

Screening Amenable Cancers in New York State, 2011-2015

Introduction

The purpose of this report is to describe patterns and trends in the incidence and mortality of screening-detectable cancers within New York State (NYS) using 2011-2015 data from the New York State Cancer Registry (NYSCR), the United States census, and national health surveys. Cancer screening refers to the use of tests to detect cancer, or conditions that may lead to cancer, before symptoms appear. Generally, cancer treatment is more effective when the disease is found earlier. The United States Preventive Services Task Force (USPSTF) is an independent panel of national experts that weighs the evidence from screening research studies and issues recommendations on cancer screening. These recommendations are typically endorsed by the NYS Department of Health (DOH).

Screening guidelines vary, depending on the type of cancer, and can change as a result of new and emerging technology and research. At the end of 2015, there were just four primary cancer sites for which the USPSTF found screening to be beneficial with respect to reducing the number of cancer-related deaths among the general population: breast,¹ cervical,² colorectal³, and lung.⁴ This report presents data for the first three of these sites. Lung cancer screening was first endorsed in December, 2013 for heavy current or former smokers. Because the initial uptake of this screening test has been slow and applied to a limited population, it is too early to assess its impact.

Screening Tests and Recommendations for Individuals at Average Risk

Breast Cancer

The most effective test for breast cancer screening is a mammogram, which is a low-dose x-ray of the breast. Having regular mammograms can lower the risk of dying from breast cancer by detecting tumors when they are small and more easily treatable. The USPSTF recommends mammograms every two years for women aged 50 to 74 years.¹ It also advises women aged 40 to 49 years to make an individual decision about when to begin screening and the appropriate frequency, in consultation with their physicians.

Cervical Cancer

There are two types of cervical cancer screening tests. The Pap test, or Pap smear, involves collecting cells from the cervix and examining them under a microscope to detect abnormalities. The human papillomavirus (HPV) test uses a similar mechanism to detect certain subtypes of the HPV virus, which are known to cause cervical cancer. When these tests are performed at the same time, it is known as HPV co-testing.

The USPSTF recommends screening for cervical cancer in women aged 21 to 29 years with a Pap test every three years. Women aged 30 to 65 years can get screened by one of three options: with a Pap test every three years, with an HPV test every five years, or with HPV co-testing every five years. Women

can stop getting screened if they are older than 65 and have had normal Pap results for many years. Women who have had their cervix removed may not need screening.

Pre-cancerous lesions identified through these screening tests can be surgically removed and thus never develop into malignant invasive cancer. The benefits of cervical cancer screening increase with age. A recent study found little benefit for women in their 20s, a modest benefit for women in their 30s, and a substantial benefit for women age 40 to 64, with a reduction in risk of cervical cancer of between 60% and 80%.⁵ The benefits were most pronounced in reducing cancers that had begun to spread beyond the cervix, which are the most lethal. For this reason, cervical cancer screening is widely viewed as one of the major success stories in public health in the twentieth century. The recent introduction of a vaccine for the strains of HPV most commonly associated with cervical cancer is expected to further reduce the already-low cervical cancer rates in the population.⁶

Colorectal Cancer

There are two primary screening methods for colorectal cancer: stool-based tests and direct visualization tests.³ The stool-based tests include the guaiac-based fecal occult blood test (gFOBT), the fecal immunochemical test (FIT), and the multi-targeted stool DNA test (FIT-DNA). These tests are non-invasive and convenient. People can take a stool sample at home and later send it to a physician's office or lab. The direct visualization tests include colonoscopy, flexible sigmoidoscopy, and CT colonography. Colonoscopy is a procedure where a doctor inserts a thin, flexible lighted tube into the rectum and checks for pre-cancerous polyps or cancer in the rectum and colon. Most pre-cancerous polyps and some cancers can be removed during this procedure. Flexible sigmoidoscopy is a similar test using a shorter tube that only reaches the lower third of the colon. These procedures are much more invasive than the stool-based tests, but also much more definitive. CT colonography (also known as CT colonoscopy, virtual colonography or virtual colonoscopy) uses low dose radiation CT scanning to look at the colon. In general, positive or ambiguous results from the stool-based tests or from CT colonography are followed up with a colonoscopy.

The USPSTF updated its recommendation for colorectal screening in June 2016. Currently the USPSTF recommends screening for colorectal cancer beginning at age 50 and continuing through age 75, consisting of any of the following: a gFOBT or a FIT test every year, a FIT-DNA test every one or three years (depending on the manufacturer), a flexible sigmoidoscopy or a CT colonography every five years, a colonoscopy every decade, or a flexible sigmoidoscopy every decade with an annual FIT test. In addition, the USPSTF advises adults aged 76 to 85 years to make an individual decision about whether to continue screening for colorectal cancer based on their medical history.

Data Sources

New York State Cancer Registry (NYSCR)

The NYSCR collects information about all NYS residents diagnosed with cancer. This reporting is mandated by law, and is required of all physicians, dentists, laboratories, and other health care providers. NYSCR data has been certified to meet the highest standard of quality by the North American Association of Central Cancer Registries (NAACCR) for completeness, timeliness, and accuracy since 2000.

Behavioral Risk Factor Surveillance System (BRFSS)

The BRFSS is an annual national survey of more than 350,000 adults developed by the Centers for Disease Control and Prevention (CDC) in 1984⁷ to collect information on health-related risk behaviors, chronic and infectious diseases, and use of preventive services.⁸ The survey has included questions on screening for cervical, colorectal, and breast cancers since 1988. As an individual's cancer screening history is not reported to the NYSCR, the BRFSS served as the source of information on screening prevalence used in this report. NYS additionally administered an Expanded BRFSS (E-BRFSS) survey to capture data at the county level (with NYC treated as a single area) between April 2013 and March 2014. This report particularly draws upon these data.

Census

Populations used in the calculations in this report originated from the United States Census Bureau. A complete count of the population including age, sex, and race/ethnicity is taken every decade, in years ending in zero. For other years, an estimation method is used which incorporates births, deaths, and interstate migration. The specific population values in this report were published by the National Cancer Institute through a special arrangement with the U.S. Census Bureau for the purposes of national cancer surveillance.

Incidence and Mortality by Demographic Characteristics

Breast cancer is the leading cause of cancer (excluding skin cancer) and the second leading cause of cancer deaths among women in NYS. For breast cancer, age-adjusted incidence rates in New York City in 2011-2015 were somewhat below those in the rest of the state, but mortality rates were virtually identical (Table 1). Some of this geographic difference in rates is accounted for by differences among racial/ethnic groups. Compared to white non-Hispanics (hereafter abbreviated as whites), black non-Hispanics (hereafter blacks) had lower incidence and Hispanics had still lower incidence. Hispanics had comparably lower mortality than whites, but for blacks, the relationship was reversed: mortality was more than 30% higher than for whites. This means that while blacks were less likely to be diagnosed with breast cancer than whites, they were much more likely to die from it once diagnosed.

For cervical cancer, incidence and mortality were higher in New York City than the rest of the state, and higher among blacks and Hispanics than whites (Table 1). Most strikingly, the mortality rate among blacks was more than double that of whites. Cervical cancer has a strong inverse correlation with socioeconomic status (that is, poorer women have higher rates) and this was partially reflected in the differences among racial/ethnic groups.

