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Disparities in Breast and Cervical Cancer Incidence and Mortality Rates for Females in Illinois, 1996 – 2019

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Disparities in Breast and Cervical Cancer Incidence and Mortality Rates for Females in Illinois, 1996 – 2019



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**Disparities in Breast and Cervical Cancer Incidence and
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ABSTRACT

Cancer is the second leading cause of mortality in the U.S. In 2019, there were 134.7 new cases of breast cancer per 100,000 women in Illinois, and it led to 20.7 deaths per 100,000 Illinois women¹. It is the second leading cause of cancer mortality after lung cancer. There were 7.4 new cervical cancer cases per 100,000 women in Illinois in 2019 and 2.0 cervical cancer deaths per 100,000 women.¹ Breast and cervical cancers are both detectable through screening. Cervical cancer arising from HPV infection is also vaccine preventable. Between 1996 and 2019, there were 290,455 new cases of breast cancer and cervical cancer in female residents of Illinois. These made up 35% of total new malignant cancer cases for females in Illinois identified between 1998 and 2019. There were 287,219 deaths caused by all cancers in female residents in Illinois between 1996 and 2019. Deaths due to breast and cervical cancers made up 17% (48,658 deaths) of the total deaths from 1996 to 2019. The purpose of this report is to investigate disparities in incidence and mortality rates for breast cancer and cervical cancer by age, race and ethnicity group, stage at diagnosis, geographic region, and years of diagnosis and death using the Illinois State Cancer Registry (ISCR) incidence data and National Center for Health Statistics (NCHS) mortality data from 1996 to 2019.

Age-adjusted incidence and mortality rates for both cancers were calculated. Trend data were analyzed, and annual percent changes (ACPs) and average annual percent changes (AAPCs) calculated. Statistical significance was set at the 95% confidence level.

The overall age-adjusted incidence rate for breast cancer in females residing in Illinois from 1996 to 2019 was 130.6 cases per 100,000, and for cervical cancer was 9.0 cases per

100,000. Non-Hispanic White women had the highest incidence rate for breast cancer; however, non-Hispanic Black women had the highest mortality rate. Non-Hispanic Black women had the highest incidence and mortality rates for cervical cancer. Women living in suburban counties had the highest incidence rate for breast cancer, but women in Cook County (an urban county) had the highest mortality rate. For cervical cancer, women in Cook County had both the highest incidence and mortality rate. The incidence rate for breast cancer increased with age with women ages 70-79 years having the highest incidence rate. Women ages 40-49 years had the highest incidence rate for cervical cancer. Incidence rates for breast cancer have not significantly changed from 1996 to 2019 (annual percentage change: 0.1%), but the mortality rates have significantly decreased over the period (-1.9% annually). Both incidence rates and mortality rates for cervical cancer have significantly decreased from 1996 to 2019 (-2.2%, -2.1% annually).

Health disparities between sub-populations in Illinois exist for breast and cervical cancer. The observed disparities could be explained by risk factors not explored in this report, including utilization of health care services, such as mammography, access to health care, poverty, genetics, health behaviors, and socio-economic and environmental factors. Information in this report can be used to help focus public health efforts to reduce disparities seen in breast and cervical cancer.

INTRODUCTION

Cancer detection and prevention is important because cancer is the second leading cause of mortality in the U.S.¹ Breast cancer was the leading cause of new cancer cases among women living in Illinois (134.7 new cases per 100,000), and the second leading cause of cancer mortality (20.7 breast cancer deaths per 100,000) behind lung cancer in 2019.¹ For the same year, the incidence rate for cervical cancer was 7.4 cases per 100,000 women in Illinois, and the mortality rate for cervical cancer was 2.0 deaths per 100,000 women in Illinois.¹ Illinois ranks as the 19th highest state for cancer mortality and 21st (tie) highest state for cancer incidence in the United States.^{1,2} In 2019, Illinois had the 12th highest breast cancer mortality rate among U.S. states.¹ For cervical cancer mortality rates, Illinois ranked 21st in 2019.¹ The female breast cancer death rate for Illinois is higher than the Healthy People 2030 objective, which aims to reduce female breast cancer death rate to 15.3 deaths per 100,000.³

The purpose of this report is to investigate disparities in incidence and mortality rates for breast cancer and cervical cancer by age, race and ethnicity group, stage at diagnosis, geographic region, and years of diagnosis and death through use of the Illinois State Cancer Registry (ISCR) incidence data and National Center for Health Statistics (NCHS) mortality data from 1996 to 2019. Examination of the incidence and mortality associated with cancers that have effective screening measures, such as breast and cervical cancers, can reveal sub-populations that may have reduced access to, or utilization of screening services.

METHODS

Cancer incidence data utilized in this report came from the ISCR. The ISCR is the only source for Illinois population-based cancer incidence data and has attained the North American Association of Central Cancer Registries Gold certification for the past 24 diagnosis years (1996-2019) and is a Centers for Disease Control and Prevention (CDC) - National Program of Cancer Registries “Registry of Excellence.” Incidence data came from the ISCR as of November 2021.¹⁰ Mortality data came from the National Center of Health Statistics as of April 2021.¹¹ Breast cancer and cervical cancer incidence and mortality rates were analyzed for female residents of Illinois who were diagnosed with, or died from, these cancers between 1996 and 2019. Age-adjusted incidence and mortality rates for both cancers were calculated in SEER-Stat (version 8.4.0).⁹ ICD-O-3 codes used for defining cases are listed in Appendix A. Incidence and mortality data for breast cancer were limited to malignant cases for most analysis, except for examinations of cancer incidence by stage of disease. Temporal trends were analyzed using the Joinpoint Regression Program to examine the annual percent change (APC) and average annual percent change (AAPC) for incidence and mortality rates for breast and cervical cancers by year of diagnosis or year of death from 1996 to 2019.⁸ Joinpoint software fits several regression lines through various segments of the study timeframe and selects the best fit for slopes and change points. An annual percent change describes the slope of the fitted regression line from one year to the next; the average annual percent change is the average of all annual percent changes for an entire time-period. Age-adjusted rates were calculated per 100,000 Illinois-resident women and age-adjusted using the 2000 U.S. standard population.⁹ Reference groups for the rate ratios are indicated in the tables. Differences in rates were determined to be

significant if the associated p-value is less than 0.05. Incidence rates are reported if the number of cases in a subgroup exceeds 16 cases. Mortality rates are reported if the number of deaths in a subgroup exceeds 10 deaths. These thresholds are chosen to ensure stability of rates and confidentiality in accordance with the standards of ISCR and NCHS.^{10,11}

Age-adjusted incidence rates for breast and cervical cancer were examined by race and ethnicity groups, stage at diagnosis, ISCR county groups (described in Appendix B), age groups, and year of diagnosis from 1996 to 2019.¹⁰ Age-adjusted mortality rates for both cancer sites were examined by race and ethnicity groups, ISCR county groups, age groups, and year of death from 1996 to 2019.¹¹ Race and ethnicity groups included non-Hispanic White (NHW), non-Hispanic Black (NHB), non-Hispanic Other (NHO) race (which included Alaska Native, American Indian, Asian, and Pacific Islander), and Hispanics. Age groups are approximately 10-year age groups starting at 18-29 years of age to 80 years and older for incidence rates. Age groups for mortality rates start at 20-29 years and end at 80 years and older. The youngest age group for incidence data differed from the youngest age group for mortality data due to age grouping in the original data sources. Stage groups included in situ (breast only), localized, regional, distant, and unknown. SEER Historic A staging was used for staging groups to ensure comparability over the time.

RESULTS

Breast Cancer

The age-adjusted incidence rate for breast cancer in females residing in Illinois from 1996 to 2019 was 130.6 cases per 100,000 women with a total of 224,045 cases during this

period (Table I).¹⁰ NHW women had the highest age-adjusted rate during 1996-2019 with 135.4 cases per 100,000, followed by NHB women with 129.7 cases per 100,000, NHO race women with 106.6 cases per 100,000, and finally Hispanic women with a rate of 93.4 cases per 100,000 (Table I). All race/ethnicity groups differed significantly from each other. When stratified by ISCR county groups (described in Appendix B), suburban counties had the highest incidence rate for breast cancer (137.3 cases per 100,000 women), while rural counties had the lowest incidence rate for breast cancer with 124.2 cases per 100,000 (Table I). For summary stage groups, the highest incidence rate for breast cancer cases was among cases diagnosed at a localized stage (80.4 cases per 100,000), and the lowest incidence rate was for cases diagnosed at an unknown stage (3.8 cases per 100,000) (Table I). Breast cancer incidence rates increase as age group increases with women ages 70 to 79 years having the highest incidence rate (464.4 cases per 100,000) (Table II).

NHO race women had the highest incidence rate (33.0 cases per 100,000) for in situ cases, however, NHW women did not have a significantly different rate for this stage (32.0 cases per 100,000) (Figure I). NHW women had the highest incidence rate for localized cases (85.6 cases per 100,000); however, NHB women had the highest incidence rate for regional cases (44.0 per 100,000), and distant cases (11.3 per 100,000), and cases diagnosed at an unknown stage (5.3 cases per 100,000) (Figure I).

In the analysis of incidence rates by age groups and by race/ethnicity groups, NHB women had the highest incidence rate for age groups 18-29 years and 30-39 years as seen in Table III, however, NHW women had the highest incidence for all other age groups. The highest incidence rate for breast cancer in all race/ethnicity groups was for women ages 70-79 years

(Table III). The incidence rate for NHW women in this age group was 483.4 cases per 100,000, whereas the incidence rate for Hispanic women for the same age group was 304.2 cases per 100,000. Differences between race/ethnicity groups increased as age group increased, shown in Table III.

NHW women had the highest incidence rate in Cook County (urban) (139.1 cases per 100,000), suburban counties (143.2 cases per 100,000), and small urban counties (134.1 cases per 100,000) (Table IV). NHO race women (124.7 cases per 100,000) had a slightly higher incidence rate for rural counties compared to NHW women (124.4 cases per 100,000), however, the difference is not significant (Table IV). For NHB women, the highest incidence rate occurred in women in Cook County (Table IV). Both NHO race women and Hispanic women had the highest incidence rate among those living in rural counties (Table IV).

Trend data for age-adjusted incidence rates for breast cancer are shown in Figure II. The APC for breast cancer incidence rates was 2.0% from 1996 to 1999, -3.1% from 1999 to 2003, and 0.6% from 2003 to 2019 (Table V). The APCs for 1999-2003 and 2003-2019 were significantly different from zero. The AAPC was 0.1% and was not significantly different from zero, so there was no significant change in breast cancer incidence rates from 1996 to 2019 (Table V). Trend data for breast cancer incidence rates by race/ethnicity groups are seen in Figure III. The trend for breast cancer incidence rates increased significantly in NHB women (0.5% annually, Table V). No other race/ethnicity groups had significant AAPCs during this time. Trends for breast cancer incidence rates stratified by stage are shown in Figure IV. Localized cases had the highest AAPC of 0.6% (Table V). Neither localized, nor distant case incidence rates have changed significantly from 1996 to 2019. Both regional and unknown stage cases

significantly decreased during this timeframe, while breast cancer in situ cases significantly increased (1.6% annually, Table V).

