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Pat Quinn, Governor

Illinois County Cancer Statistics Review Incidence, 2004-2008

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**ILLINOIS COUNTY CANCER STATISTICS REVIEW
INCIDENCE, 2004 – 2008**

TABLE OF CONTENTS

Overview and Technical Notes	1
------------------------------	---

SECTION I

Cancer Incidence Rates for Selected Sites by County and Sex.....	I-1
All Sites Combined.....	I-2
Oral Cavity and Pharynx.....	I-7
Colon and Rectum.....	I-12
Lung and Bronchus.....	I-17
Melanoma of the Skin.....	I-22
Female Breast (invasive).....	I-27
Female Breast (in situ).....	I-30
Cervix.....	I-33
Prostate.....	I-36

SECTION II

Percent Distribution of Stage at Diagnosis by County.....	II-1
Oral Cavity and Pharynx.....	II-2
Colon and Rectum.....	II-6
Melanoma of the Skin.....	II-10
Female Breast.....	II-14
Cervix.....	II-18
Prostate.....	II-22

SECTION III

County-specific Cancer Incidence Rates, All Races.....	III-1
Illinois.....	III-2
Adams County.....	III-3

Alexander County.....	III-4
Bond County.....	III-5
Boone County.....	III-6
Brown County.....	III-7
Bureau County.....	III-8
Calhoun County.....	III-9
Carroll County.....	III-10
Cass County.....	III-11
Champaign County.....	III-12
Christian County.....	III-13
Clark County.....	III-14
Clay County.....	III-15
Clinton County.....	III-16
Coles County.....	III-17
Cook County.....	III-18
Crawford County.....	III-19
Cumberland County.....	III-20
DeKalb County.....	III-21
DeWitt County.....	III-22
Douglas County.....	III-23
DuPage County.....	III-24
Edgar County.....	III-25
Edwards County.....	III-26
Effingham County.....	III-27
Fayette County.....	III-28
Ford County.....	III-29
Franklin County.....	III-30
Fulton County.....	III-31
Gallatin County.....	III-32
Greene County.....	III-33
Grundy County.....	III-34
Hamilton County.....	III-35
Hancock County.....	III-36
Hardin County.....	III-37
Henderson County.....	III-38
Henry County.....	III-39
Iroquois County.....	III-40
Jackson County.....	III-41
Jasper County.....	III-42
Jefferson County.....	III-43
Jersey County.....	III-44
Jo Daviess County.....	III-45

Johnson County.....	III-46
Kane County.....	III-47
Kankakee County.....	III-48
Kendall County.....	III-49
Knox County.....	III-50
Lake County.....	III-51
LaSalle County.....	III-52
Lawrence County.....	III-53
Lee County.....	III-54
Livingston County.....	III-55
Logan County.....	III-56
McDonough County.....	III-57
McHenry County.....	III-58
McLean County.....	III-59
Macon County.....	III-60
Macoupin County.....	III-61
Madison County.....	III-62
Marion County.....	III-63
Marshall County.....	III-64
Mason County.....	III-65
Massac County.....	III-66
Menard County.....	III-67
Mercer County.....	III-68
Monroe County.....	III-69
Montgomery County.....	III-70
Morgan County.....	III-71
Moultrie County.....	III-72
Ogle County.....	III-73
Peoria County.....	III-74
Perry County.....	III-75
Piatt County.....	III-76
Pike County.....	III-77
Pope County.....	III-78
Pulaski County.....	III-79
Putnam County.....	III-80
Randolph County.....	III-81
Richland County.....	III-82
Rock Island County.....	III-83
St. Clair County.....	III-84
Saline County.....	III-85
Sangamon County.....	III-86
Schuyler County.....	III-87

Scott County.....	III-88
Shelby County.....	III-89
Stark County.....	III-90
Stephenson County.....	III-91
Tazewell County.....	III-92
Union County.....	III-93
Vermilion County.....	III-94
Wabash County.....	III-95
Warren County.....	III-96
Washington County.....	III-97
Wayne County.....	III-98
White County.....	III-99
Whiteside County.....	III-100
Will County.....	III-101
Williamson County.....	III-102
Winnebago County.....	III-103
Woodford County.....	III-104

SECTION IV

County-specific Cancer Incidence Rates by Race.....	IV-1
Whites	
Illinois.....	IV-2
Champaign County.....	IV-3
Cook County.....	IV-4
DuPage County.....	IV-5
Kane County.....	IV-6
Kankakee County.....	IV-7
Lake County.....	IV-8
Macon County.....	IV-9
Madison County.....	IV-10
Peoria County.....	IV-11
Rock Island County.....	IV-12
St. Clair County.....	IV-13
Sangamon County.....	IV-14
Vermilion County.....	IV-15
Will County.....	IV-16
Winnebago County.....	IV-17
Blacks	
Illinois.....	IV-18
Champaign County.....	IV-19

