# Cancers with Population-Based Screening Methods - Incidence, Stage at Diagnosis and Screening Prevalence, New Jersey

**Cancer Epidemiology Services**
**Public Health Services Branch**
**New Jersey Department of Health and Senior Services**

**Chris Christie, Governor**
**Kim Guadagno, Lt. Governor**

**Mary E. O'Dowd, MPH**
**Commissioner**

# Cancers with Population-Based Screening Methods – Incidence, Stage at Diagnosis and Screening Prevalence, New Jersey

Prepared by:

Lisa M. Roche, PhD, MPH
Xiaoling Niu, MS
Karen S. Pawlish, ScD, MPH


Cancer Epidemiology Services
Public Health Services
New Jersey Department of Health and Senior Services


Christina G. Tan, MD
State Epidemiologist and Acting Deputy Commissioner
Public Health Services


Mary E. O'Dowd, MPH
Commissioner


Chris Christie
Governor

Kim Guadagno
Lt. Governor


Cancer Epidemiology Services
New Jersey Department of Health and Senior Services
P.O. Box 369
Trenton, NJ 08625-0369
(609) 588-3500
http://nj.gov/health/ces/index.shtml


October 2011

**ACKNOWLEDGMENTS**

**TABLE OF CONTENTS**

## INTRODUCTION

Cancer is the second leading cause of death among all people and the leading cause of death among persons under age 85 in the U.S.[1] The American Cancer Society estimates that in 2011, nearly 1.6 million new cases of cancer will be diagnosed and almost 572,000 residents will die of cancer in the U.S.[2] Screening for cancer can increase survival by allowing diagnosis at earlier stages when it is more treatable.[2] Screening may also prevent cancer by detecting precancerous growths that can be removed.[2] Population-based screening for cancer involves screening individuals who may be at risk for cancer but do not have any symptoms of cancer.[3] Population-based screening is recommended for certain cancers for which studies have shown the benefits of screening such as reductions in incidence and/or mortality.[2,3] Several organizations publish screening recommendations including the types of screening tests, ages at which screening should begin, and how often screening should occur.[2,3] Currently, there are population-based screening recommendations for breast, cervical and colorectal cancers. Progress in reducing the burden of cancer can be measured by trends over time in incidence and mortality rates, in the proportion of cancers diagnosed in earlier stages, and in the prevalence of population-based screening.

This report includes information on incidence and stage at diagnosis for breast, cervical and colorectal cancers diagnosed among New Jersey residents during 2006-2008, as well as time trends between 1990 and 2008, using data from the New Jersey State Cancer Registry. Screening prevalence data for these three cancers for New Jersey residents from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) surveys also are presented. This is the first report published by Cancer Epidemiology Services, New Jersey Department of Health and Senior Services, to assess progress in reducing the burden of the major cancers with population-based screening recommendations.

Additional New Jersey cancer incidence, prevalence, risk, mortality and survival data are available from the Cancer Epidemiology Services office (609-588-3500) or on our website, http://www.state.nj.us/health/ces/index.shtml, including:

- *Cancer Incidence and Mortality in New Jersey 2004-2008*;
- *Cancer Among Asians and Pacific Islanders in New Jersey 1990-2007*;
- *Adolescent and Young Adult Cancer in New Jersey 1979-2006*;
- *Childhood Cancer in New Jersey 1979-2005*;
- *Area Socioeconomic Variations in Cancer Incidence and Stage at Diagnosis in New Jersey, 1996-2002*;
- *Cancer Prevalence in New Jersey on January 1, 2003;*
- *Probability of Developing Cancer for Selected Age Groups by Sex, 2004-2006 (New Jersey and U.S.)*;
- *Cancer Survival in New Jersey, 1979-1997*;
- *Cancer Incidence Rates in New Jersey's Ten Most Populated Municipalities, 1998-2002*; and

- *Trends in Cancer Incidence and Mortality in New Jersey, 1979-2002.*

Our interactive cancer data mapping application provides statewide and county-level cancer incidence and mortality data by cancer type, gender, race, and ethnicity for the most recent five years of data, currently 2004-2008. Similar data are available for cancer mortality. Additionally, statewide age-specific incidence and mortality data may be obtained from this site. The interactive cancer data mapping application can be found at http://nj.gov/health/ces/cancer-rates.shtml. This application is updated annually.

Additional New Jersey and U.S. cancer data and information can be found on the following websites:

- New Jersey Department of Health and Senior Services at http://www.state.nj.us/health/ces/cci.shtml;
- National Cancer Institute's Surveillance, Epidemiology and End Results Program (SEER) Cancer Statistics at http://surveillance.cancer.gov/statistics/;
- Cancer Control P.L.A.N.E.T. at http://cancercontrolplanet.cancer.gov/;
- State Cancer Profiles at http://statecancerprofiles.cancer.gov/index.html;
- North American Association of Central Cancer Registries'(NAACCR) *Cancer in North America* at http://www.naaccr.org; and
- Center for Disease Prevention and Control's Behavioral Risk Factor Surveillance System (BRFSS) surveys at http://www.cdc.gov/brfss/technical_infodata/surveydata.htm.

# SUMMARY

## Late Stage at Diagnosis

In New Jersey, substantial percentages of women diagnosed with breast or cervical cancer and men and women diagnosed with colorectal cancer during 2006-2008 were diagnosed at a late stage (regional or distant stage). Specifically, over 25% of women 40 to 79 years old diagnosed with breast cancer, 49% of women 20 to 79 years old diagnosed with cervical cancer, and about half the women and men 50 to 79 years old diagnosed with colorectal cancer were diagnosed at a late stage. The percentage diagnosed at a late stage varied by age, race and ethnicity, with 41% of younger (40-49) black women and 34% of middle-age (50-59) black and Hispanic women with late-stage breast cancer diagnoses. For cervical cancer, the younger (20-39) black women and older (60-79) white and Hispanic women had the highest percentages diagnosed at a late stage – 62%, 65%, and 64%, respectively. The percentage of late-stage colorectal cancers diagnosed during 2006-2008 did not vary greatly across the age, race and ethnic groups, except a higher percentage (66%) of young Asian and Pacific Islander men with colorectal cancer were diagnosed at a late stage. (See Tables 1., 4., 7. and 9.)

For breast and colorectal cancer diagnosed during 2006-2008, cases with no health insurance had the highest percentage of late-stage diagnoses – 42% among women 40-79 with breast cancer, 60% among women 50-79 with colorectal cancer and 62% among men 50-79 with colorectal cancer. Generally, for each race and ethnicity the uninsured cases had the highest percentage of late-stage diagnoses and the privately insured cases had the lowest percentage of late-stage diagnoses. Additionally, uninsured black women diagnosed with breast cancer or with colorectal cancer had much higher percentages diagnosed at a late stage than the other uninsured race and ethnic groups – 51% and 68%, respectively. Among New Jersey women diagnosed with cervical cancer during 2006-2008, those on Medicare had the highest percentage diagnosed at a late stage – 64%, although the uninsured had nearly as large a percentage – 63%. Among white, Asian and Pacific Islander, and Hispanic women, those on Medicare had the highest percentages diagnosed at a late stage; however, among black women those without insurance had the highest percentage. Cervical cancer cases on Medicaid also had a high percentage diagnosed at a late stage, while cases with private insurance had the lowest percentage diagnosed at a late stage. This held for all the race and ethnic groups. (See Tables 2., 5., 8. and 10.)

From the 1990-1993 time period to the 2006-2008 time period, the percentage of women ages 40-79 diagnosed with late-stage breast cancer or ages 50-79 with late-stage colorectal cancer decreased in each race and ethnicity group. Decreases in the percentage of late-stage diagnoses also occurred among 50-79 year old white, black and Hispanic men diagnosed with colorectal cancer. However, between the same time periods the percentage of women ages 20-79 diagnosed with late-stage cervical cancer increased in all race and ethnic groups. Racial and ethnic disparities in the percentage of late-stage

3

diagnoses lessened over time among women with any of these three cancers, but not among men with colorectal cancer. (See Figures 1., 3., 5. and 6.)

**Screening Prevalence**

Regarding breast cancer screening, in 2008, 76% of New Jersey women 40 and older reported having a mammogram in the past two years; there were similar percentages in all the age, race and ethnic groups. However, there was great disparity by annual income – 65% of women with $15,000 or lower annual income versus 81% of women with $50,000 or higher annual income reported having a mammogram in the past two years. For cervical cancer screening, 80% of women 18 and older reported having a pap test in the past three years. While the percentages were similar among the race and ethnic groups, much lower percentages of the youngest (18-24) and oldest (65 and older) women reported having a pap test in the past three years – 65% and 63%, respectively. Similar to mammograms, there was great disparity by annual income – 65% of women with $15,000 or lower annual income compared to 88% of women with $50,000 or higher annual income reported having a pap test in the past three years. (See Tables 3. and 6.)

Fifty-nine percent of New Jersey adults 50 and older reported ever having a sigmoidoscopy or colonoscopy for colorectal cancer, much lower than the reported percentages reporting having a mammogram or pap test. The percentages were similar for men and women, but were lower the younger the age group and for blacks and Hispanics. As with mammograms and pap tests, the lower the income, the lower the percentage reporting ever having a sigmoidoscopy or colonoscopy. The percentage ranged from 46% in the $15,000 or lower income group to 64% in the $50,000 or higher income group. A very low percentage of adults 50 and over reported having a blood stool test in the past two years - 21%. (See Tables 11. and 12.)

That lower income groups are less likely to report having the various screening tests is consistent with the cancer incidence data showing that cancer cases with no insurance or on Medicaid were more likely to be diagnosed at a later stage than cases with private insurance.

Between 2004 and 2010, the percentage of women 40 and older who reported having a mammogram in the past two years fluctuated between 75% and 78%. Only Hispanic women's percentages increased over time – from 70% to 81%, which contributed to a decrease in racial and ethnic disparity. Over the same time period, similar percentages of women 18 or older reported having a pap test in the past three years, with very little differences among white, black and Hispanic women. The percent of adults 50 and over who reported ever having a sigmoidoscopy or colonoscopy increased between 2004 and 2010 from 57% to 66%, while the percent reporting having a blood stool test in the past two years decreased from 20% to 17%. These changes occurred among whites, blacks and Hispanics. (See Figures 2., 4., 7. and 8.)

**Conclusion**

While these results show progress in reducing the burden of the cancers with recommended population-based screening methods (breast, cervical, colorectal), much additional work is needed to educate the public about the importance of screening, to ensure access to screening and to encourage prompt follow-up on positive screening tests. The results also indicate population groups that are in need of specific attention such as people who are uninsured or on Medicaid (all types of screening), women on Medicare (cervical cancer screening), black and Hispanic women (breast and cervical cancer screening), and older and younger women (breast and cervical cancer screening).