The overall age-adjusted mortality rate for women in Illinois from 1996 to 2019 for breast cancer was 24.6 deaths due to breast cancer per 100,000 deaths (Table VI). There were 44,146 deaths caused by breast cancer during 1996-2019.¹¹ When stratified by ISCR county groups, women in Cook County had the highest breast cancer mortality rate (26.5 deaths per 100,000) shown in Table VI. The mortality rate for Cook County was significantly higher than other county group rates. Mortality rates for breast cancer increased significantly as age group increased, similar to the incidence rates. The breast cancer mortality rate for those ages 20-29 years was 0.5 deaths per 100,000 while the mortality rate for those 80 years or older was 165.6 deaths per 100,000 (Table VII).

NHB women had the highest breast cancer mortality rate between 1996 and 2019 (34.8 deaths per 100,000) (Table VI). NHO race women had the lowest breast cancer mortality rate during this same period (11.1 deaths per 100,000). NHB women had the highest mortality rate for all age groups (Table VIII). There were insufficient data to calculate breast cancer mortality rates for NHO race women ages 20 to 29 years. Hispanic women and NHO race women had the lowest breast cancer mortality rates for all age groups except among women ages 20-29 years old (Table VIII). The highest breast cancer mortality rate for all race and ethnicity groups was for those ages 80 years and older. NHB women had the highest breast cancer mortality rate for every county group as shown in Table IX. Most race and ethnicity groups had the highest breast cancer mortality rates for those in Cook County; Hispanic women had the highest breast cancer mortality rate in small urban counties (Table IX). The lowest breast cancer mortality rates for

NHW women and NHO race women were in those residing in small urban counties. NHB women had the lowest breast cancer mortality rate among those in suburban counties. Lastly, Hispanic women in rural counties had the lowest breast cancer mortality rate (Table IX).

The trends for mortality rates for breast cancer from 1996 to 2019 are shown in Figure V and Table X. The APC for breast cancer mortality rates from 1996 to 2006 was -2.6% annually and decreased to -1.4% annually from 2006 to 2019. The breast cancer mortality rates decreased significantly (AAPC = -1.9). Trends for breast cancer mortality rates stratified by race/ethnicity groups are shown in Figure VI and Table X. NHW women (-1.9% annually) and NHB women (-1.3% annually) had significantly decreasing breast cancer mortality rates. The APCs for NHO race women and Hispanic women did not differ significantly from zero.

Cervical Cancer

The incidence rate of cervical cancer in females residing in Illinois, from 1996 to 2019 was 9.0 per 100,000 women. A total of 14,289 cervical cancer cases during this period (Table I). NHB women had the highest cervical cancer incidence rate among the race/ethnicity groups (13.5 cases per 100,000), followed by Hispanic women (12.4 cases per 100,000), NHW women (7.9 cases per 100,000), and NHO race women (7.5 cases per 100,000 women) (Table I). Incidence rates did not differ significantly between Hispanic women compared to NHB women, and between NHO race women and NHW women (Table I). Cook County had the highest incidence rate (10.1/100,000) among the ISCR county groups (Table I). The lowest cervical cancer incidence rate occurred in suburban counties (6.8 cases per 100,000). Cervical cancer cases diagnosed at a localized stage had the highest rate (4.3 cases per 100,000) by stage; the

lowest cervical cancer incidence rate was seen in cases diagnosed with an unknown stage (0.5 cases per 100,000) (Table I). By age group, women aged 40 to 49 years had the highest cervical cancer incidence rate of 16.5 cases per 100,000 women (Table II).

Among the race/ethnicity groups, Hispanic women had the highest cervical cancer incidence rate for localized cases (6.0 cases per 100,000) (Figure VII). NHB women had the highest cervical cancer incidence rate for regional cases (5.4 cases per 100,000) and distant cases (1.7 cases per 100,000) (Figure VII).

Among race/ethnicity groups, NHB women had the highest cervical cancer incidence rates for all age groups except ages 60-69 years and 70-79 years, for which Hispanic women had a higher incidence (Table III). Among NHW women, the highest cervical cancer incidence rate was seen in those ages 40-49 years old. Cervical cancer incidence rates rose with age among NHB women, with the highest rates in those ages 80 years and older. A similar pattern was seen in NHO women and Hispanic women, with the highest cervical cancer incidence rates in those ages 70-79 years (Table III).

NHB women and Hispanic women had significantly higher cervical cancer incidence rate in Cook County compared to the other groups (14.4 cases, and 13.3 cases per 100,000 respectively, Table IV). There were similar findings in suburban (NHB 9.0 per 100,000, Hispanic 10.0 per 100,00) and small urban counties (NHB 11.6 per 100,000, Hispanic 12.9 per 100,000 (Table IV). NHO race women had the highest cervical cancer incidence rate for rural counties (15.2 cases per 100,000), but the rate did not differ significantly from NHB women and Hispanic women in the same group (Table IV). In rural counties, the highest cervical cancer incidence

rate was seen in NHO women (Table IV). For NHB women, the highest cervical cancer incidence rate was seen in Cook County, while Hispanic women experienced the highest incidence rates in rural counties.

There were 4,512 deaths caused by cervical cancer in Illinois women from 1996 to 2019; the overall age-adjusted mortality rate was 2.7 deaths due to cervical cancer per 100,000 women (Table VI). In the study timeframe, NHB women had the highest mortality rate for cervical cancer (5.3 deaths per 100,000), while NHO race women had the lowest cervical cancer mortality rate. Women in Cook County had a significantly higher cervical cancer mortality rate (3.2 deaths per 100,000) when compared to the other county groups (Table VI). As age increased, the mortality rate for cervical cancer also increased (Table VII). The cervical cancer mortality rate for those who were 20-29 years was 0.4 deaths per 100,000 and was 8.0 deaths per 100,000 for those who were 80 years and older (Table VII). NHB women had the highest cervical cancer mortality rate among all age groups (Table VIII) and in each county group (Table IX).

Trend data for cervical cancer age-adjusted incidence rates are shown in Figure II, and Table XI. Cervical cancer incidence rates declined significantly between 1996 and 2019 (AAPC= -2.2%). All race groups showed a significant decrease, with the biggest decline seen among NHO race women (Figure IX and Table XI). Trend data for cervical cancer incidence rates stratified by stage at diagnosis have changed significantly during this timeframe as seen in Figure VII. Cases diagnosed at a localized stage (-2.7% annually), regional stage (-2.0% annually), and unknown stage (-5.7% annually) have significantly decreased from 1996 to 2019 (Table XI). Only cases

diagnosed at a distant stage for cervical cancer have increased significantly (1.0% annually) (Table XI).

The mortality rates for cervical cancer significantly decreased by 2.1% annually during the timeframe (Figure X and Table XII). NHW women (-1.5% annually) and NHB women (-2.8% annually) had significantly decreasing cervical mortality trends (Table XII). There were not sufficient data to create trend data for the other two race/ethnicity groups.

DISCUSSION

Breast Cancer

In this analysis, trends for breast cancer by stage at diagnosis show that the rate of cases diagnosed in situ increased significantly during the study period; this is consistent with an increase in the uptake of screening services since 1996. Over the same timeframe, the number of breast cancer cases diagnosed at the regional stage have decreased, while cases diagnosed at a localized or distant stage have not significantly changed. Despite NHW women having a higher overall incidence rate for breast cancer, NHB women were more likely to have been diagnosed at later stages of breast cancer, and to have higher mortality rates compared to all other women. NHO race women and Hispanic women had higher incidence rates for localized and regional breast cancer than in situ breast cancer incidence rates. Females in these race/ethnicity groups may not have been receiving timely screening. Between 1996 and 2019, breast cancer incidence was highest in suburban areas, and small urban areas, and was lower in Cook County and rural areas. Mortality due to breast cancer, however, was highest in Cook

County. The same race/ethnicity patterns of breast cancer incidence and mortality that were seen in the state as a whole were also observed in each county group.

Screening recommendations provided by the U.S. Preventive Services Task Force (USPSTF) recommend screening mammography every two years for women ages 50 to 74 years with an average risk of developing breast cancer. There are no specific screening recommendations for women ages 40 to 49 years, but the USPSTF suggest the decision should be made by the individual. The risk for overdiagnosis and overtreatment increases in women ages less than 50 years, however, women with a first degree relative who was diagnosed with breast cancer can benefit from beginning mammograms in their 40's. For women ages 75 years and older, there is again insufficient evidence to screening make recommendations.⁴

The Behavioral Risk Factor Surveillance System (BRFSS) from 2020 estimated that 28.2% of Illinois women ages 40 years and older had not received a mammogram within the past two years (95% CI: 24.8%-31.8%).¹² This was a slight increase from 2018 (26.9%, 95% CI: 24.5% - 29.5%).¹² This change may be due to the COVID-19 pandemic since many health care facilities had to shut down temporarily. The 2020 BRFSS indicated that NHB women aged 40 years or older were most likely to have received a mammogram within the previous two years (80.4%), while only 72.4% of NHW women had received one.¹² BRFSS data about screening were not available for Hispanic nor other race women. The Healthy People 2030 goal for breast cancer screening is to increase screening coverage for females ages 50 to 74 years to 80.5% by 2030.³ Illinois is close to achieving this goal in NHB women but has a substantial way to go before reaching it in NHW women. According to BRFSS 2020 data, screening rates do not differ greatly between different county groups: 72.5% of women ages 40 years or older residing in Cook

County received a mammogram in the previous two years, while about 71.9% of women in collar counties and 71.1% of women in the rest of the state had not received a mammogram in the previous two years.¹²

The observed race/ethnic and geographical disparities in age-adjusted breast cancer incidence and mortality rates are likely to be the result of many different factors that could include; changes in utilization of screening services over the study time period, environmental, genetic, socio-economic, and behavioral factors such as diet and smoking history.

Cervical Cancer

In contrast to breast cancer, the race/ethnic patterns of incidence and mortality observed in this study were consistent. NHB women had the highest age-adjusted incidence rates for cervical cancer overall, for diagnosis at regional and distant stages, and the highest mortality rate due to cervical cancer. Hispanic women had the second highest incidence and mortality rates. Similar patterns were observed when stratifying incidence and mortality by county group. Incidence rates of cervical cancer were greatest between the ages of 40 and 69 years. When considering geography, the observed cervical cancer incidence and mortality rates are higher in Cook County and rural counties (opposite the pattern seen with breast cancer). The incidence rates for cervical cancer cases diagnosed at localized and regional stages have been significantly decreasing during this period, while the rate of cases diagnosed at a distant stage have been stable.