Cook County.....	IV-20
DuPage County.....	IV-21
Kane County.....	IV-22
Kankakee County.....	IV-23
Lake County.....	IV-24
Macon County.....	IV-25
Madison County.....	IV-26
Peoria County.....	IV-27
Rock Island County.....	IV-28
St. Clair County.....	IV-29
Sangamon County.....	IV-30
Vermilion County.....	IV-31
Will County.....	IV-32
Winnebago County.....	IV-33

SECTION V

County-specific Cancer Incidence Rates by Hispanic Ethnicity.....	V-1
Hispanics	
Illinois.....	V-2
Cook County.....	V-3
DuPage County.....	V-4
Kane County.....	V-5
Lake County.....	V-6
Will County.....	V-7
Non-Hispanics	
Illinois.....	V-8
Cook County.....	V-9
DuPage County.....	V-10
Kane County.....	V-11
Lake County.....	V-12
Will County.....	V-13
APPENDIX A: Illinois County Population Totals, 2004-2008.....	A-1
APPENDIX B: ISCR County Cancer Site Groups.....	B-1
APPENDIX C: Formulas for Rates.....	C-1

OVERVIEW AND TECHNICAL NOTES

ILLINOIS COUNTY CANCER STATISTICS REVIEW

INCIDENCE, 2004 – 2008

OVERVIEW

This report presents cancer incidence in Illinois' 102 counties for 2004 through 2008. The first two sections of the report include tables designed to facilitate county comparisons. County-specific tables with expanded cancer sites are included in Section III for all races. Cancer incidence data for whites and blacks are included in Section IV for 15 counties including Champaign, Cook, DuPage, Kane, Kankakee, Lake, Macon, Madison, Peoria, Rock Island, Sangamon, St. Clair, Vermilion, Will and Winnebago; these counties have sufficiently large black populations to allow meaningful statistics for the race group. Cancer incidence for Hispanics (of any race) and non-Hispanics (of any race) are included in Section V for five counties (Cook, DuPage, Kane, Lake and Will) that have sufficiently large Hispanic populations to allow meaningful statistics for the ethnicity group. Details for each section follow.

Section I. Tables containing five-year aggregate incidence counts, average annual age-adjusted rates, and lower and upper 95 percent confidence intervals are presented for all sites combined, oral cavity and pharynx, colon and rectum, lung and bronchus, and melanoma of the skin by sex, race, and Hispanic ethnicity (selected counties) and for female breast invasive and *in situ*, cervix and prostate by race and Hispanic ethnicity (selected counties). These sites were chosen based on two considerations: 1) the need to facilitate evaluation of various cancer prevention and control programs, and 2) the sufficient number of cases to allow meaningful presentation of rates.

Section II. Stage at diagnosis of cancer for counties is expressed as percentage localized, regional, distant and unstaged for cancers of the oral cavity and pharynx (both sexes), colon and rectum (both sexes), melanoma and the skin (both sexes), and for invasive cervix and prostate. Female breast cancer incidence data are displayed with *in situ* stage in addition to localized, regional, distant and unstaged stage categories. Data by race and Hispanic ethnicity are available for the selected counties.

Section III. In separate tables for each of the state's counties, cancer incidence data are presented for all sites combined, the sites in Sections I-II, as well as additional cancer sites included in the county-level public data set for 2004 – 2008. Since the incidence for female breast cancer *in situ* is highly correlated with mammography screening usage, it also is reported in the section. All tables in the section contain five-year aggregate incidence counts, average annual age-adjusted rates, and lower and upper 95 percent confidence intervals for each cancer site by sex category for all races.

Section IV. For the 15 above-mentioned counties with sufficiently large black populations, tables in the same format as Section III are presented for whites and blacks.

Section V. For the five above-mentioned counties with sufficiently large Hispanic populations, tables in the same format as Section III are presented for Hispanics (of any race) and non-Hispanics (of any race).

TECHNICAL NOTES

Data Sources

Cancer Incidence

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. Identification of cancer cases in the ISCR is dependent upon reporting by hospitals, free-standing clinics, radiation treatment facilities, laboratories and physician offices as mandated by state law. All newly diagnosed cancer cases among Illinois residents are reported to ISCR by these reporting sources. In addition, ISCR has agreements with other central registries to send back Illinois cancer data that are identified outside of the state. These registries include Arkansas, California, Florida, Indiana, Iowa, Kentucky, Michigan, Mississippi (through August of 2004), Missouri, North Carolina, Washington, Wisconsin, Wyoming (through February 2008), and the Mayo Clinic in Minnesota (through October 2005).

