



EPI Updates

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Invasive Breast Cancer Incidence in Illinois Females, 1986 to 1997

Breast cancer is the most common cancer among women worldwide and is the second leading cause of cancer mortality next to lung and bronchus among women in the United States. Every woman is at risk for breast cancer; this risk increases as a woman ages, if she has a family history of breast cancer or if she has had an increased cumulative exposure to estrogen. Hormone-associated risk factors include early menarche, late menopause, hormone replacement therapy, and never having children or having a first child after age 30. However, most breast cancers occur in women who have no identifiable risk factors. The rising incidence of breast cancer over the past few decades can be only partially explained by the increased use of mammography. Further research is needed to identify unrecognized risk factors that may exist.

Table 1 shows the number of cases of invasive breast cancer diagnosed from 1986 to 1997.

Table 1 Number of Invasive Breast Cancer Cases by Race and Ethnicity, Females, Illinois, 1986-1997												
	1986	1987	1988	1989	1990	1991	1992	1993	1994*	1995*	1996*	1997*
All Women	6,651	7,165	7,337	7,053	7,433	7,648	7,774	7,603	8,204	8,019	8,234	8,211
Race												
White	5,859	6,358	6,450	6,156	6,567	6,723	6,824	6,586	7,166	6,891	7,052	6,957
Black	651	664	760	760	717	763	793	864	875	909	936	984
Asian/other	63	77	68	84	76	73	95	95	84	127	122	144
Ethnicity												
Hispanic	n/a	n/a	n/a	162	171	180	192	215	223	247	271	295
Non-Hispanic	n/a	n/a	n/a	6,891	7,262	7,468	7,582	7,388	7,981	7,772	7,963	7,916

Source: Illinois Department of Public Health, December 1999

*Death certificate clearance instituted.

The age-adjusted incidence rates of invasive breast cancer among Illinois women are shown in Table 2. Since the completeness of the Illinois State Cancer Registry has increased steadily since its inception, from an estimated 86 percent in 1986 to 99 percent in 1997, rates in earlier years are likely to have been higher than presented here. Therefore, the observed increase in Illinois is at least partially attributable to improved reporting to the state cancer registry. Since 1986,

the first year statistics were available for Illinois, the incidence of breast cancer appears to have increased from 97.0 cases per 100,000 to 109.0 cases per 100,000 in 1997.

To account for the increase in registry completeness in the trend analysis, incidence rates were adjusted for estimated percent completeness. These adjusted rates were used in the calculation of estimated annual percentage change (EAPC). As shown above, Illinois women in all race groups had a 0.8 percent per year decrease in the incidence of invasive breast cancer, which was statistically significant ($p < 0.05$). The last column demonstrates that women of all race groups in the SEER program experienced a non-significant increase of 0.4 percent per year.

White women in Illinois had a 0.9 percent annual decrease per year in the incidence of invasive breast cancer, which was statistically significant ($p < 0.05$). White women in the SEER program experienced a non-significant 0.3 percent annual increase.

Black women in Illinois and the SEER program experienced statistically significant ($p < 0.05$) increases in the incidence of invasive breast cancer. The average annual increase for Illinois women was 0.2 percent, while the SEER increase was 1.1 percent per year.

For Asian/other women in Illinois, a non-significant annual decrease of 1.2 percent in the incidence of breast cancer occurred. In the SEER program, Asian/other women experienced a 1.3 percent increase per year, which was statistically significant ($p < 0.05$).

Hispanic women in Illinois had a non-significant 0.02 percent increase of invasive breast cancer, while non-Hispanic women in Illinois had a statistically significant 1.0 percent annual decrease ($p < 0.05$). Information on Hispanic ethnicity is not available in SEER.

