

Human Cost

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Background

Mortality and survival rates give a partial picture of the burden of cancer deaths in a population. Years of life lost (YLL) due to premature death from cancer were calculated to further assess the burden of disease. The person-years of life lost (PYLL) is the sum of the difference between the actual age at death and the expected remaining lifetime for each person who died of cancer. This measure was estimated by linking life table data to each death of a person of a given age and sex. The life table is used to determine the number of additional years an average person of that age, race, and sex would be expected to live. The average years of life lost (AYLL) is a measure of the burden of cancer to the individual patient. The AYLL was obtained by dividing the PYLL by the number of cancer deaths.

For this report, PYLL and AYLL estimates for 2008 were produced using 2006 United States Life Tables, from the Centers for Disease Control and Prevention's National Center for Health Statistics US mortality files.^{1,2} The age groups used in the calculation were 1-year intervals. Average years of life lost were compared between blacks and whites for each cancer site. SEER estimates of AYLL for the United States were compared to estimates of Michigan's AYLL.³

Summary

Figure 1 shows the total number of person-years of life lost by cancer site in Michigan in 2008. The greatest number of person-years of life lost was due to lung cancer, which caused 91,319 total person-years. Colorectal cancer accounted for 26,568 total person-years of life lost and breast cancer accounted for 27,898 person-years of life lost. Prostate cancer cost 8,932 total years of life, ovarian cancer accounted for 8,427 total years of life, and cervical cancer was responsible for 3,020 person-years of life lost.

Figure 2 presents the total number of person-years of life lost by cancer site over time from 1994 to 2008. The total person-years of life lost has not changed drastically since 1994 for colorectal, breast, cervical, and prostate cancer. The total person-years of life lost from lung cancer did decrease in 2008 after gradually increasing since 1994.

Figure 3 shows average years of life lost by cancer site from 1994 to 2008. The greatest number of average years of life lost was due to cervical cancer, which decreased in 2008 after increasing in the previous four years. Breast cancer accounted for the second greatest number of average years of life lost, followed by lung cancer, colorectal cancer, and prostate cancer.

¹ National Center for Health Statistics. (2010). *United States Life Tables, 2006*; National Vital Statistics Reports; Vol 58 No 21. Retrieved at: http://www.cdc.gov/nchs/products/life_tables.htm.

² The 2006 Life Tables are the most recent year publicly available. The Life Tables for years 1997-2006 show expected years of life remaining for ages zero to 100. Life Tables for years 1985-1996 show expected years of life remaining for ages zero to 85. In order to calculate years of life lost prior to 1997, the years remaining in the 1997 Life Table for ages 86 to 100 years were used to estimate the years remaining for the 1985-1996 calculations.

³ National Cancer Institute. (2011). *SEER Cancer Statistics Review, 1975-2008*. Retrieved from: www.seer.cancer.gov/csr/1975_2008/index.html

Figure 4 presents the average years of life lost in Michigan in 2008 compared with the average years of life lost in the United States in 2007. The average numbers of years of life lost in Michigan were similar to those in the U.S. SEER estimates at each of the selected cancer sites. Although cervical cancer caused the fewest person-years of life to be lost in the total population cumulatively, it had the greatest average number of years of life lost among the six cancer sites. Breast cancer had the next highest average cost in years of life lost, followed by ovarian, lung, colorectal, and prostate cancer.

Figure 5 presents the average years of life lost by cancer site and race in Michigan in 2008. Compared to whites, blacks had a greater average of years of life lost for all the cancer sites. The greatest disparity between whites and blacks is from cervical cancer and the smallest disparity between whites and black in average years of life lost was from prostate cancer.

Other than years of life lost, estimates of the human costs of cancer are scant. Morbidity indicators for the cancer patient, such as loss of work or school time and periods of restricted activity due to the disease are difficult to measure. In addition, there are significant human and financial costs to family members and other caregivers who give up activities, opportunities, and income to provide assistance to cancer patients. To date, no such data have been identified for the cancers of interest.