Completeness of out-of-state reporting depends upon the years of operation of these other central registries, the extent of their identification of out-of-state residents, and their standards of quality.¹ For data used in this publication, 5.2 percent of ISCR cases were reported from out-of-state agencies and organizations. However, three states did not report all cancer case among Illinois residents diagnosed in 2008. This had little impact on the overall cancer incidence rate for Illinois but the rates among some rural counties along the border of Illinois may be affected.

A death certificate clearance process has been employed since August 1993. The process involves follow back of cancer deaths in an effort to identify the cases that are not reported to ISCR. On average, between 2004 and 2008, 1.7 percent of reported cases were identified from death certificate clearance.

The preparation and release of data used for this report is dependent on the completion of annual reporting by Illinois facilities. 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. This practice is consistent with data published nationally. For this report, the database files reflect the status of ISCR as November 2010.

Population Estimates

The population estimates of the sex- and race-specific as well as sex- and ethnicity/race-specific groups in five-year age categories were used as denominators in the formulation of rates. These population estimates of Illinois and Illinois counties for all races, whites, blacks,

and Asian/other races from 1986 through 2008 and for Hispanics and non-Hispanics for 1990 through 2008 were obtained from the Surveillance, Epidemiology and End Results program based on United States Bureau of Census population estimates.

The U.S. Census Bureau revised their population estimation methodology for Vintage 2009. The Vintage 2009 population estimates used in this report incorporate four improvements in methodology: 1) changes in the estimation of net internal migration, 2) changes in the estimation of the distribution of deaths to people aged 70 and older by age, sex, race, and Hispanic origin, 3) changes in the estimation of domestic migration of the population 65 years and older, and 4) changes in the estimation of the age distribution of migrations to and from counties. These changes are in addition to changes made in Vintage 2008 and Vintage 2007. The net impact of these changes was a downward shift in the latest post-censal population estimates covering 2000 through 2009. In general, this shift caused a small upswing in rates. These population estimates are displayed in Appendix A. The methodology for these estimates is available at the following website: <http://www.seer.cancer.gov/popdata/methods.html>.

Illinois population estimates from Vintage 2008 data for 2003 through 2007 were compared to those produced using the Vintage 2009 data for the same time period. Use of new methods in the Vintage 2009 file resulted in a 0.2 percent decrease in Illinois' total population. The new methods resulted in total population changes ranging from -0.5 percent to +0.3 percent among individual Illinois counties. The new Vintage 2009 methods put Illinois' cancer rate 0.8 percent higher than what was calculated previously using Vintage 2008. Differences in incidence rates may not solely be the result of changes in population estimates. Changes in rates also could be attributable to the addition of cases reported late.

Definitions

Cancer Incidence Sites

All cases diagnosed during 2004 through 2008 were reported with *The International Classification of Diseases for Oncology* version 3 (ICD-O-3) codes.² Cancer sites in this report were grouped according to site group definitions established by the SEER program of the National Cancer Institute (NCI)³ and also 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.³⁻⁵ The ISCR cancer site groups used in the county tables are listed in Appendix B.

Beginning with the 1998-2002 report and continuing through this year's report, both Kaposi sarcoma and mesothelioma were classified as separate site groups. Compared to using the previous site grouping method, this change has a slight impact on cancer incidence rates for a few specific cancers. However, due to small numbers of cases at the county level, these two sites are not shown in this report.

When comparing this report to the ones published before the 2001-2005 county report, it should be noted that several cancers that previously were not coded as malignant in ICD-O-2 (used in diagnoses prior to 2001) are coded as malignant in ICD-O-3 (beginning with 2001 diagnoses). For example, Myelodysplastic syndrome (MDS) and chronic myeloproliferative disease (CMPD) are considered malignant cancer in ICD-O-3, so are papillary ependymomas and papillary meningiomas which, according to ICD-O-3, are included in the “Brain and Other Nervous System” and “All Sites” categories. Some endometrial tumors also are classified as malignant in ICD-O-3. Conversely, some low malignant potential tumors of the ovary and pilocytic astrocytomas are no longer coded as malignant in ICD-O-3. Overall, these changes would have a slight impact on incidence of a specific cancer site; however, it might result in a noticeable increase in cancer incidence rates for “all sites” or for “all other sites.”

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 separately in tables but were not included in the calculation of counts or incidence rates for all sites combined.

Incidence Rates

Rates are expressed per 100,000 population and are age-adjusted by the direct method to the 2000 U.S. standard million population. The SEER*Stat® software package, developed by Information Management Services Inc. for the NCI, was used to calculate average annual age-adjusted cancer incidence rates for 2004 – 2008.⁶ Rates are rounded to the nearest tenth and very small rates (e.g., 0.04) are shown as 0.0. Rates are presented with the lower and upper confidence intervals computed at the 95 percent level using Tiwari method.⁷ The formulas for rate calculations are displayed in Appendix C.