USPSTF screening recommendations for cervical cancer includes the Papanicolaou (Pap) tests and high-risk human papillomavirus (hrHPV) tests.⁵ USPSTF does not recommend

screening for cervical cancer for women younger than 21 years, women older than 65 years who are not at high-risk for cervical cancer and have had adequate screening previously, nor women who have had a hysterectomy with the cervix removed with no history of high-grade precancerous lesions or cervical cancer.⁵ For women ages 21-29 years, USPSTF recommends screening every three years for cervical cancer with cytology alone.⁵ Women ages 30 to 65 years of age are recommended to get screening for cervical cancer every three years with cytology alone, every five years with high-risk human papillomavirus (hrHPV) testing alone, or a combination of hrHPV and cytology testing every five years.⁵ Women who are vaccinated against HPV should still be screened for cervical cancer.⁵

BRFSS 2020 data demonstrate that Black women, and those living in Cook County have the lowest screening rates. Overall, 27.9% (95% CI: 23.9% - 32.3%) of women aged 21 to 65 years had not received a Pap test in the past three years.¹² This is a concerning and significant increase from the percentage of women who had not been screened (20.7%, 95% CI: 18.3%-23.3%).¹² Again, the disruption in health care services due to the COVID-19 pandemic may have contributed to this decline in screening. About 75.6% of NHW women in the target age group received a Pap test within the previous three years, while 73.6% NHB women had been screened.¹² BRFSS screening data were not available for NHO race women and Hispanic women. In 2020, about 69.3% of women ages 21 to 65 years in Cook County had not received a Pap test in the previous three years.¹² This percentage was lower than those residing in collar counties (74.4%) and in the rest of the state (74.5%).¹² The Healthy People 2030 goal on cervical cancer screening for females aims to increase the proportion of females ages 21 to 65 years who have been screened to 84.3%.³ Every race/ethnicity and geography were lower than

this goal. Differences in screening rates are unable to provide the full explanation of the observed disparities in cervical cancer incidence and mortality. Additional factors could be related to genetic, environmental, socio-economic, and behavioral factors.²⁰

Cervical cancer is caused by human papillomavirus (HPV) for about 90% of cases, and is transmitted through sexual contact.²¹ Sometimes, HPV infections are self-limiting and do not cause any disease. Some HPV infections can lead to less severe manifestations such as benign warts or cervical lesions, but some infections can lead to malignant cancers such as cervical cancer.⁷ HPV vaccines help reduce the number of cervical cancer cases caused by HPV. Vaccination was first recommended in the U.S. in 2006.⁶ In the United States, the only HPV vaccine currently distributed is the 9-valent HPV vaccine (Gardasil 9 or 9vHPV).⁷ This vaccine was approved by the Food and Drug Administration in December 2014 and provides protection against HPV types 6, 11, 16, 18, 31, 33, 45, 52, and 58.⁶ HPV vaccination is recommended for children ages 11 or 12 years, although vaccination can start at the age of 9 and continue until age 26.⁶ Individuals who are 27 to 45 years can still receive the vaccines based on their physician's recommendation, although it will not provide the same benefit since individuals in this age group most likely have already been exposed to the virus.⁶ Depending on the age of the individual receiving the vaccine, they may receive two or three doses. For children receiving the vaccine prior to their 15th birthday, only two doses are recommended unless they are immunocompromised.⁶ Those who start their vaccination series from ages 15 years to 26 years are recommended to receive three doses.⁶ Data from the CDC from 2020 showed that about 63.1% of children ages 13 to 17 years in Illinois were up to date on their HPV

vaccination.¹³ Although this prevalence is higher than previous years, it is still not close to the Healthy People 2030 goal of 80% coverage in the U.S.³

Both breast cancer and cervical cancer are screen-preventable cancers, with early detection leading to a better prognosis. Effective screening measures exist to reduce the burden and deaths from those cancers. The Illinois Breast and Cervical Cancer Program (IBCCP) provides free screening services and treatment benefits to eligible women in Illinois. Receiving timely screening for breast and cervical cancer is important for early detection and effective treatment options. Studies have shown the importance of screening services to decrease the number of deaths due to cancer.¹⁵⁻¹⁸ Programs such as IBCCP can help women with a risk of developing breast and cervical cancer receive the screening services and treatment needed to help reduce the burden of these diseases.

Limitations

Although this analysis was able to observe several health disparities in breast and cervical cancer rates between sub-populations in Illinois, there were still several limitations. First, this analysis does not fully capture the extent of health disparities in Illinois for cancer screening. There could be other factors that could lead to these disparities, such as behavioral, genetic, and environmental influences. For example, Black women diagnosed with breast cancer at age 35 years or younger are at an increased risk for having breast cancer gene mutation (mutations in BRCA1 or BRCA2 genes).¹⁴ In addition, smoking is a behavioral risk factor that increases the risk for breast cancer in younger, premenopausal women. Women who smoke are at an increased risk for developing cancer.¹⁴ Lastly, ISCR data does not include

data on screening practices of cancer patients, so it is difficult to ascertain a clear association between screening and cancer incidence or mortality.

CONCLUSION

Although some incidence and mortality rates have significantly decreased for breast and cervical cancer, some rates have remained steady throughout this period. Disparities exist between sub-populations by stage, geographic region, age, and race and ethnicity group. Disparities identified in this report could be a focal point for public health intervention efforts. Utilizing robust surveillance methods using high-quality registry data is important in the continuation of monitoring racial and ethnic disparities in breast and cervical cancer incidence and mortality data in Illinois.

Both breast and cervical cancer screening rates and HPV vaccination rates are below the Healthy People 2030 goals. Public health interventions should continue focusing on increasing screening rates for at-risk populations to help reduce cancer mortality and health disparities. Increasing HPV vaccination among adolescents in Illinois could help reduce the disparities in sub-populations with respect to cervical cancer incidence and mortality.

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TABLES AND FIGURES:

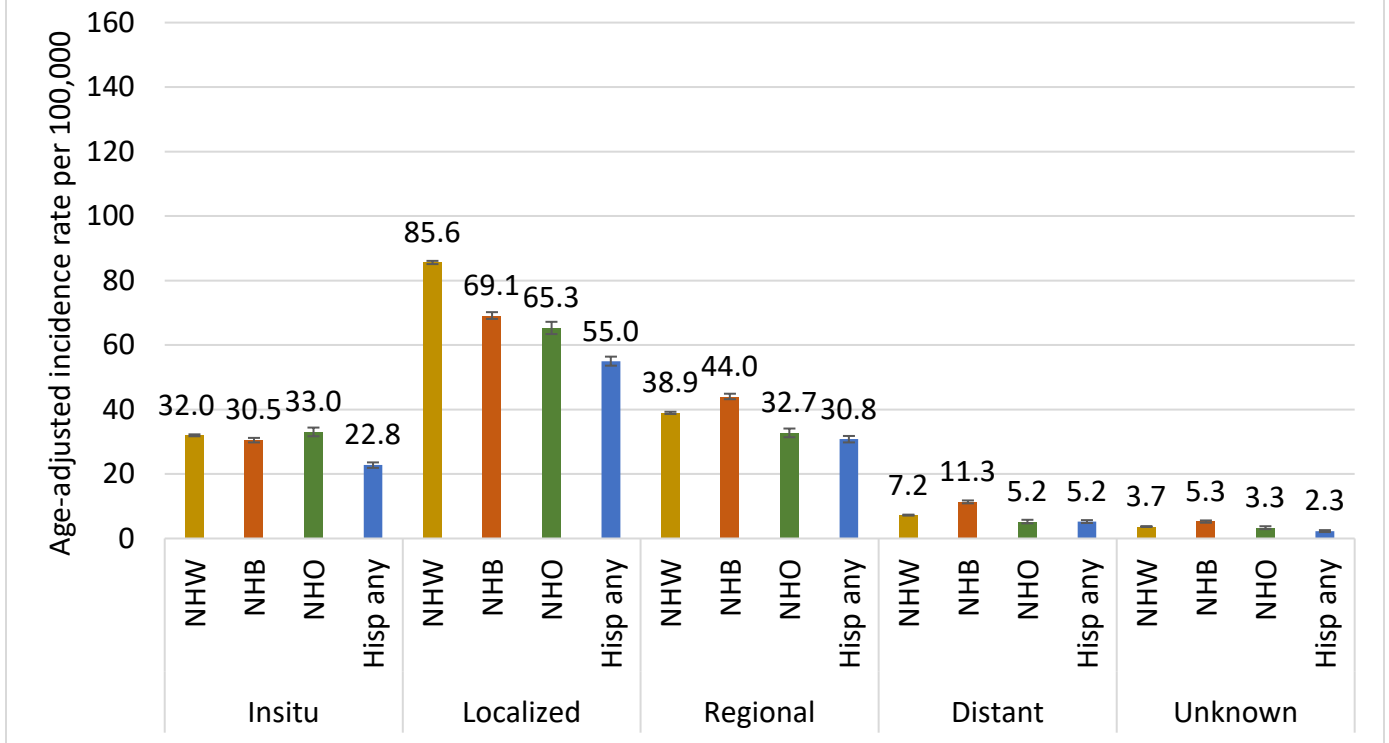
Table I. Breast Cancer and Cervical Age-Adjusted Incidence Rates by Race/Ethnicity, ISCR County Groups, and Summary Stage, Females, Illinois, 1996 to 2019						
Characteristics	Breast Cancer			Cervical Cancer		
	Rate	95% CI	Count	Rate	95% CI	Count
<i>Illinois Race/ethnicity</i>	130.6	130.0-131.1	224,045	9.0	8.8-9.1	14,289
<i>Non-Hispanic White*</i>	135.4	134.7-136.0	174,543	7.9	7.7-8.0	8,764
<i>Non-Hispanic Black</i>	129.7 ⁺	128.3-131.2	29,726	13.5 ⁺	13.0-14.0	3,079
<i>Non-Hispanic Other Race</i>	106.6 ⁺	104.1-109.0	7,657	7.5	6.9-8.2	556
<i>Hispanic any</i>	93.4 ⁺	91.6-95.2	12,119	12.4 ⁺	11.8-13.0	1,890
<i>ISCR County Groups</i>						
<i>Urban*</i>	129.3	128.5-130.2	90,382	10.1	9.9-10.4	6,748
<i>Suburban</i>	137.3 ⁺	136.1-138.5	51,195	6.8 ⁺	6.6-7.1	2,500
<i>Small urban</i>	132.1 ⁺	130.8-133.4	40,822	8.7 ⁺	8.4-9.1	2,406
<i>Rural</i>	124.2 ⁺	123.0-125.5	41,646	9.7	9.4-10.1	2,635
<i>Summary Stage</i>						
<i>In situ</i>	31.0	30.7-31.3	52,121	-	-	-
<i>Localized*</i>	80.4	80.0-80.8	138,560	4.3	4.2-4.4	6,677
<i>Regional</i>	38.8 ⁺	38.5-39.1	65,186	3.1 ⁺	3.0-3.2	5,013
<i>Distant</i>	7.6 ⁺	7.5-7.7	13,204	1.0 ⁺	1.0-1.1	1,738
<i>Unknown</i>	3.8 ⁺	3.7-3.9	7,095	0.5 ⁺	0.5-0.5	861
<p>Data Source: Illinois State Cancer Registry data as of November 2021. Only the summary stage data includes breast cancer in situ (non-malignant) cases. Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard. ⁺ Rate significantly differs from referent group. - Rate not available due to no cases in specific strata * Referent group</p>						

Table II. Malignant Breast and Cervical Cancer Age-Adjusted Incidence Rates by Age Group, Females, Illinois, 1996 to 2019

Characteristics	Breast Cancer			Cervical Cancer		
	Rate	95% CI	Count	Rate	95% CI	Count
Age Groups						
<i>18 - 29 years</i>	4.6	4.3-4.9	1,180	2.8	2.6-3.0	720
<i>30 - 39 years</i>	47.7	46.8-48.6	10,003	12.9	12.4-13.4	2,743
<i>40 - 49 years</i>	157.9	156.2-159.6	34,748	16.5	16.0-17.1	3,582
<i>50 - 59 years</i>	259.9	257.6-262.2	50,719	15.0	14.5-15.6	2,897
<i>60 - 69 years</i>	387.2	384.0-390.5	53,764	15.3	14.7-16.0	2,134
<i>70 - 79 years</i>	464.4	460.1-468.7	44,375	14.0	13.3-14.8	1,341
<i>80+ years</i>	414.2	409.5-419.1	29,249	12.3	11.5-13.2	865

Data Source: Illinois State Cancer Registry data as of November 2021.
 Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Figure I. Breast Cancer Incidence by Stage and Race/Ethnicity, Females, Illinois, 1996-2019



Data source: Illinois State Cancer Registry data as of November 2021

Rates are per 100,000 women and age-adjusted to the 2000 US population standard.