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Figure 1: Total Person-Years of Life Lost due to Cancer by Cancer Site, Michigan 2008

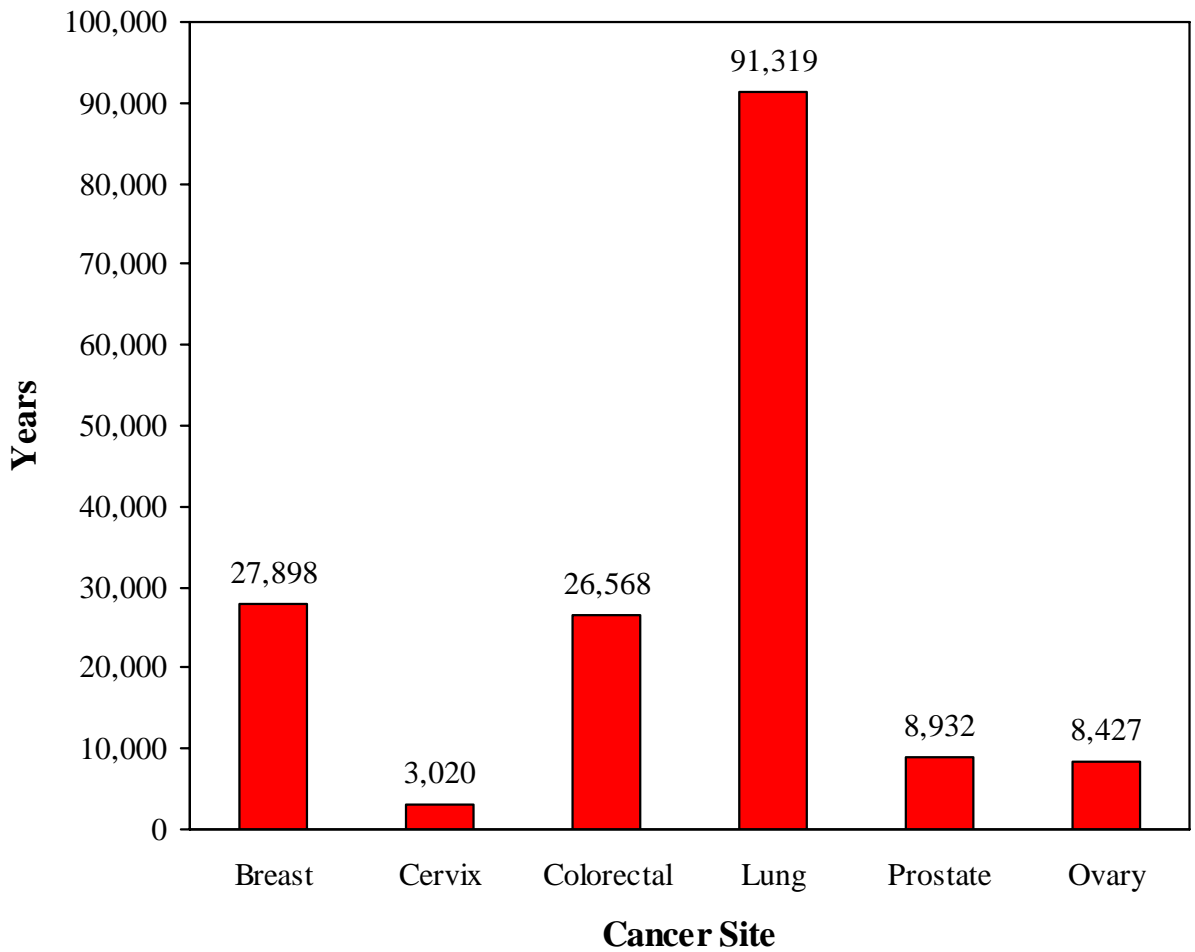


Figure 2: Total Person-Years of Life Lost due to Cancer Michigan, 1994-2008

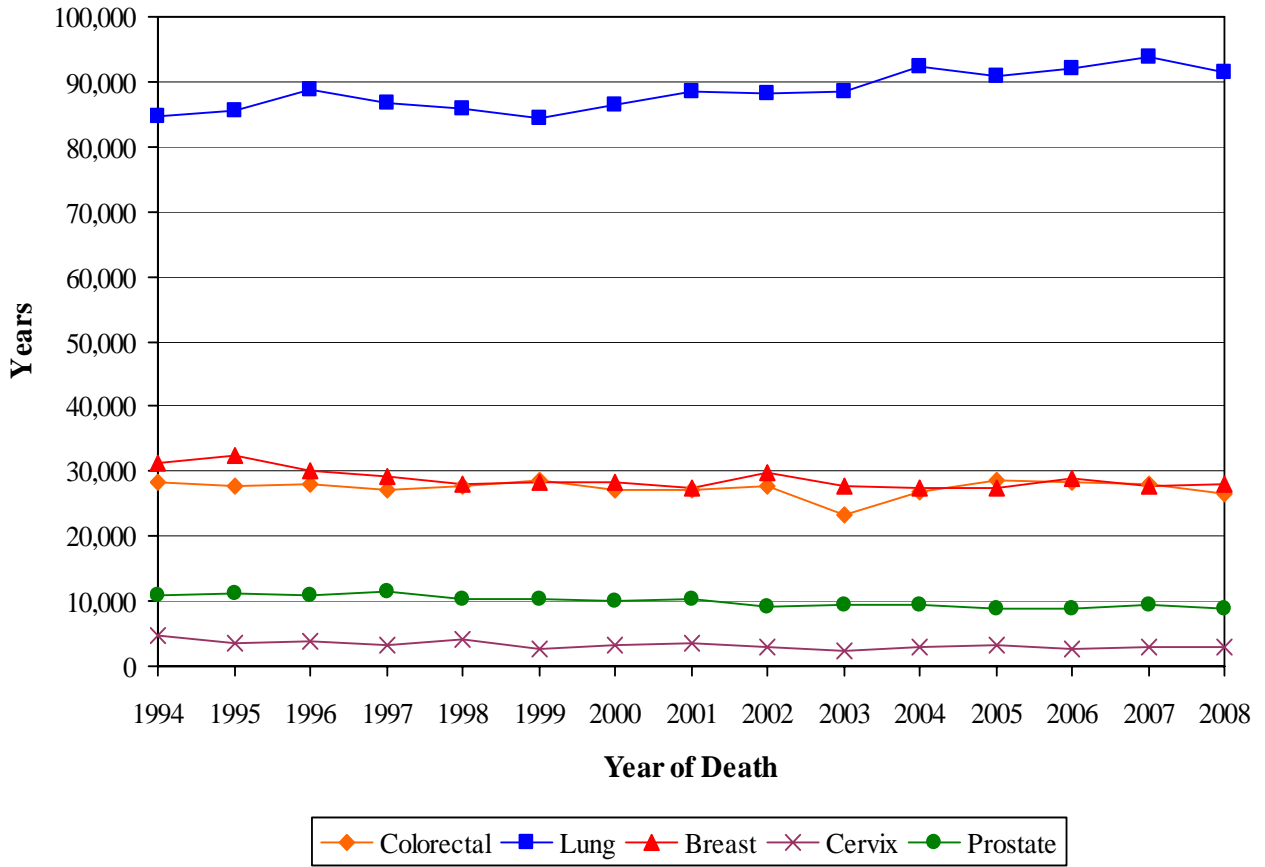