**BREAST CANCER**

**Background**

Breast cancer is the most commonly diagnosed cancer in women, and is the second highest cause of cancer deaths in the U.S.[2,3] Since the early 1990s widespread screening resulting in early detection and improvements in treatment have led to reductions in breast cancer mortality.[2,3] Mammography can detect breast cancer at an early stage, when treatment is most effective. On average, mammography will detect 80 to 90 percent of breast cancers in women without symptoms.[2] Overall, the five-year relative survival rate of women diagnosed with breast cancer is 90 percent.[2] For women diagnosed with localized breast cancer, the five-year survival rate is 98 percent, while for women diagnosed with regional or distant stage breast cancer five-year survival is 84 and 23 percent, respectively. The American Cancer Society (ACS) recommends that women in their 20s and 30s have clinical breast examinations as part of a periodic health exam at least every three years; asymptomatic women 40 and older should continue with annual clinical breast examinations.[2] Women age 40 and older also should have annual mammograms. For women with a high lifetime risk of breast cancer, ACS recommends annual screening using magnetic resonance imaging (MRI) and annual mammography beginning at age 30.[2]

**Breast Cancer Late Stage at Diagnosis Incidence in New Jersey, 2006-2008**

➢ Over 25% of women ages 40-79 diagnosed with breast cancer were diagnosed in the late stage (regional and distant stages). The percentage was slightly lower in the older age groups than in the youngest age group. (Table 1.)

➢ In every age group, black women diagnosed with breast cancer had the highest percentage diagnosed in the late stage compared to white, Asian and Pacific Islander (API) and Hispanic women. Black women in the youngest age group (40-49) had a particularly high percentage of late stage breast cancers - 41%, higher than any other age, race and ethnic group. (Table 1.)

➢ Hispanic women with breast cancer had the next highest percentages diagnosed in the late stage, as high as 34% in the 50-59 age group. (Table 1.)

➢ Among women diagnosed with breast cancer, those with no health insurance or on Medicaid had the highest percentages diagnosed in the late stage, 42% and 39% respectively. (Table 2.)

➢ Over half the uninsured black women and 45% of black women on Medicaid with breast cancer were diagnosed in the late stage. (Table 2.)

➢ In each race and ethnic group except APIs, women with private insurance had the lowest percentage diagnosed in the late stage. (Table 2.)

**Table 1: Breast Cancer Incidence Rate and Percent Late Stage at Diagnosis by Age, Race and Ethnicity - Women, New Jersey, 2006-2008\***

| Age[#] | Total N=5,799 | | White N=4,638 | | Black N=822 | | API[+] N=288 | | Hispanic N=485 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Rate** | **%\*\*** | **Rate** | **%\*\*** | **Rate** | **%\*\*** | **Rate** | **%\*\*** | **Rate** | **%\*\*** |
| **40-49** | 69.2 | 28.3% | 69.4 | 27.0% | 72.4 | 40.6% | 57.2 | 27.4% | 48.2 | 29.0% |
| **50-59** | 94.3 | 27.2% | 93.9 | 26.4% | 105.2 | 34.4% | 71.7 | 26.5% | 87.7 | 33.6% |
| **60-69** | 122.8 | 25.2% | 119.7 | 24.0% | 138.4 | 32.1% | 110.6 | 29.9% | 87.7 | 27.0% |
| **70-79** | 143.2 | 26.1% | 144.5 | 25.5% | 146.5 | 32.9% | 74.7 | 25.2% | 106.2 | 29.8% |

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Late stage is the regional and distant stages combined. Rates are per 100,000 population and age-adjusted to the 2000 U.S. population standard. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The Ns are numbers of women 40-79 diagnosed with late stage breast cancer.
[#]The age group 80 and older is not shown due to a high percentage of breast cancers with unknown stage at diagnosis.
[+]API is Asian and Pacific Islanders.
**Percent of all breast cancers (including *in situ* stage) in the age and race or ethnic group that was diagnosed in the late stage.

**Table 2: Breast Cancer Percent Late Stage at Diagnosis by Race, Ethnicity and Health Insurance Status - Women Ages 40-79, New Jersey, 2006-2008\***

| Insurance Status[#] | Total N=5,799 | | White N=4,638 | | Black N=822 | | API[+] N=288 | | Hispanic N=485 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Count** | **%\*\*** | **Count** | **%\*\*** | **Count** | **%\*\*** | **Count** | **%\*\*** | **Count** | **%\*\*** |
| **None** | 290 | 42.0% | 171 | 39.6% | 72 | 50.7% | 38 | 42.2% | 83 | 43.2% |
| **Medicaid** | 190 | 38.9% | 124 | 38.3% | 53 | 44.9% | 9 | 28.1% | 37 | 29.6% |
| **Medicare** | 1,724 | 26.4% | 1,424 | 25.4% | 253 | 34.3% | 37 | 24.0% | 117 | 31.5% |
| **Private** | 3,264 | 25.7% | 2,657 | 24.9% | 396 | 32.7% | 189 | 26.2% | 216 | 26.1% |
| **Unknown** | 321 | 25.0% | 256 | 25.0% | 44 | 33.3% | 15 | 31.9% | 30 | 33.7% |

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Late stage is the regional and distant stages combined. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of breast cancers with unknown stage at diagnosis. The Ns and counts are numbers of women 40-79 diagnosed with late stage breast cancer.
[#]The Medicaid category includes only women who do not have any insurance other than Medicaid. The Medicare category includes women with Medicare as well as Medicaid or private insurance. The TRICARE, Military, VA, Indian/PHS insurance category is not shown due to too few numbers (n=10).
[+]API is Asian and Pacific Islanders.
**Percent of all breast cancers (including *in situ* stage) in the race or ethnic group that was diagnosed in the late stage.

**Breast Cancer - Trends in Late Stage at Diagnosis Incidence in New Jersey, 1990-2008**

**Figure 1.**
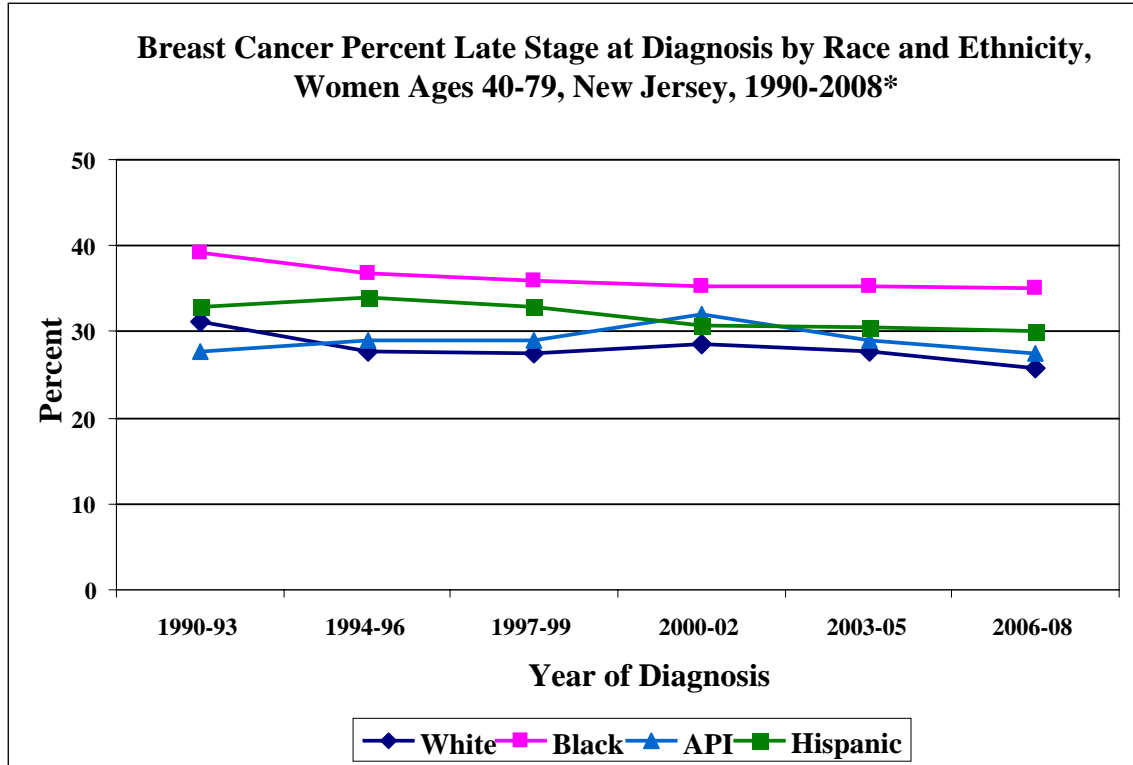


**Breast Cancer Percent Late Stage at Diagnosis by Race and Ethnicity, Women Ages 40-79, New Jersey, 1990-2008***

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Percent is of all breast cancers (including *in situ* stage) in the race or ethnic group that was diagnosed in the late stage. Late stage is the regional and distant stages combined. API is Asian and Pacific Islanders. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of breast cancers with unknown stage at diagnosis.

> ➢ The percentage of breast cancers diagnosed in the late stage generally decreased over time in women of each race and ethnicity.

> ➢ The disparity among race and ethnic groups in the percent of breast cancer diagnosed at the late stage lessened over time.

**Breast Cancer Screening Prevalence in New Jersey, 2008**

**Table 3: Percent of Women 40 and Older Who Had a Mammogram in the Past Two Years by Age, Race, Ethnicity and Income, New Jersey, 2008***

| Demographic | Total Number Who Answered the Question[#] | Percent Who Answered Yes[+] | 95% CI** |
|---|---|---|---|
| **Age:** | | | |
| 40-49 | 1,370 | 72.0% | 68.8-75.2% |
| 50-59 | 1,498 | 79.5% | 76.8-82.1% |
| 60-64 | 625 | 81.7% | 77.8-85.6% |
| 65 and older | 2,006 | 75.0% | 72.5-77.4% |
| **Race/Ethnicity:** | | | |
| white | 4,264 | 76.8% | 75.2-78.5% |
| black | 525 | 76.4% | 71.7-81.1% |
| Hispanic | 452 | 75.6% | 70.0-81.3% |
| other | 172 | 63.5% | 53.9-73.1% |
| **Annual Income:** | | | |
| <$15,000 | 448 | 65.2% | 59.1-71.3% |
| $15,000-24,999 | 826 | 66.2% | 61.9-70.5% |
| $25,000-34,999 | 508 | 71.2% | 65.2-77.2% |
| $35,000-49,999 | 644 | 78.8% | 74.9-82.7% |
| $50,000 or more | 2,318 | 81.1% | 79.0-83.1% |
| **Total** | 5,499 | 76.0% | 75.8-78.8% |

*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.
[#]Includes all respondents except those with missing, don't know, and refused answers.
[+]Percentages are weighted to population characteristics.
**CI=confidence interval.

> Overall, in 2008 about 76% of New Jersey women 40 years of age and older reported having a mammogram in the past two years.

> Women between 40 and 49 years of age were less likely to have had a mammogram in the past two years than women in the older age groups.

> About the same percentage of white, black and Hispanic women reported having a mammogram in the past two years.