NHW=Non-Hispanic White; NHB=Non-Hispanic Black; NHO= Non-Hispanic Other races.

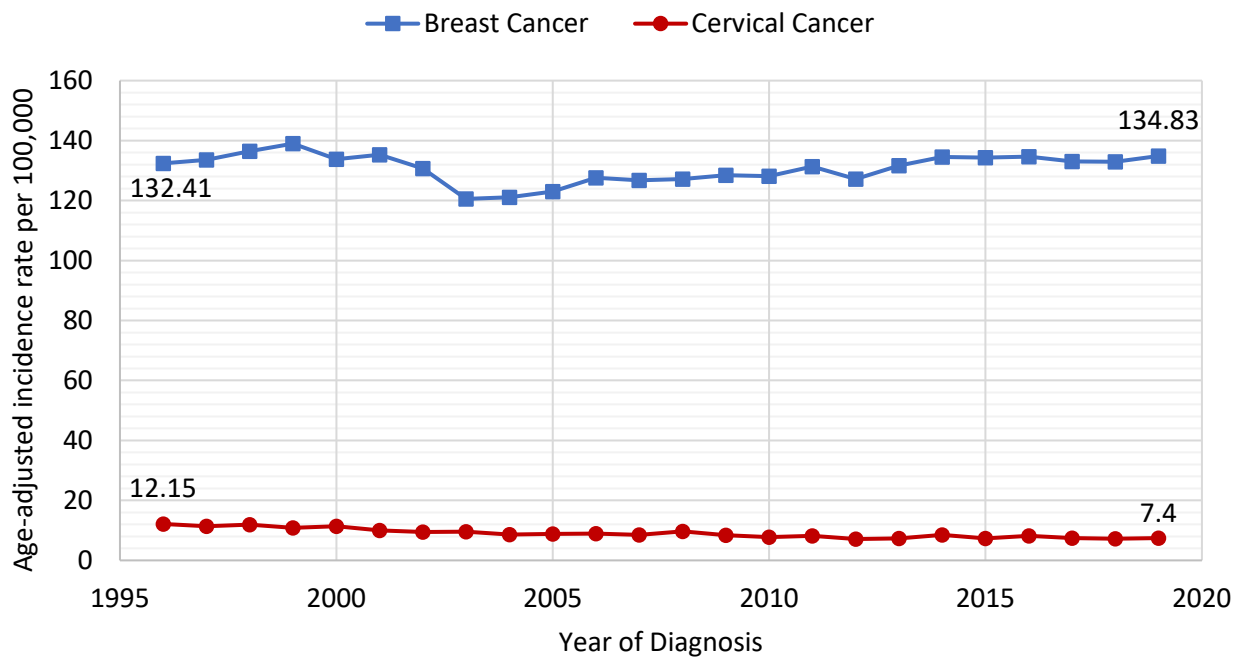
Table III. Malignant Breast and Cervical Cancer Incidence by Race/Ethnicity, and Age Groups, Females, Illinois, 1996 to 2019							
Characteristics		Breast Cancer			Cervical Cancer		
		Rate	95% CI	Count	Rate	95% CI	Count
<i>Age</i>	<i>Race/ethnicity</i>						
18-29 years	<i>NHW*</i>	4.4	4.1-4.7	667	2.8	2.5-3.0	424
	<i>NHB</i>	6.5 ⁺	5.8-7.3	273	4.0 ⁺	3.4-4.6	166
	<i>NHO</i>	4.2	3.3-5.4	71	1.6 ⁺	1.0-2.3	25
	<i>Hispanic</i>	3.7	3.1-4.3	169	2.3	1.9-2.8	105
30 - 39 years	<i>NHW*</i>	49.2	48.0-50.4	6,472	12.5	11.9-13.1	1,664
	<i>NHB</i>	56.2 ⁺	53.6-58.8	1,819	15.6 ⁺	14.3-17.0	512
	<i>NHO</i>	45.0	41.3-48.8	577	8.5 ⁺	7.0-10.3	113
	<i>Hispanic</i>	34.5 ⁺	32.5-36.6	1,135	13.5	12.3-14.8	454
40 - 49 years	<i>NHW*</i>	164.4	162.4-166.5	24,634	14.2	13.6-14.8	2,075
	<i>NHB</i>	156.8 ⁺	152.5-161.1	5,219	24.1 ⁺	22.5-25.9	800
	<i>NHO</i>	156.5	149.2-164.0	1,738	12.6	10.6-14.9	139
	<i>Hispanic</i>	122.2 ⁺	118.0-126.5	3,157	21.9 ⁺	20.1-23.8	568
50 - 59 years	<i>NHW*</i>	268.0	265.3-270.7	37,975	12.6	12.0-13.2	1,768
	<i>NHB</i>	264.8	258.8-270.9	7,449	23.7 ⁺	21.9-25.5	664
	<i>NHO</i>	240.5 ⁺	230.3-251.0	2,117	12.9	10.6-15.5	112
	<i>Hispanic</i>	193.0 ⁺	186.4-199.9	3,178	21.5 ⁺	19.3-23.9	353
60 - 69 years	<i>NHW*</i>	403.5	399.7-407.4	42,270	12.7	12.1-13.4	1,337
	<i>NHB</i>	375.8 ⁺	367.2-384.6	7,182	24.8 ⁺	22.6-27.1	475
	<i>NHO</i>	308.9 ⁺	294.9-323.4	1,847	15.1	12.2-18.6	92
	<i>Hispanic</i>	272.8 ⁺	262.1-283.9	2,465	25.0 ⁺	21.9-28.5	230
70 - 79 years	<i>NHW*</i>	483.4	478.5-488.4	36,850	11.4	10.7-12.2	872
	<i>NHB</i>	439.0 ⁺	427.0-451.2	5,122	24.9 ⁺	22.2-28.0	291
	<i>NHO</i>	324.0 ⁺	304.2-344.8	1,014	18.3 ⁺	13.8-23.9	56
	<i>Hispanic</i>	304.2 ⁺	288.3-320.8	1,389	26.6 ⁺	22.0-31.8	122
80+ years	<i>NHW*</i>	426.1	420.9-431.4	25,672	10.3	9.5-11.2	620
	<i>NHB</i>	399.6 ⁺	384.6-415.1	2,660	25.7 ⁺	21.9-29.8	170
	<i>NHO</i>	198.2 ⁺	176.2-222.3	293	12.9	7.8-20.2	19
	<i>Hispanic</i>	283.8 ⁺	261.9-306.9	624	25.5 ⁺	19.3-33.1	56

Data Source: Illinois State Cancer Registry data as of November 2021.
Rates are per 100,000 women and age-adjusted to the 2000 US population standard.
NHW=Non-Hispanic White; NHB=Non-Hispanic Black; NHO= Non-Hispanic Other races.
⁺ Rate significantly differs from referent group.
* Referent group

Table IV. Malignant Breast and Cervical Cancer Age-Adjusted Incidence Rates by Race/Ethnicity, and ISCR County Groups, Females, Illinois, 1996 to 2019							
Characteristics		Breast Cancer			Cervical Cancer		
		Rate	95% CI	Count	Rate	95% CI	Count
<i>ISCR County Groups</i>	<i>Race/ethnicity</i>						
<i>Urban</i>	<i>NHW*</i>	139.1	137.9-140.3	54,835	7.6	7.3-7.9	424
	<i>NHB</i>	131.4 ⁺	129.7-133.1	23,192	14.4 ⁺	13.8-15.0	166
	<i>NHO</i>	105.6 ⁺	102.4-108.8	4,407	7.7	6.9-8.6	25
	<i>Hispanic</i>	90.0 ⁺	88.0-92.2	7,948	13.3 ⁺	12.5-14.1	105
<i>Suburban</i>	<i>NHW*</i>	143.2	141.9-144.6	43,542	6.5	6.2-6.8	1,664
	<i>NHB</i>	127.2 ⁺	121.8-132.7	2,318	9.0 ⁺	7.7-10.5	512
	<i>NHO</i>	109.6 ⁺	105.2-114.2	2,457	6.1	5.1-7.2	113
	<i>Hispanic</i>	94.7 ⁺	90.8-98.6	2,878	10.0 ⁺	8.8-11.2	454
<i>Small Urban</i>	<i>NHW*</i>	134.1	132.6-135.5	35,944	8.3	7.9-8.7	2,075
	<i>NHB</i>	124.1 ⁺	120.0-128.2	3,601	11.6 ⁺	10.4-12.9	800
	<i>NHO</i>	95.8 ⁺	87.3-104.9	519	9.1	6.7-12.2	139
	<i>Hispanic</i>	109.5 ⁺	101.4-118.2	758	12.9 ⁺	10.4-15.7	568
<i>Rural</i>	<i>NHW*</i>	124.4	123.2-125.7	40,222	9.6	9.2-10.0	1,768
	<i>NHB</i>	112.1 ⁺	103.3-121.4	615	12.8 ⁺	10.1-16.1	664
	<i>NHO</i>	124.7	109.8-140.9	274	15.2 ⁺	10.6-21.2	112
	<i>Hispanic</i>	139.1	111.4-133.2	54,835	12.4	9.5-15.8	353

Data Source: Illinois State Cancer Registry data as of November 2021.
Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.
⁺ Rate significantly differs from referent group.
* Referent group