Figure 3: Average Years of Life Lost due to Cancer, Michigan 1994-2008

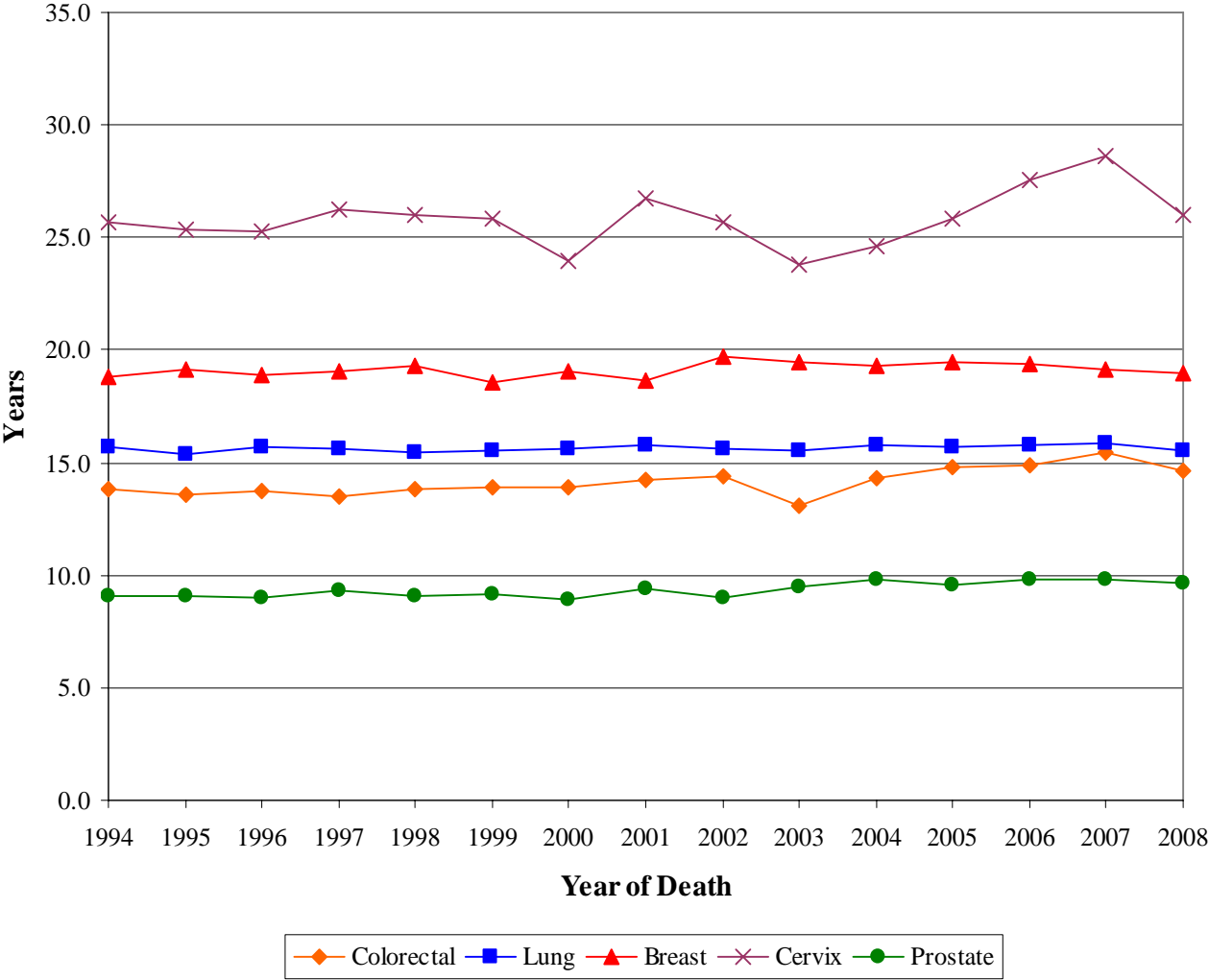


Figure 4: Average Years of Life Lost by Cancer