Colorectal cancer is the fourth most common cancer in NYS (excluding skin cancer) and overall the second leading cause of cancer deaths. In 2011-2015, incidence and mortality rates were similar between New York City and the rest of the state (Table 1). Blacks had higher incidence and mortality than whites, and Hispanics had lower incidence and mortality than whites. The most striking pattern was by gender, where males had approximately 30% higher incidence and 40% higher mortality than females.

Table 1 Incidence and mortality rates for screening amenable cancers by selected characteristics, New York State, 2011-2015*

| Cancer | Characteristic | Incidence | | Mortality | |
|--------------------|--------------------|---------------------|-----------------------------|--------------------|-----------------------------|
| | | Cases [†] | Rate [§] (LCI-UCI) | Cases [†] | Rate [§] (LCI-UCI) |
| Breast | Region | | | | |
| | New York State | 15,765 | 131.3 (130.3-132.2) | 2,554 | 19.8 (19.5-20.2) |
| | New York City | 5,887 | 121.2 (119.8-122.6) | 1,527 | 19.6 (19.1-20.0) |
| | NYS excluding NYC | 9,877 | 138.1 (136.8-139.3) | 1,027 | 20.2 (19.7-20.8) |
| | Race/Ethnicity | | | | |
| | White non-Hispanic | 11,145 | 144.0 (142.7-145.2) | 1,767 | 20.0 (19.6-20.4) |
| | Black non-Hispanic | 2,151 | 123.8 (121.4-126.2) | 464 | 26.7 (25.6-27.8) |
| | Hispanic | 1,511 | 93.1 (91.0-95.3) | 224 | 14.5 (13.6-15.4) |
| Other non-Hispanic | 959 | 103.9 (100.9-106.9) | 98 | 11.1 (10.1-12.2) | |
| Cervix | Region | | | | |
| | New York State | 844 | 7.7 (7.4-7.9) | 277 | 2.3 (2.2-2.5) |
| | New York City | 427 | 9.1 (8.7-9.5) | 138 | 2.0 (1.8-2.2) |
| | NYS excluding NYC | 417 | 6.7 (6.4-7.1) | 139 | 2.8 (2.6-3.1) |
| | Race/Ethnicity | | | | |
| | White non-Hispanic | 424 | 6.5 (6.2-6.8) | 146 | 1.9 (1.8-2.1) |
| | Black non-Hispanic | 182 | 10.8 (10.1-11.6) | 71 | 4.1 (3.7-4.6) |
| | Hispanic | 152 | 9.0 (8.3-9.7) | 44 | 2.8 (2.4-3.1) |
| Other non-Hispanic | 87 | 9.2 (8.3-10.1) | 16 | 1.8 (1.4-2.3) | |
| Colorectal | Region | | | | |
| | New York State | 9,003 | 39.8 (39.4-40.2) | 3,133 | 13.6 (13.3-13.8) |
| | New York City | 3,532 | 40.2 (39.6-40.8) | 1,892 | 13.3 (13.0-13.5) |
| | NYS excluding NYC | 5,471 | 39.6 (39.1-40.1) | 1,241 | 14.1 (13.7-14.4) |
| | Sex | | | | |
| | Male | 4,559 | 46.0 (45.4-46.6) | 1,560 | 16.1 (15.8-16.5) |
| | Female | 4,444 | 35.0 (34.5-35.4) | 1,573 | 11.6 (11.3-11.9) |
| | Race/Ethnicity | | | | |
| | White non-Hispanic | 6,248 | 40.5 (40.0-40.9) | 2,210 | 13.5 (13.2-13.8) |
| | Black non-Hispanic | 1,285 | 43.8 (42.7-44.9) | 478 | 16.9 (16.2-17.6) |
| | Hispanic | 899 | 33.5 (32.5-34.6) | 292 | 11.7 (11.1-12.3) |
| | Other non-Hispanic | 569 | 35.4 (34.1-36.8) | 152 | 10.6 (9.9-11.4) |

* Source of data: New York State Cancer Registry.

[†] Average number of new cases per year, rounded to the nearest integer.

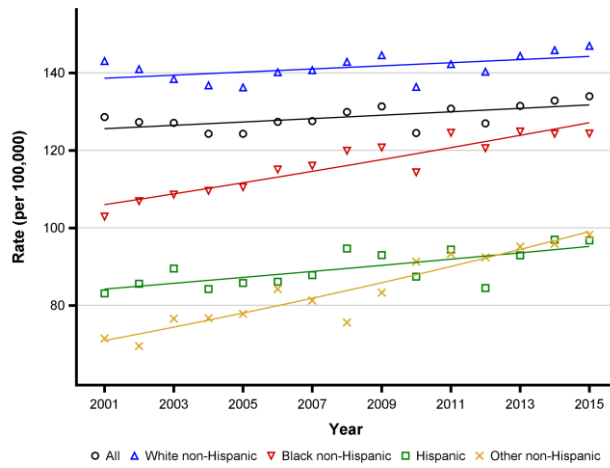
[§] Rate is per 100,000 persons, age-adjusted to the 2000 US standard population, with 95% confidence intervals in parentheses.

Incidence and Mortality Trends by Race and Ethnicity

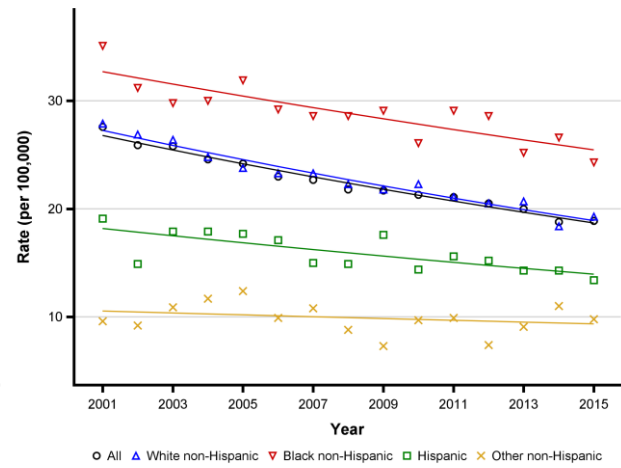
Incidence and mortality trends by race for the three screenable cancer sites are shown in Figures 1-3. A statistical technique known as Joinpoint analysis allowed the prevailing trend directions over the years to be summarized with one or more line segments. Version 4.6 of the Joinpoint Regression Program published by the National Cancer Institute was used for this purpose.⁹

Figure 1 Trends in breast cancer incidence and mortality by race and ethnicity, New York State, 2001-2015.