> The lower the income, the less likely women were to have had a mammogram in the past two years; 65% of women with lower than $15,000 annual income had a mammogram compared to 81% of women with $50,000 or higher annual income.

**Breast Cancer - Trends in Screening Prevalence in New Jersey, 2004-2010**

**Figure 2.**

**Percent of Women Ages 40 and Older with Mammogram in Past Two Years by Race and Ethnicity, New Jersey, 2004-2010\***

*(Line graph showing Percent on y-axis from 0 to 90, Year of Survey on x-axis: 2004, 2006, 2008, 2010. Legend: White, Black, Hispanic.)*

\*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2004, 2006, 2008, 2010. Includes a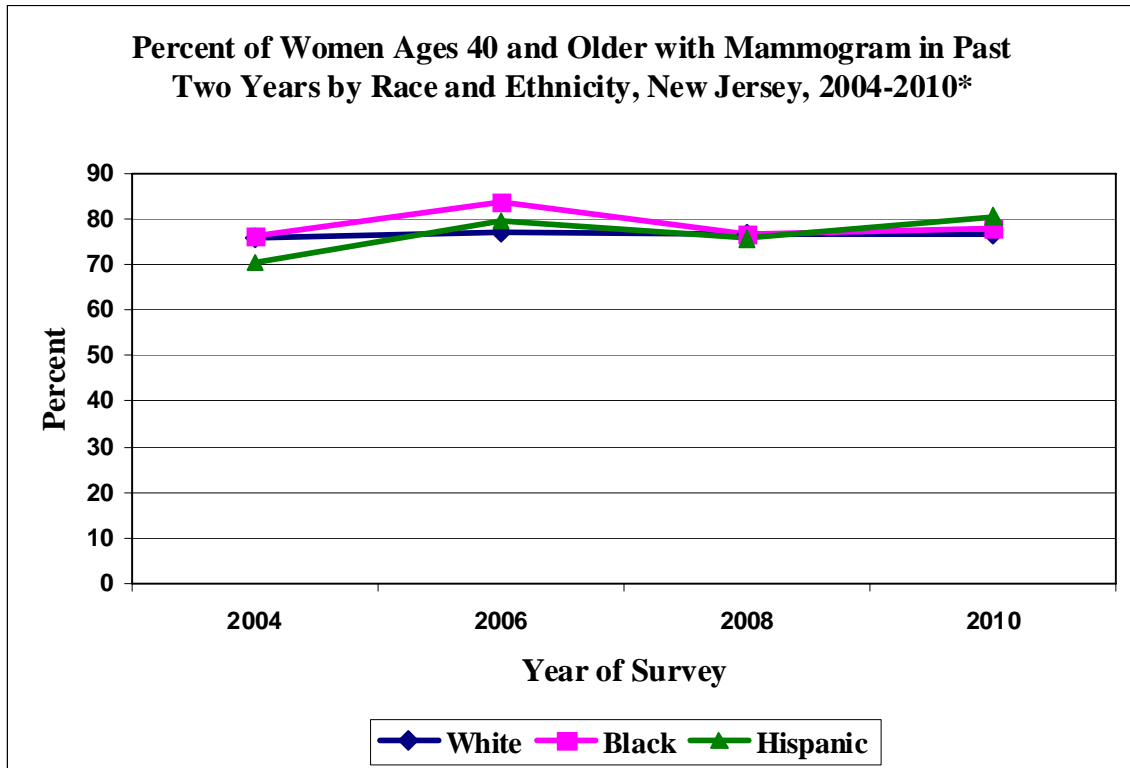ll respondents except those with missing, don't know, and refused answers. Percentages are weighted to population characteristics.

➢ Overall, the percent of women 40 or older who reported having a mammogram in the past two years fluctuated between 75% and 78% in the years 2004, 2006, 2008 and 2010. (Data not shown.)

➢ The percentages for women of white or black race fluctuated over time, 76 to 77% and 76 to 84%, respectively.

➢ The percentages for Hispanic women increased from 70% to 81% during these years.

## CERVICAL CANCER

**Background**

In the U.S. cervical cancer incidence has declined greatly over the past several decades, as has cervical cancer mortality.[2,3] The decline in incidence and mortality is due to the development and routine use of the Pap test. Screening using the Pap test can prevent cervical cancer by detecting precancerous lesions, and can increase survival by detecting cervical cancer early when treatment is most effective.[2] The five-year survival rate for women diagnosed with cervical cancer is 70 percent.[2] However, for women diagnosed with localized cervical cancer the five-year survival rate is 91 percent[2], compared with a survival rate of 58 percent for diagnosis in the regional stage and 17 percent for the distant stage.[3] The American Cancer Society (ACS) recommends that women begin cervical cancer screening about three years after first vaginal intercourse, but not later than age 21, consisting of conventional Pap tests every year or a liquid-based Pap test every two years.[2] At or after age 30, women with three normal Pap tests in a row may be screened every two to three years with pap tests or every three years with an HPV (human papillomavirus) DNA test plus cervical cytology.[2] ACS also notes that women 70 years or older who have had at least three normal Pap tests and no abnormal Pap test in the past ten years and women with a total hysterectomy may stop cervical cancer screening.[2]

**Cervical Cancer Late Stage at Diagnosis Incidence in New Jersey, 2006-2008**

➢ Overall, among women diagnosed with cervical cancer in 2006-2008, about a third of the 20-39, nearly half of the 40-59 and over three-fifths of the 60-79 year age groups were diagnosed in the late stage (regional and distant stages). (Table 4.)

➢ This pattern was reversed in black women with cervical cancer – 62% of the black women 20-39 years old versus 50% of the black women 60-79 years old were diagnosed in the late stage. (Table 4.)

➢ Over 60% of uninsured women diagnosed with cervical cancer were diagnosed at the late stage; this was true for all the race and ethnic groups except Hispanic women, 52% of whom were diagnosed at the late stage. (Table 5.)

➢ Even higher percentages of women on Medicare than uninsured women diagnosed with cervical cancer were diagnosed in the late stage; the exception was black women. (Table 5.)

➢ In each race and ethnic group, women with private insurance had the lowest percentages diagnosed at the late stage – 37% to 48%. (Table 5.)

**Table 4: Cervical Cancer Incidence Rate and Percent Late Stage at Diagnosis by Age, Race and Ethnicity - Women, New Jersey, 2006-2008\***

| Age[#] | Total N=580 | | White N=418 | | Black N=119 | | API[+] N=34 | | Hispanic N=108 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rate | %** | Rate | %** | Rate | %** | Rate | %** | Rate | %** |
| **20-39** | 1.4 | 34.1% | 1.2 | 28.9% | 2.8 | 61.7% | 0.7 | 35.7% | 2.1 | 37.8% |
| **40-59** | 3.8 | 48.9% | 3.4 | 47.6% | 6.1 | 52.5% | 3.4 | 57.6% | 4.8 | 46.5% |
| **60-79** | 5.3 | 61.7% | 5.1 | 65.2% | 6.8 | 50.0% | 5.0 | 58.8% | 10.9 | 63.5% |

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Rates are per 100,000 population and age-adjusted to the 2000 U.S. population standard. Late stage is the regional and distant stages combined. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The Ns are numbers of women 20-79 diagnosed with late stage cervical cancer.

[#]The age group 80 and older is not shown due to a high percentage of cervical cancers with unknown stage at diagnosis.

[+]API is Asian and Pacific Islanders.

**Percent of all cervical cancers (excluding *in situ* stage) in the age and race or ethnic group that was diagnosed in the late stage.

**Table 5: Cervical Cancer Percent Late Stage at Diagnosis by Race, Ethnicity and Health Insurance Status - Women Ages 20-79, New Jersey, 2006-2008\***

| Insurance Status[#] | Total N=580 | | White N=418 | | Black N=119 | | API[+] N=34 | | Hispanic N=108 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | %** | Count | %** | Count | %** | Count | %** | Count | %** |
| **None** | 115 | 62.5% | 73 | 61.9% | 29 | 65.9% | 8 | 61.5% | 36 | 52.2% |
| **Medicaid** | 50 | 56.2% | 29 | 54.7% | 18 | 58.1% | ^ | ^ | 17 | 54.8% |
| **Medicare** | 124 | 63.6% | 96 | 66.7% | 21 | 50.0% | 7 | 87.5% | 20 | 66.7% |
| **Private** | 254 | 41.4% | 195 | 40.0% | 42 | 48.3% | 15 | 45.5% | 29 | 36.7% |
| **Unknown** | 35 | 34.7% | 23 | 34.3% | 9 | 56.3% | ^ | ^ | 6 | 35.3% |

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Late stage is the regional and distant stages combined. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of cervical cancers with unknown stage at diagnosis. The Ns and counts are numbers of women 20-79 diagnosed with late stage cervical cancer.

[#]The Medicaid category includes only women who have no insurance other than Medicaid. The Medicare category includes women with Medicare as well as Medicaid or private insurance. The TRICARE, Military, VA, Indian/PHS insurance category is not shown due to too few numbers (n=2).
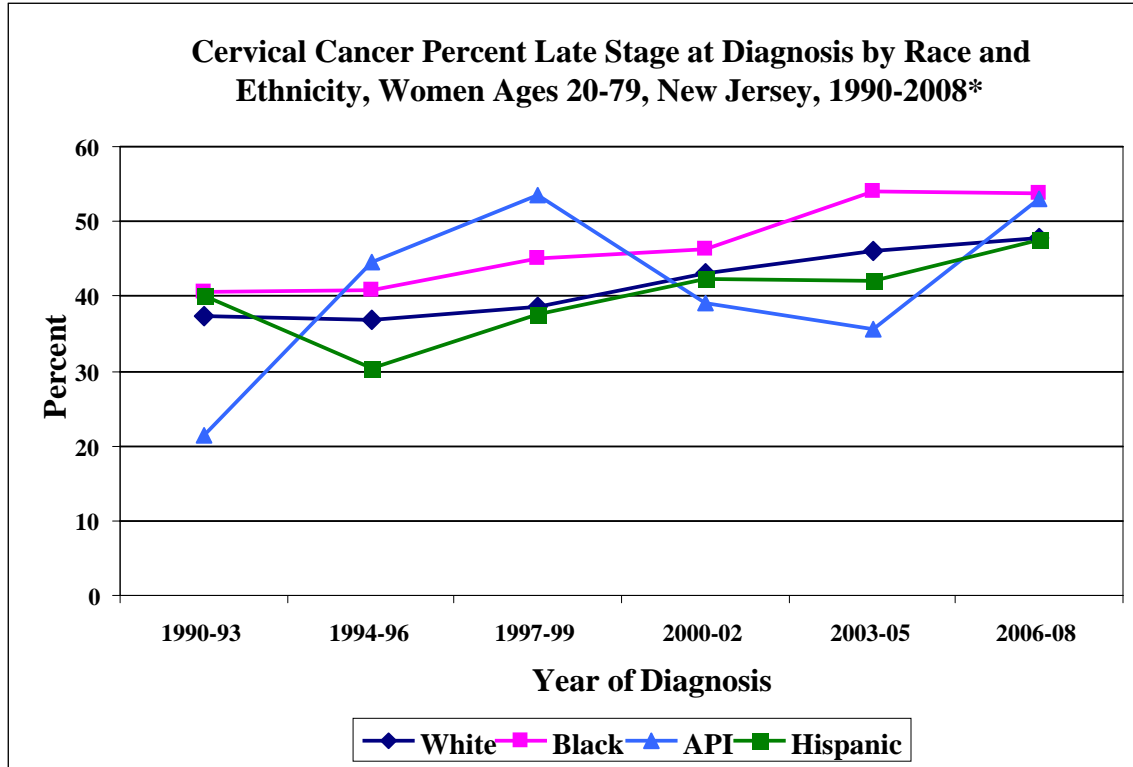
[+]API is Asian and Pacific Islanders.