Site, Michigan 2008 vs. US 2007

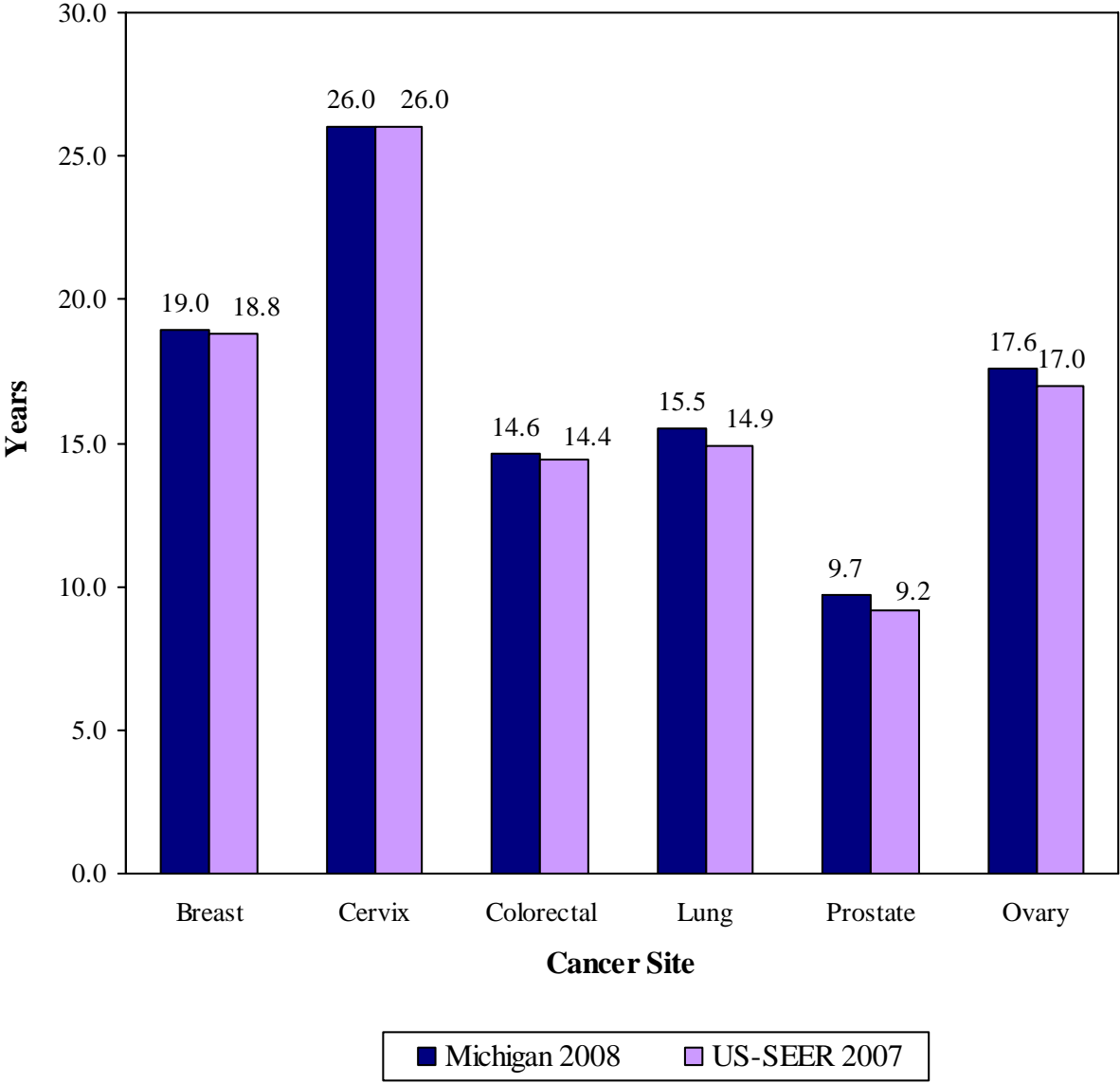


Figure 5: Average Years of Life Lost by Cancer Site and Race, Michigan 2008