(A) Incidence



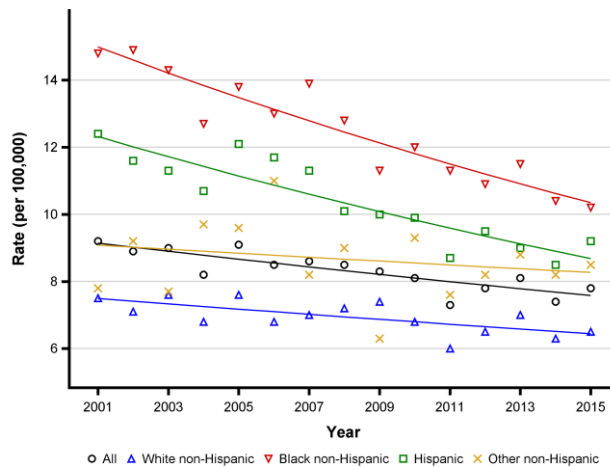
(B) Mortality



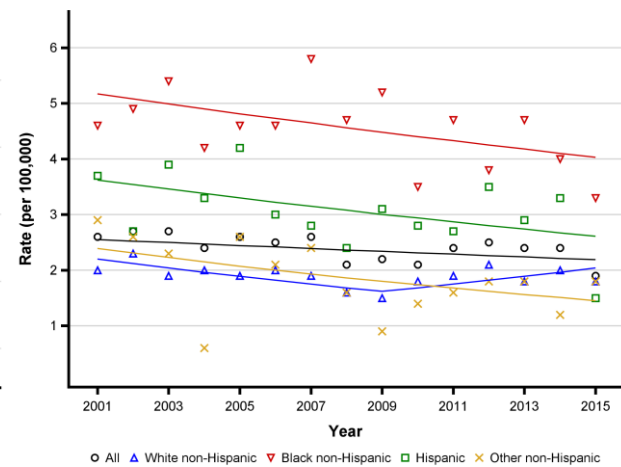
Rates are age adjusted to the 2000 U.S. standard population.
Source of data: New York State Cancer Registry.

Figure 2 Trends in cervical cancer incidence and mortality by race and ethnicity, New York State, 2001-2015.

(A) Incidence



(B) Mortality



Rates are age adjusted to the 2000 U.S. standard population.
Source of data: New York State Cancer Registry.

There was a marked increasing trend in breast cancer incidence rates among all racial and ethnic groups, with the rate of increase largest among blacks (Fig. 1A). There was a decreasing trend in mortality with the rate of decrease largest among whites (Fig. 1B).

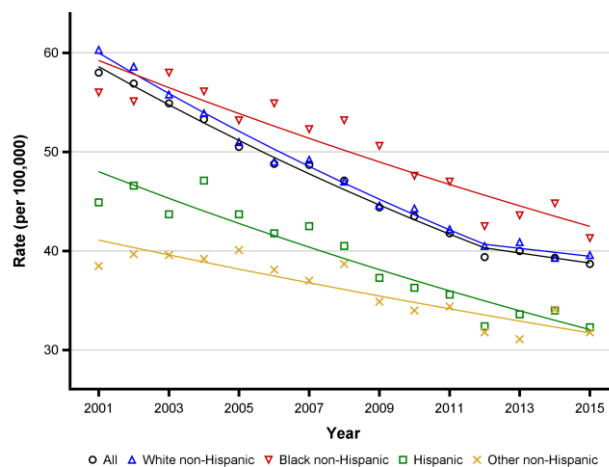
All groups saw a decline in cervical cancer incidence over the 14-year period, with blacks and Hispanics showing the sharpest declines, thus also reducing black-white and Hispanic-white disparities (Fig. 2A).

Mortality has also shown declines in all groups except for whites, where rates began an increasing trend in 2009 after years of decline (Fig. 2B).

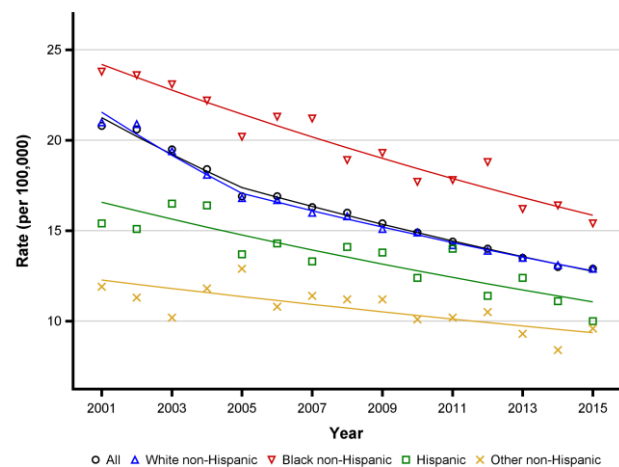
Incidence rates of colorectal cancer declined substantially between 2001 through 2015, though at a slower rate overall and among whites since 2012 (Fig. 3A). Mortality also saw sharp declines over this period among all groups, with the largest decrease of nearly 30% seen among Hispanics (Fig. 3B).

Figure 3 Trends in colorectal cancer incidence and mortality by race and ethnicity, New York State, 2001-2015

(A) Incidence



(B) Mortality



Rates are age adjusted to the 2000 U.S. standard population.
Source of data: New York State Cancer Registry.