**Percent of all cervical cancers (excluding *in situ* stage) in the race or ethnic group that was diagnosed in the late stage.

^Counts less than 5 are suppressed due to statistical unreliability.

**Cervical Cancer - Trends in Late Stage at Diagnosis Incidence in New Jersey, 1990-2008**

**Figure 3.**

**Cervical Cancer Percent Late Stage at Diagnosis by Race and Ethnicity, Women Ages 20-79, New Jersey, 1990-2008\***

*[Line chart showing Percent on the y-axis (0 to 60) and Year of Diagnosis on the x-axis (1990-93, 1994-96, 1997-99, 2000-02, 2003-05, 2006-08). Lines for White, Black, API, and Hispanic.]*

**Year of Diagnosis**

White — Black — API — Hispanic

\*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Percent is of all cervical cancers (excluding *in situ* stage) in the race or ethnic group that was diagnosed in the late stage. Late stage is the regional and distant stages combined. API is Asian and Pacific Islanders. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of cervical cancers with unknown stage at diagnosis.

➢ The percentage of cervical cancer cases diagnosed in the late stage increased between 1990 and 2008 in each race and ethnic group.

➢ The disparity among race and ethnic groups in the percentage of cervical cancer diagnosed at the late stage lessened over time.

**Cervical Cancer Screening Prevalence in New Jersey, 2008**

**Table 6: Percent of Women 18 and Older Who Had a Pap Test in the Past Three Years by Age, Race, Ethnicity and Income, New Jersey, 2008\***

| Demographic | Total Number Who Answered the Question[#] | Percent Who Answered Yes[+] | 95% CI** |
|---|---|---|---|
| **Age:** | | | |
| 18-24 | 189 | 65.3% | 56.0-74.7% |
| 25-34 | 661 | 85.3% | 81.7-88.9% |
| 35-44 | 1,092 | 89.4% | 86.8-91.9% |
| 45-54 | 1,310 | 86.2% | 83.8-88.5% |
| 55-64 | 1,036 | 80.1% | 77.0-83.3% |
| 65 and older | 1,301 | 62.9% | 59.5-66.2% |
| **Race/Ethnicity:** | | | |
| white | 4,054 | 80.4% | 78.3-82.5% |
| black | 550 | 83.2% | 79.2-87.2% |
| Hispanic | 639 | 79.7% | 75.0-84.4% |
| other | 263 | 69.8% | 61.9-77.7% |
| **Annual Income:** | | | |
| <$15,000 | 389 | 65.1% | 55.1-75.0% |
| $15,000-24,999 | 796 | 69.5% | 64.4-74.6% |
| $25,000-34,999 | 481 | 71.9% | 65.2-78.5% |
| $35,000-49,999 | 603 | 81.9% | 77.5-86.3% |
| $50,000 or more | 2,629 | 87.5% | 85.5-89.5% |
| **Total** | 5,589 | 79.9% | 78.1-81.6% |

\*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.
[#]Includes all respondents except those with missing, don't know, and refused answers.
[+]Percentages are weighted to population characteristics.
**CI=confidence interval.

> In 2008, nearly 80% of New Jersey women 18 and over reported having a Pap test in the past three years.

> The lowest percentages reporting having a Pap test in the past three years were the youngest (18-24) and oldest (65 and older) age groups – 65% and 63%, respectively.

> The percentages of white, black and Hispanic women having a Pap test in the past three years were similar – 80% or higher.

> The lower the income, the less likely women were to have had a Pap test in the past three years, 65% of women with less than $15,000 income to 88% of women with $50,000 or more income.

**Cervical Cancer - Trends in Screening Prevalence in New Jersey, 2004-2010**

**Figure 4.**



**Percent of Women Ages 18 and Older with Pap Test in Past Three Years by Race and Ethnicity, New Jersey, 2004-2010***

*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2004, 2006, 2008, 2010. Includes all respondents except those with missing, don't know, and refused answers. Percentages are weighted to population characteristics.
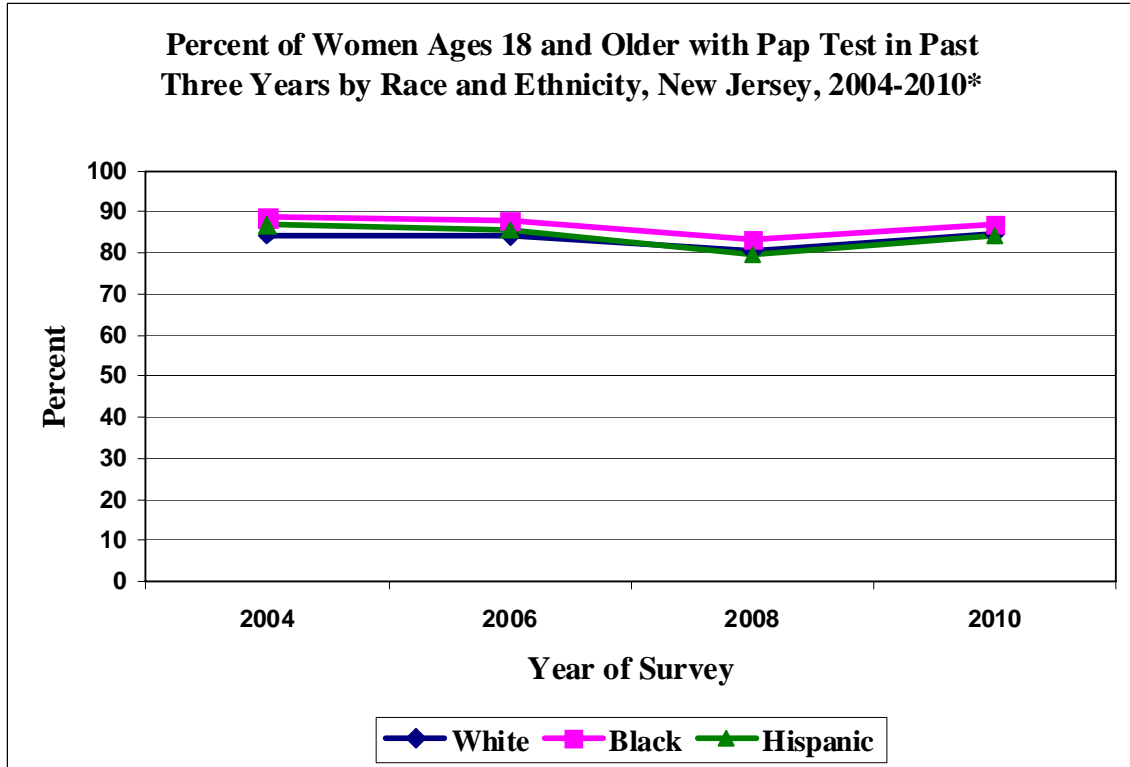
➢ The percent of women 18 years and older who reported having a pap test in the past three years was about 84% in 2004, 2006, and 2010 and 80% in 2008. (Data not shown.)

➢ In each of these years, the percentages were similar among white, black and Hispanic women, with black women's percentages slightly higher than white and Hispanic women's.

**COLORECTAL CANCER**

**Background**

Colorectal cancer is the third most common cancer among women and men in the U.S.[2,3] Incidence rates have been declining since 1985, with the decline accelerating since 1998.[2,3] The accelerating decrease since 1998 is largely due to increased screening which allows the detection and removal of colorectal polyps before they progress to cancer. The simultaneous decline in colorectal cancer mortality reflects the decline in incidence, as well as earlier detection and treatment resulting from increased screening.[2,3] The five-year relative survival rate for people with colorectal cancer is 65 percent. However, the survival rate is 90 percent for colorectal cancers that are diagnosed in the local stage, 70 percent in the regional stage and only 12 percent in the distant stage.[2,3] The American Cancer Society (ACS) recommends screening for colorectal polyps and cancer starting at age 50 - every five years with flexible sigmoidoscopy, double-contrast barium enema, or virtual colonoscopy or every ten years with colonoscopy.[2] Annual testing beginning at age 50 is recommended if a test that mainly finds cancer (not polyps) is used, such as the fecal occult blood test or fecal immunochemical test.[2]

**Colorectal Cancer Late Stage at Diagnosis Incidence in New Jersey, 2006-2008, Women**

➢ About half the women 50-79 diagnosed with colorectal cancer were diagnosed in the late stage (regional and distant stages); the highest percentage was in the youngest age group (50-59), 54%. (Table 7.)

➢ The percentages of colorectal cancer diagnosed in the late stage were similar across the race and ethnic groups, although older (70-79) black and Hispanic women had lower percentages of late stage diagnoses than older white and API women. (Table 7.)

➢ Nearly 60% of uninsured women diagnosed with colorectal cancer were diagnosed in the late stage. Although the percentages for women with Medicaid, Medicare, or private insurance were not as high as for uninsured women, they were well over 50%. (Table 8.)

➢ An especially high percentage of uninsured black women were diagnosed in the late stage – 68%. (Table 8.)

**Table 7: Colorectal Cancer Incidence Rate and Percent Late Stage at Diagnosis by Age, Race and Ethnicity, New Jersey, 2006-2008 - Women\***

| Age[#] | Total N=2,186 | | White N=1,777 | | Black N=322 | | API[+] N=69 | | Hispanic N=160 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rate | %** | Rate | %** | Rate | %** | Rate | %** | Rate | %** |
| **50-59** | 30.3 | 54.4% | 29.7 | 55.4% | 41.3 | 54.4% | 13.2 | 51.6% | 25.0 | 52.7% |
| **60-69** | 56.3 | 49.5% | 54.2 | 50.2% | 72.5 | 48.4% | 41.1 | 50.9% | 57.4 | 49.6% |
| **70-79** | 118.7 | 50.4% | 119.5 | 51.8% | 125.5 | 45.3% | 69.5 | 51.0% | 70.1 | 42.9% |

\*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Rates are per 100,000 population and age-adjusted to the 2000 U.S. population standard. Late stage is the regional and distant stages combined. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The Ns are numbers of women 50-79 diagnosed with late stage colorectal cancer.

[#]The age group 80 and older is not shown due to a high percentage of colorectal cancers with unknown stage at diagnosis.