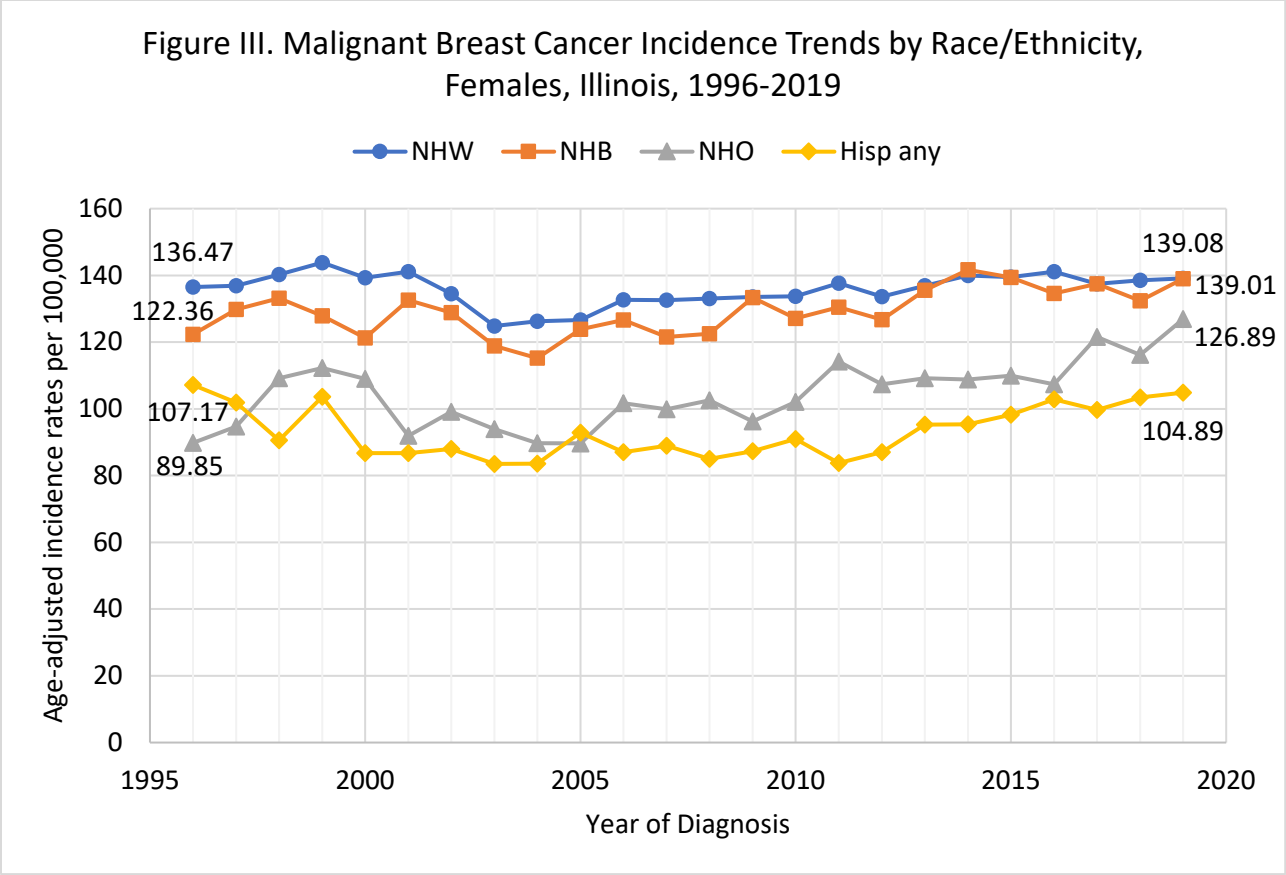
Figure II. Malignant Breast and Cervical Cancer Incidence Rates for Females, Illinois, 1996 - 2019



Data source: Illinois State Cancer Registry data as of November 2021.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

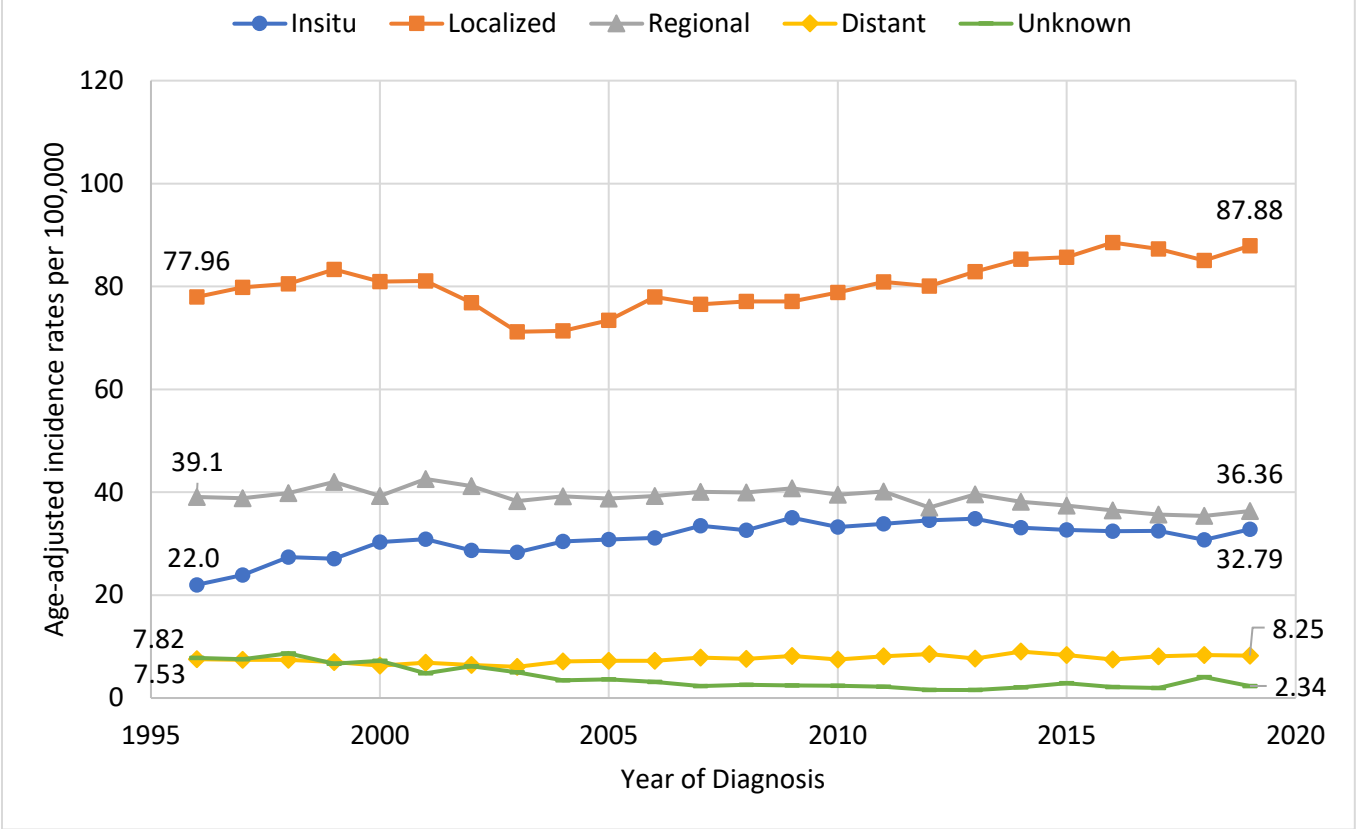
Table V. Trends in Breast Cancer Incidence by Race/Ethnicity, and Stage at Diagnosis, Females, Illinois, 1996 to 2019							
Characteristic	Trends Observed	Starting Year	Ending Year	Annual Percent Change (APC)	95% Confidence Interval for APC	Average Annual Percent Change (AAPC)	95% Confidence Interval for AAPC
Overall	1	1996	1999	2.0%	-0.2, 4.3	0.1%	-0.3, 0.6%
	2	1999	2003	-3.1% ⁺	-5.2, -0.9		
	3	2003	2019	0.6% ⁺	0.4, 0.8		
Race/Ethnicity							
<i>Non-Hispanic White</i>	1	1996	2000	1.3%	-0.2, 2.8	0.2%	-0.4, 0.8
	2	2000	2003	-3.7%	-8.0, 0.8		
	3	2003	2019	0.6% ⁺	0.5, 0.8		
<i>Non-Hispanic Black</i>	1	1996	2019	0.5% ⁺	0.2, 0.7	-	-
<i>Non-Hispanic Other Race</i>	1	1996	1999	7.7%	-2.9, 19.3	1.3%	-0.6, 3.3
	2	1999	2003	-5.1%	-13.3, 3.9		
	3	2003	2019	1.8% ⁺	1.3, 2.4		
<i>Hispanic</i>	1	1996	2003	-3.5% ⁺	-5.7, -1.2	-0.1%	-0.8, 0.7
	2	2003	2019	1.4% ⁺	1.0, 1.9		
Stage at Diagnosis							
<i>In Situ</i>	1	1996	1998	12.7%	-1.5, 28.8	1.6% ⁺	0.4, 2.9
	2	1998	2011	1.8% ⁺	1.1, 2.4		
	3	2011	2019	-1.1%	-2.2, 0.0		
<i>Localized</i>	1	1996	2000	1.5%	-0.4, 3.5	0.6%	-0.2, 1.4
	2	2000	2003	-4.6%	-10.2, 1.4		
	3	2003	2019	1.3% ⁺	1.1, 1.5		
<i>Regional</i>	1	1996	2010	0%	-0.5, 0.4	-0.5% ⁺	-0.9, -0.1
	2	2010	2019	-1.3% ⁺	-2.1, -0.5		
<i>Distant</i>	1	1996	2000	-3.4%	-9.3, 2.8	0.5%	-0.6, 1.6
	2	2000	2019	1.4% ⁺	0.8, 1.9		
<i>Unknown</i>	1	1996	2012	-9.7% ⁺	-11.6, -7.8	-4.5% ⁺	-7.4, -1.6
	2	2012	2019	8.5%	-1.2, 19.1		
Data source: Illinois State Cancer Registry data as of November 2021.							
Only the data on stage at diagnosis includes breast cancer in situ (non-malignant) cases.							
* APC/AAPC is significantly different from zero at alpha = 0.05 level							
- APC and AAPC were the same in the model.							