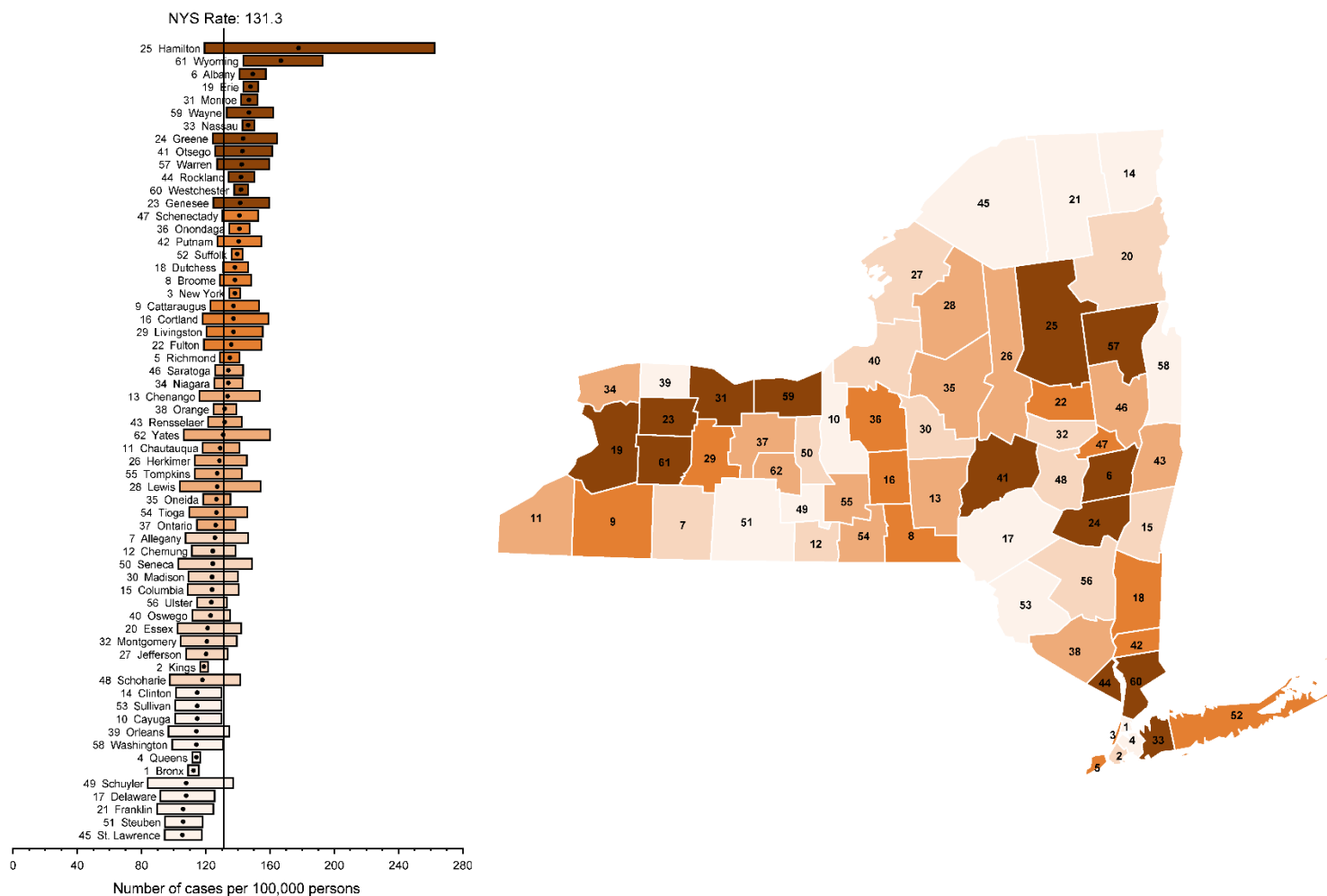
Incidence by County

Between 2011 and 2015, Hamilton County had the highest breast cancer rate in New York State, about 35% above the state rate (Fig. 4). Given its very small population, however, the certainty of this measurement was very low. Albany County, the county with the third-highest rate in the state, had a rate that was just 13% above the statewide level. The lowest rates were seen in St. Lawrence, Steuben, and Franklin Counties, each about 19% below the state rate.

Wayne County saw the highest incidence of cervical cancer with a rate of 14.4 per 100,000, nearly double the state rate (Fig. 5). The lowest rates of 2.2 per 100,000 were seen in Franklin County, more than a six-fold difference. However, Wayne County’s rate was based on only 33 cases, and Franklin County’s on just 3. The addition or subtraction of a single case in these or similarly-sized counties would have a profound effect on the rates. This is reflected in the wide horizontal bars in Figure 5, designating the confidence of the rate estimates.

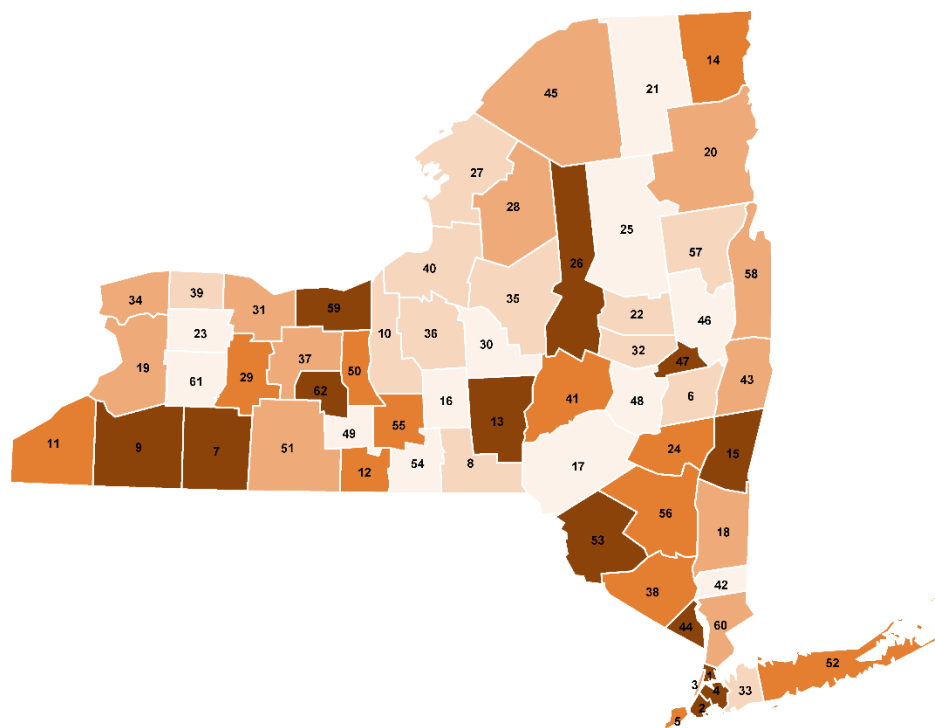
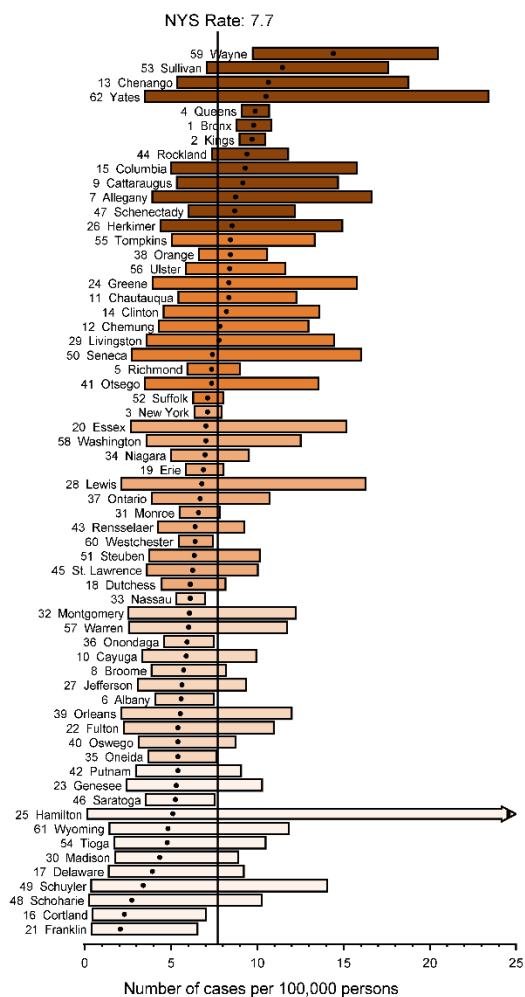
Colorectal cancer incidence varied across a two-fold range, from a high of 61.7 per 100,000 in Lewis County (55% above the state rate) to a low of 31.7 per 100,000 in Ontario County (20% below the state rate), as shown in Figure 6. Although Lewis County has a small population, its rate was based on a total of 100 cases and was statistically significantly higher than the state.

Figure 4 Incidence rates of breast cancer by county, New York State, 2011-2015



Rates are age adjusted to the 2000 U.S. standard population.
 Colors indicate quintiles. Width of bars indicate 95% confidence intervals.
 Source of data: New York State Cancer Registry.