[+]API is Asian and Pacific Islanders.

\*\*Percent of all colorectal cancers (including *in situ* stage) in the age and race or ethnic group that was diagnosed in the late stage.

**Table 8: Colorectal Cancer Percent Late Stage at Diagnosis by Race, Ethnicity and Health Insurance Status - Women Ages 50-79, New Jersey, 2006-2008\***

| Insurance Status[#] | Total N=2,186 | | White N=1,777 | | Black N=322 | | API[+] N=69 | | Hispanic N=160 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | %** | Count | %** | Count | %** | Count | %** | Count | %** |
| **None** | 91 | 59.9% | 55 | 57.3% | 27 | 67.5% | 7 | 53.9% | 25 | 59.5% |
| **Medicaid** | 46 | 53.5% | 25 | 51.0% | 15 | 55.6% | 6 | 66.7% | 7 | 36.8% |
| **Medicare** | 1,192 | 52.2% | 1,003 | 53.2% | 156 | 48.0% | 27 | 49.1% | 71 | 45.5% |
| **Private** | 738 | 53.0% | 604 | 54.2% | 106 | 48.2% | 20 | 50.0% | 50 | 52.1% |
| **Unknown** | 115 | 31.9% | 88 | 33.9% | 17 | 38.6% | 9 | 50.0% | 6 | 35.3% |

\*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Late stage is the regional and distant stages combined. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of colorectal cancers with unknown stage at diagnosis. The Ns and counts are numbers of women 50-79 diagnosed with late stage colorectal cancer.

[#]The Medicaid category includes only women who do not have any insurance other than Medicaid. The Medicare category includes women with Medicare as well as Medicaid or private insurance. The TRICARE, Military, VA, Indian/PHS insurance category is not shown due to too few numbers (n=4).

[+]API is Asian and Pacific Islanders.

\*\*Percent of all colorectal cancers (including *in situ* stage) in the race or ethnic group that was diagnosed in the late stage.

**Colorectal Cancer Late Stage at Diagnosis Incidence in New Jersey, 2006-2008, Men**

➢ Almost half the men diagnosed with colorectal cancer were diagnosed in the late stage. The percentage of late stage diagnoses was similar for each ten-year age group from 50 to 79 years of age, although the older the age group the lower the percentage. (Table 9.)

➢ The percentage of late stage diagnoses was similar for both white and black men in each age group, about 50%. (Table 9.)

➢ Among Hispanic men with colorectal cancer, the percentages in each age group diagnosed in the late stage were lower than for white or black men. (Table 9.)

➢ API men in the 50-59 and 60-69 year age groups had much higher percentages of late stage diagnoses, 66% and 54%, respectively, than the same age groups in the other race and ethnic groups. (Table 9.)

➢ Men without health insurance or on Medicaid had the highest percentages of colorectal cancer diagnosed in the late stage – 62% and 59%, respectively. (Table 10.)

➢ White and black men had similar percentages of colorectal cancer diagnosed in the late stage, except black men on Medicaid had a much higher percentage of colorectal cancer diagnosed in the late stage – 67%. (Table 10.)

➢ In general, API and Hispanic men had lower percentages of colorectal cancer diagnosed in the late stage than white or black men; however, API men with private health insurance had a much higher percentage (63%) diagnosed in the late stage. (Table 10.)

**Table 9: Colorectal Cancer Incidence Rate and Percent Late Stage at Diagnosis by Age, Race and Ethnicity, New Jersey, 2006-2008 - Men**

| Age[#] | Total N=2,486 | | White N=2,099 | | Black N=288 | | API[+] N=87 | | Hispanic N=197 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Rate | %** | Rate | %** | Rate | %** | Rate | %** | Rate | %** |
| **50-59** | 40.2 | 50.6% | 40.5 | 51.9% | 43.4 | 50.3% | 30.2 | 66.0% | 37.3 | 47.9% |
| **60-69** | 84.7 | 49.9% | 85.4 | 50.9% | 95.0 | 49.0% | 58.0 | 54.3% | 75.4 | 48.7% |
| **70-79** | 153.3 | 47.6% | 156.1 | 48.1% | 171.2 | 48.1% | 47.4 | 35.9% | 119.6 | 39.9% |

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Late stage is the regional and distant stages combined. Rates are per 100,000 population and age-adjusted to the 2000 U.S. population standard. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The Ns are the numbers of men 50-79 diagnosed with late stage colorectal cancer.
[#]The age group 80 and older is not shown due to a high percentage of colorectal cancers with unknown stage at diagnosis.
[+]API is Asian and Pacific Islanders.
**Percent of all colorectal cancers (including *in situ* stage) in the age and race or ethnic group that was diagnosed in the late stage.

**Table 10: Colorectal Cancer Percent Late Stage at Diagnosis by Race, Ethnicity and Health Insurance Status, Ages 50-79, New Jersey, 2006-2008 - Men***

| Insurance Status[#] | Total N=2,486 | | White N=2,099 | | Black N=288 | | API[+] N=87 | | Hispanic N=197 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | %** | Count | %** | Count | %** | Count | %** | Count | %** |
| **None** | 128 | 61.8% | 86 | 63.7% | 31 | 62.0% | 9 | 52.9% | 21 | 52.5% |
| **Medicaid** | 39 | 59.1% | 23 | 59.0% | 12 | 66.7% | ^ | ^ | 7 | 46.7% |
| **Medicare** | 1,255 | 50.8% | 1,085 | 51.2% | 147 | 49.3% | 18 | 46.2% | 92 | 46.2% |
| **Private** | 935 | 51.0% | 798 | 51.4% | 82 | 46.9% | 52 | 62.7% | 64 | 47.1% |
| **Unknown** | 126 | 27.1% | 106 | 30.5% | 15 | 34.9% | ^ | ^ | 13 | 30.2% |

*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Late stage is the regional and distant stages combined. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of colorectal cancers with unknown stage at diagnosis. The Ns and counts are numbers of men 50-79 diagnosed with late stage colorectal cancer.
[#]The Medicaid category includes only men who do not have any insurance other than Medicaid. The Medicare category includes men with Medicare as well as Medicaid or private insurance. The TRICARE, Military, VA, Indian/PHS insurance category is not shown due to too few numbers (n=3).
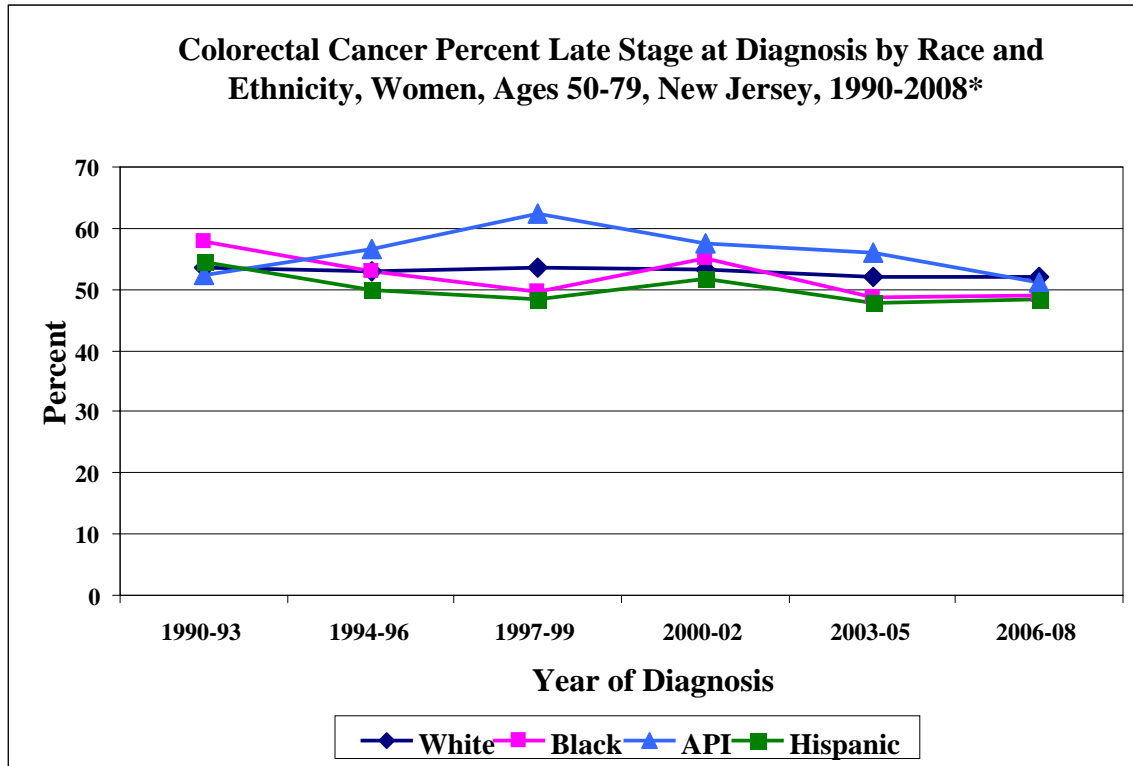[+]API is Asian and Pacific Islanders.
**Percent of all colorectal cancers (including *in situ* stage) in the race or ethnic group that was diagnosed in the late stage.
^Counts less than 5 are suppressed due to statistical unreliability.

**Colorectal Cancer - Trends in Late Stage at Diagnosis Incidence in New Jersey, 1990-2008**
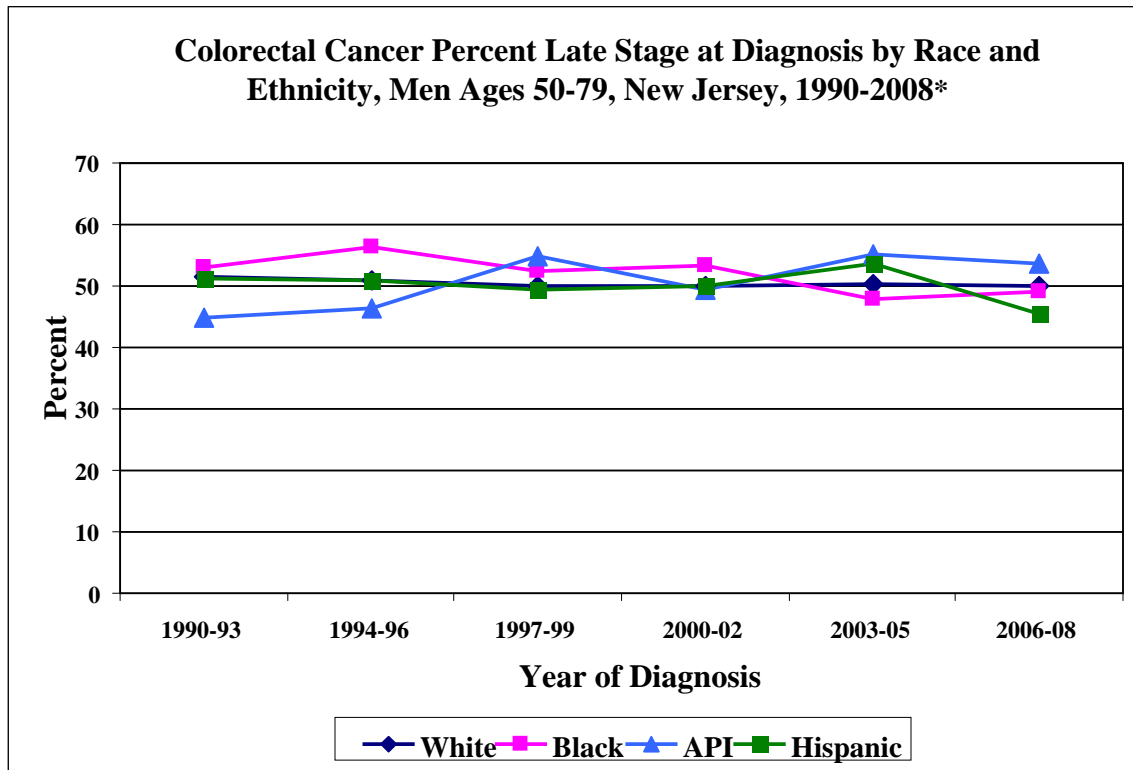
**Figure 5.**