Data source: Illinois State Cancer Registry data as of November 2021.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Figure IV. Breast Cancer Incidence Trends by Stage, Females, Illinois, 1996 - 2019



Data source: Illinois State Cancer Registry data as of November 2021.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Table VI. Malignant Breast and Cervical Cancer Age-Adjusted Mortality Rates by Race/Ethnicity, and ISCR County Groups, Females, Illinois, 1996 to 2019						
Characteristics	Breast Cancer			Cervical Cancer		
	Rate	95% CI	Count	Rate	95% CI	Count
<i>Illinois Race/ethnicity</i>	24.6	24.3-24.8	44,146	2.7	2.6-2.8	4,512
<i>Non-Hispanic White*</i>	24.2	23.9-24.5	33,944	2.3	2.2-2.4	2,826
<i>Non-Hispanic Black</i>	34.8 ⁺	34.0-35.6	7,857	5.3 ⁺	5.0-5.6	1,212
<i>Non-Hispanic Other Race</i>	11.1 ⁺	10.3-11.9	760	1.4 ⁺	1.1-1.7	90
<i>Hispanic any</i>	11.9 ⁺	11.2-12.5	1,424	2.8 ⁺	2.5-3.1	366
<i>ISCR County Groups</i>						
<i>Urban*</i>	26.5	26.1-26.8	19,206	3.2	3.1-3.4	2,219
<i>Suburban</i>	23.3 ⁺	22.8-23.8	8,644	1.9 ⁺	1.7-2.0	695
<i>Small urban</i>	24.1 ⁺	23.5-24.6	7,847	2.5 ⁺	2.3-2.7	742
<i>Rural</i>	22.8 ⁺	22.3-23.3	8,449	2.8 ⁺	2.6-3.0	856
Data source: National Center for Health Statistics as of April 2021. Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard. ⁺ Rate significantly differs from referent group. *Referent group						

Table VII. Malignant Breast and Cervical Cancer Mortality Rates by Age Groups, Females, Illinois, 1996 to 2019

Characteristics	Breast Cancer			Cervical Cancer		
	Rate	95% CI	Count	Rate	95% CI	Count
<i>Age group</i>						
<i>20-29 years</i>	0.5	0.5-0.7	117	0.4	0.3-0.4	76
<i>30-39 years</i>	5.8	5.5-6.1	1,219	1.9	1.8-2.1	411
<i>40-49 years</i>	18.9	18.3-19.5	4,155	4.0	3.7-4.3	876
<i>50-59 years</i>	40.8	39.9-41.7	7,977	5.4	5.1-5.7	1,052
<i>60-69 years</i>	65.6	64.3-67.0	9,114	6.2	5.8-6.7	868
<i>70-79 years</i>	99.7	97.7-101.7	9,515	6.7	6.2-7.3	641
<i>80+ years</i>	165.6	162.7-168.6	12,049	8.0	7.4-8.7	583

Data source: National Center for Health Statistics as of April 2021.
 Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Table VIII. Malignant Breast and Cervical Cancer Mortality Rates by Race/Ethnicity and Age, Females, Illinois, 1996 to 2019

Characteristics		Breast Cancer			Cervical Cancer		
		Rate	95% CI	Count	Rate	95% CI	Count
<i>Age</i>	<i>Race/ethnicity</i>						
20-29 years	NHW*	0.4	0.3-0.5	48	0.3	0.2-0.4	35
	NHB	1.4 ⁺	1.1-1.9	50	0.8 ⁺	0.6-1.2	29
	NHO	^	^	^	^	^	^
	Hispanic	0.5	0.3-0.7	18	0.3	0.1-0.5	10
30 - 39 years	NHW*	5.4	5.0-5.8	706	1.7	1.5-1.9	222
	NHB	11.0 ⁺	9.9-12.2	356	3.5 ⁺	2.9-4.3	116
	NHO	2.4 ⁺	1.6-3.4	30	^	^	^
	Hispanic	3.6 ⁺	2.9-4.3	119	1.9	1.5-2.4	63
40 - 49 years	NHW*	17.3	16.6-18.0	2,587	3.5	3.2-3.8	514
	NHB	34.8 ⁺	32.8-36.8	1,157	7.5 ⁺	6.6-8.5	251
	NHO	8.6 ⁺	7.0-10.5	96	1.7 ⁺	1.0-2.7	19
	Hispanic	11.0 ⁺	9.8-12.4	286	3.3	2.7-4.1	87
50 - 59 years	NHW*	38.8	37.8-39.9	5,511	4.7	4.3-5.0	658
	NHB	64.7 ⁺	61.8-67.8	1,827	10.5 ⁺	9.4-11.8	295
	NHO	24.8 ⁺	21.6-28.3	220	2.3 ⁺	1.4-3.6	21
	Hispanic	23.0 ⁺	20.8-25.4	380	4.5	3.5-5.6	74
60 - 69 years	NHW*	65.8	64.2-67.4	6,890	5.2	4.7-5.6	541
	NHB	88.7 ⁺	84.5-93.0	1,694	12.8 ⁺	11.2-14.5	245
	NHO	35.7 ⁺	31.1-40.8	214	2.7 ⁺	1.5-4.3	16
	Hispanic	30.9 ⁺	27.3-34.7	281	7.2	5.5-9.2	65
70 - 79 years	NHW*	101.7	99.4-104.0	7,756	5.8	5.3-6.3	441
	NHB	122.1 ⁺	115.8-128.6	1,421	12.8 ⁺	10.8-15.0	148
	NHO	39.2 ⁺	32.5-46.9	122	5.0	2.8-8.2	15
	Hispanic	42.1 ⁺	36.3-48.6	190	7.1	4.9-10.0	33
80+ years	NHW*	167.4	164.2-170.7	10,446	6.6	6.0-7.3	413
	NHB	201.5 ⁺	190.9-212.6	1,352	19.0 ⁺	15.8-22.6	127
	NHO	52.1 ⁺	41.2-65.2	77	7.5	3.7-13.3	11
	Hispanic	68.4 ⁺	57.9-80.2	150	14.6 ⁺	10.0-20.6	32

Data source: National Center for Health Statistics as of April 2021.
 Rates are per 100,000 women and age-adjusted to the 2000 US population standard.
 NHW=Non-Hispanic White; NHB=Non-Hispanic Black; NHO= Non-Hispanic Other races.
⁺ Rate significantly differs from referent group.
[^] Statistic not displayed due to fewer than 10 cases.
 *Referent group

Table IX. Malignant Breast and Cervical Cancer Age-Adjusted Mortality Rates by Race/Ethnicity, and ISCR County Groups, Females, Illinois, 1996 to 2019

Characteristics		Breast Cancer			Cervical Cancer		
		Rate	95% CI	Count	Rate	95% CI	Count
<i>ISCR County Group</i>	<i>Race/ethnicity</i>						
<i>Urban</i>	<i>NHW*</i>	25.6	25.1-26.1	11257	2.3	2.1-2.4	863
	<i>NHB</i>	36.3 ⁺	35.4-37.2	6359	5.8 ⁺	5.4-6.2	1,013
	<i>NHO</i>	11.6 ⁺	10.6-12.7	475	1.5 ⁺	1.1-1.9	58
	<i>Hispanic</i>	12.0 ⁺	11.2-12.8	989	3.0 ⁺	2.6-3.4	271
<i>Suburban</i>	<i>NHW*</i>	24.5	23.9-25.0	7630	1.8	1.7-2.0	551
	<i>NHB</i>	29.2 ⁺	26.5-32.1	486	2.9 ⁺	2.1-3.9	54
	<i>NHO</i>	11.0 ⁺	9.5-12.6	219	1.3	0.8-1.9	24
	<i>Hispanic</i>	10.7 ⁺	9.4-12.2	298	2.3	1.7-3.0	66
<i>Small Urban</i>	<i>NHW*</i>	23.8	23.2-24.3	6855	2.3	2.1-2.5	592
	<i>NHB</i>	30.1 ⁺	28.1-32.3	844	4.2 ⁺	3.4-5.0	121
	<i>NHO</i>	8.5 ⁺	6.1-11.6	44	^	^	^
	<i>Hispanic</i>	15.8 ⁺	12.6-19.5	95	3.5	2.1-5.4	22
<i>Rural</i>	<i>NHW*</i>	22.9	22.4-23.4	8202	2.8	2.6-3.0	820
	<i>NHB</i>	30.4 ⁺	26.0-35.4	168	4.2	2.7-6.2	24
	<i>NHO</i>	10.5 ⁺	6.4-16.2	22	^	^	^
	<i>Hispanic</i>	9.9 ⁺	7.0-13.4	42	^	^	^

Data source: National Center for Health Statistics as of April 2021.

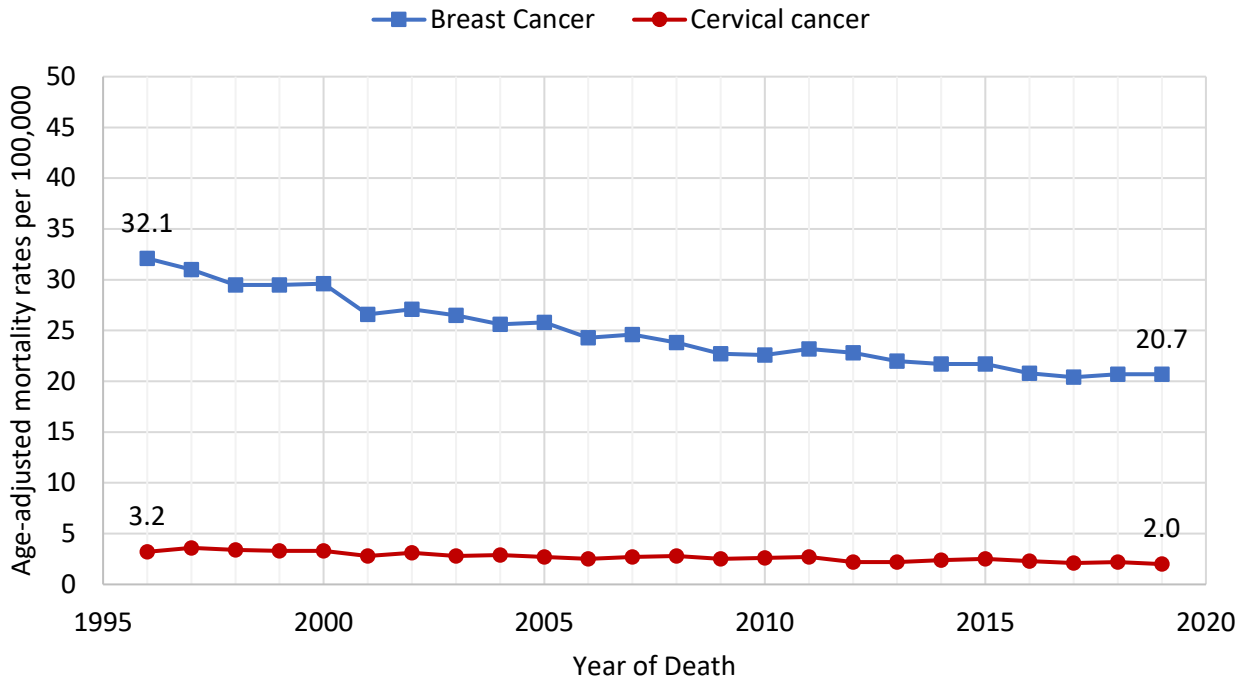
Rates are per 100,000 women and age-adjusted to the 2000 US population standard.

⁺ Rate significantly differs from referent group.

[^] Statistic not displayed due to fewer than 10 cases.