Figure 5 Incidence rates of cervical cancer by county, New York State, 2011-2015

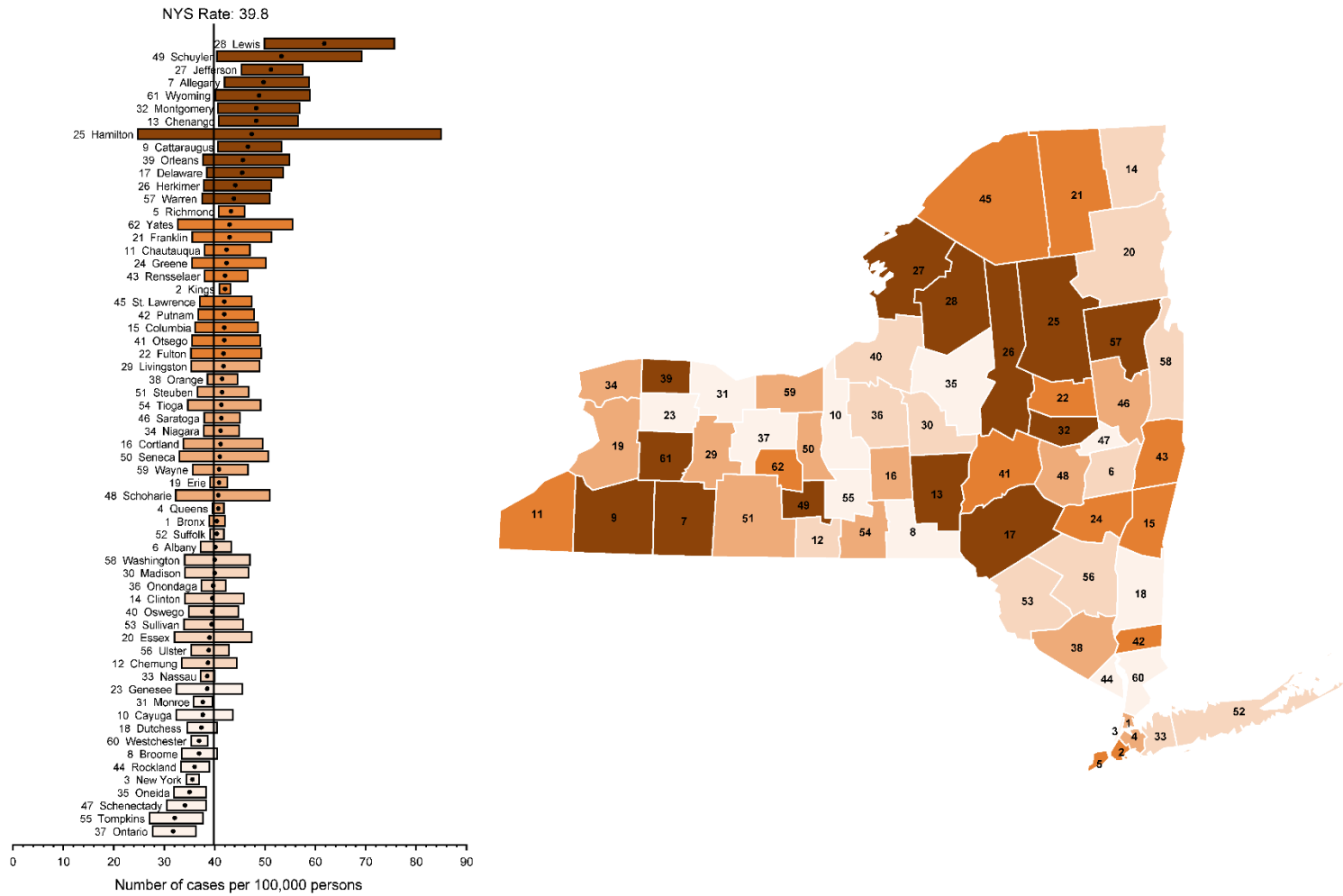


Rates are age adjusted to the 2000 U.S. standard population.

Colors indicate quintiles. Width of bars indicate 95% confidence intervals. Arrow indicates upper confidence interval extends beyond graphic area.

Source of data: New York State Cancer Registry.

Figure 6 Incidence rates of colorectal cancer by county, New York State, 2011-2015



Rates are age adjusted to the 2000 U.S. standard population.
 Colors indicate quintiles. Width of bars indicate 95% confidence intervals.
 Source of data: New York State Cancer Registry.

Screening Rates

While cancer screening questions have been included in all recent surveys, the specific questions have varied, making comparisons between years difficult. We therefore report screening rates for breast,⁸ cervical,¹⁰ and colorectal¹¹ cancers from the 2014 BRFSS as representative of the period 2011-2015.

According to the 2014 BRFSS, 79% of all women aged 50 to 74 years had a mammogram within the past two years (Table 2). Hispanics had a significantly higher screening prevalence than white non-Hispanics. There was no significant variation by household income, education, disability status, or residence in New York City. Medicaid-insured women were screened more than women with other insurance types, and those with other insurance or no insurance were screened much less often. Those without a regular health care provider were also screened much less often.

Among NYS women aged 21 to 65 years, 83% received a Pap test within the past three years (Table 2). The percentage was lower among those with a race/ethnicity other than white, black, or Hispanic, with no insurance, and no regular health care provider. Additionally, the screening rate was lower among women 21-29 years of age (72.6%, 95% CI 66.0-79.2%) than those aged 30-65 (85.5%, 95% CI 83.5-87.5%).

For the 2014 BRFSS, the definition of up-to-date with colorectal screening reflected the recommendations that were in place prior to June 2016. That is being up-to-date on colorectal cancer screening meant that an adult aged 50 to 75 years old was screened by FOBT/FIT in the past year, sigmoidoscopy in the past 5 years with FOBT/FIT in the past 3 years, or by colonoscopy in the past 10 years.¹¹ Among NYS adults aged 50 to 75 years, 68% were up-to-date on their colorectal screening (Table 2). There were significant gradients in income and education, with less screening at lower levels. Screening was extremely low among persons with no regular health care provider. Screening rates also differed by insurance type, with Medicare the highest and uninsured the lowest. Persons 50-64 years old were less likely to be up-to-date (63.6%, 95% CI 60.8-66.3%) than those 65-75 (78.3%, 95% CI 75.1-81.6%).

Trends in Cancer Screening and Incidence Rates

Trends in cancer screening rates in NYS from 2000 through 2016 are shown in Figures 7.¹²⁻¹⁴ Because the NYS BRFSS changed its methods in 2011,¹⁵ data collected after this year are not directly comparable to prior years.

