarcoma and mesothelioma were classified as separate site groups. This change will have slight impact on cancer incidence rates for a few specific cancers, compared to using the previous site grouping method. Counts and rates were calculated only for invasive cancers with the exception of carcinoma *in situ* occurring in the urinary bladder. Counts and rates for carcinoma *in situ* of the breast are displayed in a separate table and were not included in the calculation of counts or incidence rates for all sites combined.

**Cancer Mortality Sites.** The *International Classification of Diseases* (ICD-9) codes<sup>9</sup> for underlying cause of death were converted to SEER major and minor cancer site groups to define the cancer death sites presented in this report for years 1986 through 1998. It was replaced by the *International Classification of Diseases* (ICD-10) coding scheme<sup>10</sup> from year 1999 onward both nationally as well as in Illinois.

**Pediatric Cancer Groups.** Tumors diagnosed in children are classified into the pediatric cancer groups according to the scheme of SEER modified International Classification of Childhood Cancer (ICCC), which uses morphology and site ICD-O-2 codes.<sup>11</sup>

**Incidence and Mortality Rates.** Rates are expressed per 100,000 population with the exception of pediatric cancer incidence rates, which are expressed per 1 million population. Age-adjustment of rates was calculated by the direct method adjusting to the 2000 U.S. standard million population. The SEER\*Stat® software package, developed by the Information Management Services Inc. for the NCI, was used to calculate both incidence and mortality rates. Rates are rounded to the nearest tenth and very small rates (e.g., 0.04) are shown as 0.0. Formulas used for the calculation of standard errors and 95 percent confidence intervals are displayed in Appendix B.

**Race-specific and Hispanic Ethnicity Rates.** The race-specific categories in this report are all races, whites, blacks and Asian/other races. Cases reported as unknown race were included in the "all races" category but not in any race-specific group. For the incidence report, Hispanic ethnicity was derived according to the NAACCR Hispanic identification algorithm (NHIA).<sup>12</sup> NHIA is a generally reliable method to enhance the ethnic identification of the Latino population in the United States.<sup>13</sup> For the mortality report, Hispanic ethnicity was used as defined in the database. Because there were a considerably large number of cancer deaths with unknown Hispanic ethnicity in the mortality database, the mortality rates calculated for Hispanics and non-Hispanics tended to be underestimated.

## Projections of Future Cancer Incidence and Deaths in Illinois

The 2002 cancer incidence and mortality data reported in Illinois were used to project future cancer incidence and cancer deaths. The sex-race specific rates for the 19 standard five-year age groups for all sites combined and selected sites were applied to the projected populations by individual year for the same sex-race-age groups to calculate

numbers of new invasive cancer cases or cancer deaths in Illinois. Cancer incidence and cancer death projections were made for years 2003, 2004, 2005 and 2006 (Detailed methodology can be found on the IDPH Web site at <http://www.idph.state.il.us/about/epi/index.html>).

## QUALITY CONTROL

Ongoing quality control procedures are integral components of ISCR operations that assure high quality cancer incidence data. In addition to these activities, in 1997, NAACCR developed a certification process that reviews registry data for completeness, accuracy and timeliness of reporting (starting with cases diagnosed in 1995). Since then, ISCR has submitted data each year to the NAACCR *Call for Data* and for NAACCR registry certification. Based on the certification criteria shown in the following table,<sup>2</sup> ISCR has been awarded gold certification for 1996, 1997, 1998, 1999, 2000, 2001 and 2002.