*Referent group

Figure V. Malignant Breast and Cervical Cancer Mortality, Females, Illinois, 1996 - 2019



Data source: National Center for Health Statistics data as of April 2021.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Table X. Trends in Malignant Breast Cancer Mortality Rates by Race/Ethnicity, Females, Illinois, 1996 to 2019

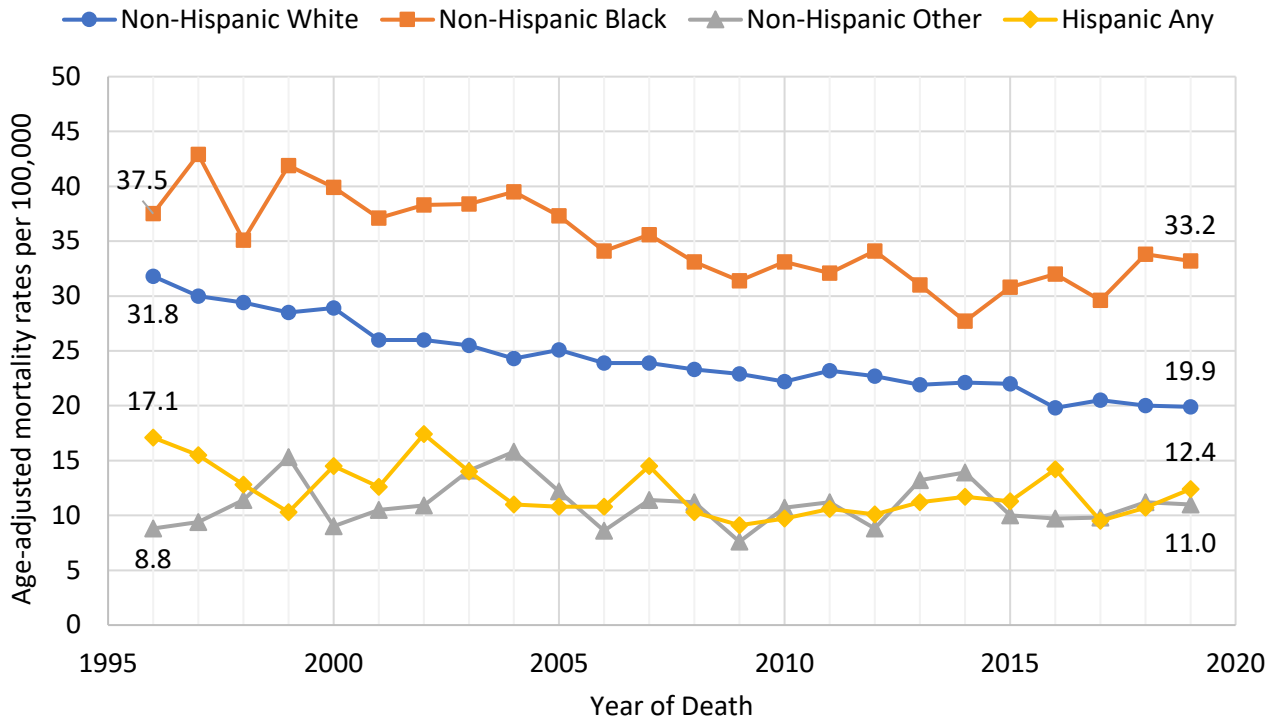
Characteristic	Trends Observed	Starting Year	Ending Year	Annual Percent Change (APC)	95% Confidence Interval for APC	Average Annual Percent Change (AAPC)	95% Confidence Interval for AAPC
Overall	1	1996	2006	-2.6% ⁺	-3.0, -2.1	-1.9% ⁺	-2.2, -1.7
	2	2006	2019	-1.4% ⁺	-1.8, -1.1		
Race/Ethnicity							
<i>Non-Hispanic White</i>	1	1996	2003	-3.1% ⁺	-4.0, -2.2	-1.9% ⁺	-2.3, -1.6
	2	2003	2019	-1.4% ⁺	-1.7, -1.1		
<i>Non-Hispanic Black</i>	1	1996	2019	-1.3% ⁺	-1.7, -0.8	-	-
<i>Non-Hispanic Other Race</i>	1	1996	2019	-0.3%	-1.4, 0.8	-	-
<i>Hispanic</i>	1	1996	2019	-1.0%	-2.0, 0.0	-	-

Data source: National Center for Health Statistics data as of April 2021.

⁺ APC/AAPC is significantly different from zero at alpha = 0.05 level.

- APC and AAPC were the same in the model.

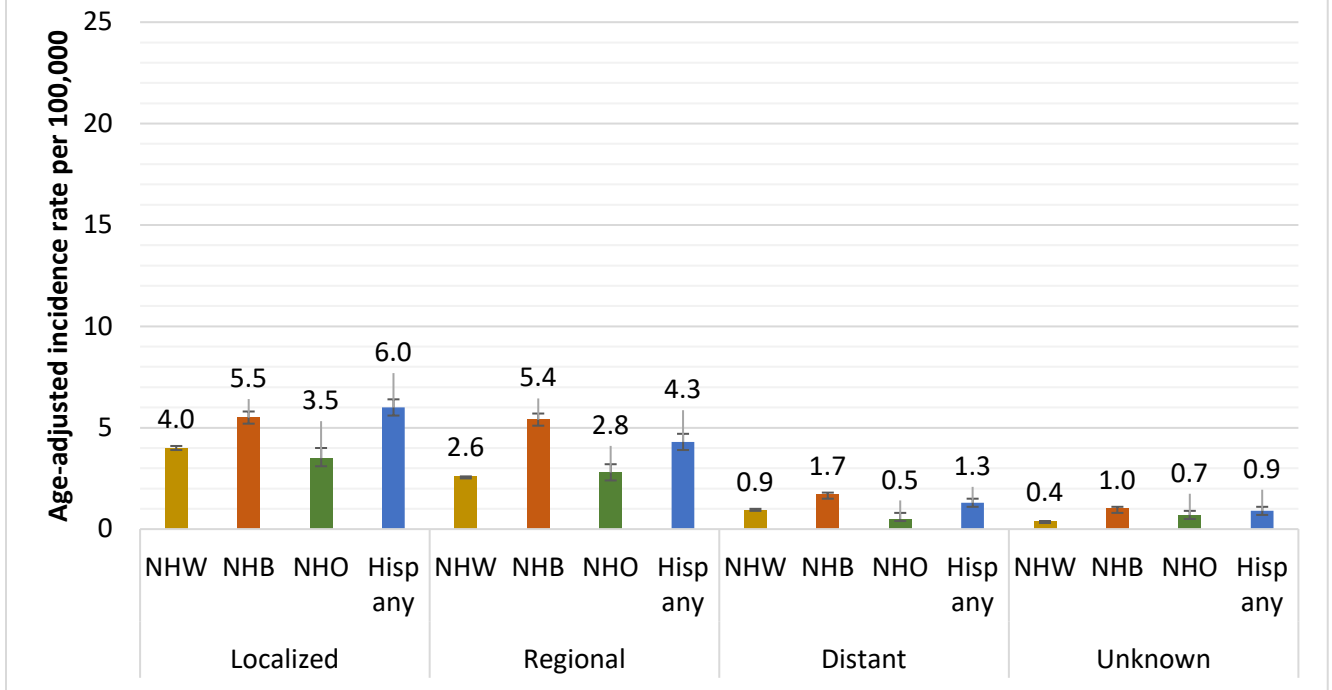
Figure VI. Malignant Breast Cancer Mortality by Race/Ethnicity, Females, Illinois, 1996-2019



Data source: National Center for Health Statistics data as of April 2021.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Figure VII. Malignant Cervical Cancer Incidence by Stage, Race/Ethnicity, Females, Illinois, 1996-2019

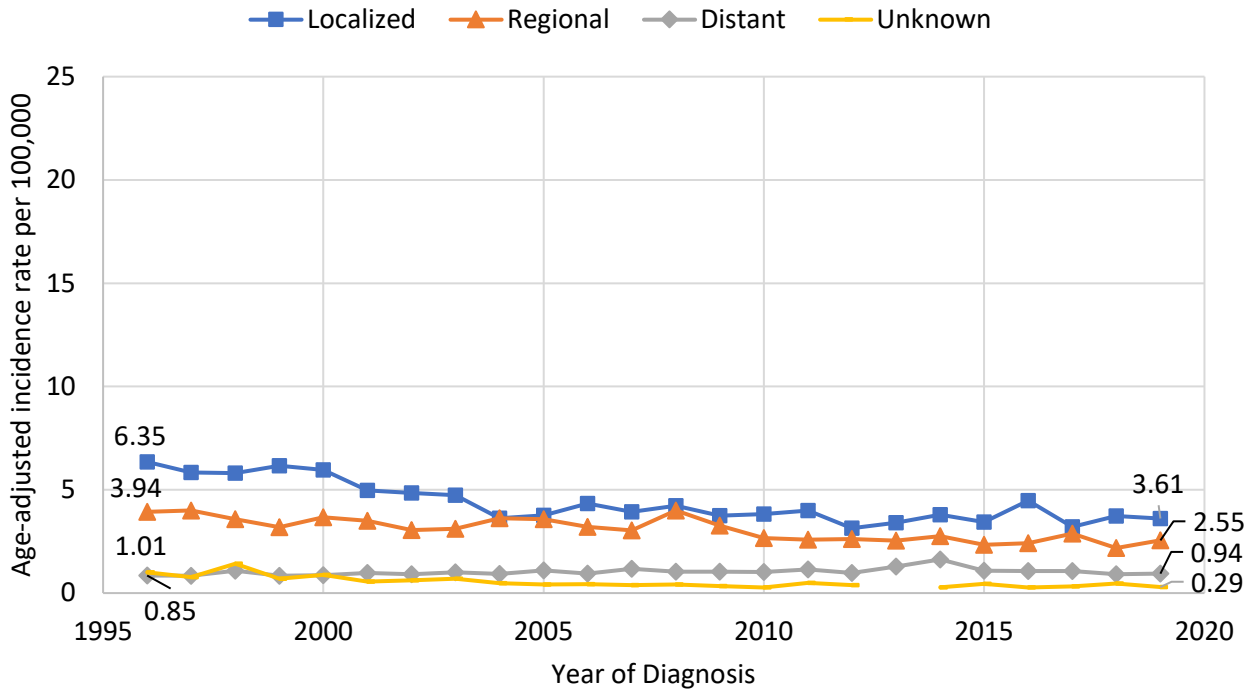


Data source: Illinois State Cancer Registry data as of November 2021.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

Table XI. Trends in Malignant Cervical Cancer Incidence by Race/Ethnicity, and Stage at Diagnosis, Females, Illinois, 1996 to 2019							
Characteristic	Trend	Starting Year	Ending Year	Annual Percent Change (APC)	95% Confidence Interval for APC	Average Annual Percent Change (AAPC)	95% Confidence Interval for AAPC
Overall	1	1996	2019	-2.2% ⁺	-2.6, -1.8	-	-
Race/Ethnicity							
<i>Non-Hispanic White</i>	1	1996	2004	-3.7% ⁺	-5.4, -2.1	-1.8% ⁺	-2.6, -1.1
	2	2004	2019	-0.8%	-1.6, 0.0		
<i>Non-Hispanic Black</i>	1	1996	2019	-3.2% ⁺	-3.8, -2.5	-	-
<i>Non-Hispanic Other Race</i>	1	1996	2019	-4.2% ⁺	-5.5, -2.9	-	-
<i>Hispanic</i>	1	1996	2019	-3.4% ⁺	-4.3, -2.5	-	-
Stage at Diagnosis							
<i>Localized</i>	1	1996	2005	-5.4% ⁺	-7.6, -3.1	-2.7% ⁺	-3.8, -1.5
	2	2005	2019	-0.9%	-2.3, 0.5		
<i>Regional</i>	1	1996	2019	-2.0% ⁺	-2.7, -1.4	-	-
<i>Distant</i>	1	1996	2019	1.0% ⁺	0.1, 2.0	-	-
<i>Unknown</i>	1	1996	2019	-5.7% ⁺	-7.3, -4.0	-	-
Data source: Illinois State Cancer Registry data as of November 2021.							
+ APC/AAPC is significantly different from zero at alpha = 0.05 level.							
- the model identified one trend so the APC and AAPC were the same.							