Mammography rates have been high and steady in NYS (Fig. 7A). Since 2012, the screening prevalence remained slightly below the Healthy People 2020 objective of 81.1% for women aged 50 to 74 to receive breast cancer screening every two years.¹⁶ If mammography was the primary driver of incidence rates by stage, then the steady rate of mammography would predict little change in incidence. However, Joinpoint regression analysis showed that diagnosis at local stage has been significantly increasing since 2003 and that distant stage diagnosis has also trended upward, while diagnosis at regional stage has declined (Fig. 7B). These patterns demonstrate there are additional factors beyond the population-wide mammography utilization rate that are impacting breast cancer incidence. These include, among others, true changes in the underlying cancer burden in the population, and changes in the sensitivity of mammograms resulting from technological improvements.¹⁷⁻¹⁸

**Table 2 Cancer screening prevalence among New York State adults by selected characteristics, 2014
New York State Behavioral Risk Factor Surveillance System**

| Characteristics | Breast Cancer ⁸ | | Cervical Cancer ¹⁰ | | Colorectal Cancer ¹¹ | |
|------------------------------|-------------------------------|----------------------|-------------------------------|----------------------|--|----------------------|
| | Age 50-74 | | Age 21-65 | | Age 50-75 | |
| | Mammogram within past 2 years | | Pap test within past 3 years | | FOBT/FIT within 1 year, or sigmoidoscopy within 5 years with FOBT/FIT within 3 years, or colonoscopy within 10 years | |
| | Percent* | 95% CIs [†] | Percent* | 95% CIs [†] | Percent* | 95% CIs [†] |
| Total NYS | 78.6 | (76.2-81.0) | 82.6 | (80.5-84.8) | 68.1 | (65.9-70.2) |
| Sex | | | | | | |
| Male | | | | | 66.6 | (63.3-69.9) |
| Female | | | | | 69.4 | (66.6-72.2) |
| Race/Ethnicity | | | | | | |
| White non-Hispanic | 78.1 | (75.3-80.8) | 84.9 | (82.3-87.5) | 70.0 | (67.6-72.3) |
| Black non-Hispanic | 82.0 | (75.6-88.4) | 87.0 | (82.3-91.6) | 68.0 | (61.9-74.1) |
| Hispanic | 87.2 | (81.7-92.6) | 85.7 | (81.1-90.4) | 64.7 | (56.9-72.4) |
| Other non-Hispanic | 62.8 | (48.0-77.6) | 63.3 | (53.1-73.4) | 55.0 | (43.8-66.2) |
| Annual household income | | | | | | |
| < \$25,000 | 77.1 | (72.3-82.0) | 80.3 | (75.9-84.8) | 62.0 | (57.2-66.9) |
| \$25,000 - <\$50,000 | 75.2 | (69.3-81.1) | 83.8 | (79.3-88.2) | 65.0 | (60.0-70.0) |
| ≥ \$50,000 | 80.1 | (76.5-83.7) | 86.6 | (83.5-89.6) | 72.7 | (69.9-75.6) |
| Missing [§] | 81.5 | (74.2-88.7) | 71.3 | (63.3-79.3) | 67.9 | (61.2-74.6) |
| Educational attainment | | | | | | |
| Less than high school | 84.0 | (76.7-91.3) | 77.2 | (69.8-84.7) | 66.8 | (58.5-75.0) |
| High school or GED | 76.8 | (72.0-81.5) | 83.3 | (79.0-87.5) | 62.3 | (58.0-66.7) |
| Some post-high school | 77.5 | (72.8-82.3) | 80.5 | (75.7-85.2) | 69.0 | (65.1-73.0) |
| College graduate | 79.9 | (76.3-83.5) | 85.9 | (83.1-88.8) | 72.9 | (69.9-75.8) |
| Primary health care coverage | | | | | | |
| Private insurance | 79.7 | (76.5-82.8) | 86.8 | (84.3-89.3) | 69.0 | (66.2-71.8) |
| Medicare | 79.5 | (75.0-84.0) | 84.7 [¶] | (80.6-88.8) | 75.2 | (71.2-79.2) |
| Medicaid | 88.7 | (82.3-95.1) | 84.7 [¶] | (80.6-88.8) | 66.5 | (57.5-75.4) |
| Other insurance | 64.5 | (46.9-82.2) | 84.7 [¶] | (80.6-88.8) | 63.0 | (51.4-74.6) |
| No insurance | 51.7 | (36.9-66.5) | 64.4 | (56.2-72.6) | 38.9 | (28.2-49.5) |
| Regular health care provider | | | | | | |
| Yes | 80.3 | (77.9-82.8) | 86.2 | (84.1-88.3) | 72.0 | (69.8-74.1) |
| No | 48.0 | (35.7-60.3) | 63.2 | (55.7-70.8) | 26.1 | (19.4-32.8) |
| Disability ^{**} | | | | | | |
| Yes | 78.5 | (74.0-83.1) | 79.2 | (73.6-84.8) | 72.0 | (68.1-76.0) |
| No | 79.1 | (76.3-81.9) | 83.3 | (81.0-85.7) | 67.1 | (64.6-69.7) |
| Residence | | | | | | |
| New York City (NYC) | 79.8 | (75.7-83.9) | 80.6 | (77.1-84.1) | 68.6 | (64.7-72.4) |
| NYS excluding NYC | 77.8 | (74.8-80.8) | 84.3 | (81.6-87.1) | 67.8 | (65.2-70.4) |

* Percentages are weighted to population characteristics.

[†] 95%CI: Confidence interval at the 95 percent probability level,

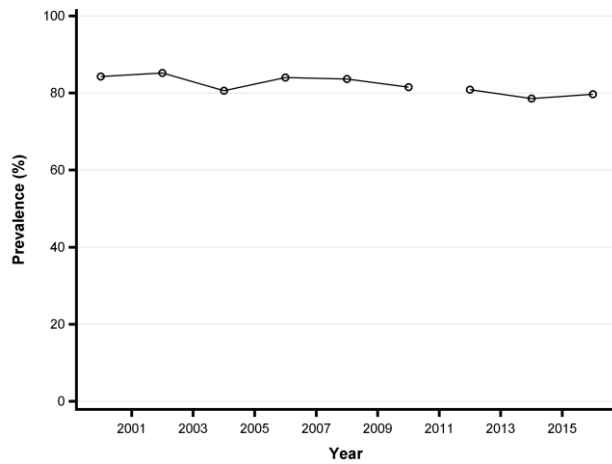
[§] "Missing" category included because more than 10% of the sample did not report income.

[¶] Rate is calculated for those who were covered by Medicare, Medicaid, and other insurance as one group.

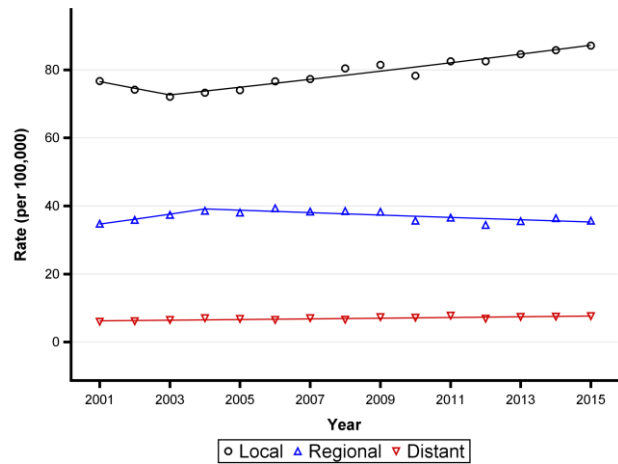
** All respondents who reported at least one type of disability (cognitive, self-care, independent living, vision, or mobility).

