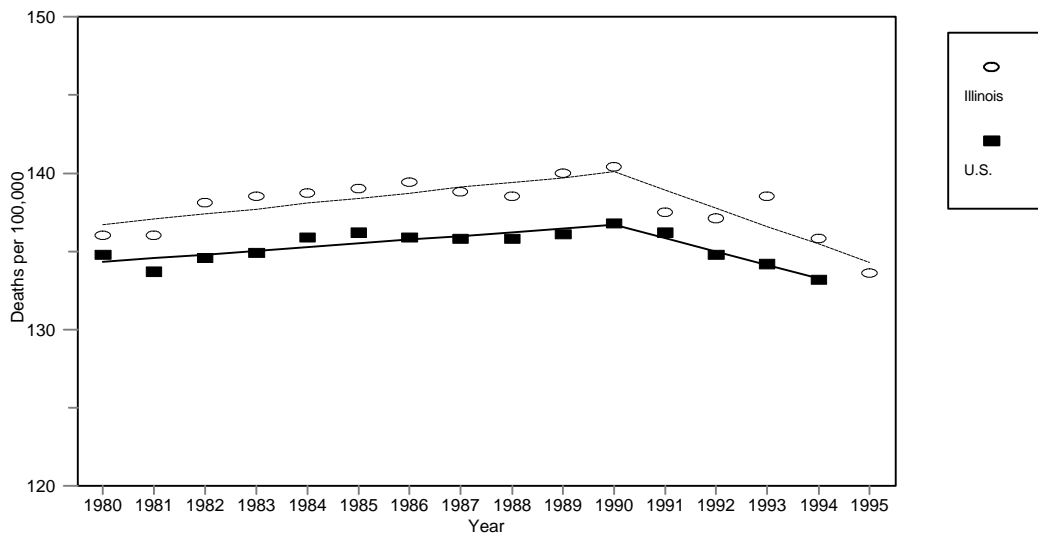


Changing Cancer Mortality in Illinois, 1980-1995

Several recent studies indicate that the cancer mortality rates in the U.S., after decades of continuous rise, began to decline after 1990. The decline of lung cancer mortality has been consistently identified as a major contributor to this change. It is not clear whether this nation-wide trend has been realized in Illinois. Because many cancer and control prevention activities are implemented locally, understanding the valid local cancer mortality trend is necessary.

The purpose of this study is to examine whether cancer mortality trends in Illinois are conforming to the national trend and what cancer groups have contributed to the change.

Figure 1. Mortality from All Cancers in Illinois, 1980-1995, and U.S. 1980-1994



Methods

Death certificates for Illinois residents from 1980 to 1995 were used to calculate mortality rates, age-adjusted to the 1940 U.S. population, for all cancers and for site-specific cancers. Estimates of the Illinois population by age and race were from the U.S. Census. U.S. cancer mortality rates were obtained from a CDC WONDER request. Piecewise regression

analyses were used to examine changing trends in mortality rates.

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 (X_{i1} - k) X_{i2} + \xi_i$$

The regression model was specified as where

Y_i = mortality rate per 100,000 in year i ;

β_0 = intercept;

β_1 = slope during 1980-1990 (annual change in death rates);

β_2 = slope change after 1990;

X_{i1} = calendar year i ;

X_{i2} = indicator variable; 1 if $X_{i1} \geq 1990$; else $X_{i2} = 0$;

k = calendar year 1990; and

ξ = error term.

Results

Table 1: Estimated Annual Changes in Deaths per 100,000 by Cancer Type Illinois, 1980-1990, 1990-1995 or 1980-1995

Type	1980-90	1990-95	1980-95
All Cancer	0.33***	-1.20***	-
Oral Cavity	-	-	-0.08***
Stomach	-	-	-0.08***
Colon/rectum	-	-	-0.25***
Lung	0.44***	-0.08	-
Breast	0.03	-0.29***	-
Prostate	0.31***	-0.28*	-
Cervix	-	-	-0.04***
Hodgkin's	-	-	-0.02***
Non-Hodgkin's	-	-	0.07***
Myeloma	-	-	0.03**

†If a significant change occurred in 1990, separate estimates are provided for 1980-90 and 1990-95. Otherwise, one estimate is stated for the entire interval, 1980-95.