Table 2 Invasive Breast Cancer Age-adjusted Incidence Rates* and Estimated Annual Percentage Change[^] (EAPC), by Race and Ethnicity, Females, Illinois and SEER, ^{^^} 1986-1997

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	EAPC	
													Illinois [§]	SEER
All Women	97.0	104.3	105.6	101.1	105.1	107.3	107.2	103.5	110.3	108.2	109.6	109.0	-0.8**	+0.4
Race														
White	97.9	106.4	106.9	101.9	107.7	109.4	109.6	104.4	112.4	109.2	110.0	108.9	-0.9**	+0.3
Black	83.0	84.0	93.9	93.0	86.4	88.8	89.9	96.7	96.9	98.3	100.8	104.3	+0.2**	+1.1* *
Asian/other	59.0	65.2	56.9	65.5	50.1	46.7	59.7	56.8	48.5	63.6	60.3	69.9	-1.2	+1.3* *
Ethnicity														
Hispanic	n/a	n/a	n/a	64.0	66.7	66.6	65.9	67.6	69.6	69.6	75.4	73.9	+0.02	n/a
Non-Hispanic	n/a	n/a	n/a	102.3	106.4	108.8	108.9	104.8	112.0	109.9	111.3	110.6	-1.0**	n/a

Sources: Illinois Department of Public Health, December 1999; Surveillance, Epidemiology and End Results (SEER) program, August 1999

*Rates are per 100,000 and are age-adjusted to the 1970 U.S. standard population.

[^]Estimated annual percentage change (EAPC) was determined by fitting a regression line to the natural logarithm of the rates using calendar year as a regression variable, i.e., $y = mx + b$ where $y = \ln(\text{rate})$ and $x = \text{calendar year}$. The EAPC was calculated as $100 \cdot (e^m - 1)$. The null hypothesis stated that the slope of the line in the above equation was equal to zero or that the rate was not changing.

^{^^}The SEER program designates nine geographic areas to monitor the impact of cancer in the general population.

[§]For the Illinois EAPC calculations, expected age-adjusted incidence rates for years the registry had less than 95 percent reporting completeness (1986-1993) were used.

** These data were statistically significant at $p < 0.05$.

Table 3 shows that the incidence of invasive breast cancer is expected to increase to 8,529 in 2001.

Table 3 Projected Cancer Incidence* Invasive Breast Cancer, Females, Illinois, 1998-2001				
Site	1998	1999	2000	2001
Invasive Breast	8,290	8,374	8,451	8,529

Source: Illinois Department of Public Health, January 2000

*Details of this methodology can be found at <<http://www.idph.state.il.us/about/epi/index.htm>>.

The number of invasive breast cancer cases and incidence rates presented above do not include the *in situ* stage of breast cancer. However, in order to represent the complete stage distribution of breast cancer, the percentage of cases in all stages are presented in Table 4 below.

Table 4 Percent Distribution of Cases by Stage of Disease at Diagnosis, All Breast Cancer Including <i>in situ</i> Tumors, Females, Illinois, 1986-1997												
Stage	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
<i>in situ</i>	7.5	7.5	8.7	8.9	9.6	10.7	11.4	11.4	11.5	13.1	14.0	14.8
local	50.0	50.3	49.3	49.8	51.3	52.6	53.4	52.2	50.3	50.8	51.1	51.4
regional	32.0	31.6	31.1	30.5	28.6	27.6	26.0	26.5	25.3	25.5	24.9	24.4
distant	7.3	6.3	7.1	6.7	6.1	5.4	5.4	5.3	5.1	5.0	4.9	4.7
unknown	3.1	4.3	3.8	4.2	4.4	3.7	3.8	4.6	7.9	5.6	5.1	4.7

Source: Illinois Department of Public Health, December 1999

Table 4 shows that the largest proportion of breast cancer cases are diagnosed in the local stage and that this proportion remained fairly constant from 1986 to 1997 at approximately half of cases. However, the percentage of breast cancer cases diagnosed in the *in situ* stage doubled from 7.5 percent to 14.8 percent during the time period, while the percent of cases in the regional stage decreased from 32.0 percent to 24.4 percent. The increase in the incidence of breast cancer in the earliest, most curable stage, combined with a decrease of incidence in the late stages, will positively impact breast cancer mortality in the future.