Completeness (NAACCR Method)	Pass EDITS	DCO	Timeliness	Unresolved Duplicate	Missing Data Fields				Certification Status
					Sex	Age	County	Race	
≥ 90%	≥ 97%	≤ 5%	Within 23 months	≤ 2/1000	≤ 3%	≤ 3%	≤ 3%	≤ 5%	SILVER
≥ 95%	100%	≤ 3%	Within 23 months	≤ 1/1000	≤ 2%	≤ 2%	≤ 2%	≤ 3%	GOLD

Constantly updating registry data is a standard operation in ISCR. As of November 2004, ISCR quality control data for each diagnosis year are as follow:

Year	Completeness (NAACCR Method) <sup>a</sup> (%) (As of 11-04)	Pass EDITS (%)	DCO <sup>b</sup> (%)	Unresolved Duplicate <sup>c</sup> (%)	Missing Data Fields			
					Sex (%)	Age (%)	County (%)	Race (%)
1986	88	~	~	~	0.0	0.0	0.0	0.35
1987	90	~	~	~	0.0	0.0	0.0	0.31
1988	87	~	~	0.04	0.0	0.0	0.0	0.40
1989	88	~	~	0.04	0.0	0.0	0.0	0.36
1990	89	100	~	0.04	0.0	0.0	0.0	0.41
1991	88	100	~	0.04	0.0	0.0	0.0	0.73
1992	91	100	~	0.04	0.0	0.0	0.0	0.31
1993	92	100	2.27	0.04	0.0	0.0	0.0	0.33
1994	97	100	6.14	0.06	0.0	0.0	0.0	0.43
1995	99	100	2.69	0.06	0.0	0.0	0.0	0.51
1996	100	100	1.87	0.06	0.0	0.0	0.0	0.67
1997	100	100	1.82	0.06	0.0	0.0	0.0	0.98
1998	100	100	1.48	0.03	0.0	0.0	0.0	1.37
1999	100	100	1.83	0.02	0.0	0.0	0.0	1.36
2000	99	100	2.45	0.03	0.0	0.0	0.0	1.34
2001	100	100	2.50	0.00	0.0	0.0	0.0	1.16
2002	100	100	2.83	0.00	0.0	0.0	0.0	1.38

~ not applicable

a. For data prior to 1995, the NAACCR's completeness estimating algorithm (version 1) was used. For data on or after 1995, the NAACCR's completeness estimating algorithm (version 2) was used.

b. DCO follow-back not started until end of 1993 reporting year

c. NAACCR's duplicate protocol was run for each year at the time of data submission for registry certification.

## DATA INTERPRETATION

Observed variations and differences over years and across sex and race/ethnicity groups in cancer incidence and mortality may be real, reflecting modifications in the risk factor status of the population or the consequence of participation in screening and early detection programs. Such changes may not be real, however, but instead may be the result of random fluctuations and other factors related to the estimation process. Any conclusions should be made only after carefully considering the following factors that influence annual incidence and mortality rates.

- Random fluctuations in annual rates are usual and may be substantial, especially for rates based on small numbers of incidence counts or deaths (i.e., less than 16).
- Differences in registry database completeness and data quality will influence the magnitude of estimated cancer incidence rates. It should be noted that, because years prior to 1994 are less than 95 percent complete (see above table), some rates for those years, especially for all sites combined, would be underestimates of the “true” rates for the Illinois population. The rates presented here have not been adjusted for completeness differences across the database.
- Population estimates used for denominators may be inaccurate or lack precision. Population data for 1990 and 2000, the years of the U.S. decennial census, are the most accurate for all age, race, ethnicity and sex-specific categories and would, therefore, produce the most accurate incidence and mortality rates. Those for other years are not based on actual population counts but rather on interpolation or extrapolation of estimates based on demographic characteristics of the population. Incidence and mortality rates based on these population estimates would be expected to exhibit more error than those for 1990 or 2000.
- The 95 percent confidence intervals are included with reported rates to help put the rate in perspective and to facilitate rate comparisons over years and across sex and race/ethnicity groups. Observed differences may not be statistically significant. The range between the lower confidence interval and the upper confidence interval defines with 95 percent probability where the “true” rate actually falls. The comparison of two sets of confidence intervals is approximately equivalent to statistical significance tests for differences between two rates and is more conservative than the standard significance test when the null hypothesis is true.<sup>14</sup>

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