Figure 1 shows that the mortality trend of all cancers in Illinois follows the same pattern as the U.S. trend. Although the Illinois rate was higher than the U.S. rate, both started to decline in 1990.

Table 1 provides estimated annual changes in cancer deaths in Illinois. Beginning in 1980, there were 0.33 more cancer deaths per 100,000 population for each succeeding year until 1990. After 1990, there were 1.2 fewer cancer deaths each year.

Two cancer groups showed statistically discernible upward trends before 1990 (lung and prostate). Two groups showed downward trends after 1990 (breast and prostate). Five groups had continuous decreases over the entire period of 1980 to 1995 (oral, stomach, colon and rectum, cervix, and Hodgkin's disease). Two groups had continuous increases (Non-Hodgkin's disease and myeloma) (Table 1).

Together, the ups and downs of the 10 cancer groups in Table 1 explained 91 percent of the variation in overall cancer mortality in Illinois during 1980 to 1995.

Many changes were consistent between black and white

racial groups (Table 2). However, blacks had more pronounced increases before 1990, and decreases after 1990 for overall cancer mortality. Mortality from cervical cancer and Hodgkin's disease did not change and mortality from breast cancer continued to rise among blacks, while similar mortality declined among whites.

Nine out of the 10 cancer groups in Table 1 had trends that parallel the national trend for comparable cancer types. The only exception was lung cancer, which stopped increasing in 1990 but has only stabilized since then. This is in contrast to the national finding of declining lung cancer mortality.

Conclusions

Although the changing pattern of overall cancer mortality was the same in Illinois as that observed nationally, changes in specific cancer groups were different. Most notably, lung cancer mortality in Illinois is higher and has not shown the decline seen nationally. The distinct profile of the changing cancer mortality in Illinois needs to be recognized in planning local cancer control and prevention activities.

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Table 2: Race-specific Estimated Annual Changes in Deaths per 100,000 by Cancer Type Illinois, 1980-1990, 1990-1995 and 1980-1995

Cancer Type	Race	1980-90	1990-95	1980-95
All Cancer	White	0.15	-0.88***	-
	Black	1.90***	-3.0***	-
	Other	-	-	0.61*
Oral cavity	White	-	-	-0.07***
	Black	-	-	-0.13**
	Other	-	-	-0.07
Stomach	White	-	-	-0.80***
	Black	-	-	0.14**
	Other	-	-	0.01
Colon/rectum	White	-	-	-0.28***
	Black	0.23	-0.65*	-
	Other	-	-	-0.02
Lung	White	0.41***	-0.01	-
	Black	-	-	0.53**
	Other	-	-	0.19
Breast	White	0.01	-0.35***	-
	Black	-	-	0.19**
	Other	-	-	0.11
Prostate	White	0.09***	-0.07	-
	Black	0.35	-0.34*	-
	Other	-	-	0.04
Cervix	White	-	-	-0.04***
	Black	-	-	0.10
	Other	-	-	-0.03
Hodgkin's	White	-	-	-0.03***
	Black	-	-	0.01
	Other	-	-	0.01
Non-Hodgkin's	White	-	-	0.07***
	Black	-	-	0.08**
	Other	-	-	0.01
Myeloma	White	-	-	0.02**
	Black	-	-	0.06
	Other	-	-	0.01

† If a significant change occurred in 1990, separate estimates are provided for 1980-90 and 1990-95. Otherwise, one estimate is stated for the entire interval, 1980-95.

*p<0.05
 ** p<0.01
 *** p<0.001