**Colorectal Cancer Percent Late Stage at Diagnosis by Race and Ethnicity, Women, Ages 50-79, New Jersey, 1990-2008\***



*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Percent is of all colorectal cancers (including *in situ* stage) in the race or ethnic group that was diagnosed in the late stage. Late stage is the regional and distant stages combined. API is Asian and Pacific Islanders. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of colorectal cancers with unknown stage at diagnosis.

➢ Among black and Hispanic women the percent of colorectal cancer diagnosed in the late stage decreased.

➢ The percent of colorectal cancer diagnosed in the late stage also decreased in white and Asian and Pacific Islander women, although not as much as in black and Hispanic women.

➢ The disparity in diagnosis at the late stage among women of different races and ethnicities had lessened by 2006-2008.

**Figure 6.**

**Colorectal Cancer Percent Late Stage at Diagnosis by Race and Ethnicity, Men Ages 50-79, New Jersey, 1990-2008***



*Data are from the New Jersey State Cancer Registry, New Jersey Department of Health and Senior Services. Cases with unknown county of residence or ascertained only through death certificate or autopsy record are not included. Percent is of all colorectal cancers (including *in situ* stage) in the race or ethnic group that was diagnosed in the late stage. Late stage is the regional and distant stages combined. API is Asian and Pacific Islanders. The race and ethnicity (Hispanic) categories are not mutually exclusive, although the majority of Hispanics are white. The age group 80 and older is not included due to a high percentage of colorectal cancers with unknown stage at diagnosis.

➢ The percent of colorectal cancers diagnosed at the late stage increased in API males, decreased slightly in white males, and decreased in black and Hispanic males.

➢ The disparity among men of different races and ethnicities in diagnosis at the late stage had not lessened by 2006-2008.

**Colorectal Cancer Screening Prevalence in New Jersey, 2008**

**Table 11: Percent of Adults 50 and Older Who Ever Had a Sigmoidoscopy or Colonoscopy by Sex, Age, Race, Ethnicity and Income, New Jersey, 2008***

| Demographic | Total Number Who Answered the Question[#] | Percent Who Answered Yes[+] | 95% CI** |
|---|---|---|---|
| **Sex:** | | | |
| Female | 4,134 | 58.7% | 56.7-60.7% |
| Male | 2,451 | 58.6% | 55.9-61.3% |
| **Age:** | | | |
| 50-59 | 2,418 | 51.3% | 48.6-54.0% |
| 60-64 | 1,039 | 63.4% | 59.4-67.5% |
| 65 and older | 3,128 | 64.9% | 62.7-67.2% |
| **Race/Ethnicity:** | | | |
| white | 5,287 | 61.1% | 59.3-62.8% |
| black | 570 | 55.8% | 50.7-61.0% |
| Hispanic | 449 | 51.9% | 45.5-58.4% |
| other | 179 | 44.7% | 35.2-54.2% |
| **Annual Income:** | | | |
| <$15,000 | 499 | 45.9% | 39.6-52.2% |
| $15,000-24,999 | 1,019 | 50.5% | 46.4-54.6% |
| $25,000-34,999 | 658 | 57.9% | 52.7-63.1% |
| $35,000-49,999 | 802 | 59.5% | 54.3-64.7% |
| $50,000 or more | 2,713 | 63.7% | 61.3-66.1% |
| **Total** | 6,585 | 58.7% | 57.0-60.3% |

*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.
[#]Includes all respondents except those with missing, don't know, and refused answers.
[+]Percentages are weighted to population characteristics.
**CI=confidence interval.

➢ About 59% of New Jersey respondents 50 and older reported ever having a sigmoidoscopy or colonoscopy; the percentage was the same for women and men.

➢ Respondents in the youngest age group (50-59) reported the lowest percentage ever having a sigmoidoscopy or colonoscopy – 51%.

➢ Hispanics had the lowest percentage ever having a sigmoidoscopy or colonoscopy (52%) and blacks the next lowest percentage (56%).

➢ The lower the income, the less likely respondents were to report ever having a sigmoidoscopy or colonoscopy; 46% with less than $15,000 annual income and 64% with $50,000 or more annual income.

**Table 12: Percent of Adults 50 and Older Who Had a Blood Stool Test in the Past Two Years by Sex, Age, Race, Ethnicity and Income, New Jersey, 2008***

| Demographic | Total Number Who Answered the Question[#] | Percent Who Answered Yes[+] | 95% CI** |
|---|---|---|---|
| **Sex:** | | | |
| female | 4,074 | 20.2% | 18.6-21.9% |
| male | 2,433 | 21.1% | 19.0-23.2% |
| **Age:** | | | |
| 50-59 | 2,402 | 16.9% | 14.9-18.8% |
| 60-64 | 1,024 | 24.2% | 20.7-27.7% |
| 65 and older | 3,081 | 23.5% | 21.5-25.4% |
| **Race/Ethnicity:** | | | |
| white | 5,216 | 22.2% | 20.7-23.6% |
| black | 567 | 21.1% | 16.9-25.4% |
| Hispanic | 445 | 12.1% | 8.2-16.0% |
| other | 179 | 15.0% | 8.0-22.0% |
| **Annual Income:** | | | |
| <$15,000 | 492 | 17.3% | 12.2-22.3% |
| $15,000-24,999 | 1,011 | 18.6% | 15.4-21.8% |
| $25,000-34,999 | 647 | 18.7% | 14.9-22.5% |
| $35,000-49,999 | 801 | 19.2% | 15.4-23.0% |
| $50,000 or more | 2,681 | 21.6% | 19.7-23.6% |
| **Total** | 6,507 | 20.7% | 19.4-21.9% |

*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.
[#]Includes all respondents except those with missing, don't know, and refused answers.
[+]Percentages are weighted to population characteristics.
**CI=confidence interval.

➢ About 21% of people 50 and older reported having a blood stool test in the past two years; a slightly smaller percentage of women had the test than men (20% vs. 21%).

➢ Respondents in the youngest age group (50-59) were least likely to have had the blood stool test in the past two years, 17% compared to 24% for the two older age groups.

➢ Hispanics were much less likely to report having had the blood stool test in the past two years than blacks or whites – 12% vs. 21% and 22%, respectively.

➢ The lower the income, the less likely respondents were to report having had the blood stool test in the past two years; 17% with less than $15,000 income versus 22% with $50,000 or more income.

**Colorectal Cancer - Trends in Screening Prevalence in New Jersey, 2004-2010**

**Figure 7.**
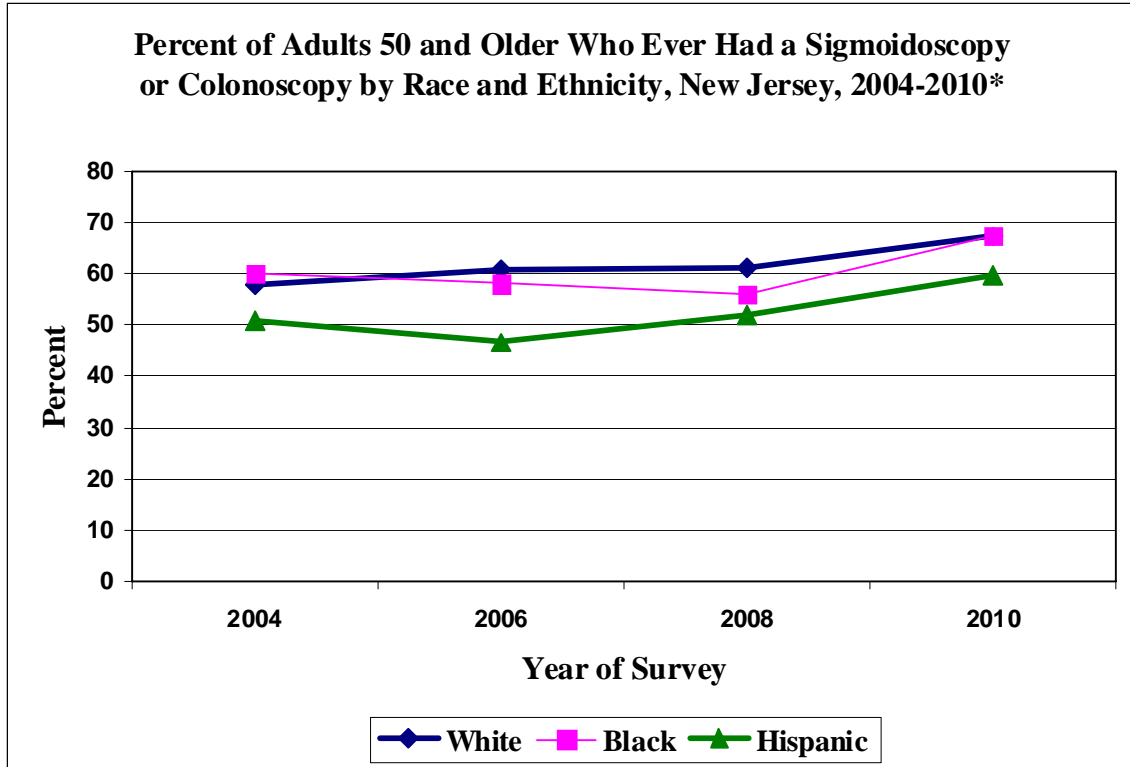
**Percent of Adults 50 and Older Who Ever Had a Sigmoidoscopy or Colonoscopy by Race and Ethnicity, New Jersey, 2004-2010***



*Data are from the Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2004, 2006, 2008, 2010. Includes all respondents except those with missing, don't know, and refused answers. Percentages are weighted to population characteristics.

➢ Overall, the percentage of adults 50 and older who reported ever having a sigmoidoscopy or colonoscopy increased from 57% in 2004 to 66% in 2010. (Data not shown.)