Figure 7 Trends in 2001-2015 cancer incidence rates* by stage at diagnosis† and 2000-2016 screening prevalence of breast cancer,¹² cervical cancer,¹³ and colorectal cancer¹⁴ for New York State

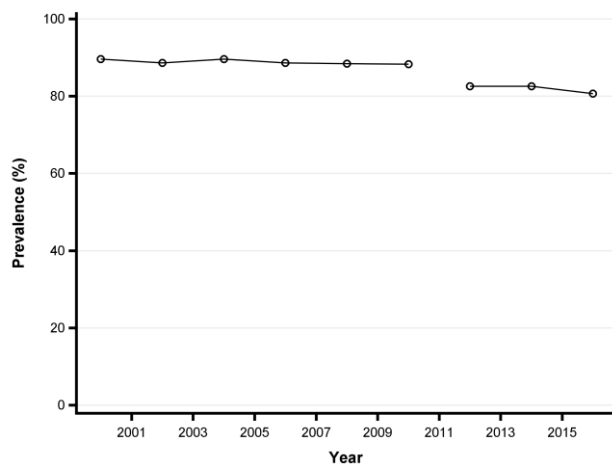
(A) Mammogram within past 2 years



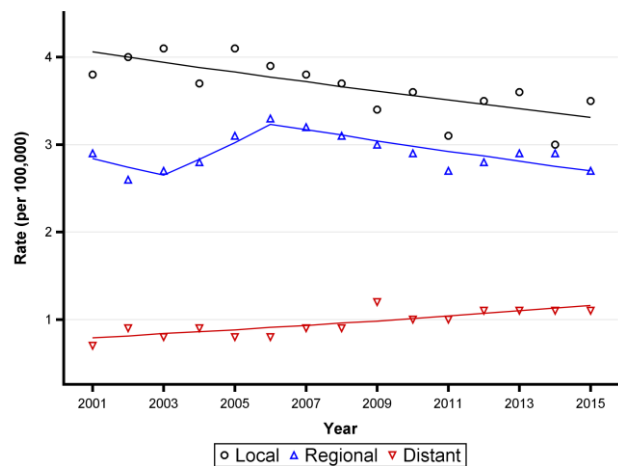
(B) Breast cancer incidence



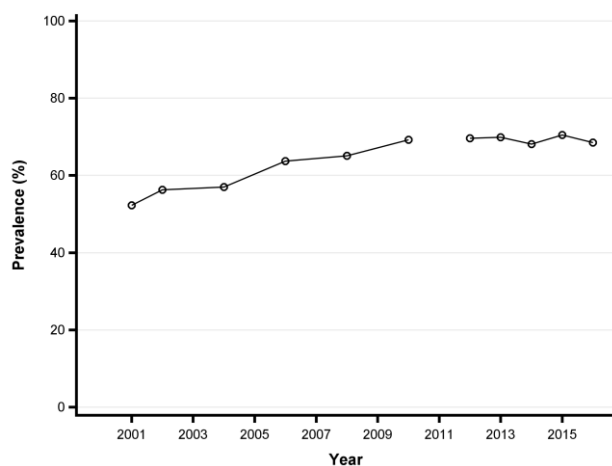
(C) Pap test within past 3 year



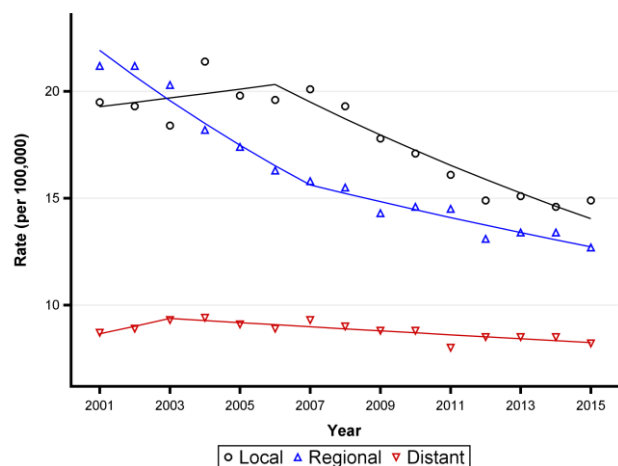
(D) Cervical cancer incidence



(E) Up-to-date with Colorectal screening



(F) Colorectal cancer incidence



* Rate is age adjusted to the 2000 U.S. standard population.

† Source of data: New York State Cancer Registry.

The cervical cancer screening rate in NYS has also been high and steady (Fig. 7C), though remaining well below the 93.0% Healthy People 2020 goal.¹⁶ The 2.4% drop from 2014 to 2016 is potentially concerning, though the change is within the margins of the survey sampling error. Local and regional cervical cancer incidence dropped markedly over the period, though partially offset in part by an increasing trend among those diagnosed at distant stage (Fig. 7D). Coupled with steady screening rates, this again suggests the role of factors beyond screening that are driving these trends. Foremost this would include the influence of the HPV vaccine as it inoculates ever-wider shares of the population against most types of cervical cancer.

As noted before, the definition of being up-to-date on colorectal cancer screening used by the NYS BRFSS for the 2011-2016 period was based on the recommendations that were in place prior to June 2016. Up-to-date meant that an adult aged 50 to 75 years old was screened by FOBT/FIT in the past year, sigmoidoscopy in the past 5 years with FOBT/FIT in the past 3 years, or by colonoscopy in the past 10 years.¹⁴ The proportion of NYS residents meeting this standard increased from 2001 to 2010 and has leveled off since (Fig. 7E), remaining below the Healthy People 2020 objective of 70.5%.¹⁶ The significant decline in tumors diagnosed at every stage in the past decade attests to the protective effect of colorectal cancer screening (Fig. 7F).

Conclusions

- Breast cancer incidence rates are higher in white women as compared to other race/ethnicities, though mortality rates are higher in black women. Rates of breast cancer screening across the state are similar for the two groups. The source of this disparity has been the subject of much research, and may relate to breast cancer actually representing multiple distinct diseases.¹⁹ In particular, black women are much more likely to have a type of breast cancer that has the poorest prognosis.²⁰ Issues related to access to care may also explain some of this variation, such as black women tending to have longer intervals to diagnosis after an abnormal mammogram.²¹
- Racial/ethnic disparities are seen in cervical and colorectal cancer incidence and mortality rates, with higher cervical cancer incidence and mortality rates in black and Hispanic women and higher colorectal cancer incidence and mortality rates in blacks. However, screening rates for these cancers do not differ strongly by race/ethnicity – screening disparities appear more closely related to factors such as annual household income, insurance status and educational attainment.
- County-level variation in breast cancer incidence is minor, with nearly all counties within 15% of the state rate. Colorectal cancer, in contrast, saw a two-fold variation between the highest and lowest rate counties. Cervical cancer saw much larger variations, but with very small numbers of cases in rural counties.
- In the century thus far, early-stage breast cancer incidence has trended upward, late-stage breast cancer (i.e., regional and distant stage combined) slightly downward, and mortality strongly downward, all as screening rates have remained steady. Improvements in breast cancer treatment are generally held to be responsible for the mortality decline.¹⁷
- Cervical cancer screening prevalence has been high and steady since 2000. To further reduce overall cervical cancer incidence as well as distant stage disease, a continued effort should be made to engage difficult-to-reach populations with screening and vaccination, the latter particularly in male and female adolescents.
- Overall incidence rates of colorectal cancer have declined in the last decade, corresponding to the increasing rates of colorectal cancer screening. However, the decline in cases diagnosed at distant stage has been more modest than at earlier stages. Future screening efforts should focus on

populations least likely to be screened including those with low annual household income, those with a high school education or less and those without health insurance.