Figure VIII. Malignant Cervical Cancer Incidence Trends by Stage, Females, Illinois, 1996 - 2019

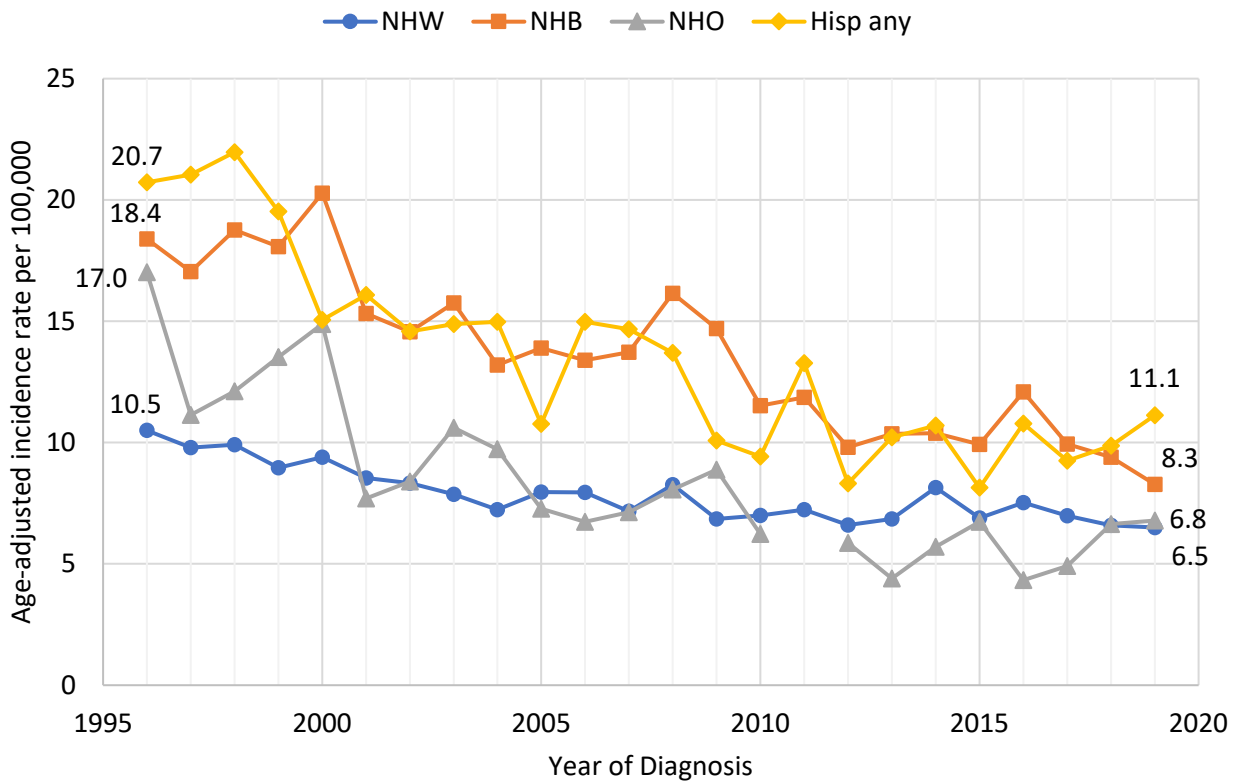


Data source: Illinois State Cancer Registry data as of November 2021.

Gap in data is due to there being fewer than 16 cases.

Rates are per 100,000 women and age-adjusted to the 2000 US population standard.

Figure IX. Malignant Cervical Cancer Incidence Trends by Race/Ethnicity, Females, Illinois, 1996-2019



Data source: Illinois State Cancer Registry data as of November 2021.

Gap in data is due to there being fewer than 16 cases.

Rates are per 100,000 women and age-adjusted to the 2000 US population standard.

NHW=Non-Hispanic White; NHB=Non-Hispanic Black; NHO= Non-Hispanic Other races.

Table XII. Trends in Malignant Cervical Cancer Mortality Rates for by Race/Ethnicity, Females, Illinois, 1996 to 2019

Characteristic	Trend	Starting Year	Ending Year	Annual Percent Change (APC)	95% Confidence Interval for APC	Average Annual Percent Change (AAPC)	95% Confidence Interval for AAPC
Overall	1	1996	2019	-2.1% ⁺	-2.5, -1.8	-	-
Race/Ethnicity							
<i>Non-Hispanic White</i>	1	1996	2019	-1.5% ⁺	-2.2, -0.9	-	-
<i>Non-Hispanic Black</i>	1	1996	2019	-2.8% ⁺	-3.4, -2.3	-	-
<i>Non-Hispanic Other Race</i>	^	^	^	^	^	^	^
<i>Hispanic</i>	^	^	^	^	^	^	^

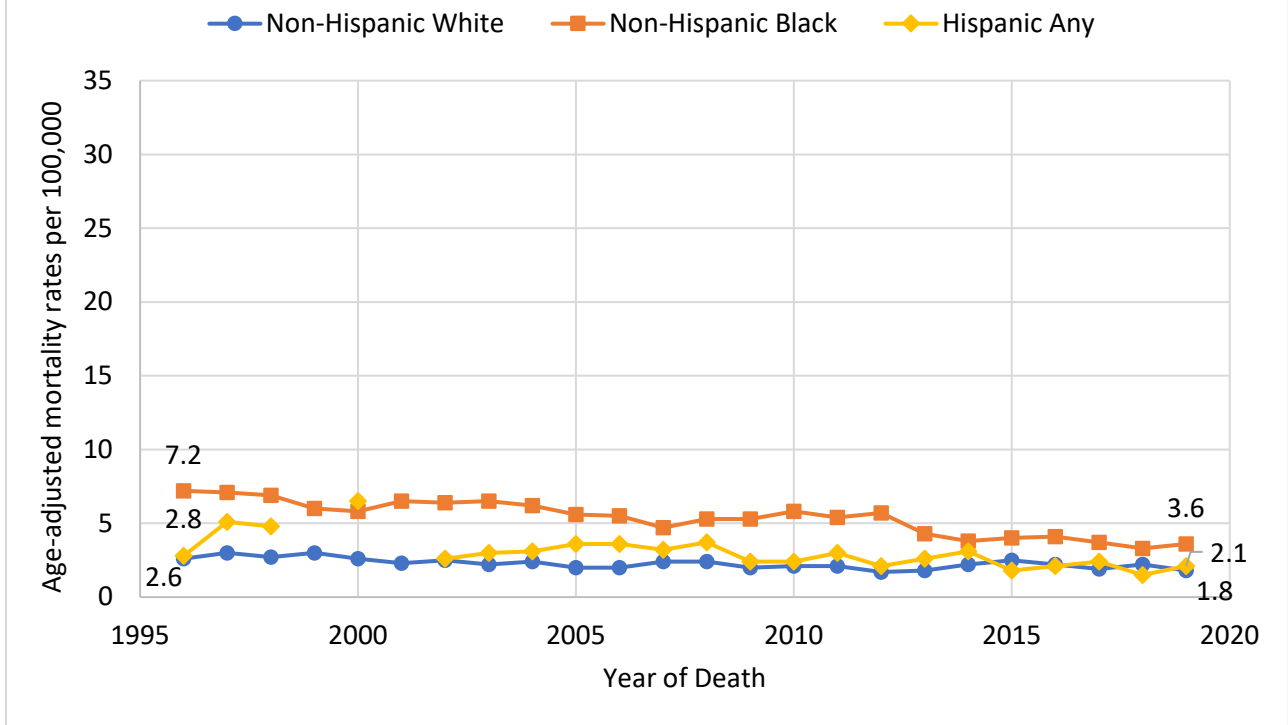
Data source: National Center for Health Statistics data as of April 2021.

⁺ APC/AAPC is significantly different from zero at alpha = 0.05 level.

[^] Trend data could not be calculated due to insufficient numbers.

- the model identified one trend so the APC and AAPC were the same.

Figure X. Malignant Cervical Cancer Mortality by Race/Ethnicity, Females, Illinois, 1996-2019



Data source: National Center for Health Statistics data as of April 2021. No data available for non-Hispanic Other race women.

Gap in data is due to there being fewer than 10 cases.

Rates are per 100,000 women and age-adjusted to the 2000 U.S. population standard.

APPENDIX A

SEER Site Groups for Primary Site Based on ICD-O-3/WHO 2008 Definition¹⁹ ^			
Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Breast	C500-C509	excluding 9050-9055, 9140, 9590-9992	26000
Cervix Uteri	C530-C539	excluding 9050-9055, 9140, 9590-9992	27010

^ Subject to change based on evolving ICD-O-3 coding rules.

APPENDIX B

Illinois State Cancer Registry (ISCR) County Groups⁹		
County Group	County code	County name
Urban	031	Cook
Suburban	043, 089, 097, 111, 197	DuPage, Kane, Lake, McHenry, Will
Small urban	019, 037, 091, 093, 113, 115, 119, 143, 161, 163, 167, 179, 201	Champaign, DeKalb, Kankakee, Kendall, McLean, Macon, Madison, Peoria, Rock Island, St. Clair, Sangamon, Tazewell, Winnebago
Rural	001-017, 021-029, 033, 035, 039, 041, 045-087, 095, 099-109, 117, 121-141, 145-159, 165, 169-177, 181-195, 199, 203	Adams, Alexander, Bond, Boone, Brown, Bureau, Calhoun, Carroll, Cass, Christian, Clark, Clay, Clinton, Coles, Crawford, Cumberland, DeWitt, Douglas, Edgar, Edwards, Effingham, Fayette, Ford, Franklin, Fulton, Gallatin, Greene, Grundy, Hamilton, Hancock, Hardin, Henderson, Henry, Iroquois, Jackson, Jasper, Jefferson, Jersey, Jo Daviess, Johnson, Knox, LaSalle, Lawrence, Lee, Livingston, Logan, McDonough, Macoupin, Marion, Marshall, Mason, Massac, Menard, Mercer, Monroe, Montgomery, Morgan, Moultrie, Ogle, Perry, Piatt, Pike, Pope, Pulaski, Putnam, Randolph, Richland, Saline, Schuyler, Scott, Shelby, Stark, Stephenson, Union, Vermilion, Wabash, Warren, Washington, Wayne, White, Whiteside, Williamson, Woodford