Race Categories

The race-specific categories in this report are all races for Illinois and all 102 counties. Data for whites and blacks are presented for Illinois and 15 counties (Champaign, Cook, DuPage, Kane, Kankakee, Lake, Macon, Madison, Peoria, Rock Island, St. Clair, Sangamon, Vermilion, Will and Winnebago) with sufficient black population estimates and annual cancer incidence for blacks to allow meaningful statistics. Cases reported as “other” or “unknown” race are included in the “all races” category.

To improve the identification and surveillance of American Indians and Alaska Natives diagnosed with cancer and to be consistent with the national data, cancer incidence data since 1995 were linked to the Indian Health Service (IHS), which provides medical services to an estimated 55 percent of the American Indian/Alaska Native population.⁸ If a race code in the ISCR database is white, black, other, or unknown and the IHS link is positive, then the race code is re-categorized to American Indian/Alaskan Native, otherwise the race code stays unchanged. This practice has minimal impact on the incidence rates for whites or blacks due to the small number of cases affected.

Hispanic Ethnicity Categories

Through the use of the NAACCR Hispanic identification algorithm (NHIA) improvements have been made in classifying cases as Hispanic or Latino for diagnosis years 1990 through 2008.⁹ NHIA is a generally reliable method to enhance the ethnic identification of the Latino population in the United States.¹⁰ Cases that meet certain criteria around race and birthplace, and who are also identified as non-Hispanic, Hispanic Not Otherwise Specified, Spanish Surname only, and Unknown Ethnicity are examined. Through the use of race, birthplace, last name, first name and maiden name NHIA assigns a more specific and sometimes different ethnicity to these cases.

The Hispanic ethnicity-specific categories are presented in this report for Illinois and five counties (Cook, DuPage, Kane, Lake and Will) with sufficient Hispanic population estimates and annual cancer incidence for Hispanics to allow meaningful statistics. To be consistent with national data, cases reported as “unknown” ethnicity are included in the non-Hispanic category.³⁻⁵

Quality Control

Ongoing quality control procedures are integral components of ISCR operations that assure high quality cancer incidence data.¹¹ In 1997, NAACCR developed a certification process that reviews registry data for completeness, accuracy and timeliness of reporting (starting with cases diagnosed in 1995). ISCR has submitted data each year to the NAACCR for registry certification. Based on the certification criteria shown in the following table, ISCR has been awarded gold certification for diagnosis years 1996-2008. The table below shows the criteria used for silver and gold certification.

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 2010, ISCR quality control data for the diagnosis years considered in this report (2004 – 2008) are as follows:

Year	Completeness (NAACCR Method- As of 11-10)	Pass EDITS	DCO	Unresolved Duplicate Per 1,000 (2004-2008)	Missing Data Fields			
					Sex	Age	County	Race
2004-2008	100%	100%	1.7%	0.88	0.0%	0.0%	0.0%	1.1%

Data Interpretation

Observed differences in cancer incidence among counties may be real, reflecting differences in risk factor modifications or consequences of screening and early detection programs within the county. However, county cancer incidence differences also could be the result of other factors. Any conclusions should be made only after carefully considering the following factors that influence the average annual age-adjusted cancer incidence rates:

- Aggregate cancer case counts for 2004 – 2008 produce more stable age-adjusted cancer incidence rates than those calculated for an individual year. Counties with smaller populations and smaller numbers of cancer incidence cases will still have less stable age-adjusted rates than larger counties or the entire state. Where the number of cases is less than or equal to 16, the relative standard error for the rate in these instances is equal to or exceeds 25 percent. At this level, interpretation of the rate is limited by excessive uncertainty and these rates should be evaluated cautiously.
- The 95 percent confidence intervals are included with reported rates to help put the rate in perspective and to facilitate county comparisons. 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 for the county or the state may fall. The comparison of two sets of confidence intervals is approximately equivalent to statistical significance tests for differences between two county rates and is more conservative than the standard significance test when the null hypothesis is true.¹²
- Population estimates used for denominators may lack precision. These data are estimates based on demographic characteristics of the population rather than actual counts. Incidence rates produced using these population estimates would be expected to exhibit more error than those calculated using 1990 or 2000 census population counts. Also, please keep in mind that when comparing this report to earlier versions the methods for developing the population estimates have changed and denominator data will lack comparability. Ensuring the same estimate methods (e.g. Vintage 2009) are being used across the time period being examined accounts for this issue.
- Due to the fact that some out-of-state data exchange is incomplete for 2008, rates for some border counties in Illinois should be interpreted with caution. This depends upon the percent of a county’s cases that are reported through out-of-state data exchanges. Any changes in these rates as compared with earlier years should be evaluated cautiously.

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