- For all three sites, the 2014 BRFSS data showed that people without health insurance or without a primary care provider were much less likely to be screened. Beginning in 2014, many NYS residents gained access to recommended preventive health services, including cancer screening, as a result of the Affordable Care Act. It was hoped that this would result in higher screening rates and reduce disparities in cancer mortality. While more years of data are needed, the 2016 BRFSS data do not suggest this was the case. Continued efforts in prevention and early detection are needed, with a continued emphasis on reaching those least likely to be engaged with the health care system. (See Appendix for current State plans related to early detection).

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Appendix

Definition of Summary Stage:

Summary Staging is the most basic way of categorizing how far a cancer has spread from its point of origin. In the simplest form it has three categories: localized, regional, and distant.

Local stage: a **localized** cancer is limited to the organ of origin; it has spread no farther than the organ in which it started.

Regional stage: the cancer has extended beyond the limits of the organ of origin. This can be either through spread into adjacent organs or surrounding tissue, or spread into nearby lymph nodes, or both.

Distant stage: the cancer has spread beyond adjacent organs/tissues or nearby lymph nodes. Most commonly this involves distant metastases, that is, tumor cells have broken away from the original tumor, have travelled to other parts of the body, and have begun to grow in the new location.

New York State Comprehensive Cancer Control Plan

The NYS Cancer Consortium, a statewide network of individuals and organizations dedicated to addressing the cancer burden in NYS (www.nyscancerconsortium.org), developed [the 2018-2023 NYS Comprehensive Cancer Control Plan](#). The Consortium identified seven priority areas for action, one of which focuses on early detection. The following is an excerpt from the plan.

Goal:

All New Yorkers will receive age-appropriate, evidence-based, guideline-driven screening services for the early detection of cancer.

Measurable Objectives:

Breast Cancer:

- By 2023, increase the percentage of women who receive a breast cancer screening based on the most recent guidelines:
 - a. By 2023, increase the percentage of women ages 40 to 49 years who have received a mammogram within the past two years from 66.0% to 69.3%. (Baseline, 2016: Behavioral Risk Factor Surveillance System [BRFSS])
 - b. By 2023, increase the percentage of women ages 50 to 74 years who have received a mammogram within the past two years from 79.7% to 87.7%. (Baseline, 2016: BRFSS)
- By 2023, decrease the rate of female breast cancer identified at late stages from 42.4 cases per 100,000 females to 38.2 cases per 100,000 females. (Baseline, 2012-2014: New York State Cancer Registry [NYSCR])

Cervical Cancer:

- By 2023, increase the percentage of women who receive a cervical cancer screening based on the most recent guidelines:
 - a. By 2023, increase the percentage of women ages 21 to 65 years who have received a Pap test within the past three years or women ages 30 to 65 years who have received a Pap and HPV co-test within the past five years from 82.2% to 86.3%. (Baseline, 2016: BRFSS)
- By 2023, decrease the rate of invasive cervical cancer from 7.7 cases per 100,000 females to 6.9 cases per 100,000 females. (Baseline, 2012-2014: NYSCR)

Colorectal Cancer:

- By 2023, increase the percentage of adults who receive a colorectal cancer screening based on the most recent guidelines:

- a. By 2023, increase the percentage of adults ages 50 to 75 years who received either a blood stool test within the past year, or a sigmoidoscopy within the past 5 years and a blood stool test within the past 3 years, or a colonoscopy within the past 10 years from 68.5% to 80.0%. (Baseline, 2016: BRFSS)

Reduce disparity:

- b. By 2023, increase the percentage of adults ages 50 to 75 years with an income <\$25,000 who received either a blood stool test within the past year, or a sigmoidoscopy within the past 5 years and a blood stool test within the past 3 years, or a colonoscopy within the past 10 years from 60.7% to 63.7%. (Baseline, 2016: BRFSS)

- By 2023, decrease the rate of invasive colorectal cancer from 39.4 cases per 100,000 population to 35.5 cases per 100,000 population. (Baseline, 2012-2014: NYSCR)

- By 2017, reduce barriers to screenings and diagnostic services for disparate populations so that there are no significant differences in screening rates and rates of invasive or late stage diagnosis by race, ethnicity, income level, education level, insurance status or geographic location. (Data Sources: BRFSS and NYSCR)

Lung Cancer:

- By 2023, establish a means by which to assess the percentage of high risk adults who are screened for lung cancer based on the most recent guidelines. (Developmental measure - potential data source: BRFSS)

- By 2023, decrease the rate of lung cancer identified at late stages from 42.8 cases per 100,000 population to 38.5 cases per 100,000 population. (Baseline, 2012-2014: NYSCR)

- By 2023, decrease the lung cancer death rate from 38.6 deaths per 100,000 population to 34.7 deaths per 100,000 population. (Baseline, 2012-2014: NYSCR)

All Screening Amenable Cancers:

By 2023, decrease barriers to screening and diagnostic services for disparate populations so that there are no significant differences in screening rates and rates of invasive or late stage diagnosis by race, ethnicity, income level, education level insurance status or geographic location. (Developmental measures- potential data sources: BRFSS and NYSCR).

Prevention Agenda 2019-2024: New York State's Health Improvement Plan

The NYS [Prevention Agenda 2019-2024](#) was updated by the Public Health and Health Planning Council in conjunction with a large group of stakeholders, at the request of the Department. The overarching strategy of the Prevention Agenda is to implement public health approaches that improve the health and well-being of entire populations and achieve health equity. The Prevention Agenda is meant to serve as a call for action urging a broad range of stakeholders to collaborate at the community level to assess health status and needs, identify local health priorities and plan, implement and evaluate strategies to improve local health. Chronic disease prevention is one of the five priority areas identified in the Prevention Agenda; it includes a goal of increasing cancer screening rates and specific objectives related to breast, cervical and colorectal cancer screening with an emphasis on the economically disadvantaged.

Goal 4.1:

Increase cancer screening rates

Objectives - By December 31, 2024

- Increase the percentage of women with an annual household income less than \$25,000 who receive a breast cancer screening based on most recent guidelines from 75.9% (2016) to 79.7%. (Data source: BRFSS;

Data Level: state (by race/ethnicity, gender, and region), and by county)

- Increase the percentage of women with an annual household income less than \$25,000 who receive a cervical cancer screening based on the most recent guidelines from 76.1% (2016) to 80.0%. (Data source: BRFSS; Data Level: state (by race/ethnicity, gender, and region), and by county)
- Increase the percentage of adults who receive a colorectal cancer screening based on the most recent guidelines (ages 50 to 75 years) from 68.5% (2016) to 80.0%. (Data source: BRFSS; Data Level: state (by race/ethnicity, gender, and region), and by county)
- Increase the percentage of adults who receive a colorectal cancer screening based on the most recent guidelines (adults with an annual household income less than \$25,000) from 60.7% (2016) to 63.7%. (Data source: BRFSS; Data Level: state (by race/ethnicity, gender, and region), and by county)
- Increase the percentage of adults aged 50-64 who receive a colorectal cancer screening based on the most recent guidelines from 63.1% (2016) to 66.3%. (Data source: BRFSS; Data Level: state (by race/ethnicity, gender, and region), and by county)