➢ This percentage increased among whites, blacks and Hispanics.

➢ In 2010, a lower percentage (60%) of Hispanics 50 and older reported ever having a sigmoidoscopy or colonoscopy compared with 67% of whites and blacks.

**Figure 8.**
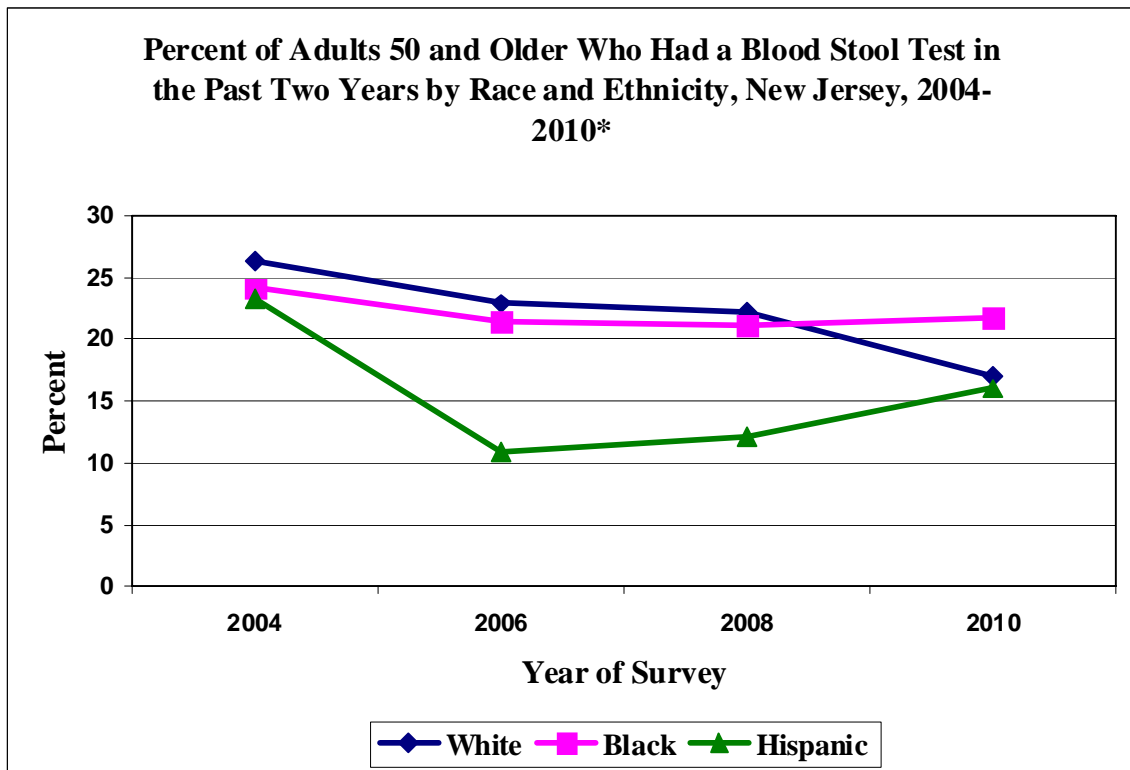
**Percent of Adults 50 and Older Who Had a Blood Stool Test in the Past Two Years by Race and Ethnicity, New Jersey, 2004-2010\***



*\*Data are from the Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2004, 2006, 2008, 2010. Includes all respondents except those with missing, don't know, and refused answers. Percentages are weighted to population characteristics.*

➢ Between 2004 and 2010, the percentage of adults 50 and older who reported they had a blood stool test in the past two years decreased from 26% to 17%. (Data not shown.)

➢ The decrease was much greater among whites and Hispanics than blacks.

➢ The disparity among the race and ethnic groups increased over time.

**TECHNICAL NOTES**

**New Jersey State Cancer Registry (NJSCR)**

**NJSCR Overview**

The objectives of the New Jersey State Cancer Registry (NJSCR) are to:

- monitor cancer trends in New Jersey;
- promote scientific research;
- respond to New Jersey residents about cancer concerns;
- educate the public;
- provide information for planning and evaluating cancer prevention and control activities; and
- share and compare cancer data with other states and the nation.

The NJSCR is a population-based cancer incidence registry that serves the entire state of New Jersey, which has a population of over 8.7 million people. The NJSCR was established by legislation (NJSA 26:2-104 et. seq.) and includes all cases of cancer diagnosed in New Jersey residents since October 1, 1978. New Jersey regulations (NJAC 8:57A) require the reporting of all newly diagnosed cancer cases to the NJSCR within three months of hospital discharge or six months of diagnosis, whichever is sooner. Reports are filed by hospitals, diagnosing physicians, dentists, and independent clinical laboratories. Every hospital in New Jersey reports cancer cases electronically. In addition, reporting agreements are maintained with Delaware, Florida, Maryland, New York, North Carolina and Pennsylvania so that New Jersey residents diagnosed with cancer outside the state can be identified. Legislation passed in 1996 strengthened the NJSCR by requiring electronic reporting, requiring abstracting by certified tumor registrars (CTRs) and establishing penalties for late or incomplete reporting.

All primary invasive and *in situ* neoplasms are reportable to the NJSCR, except cervical cancer *in situ* diagnosed after 1994 and certain carcinomas of the skin. Benign brain/central nervous system (CNS) tumors have been collected since 2004, as required by the federal Benign Brain Tumor Cancer Registries Act signed in October 2002. The information collected by the NJSCR on each cancer includes basic patient identifiers, demographic characteristics of the patient, medical information on each cancer diagnosis such as the anatomic site, histologic type and stage of disease, first course of treatment and vital status (alive or deceased) determined annually. For deceased cases, the underlying cause of death is also included. The primary site, behavior, grade, and histology of each cancer are coded according to the *International Classification of Diseases for Oncology (ICD-O), 2<sup>nd</sup> edition*[4] for cancers diagnosed through 2000 and the *3<sup>rd</sup> edition*[5] for cancers diagnosed after 2000.

The NJSCR follows the data standards promulgated by the North American Association of Central Cancer Registries (NAACCR), including the use of the Surveillance,

Epidemiology, and End Results (SEER) multiple primary rules. An individual may develop more than one cancer. Following the SEER multiple primary rules, patients could therefore be counted more than once if they were diagnosed with two or more primary cancers.

The NJSCR is a member of NAACCR, an organization that sets standards for cancer registries, facilitates data exchange and publishes cancer data. The NJSCR has been a participant of the National Program of Cancer Registries (NPCR) sponsored by the Centers for Disease Control and Prevention (CDC) since it began in 1994 and is one of the National Cancer Institute's (NCI) SEER expansion registries.

**NJSCR Data Quality**

NAACCR has awarded the Gold Standard, the highest standard possible, to the NJSCR for the quality of the 1995 through 2008 data. The NJSCR has consistently achieved the highest level of certification for its data since the inception of this award. The criteria used to judge the quality of the data are completeness of cancer case ascertainment, completeness of certain information on cancer cases, percent of death certificate only cases, percent of duplicate cases, passing an editing program, and timeliness.

Completeness of reporting to the NJSCR was estimated by comparing New Jersey and U.S. incidence to mortality ratios for whites standardized for age, gender, and cancer site. The data used to generate these ratios were the cancer incidence rates for all SEER registries combined. Using these standard formulae, it is possible for the estimation of completeness to be greater than 100 percent. For the NJSCR 2008 data, the completeness of case reporting was estimated as 106 percent at the time this report was prepared.

While our estimates of completeness are very high, some cases of cancer among New Jersey residents who were diagnosed and/or treated in out-of-state facilities may not yet have been reported to the NJSCR by other state registries. This should be considered in interpreting data for the more recent years. However, these relatively few cases will not significantly affect the cancer rates, nor alter the overall trends presented in this report.

Other 2008 cancer incidence data quality indicators that were measured include:

- percent death-certificate-only cases - 1.4 percent;
- percent of unresolved duplicates - less than 0.1 percent;
- percent of cases with unknown race - 1.3 percent;
- percent of cases with unknown county - 0.1 percent;
- number of cases with unknown age - 1; and
- number of cases with unknown gender - 0.

It also should be noted that the 2008 incidence counts presented here are expected to increase by the time all data are complete, and, therefore, are considered preliminary. Another limitation that could affect New Jersey cancer incidence data is the recent federal restriction on the submission of cancer cases from Veteran's Health Administration (VA) hospitals to cancer registries. The NJSCR received 0.6 percent of total cases from VA hospitals for the years 2004 and earlier. Since then the NJSCR received only 0.3 percent of total cases from VA hospitals for 2005 and no cases for 2006 through 2008. The impact of missing VA hospital cases in New Jersey could result in underestimates of cancer incidence rates for men in 2005 through 2008.

The NJSCR continues to work toward improving the quality and number of its reporting sources. Over the past few years, significant improvements have been realized in this regard. For example, some of these improvements have resulted in better reporting of skin cancers such as melanoma. One of the most significant improvements has been the implementation of electronic pathology laboratory reporting (E-path) from a national pathology laboratory and several hospital-based laboratories. The ultimate goal is to enable E-path laboratory reporting from every laboratory that serves New Jersey. E-path reporting has improved the timeliness and completeness of cancer reporting, especially for non-hospitalized cases.

## Data Sources and Specifications for This Report

### Data Sources

New Jersey cancer incidence and stage at diagnosis data for the years 1990 through 2008 were taken from the December 2010 analytic file of the NJSCR. The 2008 New Jersey population estimates used for the incidence rates in this report are estimates from the National Center for Health Statistics (NCHS) based on U.S. Census Bureau data, which were downloaded from NCI SEER's website (NCI SEER Program release January 21, 2011), http://www.seer.cancer.gov/popdata/download.html. The data on screening prevalence are from the Center for Disease Prevention and Control's Behavioral Risk Factor Surveillance System (BRFSS) survey for the years 2002, 2004, 2006, 2008 and 2010, available at the BRFSS website http://www.cdc.gov/brfss/technical_infodata/surveydata.htm. BRFSS selects a representative sample of the non-institutionalized adult population 18 years or older in each state using a multistage sampling design based on random-digit dialing methods.[3] Details on the methodology, random sampling procedures and validity of the measures used in BRFSS are described elsewhere.[6,7]

### Data Specifications

Incident cases were limited to: breast cancer cases among women whose age at diagnosis was 40 to 79; cervical cancer cases among women whose age at diagnosis was 20 to 79; and colorectal cancer cases among women and men whose age at diagnosis was 50 to 79. Cases older than 79 were not included in this report due to high percentages with

unknown stage at diagnosis. The age at diagnosis in the NJSCR was derived from the date of birth and the date of diagnosis information in the medical records. Race and health insurance status in the NJSCR were consolidated from the medical records. Out-of-state residents and cases whose residence in New Jersey at the time of diagnosis could not be confirmed (unknown county) were excluded from the New Jersey incidence rates and counts, as were cases of unknown age and/or gender. The ICD-O-3 coding system[5] was used for cancer incidence data. A complete listing of the ICD-O-3 site codes is at http://seer.cancer.gov/siterecode/icdo3_d01272003/.

The population estimates incorporate Vintage 2009 bridged single-race estimates for July 2000-2009 that are derived from the original multiple race categories in the 2000 Census (as specified in the 1997 Office of Management and Budget standards for the collection of data on race and ethnicity). The bridged single-race estimates and a description of the methodology used to develop them are available on the NCHS web site (http://www.cdc.gov/nchs/nvss/bridged_race.htm). The new vintage 2009 bridged single-race populations result in a general downward shift of the latest post-census populations compared with the Vintage 2008 populations. This general downward shift in the populations causes a general upward shift in cancer rate calculations based on these new populations.

**Description of Algorithm for Designating Hispanic Ethnicity**

In 2003, the NJSCR adopted the NAACCR Hispanic Identification Algorithm (NHIA) to assign Hispanic ethnicity to cases. This method uses information on birthplace, marital status, gender, and race and the results of a surname match to the 1990 Hispanic surname list to augment the number of cases reported as Hispanic in the registry during the years 1990-2008.

In 2005, NAACCR made several revisions to NHIA, now NHIA version 2. The most significant change in NHIA version 2 was the addition of an option for registries to not apply the algorithm to counties in which the Hispanic population is less than five percent. The NJSCR determined that this option did not enhance the accuracy of NHIA for New Jersey and therefore opted not to apply this option. Thus, using NHIA version 2 does not affect the New Jersey cancer rates among Hispanics.

Prior to the development of NHIA, the NJSCR used a method to assign Hispanic ethnicity to cases that was adapted from algorithms developed by the Illinois State Cancer Registry (ISCR) and by the NJSCR. NHIA is closely related to these former algorithms, so there is high agreement between the cases previously determined to be Hispanic and those currently determined to be Hispanic.

As a result of using NHIA, the NJSCR was able to increase the number of Hispanic cases, thereby correcting an under-identification of Hispanics. For a more complete description of the NHIA version 2 and a copy of the NHIA SAS program visit the following link at the NAACCR website: http://www.naaccr.org/datastandards.

Caution should be used when comparing rates among Hispanics with the rates in the different race groups (e.g. black, white) because ethnicity and race are not mutually exclusive. In New Jersey, in the 2000 Census the majority (89%) of Hispanics identified themselves as white. In the 2010 Census, a majority of Hispanics continued to identify themselves as white but the percentage was lower (54%). The Hispanics who identify themselves as white or black are included in the white or black race category as well as the all races category.

## Calculation of Rates

### Age-Adjusted Rates and the Year 2000 Standard

The U.S. Department of Health and Human Services requires that health data be age-adjusted using the U.S. year 2000 population as the standard, beginning with the 1999 reporting year. Age-adjustment to the year 2000 population as the standard has been used in our last nine annual reports starting with *Cancer Incidence and Mortality in New Jersey 1996-2000,* issued in December 2002. Prior to the release of 1999 data, various federal and state agencies calculated disease rates using different U.S. population standards, including the 1940 and 1970 U.S. standard populations.

Calculations using the 2000 U.S. population as the standard do not indicate a change in cancer incidence or occurrence, only a different representation of the rates of reported cancer. Using the 2000 U.S. population as the standard produces age-standardized cancer rates that appear to be about 20 percent higher than previously reported.

For this report, the 2000 U.S. Standard Population (19 age groups-Census P25-1130) was used for age-adjustment instead of the 2000 U.S. Standard Million (19 age groups). This has been standard practice for all NCI SEER reports with incidence or mortality data for 2002 or later. The 2000 U.S. Standard Population was created for use with single year of age population data. Differences in the age-adjusted rates using the 2000 U.S. Standard Million and the new 2000 U.S. Standard Population are minimal. For further details, see SEER's website at http://seer.cancer.gov/stdpopulations/single_age.html.

### Rate Calculation Formulas

A cancer incidence rate is defined as the number of new cases of cancer diagnosed during a specified time period in a specified population. Cancer rates are most commonly expressed as cases per 100,000 population. Cancer occurs at different rates in different age groups, and population subgroups defined by sex and race have different age distributions. Therefore, before a valid comparison can be made between rates, it is necessary to standardize the rates to the age distribution of a standard population. In this report, the 2000 U.S. Standard Population (19 age groups-Census P25-1130) was used. Cases that were missing gender, age, or race were not included in the rates presented in this report. Since the number of cases so affected was very small, the rates were virtually unaffected by the non-inclusion of these cases.

The first step in the age-standardization procedure is to determine the age-specific rates. For each age group for a given time interval (within each race-sex group, for the entire state), the following formula is applied:

$$r_a = \frac{n_a}{t \; x \; P_a}$$

where:

$r_a =$     the age-specific rate for age group a;

$n_a =$     the number of events (cancer diagnoses) in the age group during the time interval;

$t \;\; =$     the length of the time interval (in years); and

$P_a =$     average size of the population in the age group during the time interval (mid-year population or average of mid-year population sizes).

In order to determine the age-adjusted rate, a weighted average of the age-specific rates is calculated, using the age distribution of the standard population to derive the age-specific weighting factors.[8] This is the technique of direct standardization, which uses the following formula:

$$R = \frac{\displaystyle\sum_{a=1}^{n} r_a \; x \; Std.P_a}{\displaystyle\sum_{a=1}^{n} Std.P_a}$$

where:

$R =$ the age-adjusted rate;

$r_a =$ the age-specific rate for age group a; and

$Std.P_a =$ the size of the standard population in each age group a.

While age standardization facilitates the comparison of rates among different populations, there can be important age-specific differences in disease occurrence, which are not apparent in comparisons of the age-adjusted rates.[9]

All the counts and rates were tabulated using SEER*Stat Version 6.6, a statistical software package distributed by NCI available at http://www.seer.cancer.gov/seerstat/.

**Suppression of Rates and Counts for Less Than Five Cases**

The annual rates for relatively uncommon cancers and cancer in smaller populations tend to fluctuate substantially from year to year because of low numbers of cases. Rates generated from low case numbers should be interpreted with caution. For this report, incidence rates and percents diagnosed in the late stage based on counts fewer than five were suppressed to ensure confidentiality and a greater level of statistical reliability. The suppressed cases, however, are included in the counts, rates and percents for larger categories.

# REFERENCES

1. Brownson RC, Joshu C. Cancer. In *Chronic Disease Epidemiology and Control*, Third Edition. Remington PL, Brownson, Wegner MV, eds. American Public Health Association: Atlanta, 2010.

2.  American Cancer Society. *Cancer Facts & Figures 2011*. Atlanta:American Cancer Society; 2011. Available at [www.cancer.org](www.cancer.org), accessed August 9, 2011.

3.  Henley SJ, King JB, German RR, Richardson LC, Plescia M. *Surveillance of screening-detected cancers (colon and rectum, breast, and cervix) – United States, 2004-2006*. Morbidity and Mortality Weekly Report, Centers for Disease Control and Prevention, November 26, 2010; 59(SS09):1-25.

4.  Percy C, Van Holten V, Muir C, eds. *International Classification of Diseases for Oncology, Second Edition*. World Health Organization, Geneva, 1990.

5.  Fritz A, Percy C, Jack A, Shanmugaratnam K, Sobin L, Parkin DM, Whelan S, eds. *International Classification of Diseases for Oncology, Third Edition, U.S. Interim Version 2000.* World Health Organization, Geneva, 2000.

6. Centers for Disease Control and Prevention. *Behavioral Risk Factor Surveillance System operational and user's guide*, Version 3.0. Atlanta, GA: US Department of Health and Human Services, CDC; 2006. Available at [ftp://ftp.cdc.gov/pub/Data/Brfss/userguide.pdf](ftp://ftp.cdc.gov/pub/Data/Brfss/userguide.pdf).

7. Nelson DE, Holtzman D, Bolen J, Stanwyck CA, Mack KA. *Reliability and validity of measures from the Behavioral Risk Factor Surveillance System (BRFSS)*. Soz Praventivmed. 2001;46 Suppl 1:S3-42.

8.  Rothman K. *Modern Epidemiology*.  U.S.A.  Little, Brown, and Company. 1986.

9.  Breslow NE and Day NE. *Statistical Methods in Cancer Research. Volume II – The Design and Analysis of Cohort Studies*. New York: Oxford University Press. 1987.

# GLOSSARY

**Clinical Terms**

**Cancer:**          A group of more than 100 diseases characterized by uncontrolled growth and spread of abnormal cells.

**Carcinogen:**          Any substance that causes cancer or helps cancer to develop.

**Carcinoma:**          Cancer of the epithelial cells that cover or line the internal organs, body surface, internal cavities and form glands.

**Diagnosis:**          Identifying a disease by its signs, symptoms, and laboratory findings; usually the earlier a diagnosis of cancer is made, the better the chance for cure.

**Histology:**          Microscopic identification of cells and tissue.

**Malignant**:          Rapidly growing cells with the ability to invade and spread.

**Metastasis:**          The spread of cancer cells to distant areas of the body through the lymph system or bloodstream.

**Primary site:**          The site in the body where the cancer began; usually cancer is named after the organ in which it started, e.g. breast cancer. It is possible to have more than one primary cancer or multiple primaries at the same time.

**Risk factor:**          Anything that increases a person's chance of getting a disease such as cancer.

**Stage at diagnosis**:          The extent to which the cancer has grown locally or invaded other tissues or organs. The stage is *in situ* if the cancer cells are present only in the layer of cells where they developed, **local** if the cancer cells have remained at their original site, **regional** if the cancer cells have spread to an adjacent area of the body, or **distant** if the cancer cells have spread (metastasized) throughout the body. Usually the less the cancer has grown or spread, the better the chance for a cure.

**Tumor or Neoplasm:**
          An abnormal growth of tissue; benign (not cancer) or malignant (cancer).

**Epidemiological Terms**

**Epidemiology:**  The study of patterns of the occurrence of disease in human populations and the factors that influence these patterns.

**Incidence:**  The number of newly diagnosed cases of disease occurring in a specific population during a specific time period.

**Incidence rate (or crude incidence rate):**

The number of newly diagnosed cases of disease in a specific population during a specific time period per "$x$" number of people. Usually the time period is one year and the "$x$" number of people is 100,000.

- **Age-specific incidence rate:**

  The number of newly diagnosed cases of a disease in a specific age group in a specific population over a specific time period per "$x$" number of people in the specific age group. Usually five-year age groups (0-4, 5-9, 10-14, etc.) are used. The time period is usually one year and the "$x$" number of people is 100,000.

- **Age-standardization (or age-adjustment):**

  The statistical adjustment of crude rates for differences in age distributions in order to compare rates in different populations. There are two types of standardization - direct and indirect.

**Prevalence**:  The number of people currently with a disease in a specific population at a specific point in time (e.g. mid-2008). Prevalence may also refer to the number of people who have a certain characteristic (e.g. had breast cancer screening within the past year).