Health Disparities in New York City

Disparities in Breast, Colorectal and Cervical Cancers in New York City

Cancer affects people of all racial/ethnic and income groups. Approximately one in four deaths is due to cancer, both nationally and in New York City (NYC). Of the 54,193 deaths in NYC in 2008, 24% (13,047 New Yorkers) were due to cancer. NYC has made significant progress: cancer death rates fell by more than a quarter (29%) between 1994 and 2008 (214 vs. 152 per 100,000 NYC residents). However, not all New Yorkers have benefited from these advances, and income and racial/ethnic disparities in screening, incidence (new cases of cancer) and death persist.
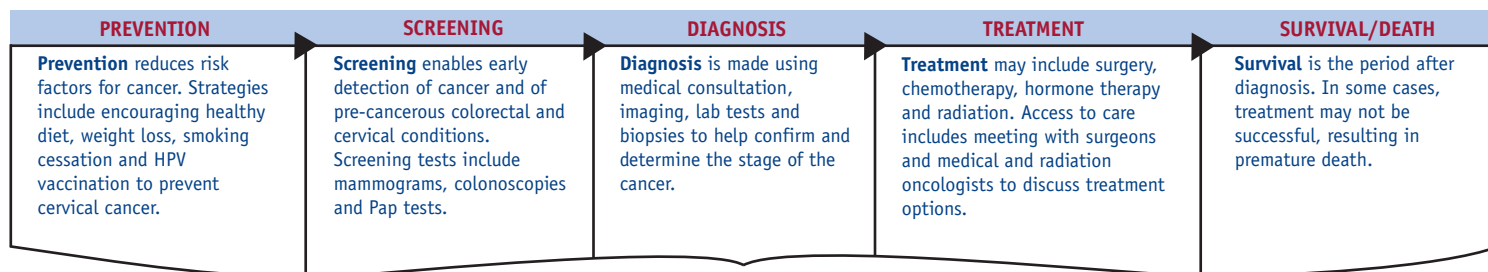
Breast, colorectal and cervical cancers together caused more than 2,500 deaths in the city in 2008 — more than a fifth of all cancer deaths that year. Many of these deaths could have been prevented with timely, high-quality screening, diagnosis and treatment. Attention must be paid to each of these areas to effectively combat cancer inequalities. This report describes health disparities among racial/ethnic and neighborhood-income groups in NYC for breast, colorectal and cervical cancers, and recommends actions to close the gaps along the continuum of cancer illness and death.

> *Disparities in Breast, Colorectal and Cervical Cancers* **is part of a series of reports from the Health Department that aims to inspire action by documenting current health disparities in NYC, as well as changes over time, and identifying community- and policy-based solutions to close the health gaps among New Yorkers.**
>
> *Coming Next:*
> - *Disparities in Cardiovascular Disease*

THE CANCER CONTINUUM

PREVENTION	SCREENING	DIAGNOSIS	TREATMENT	SURVIVAL/DEATH
Prevention reduces risk factors for cancer. Strategies include encouraging healthy diet, weight loss, smoking cessation and HPV vaccination to prevent cervical cancer.	**Screening** enables early detection of cancer and of pre-cancerous colorectal and cervical conditions. Screening tests include mammograms, colonoscopies and Pap tests.	**Diagnosis** is made using medical consultation, imaging, lab tests and biopsies to help confirm and determine the stage of the cancer.	**Treatment** may include surgery, chemotherapy, hormone therapy and radiation. Access to care includes meeting with surgeons and medical and radiation oncologists to discuss treatment options.	**Survival** is the period after diagnosis. In some cases, treatment may not be successful, resulting in premature death.

TIMING and QUALITY
Survival is improved with appropriate screening and high-quality continuity of care.

Cancer detection and care occur on a continuum that spans prevention, screening, diagnosis, treatment, survival and sometimes, death from cancer. Inadequacies in the timeliness and quality of care can occur at any point in the continuum, contributing to poor survival outcomes and racial/ethnic and economic disparities in screening, incidence (newly diagnosed cases of cancer) and death rates.

There are several points in the cancer continuum at which both individuals and health care providers can take action to improve survival and reduce disparities. Good screening alone cannot guarantee better survival outcomes, and improvements in screening, diagnosis and treatment disparities may take

time to translate into decreased disparities in mortality. Improving outcomes for the most disadvantaged groups, blacks and poor New Yorkers, will require intervention at all points along the continuum for better survival outcomes.

This report uses NYC data to examine several key points on the cancer continuum, including screening, incidence and death. Although important, these data do not describe the entire cancer continuum. Because key information about care and treatment is not readily available, this report generates hypotheses and pinpoints gaps where additional data are needed to understand disparities in cancer prevention, screening, diagnosis, treatment and death.

First step in reducing cancer disparities: promoting primary cancer prevention

Existing knowledge from national and international studies point to the importance of primary prevention of cancer by addressing risk factors before the disease develops. A risk factor is anything that increases a person's chance of getting a disease. Different cancers have different risk factors, but many overlap.
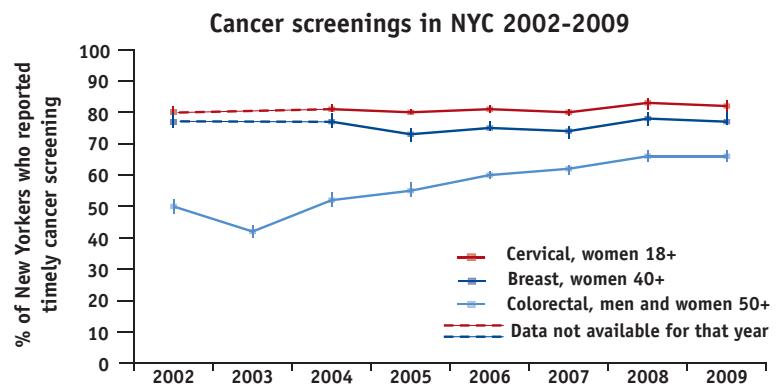
Cancer	Ways to modify risk factors	Non-modifiable risk factors
Breast	• *Maintain a healthy body weight* (body mass index [BMI] less than 25). • *Be physically active:* 30-60 minutes of moderate or vigorous-intensity exercise done at least five days per week may reduce cancer risk. • *Limit alcohol intake* • *Avoid tobacco* • *Breastfeed*	• Family history • Age • Genetics – BRCA gene carrier • Age at menarche (first menstrual period) and menopause • Age at first childbirth • Race/ethnicity
Colorectal	• *Maintain a healthy body weight* (body mass index [BMI] less than 25). • *Be physically active:* 30-60 minutes of moderate or vigorous-intensity exercise done at least five days per week may reduce cancer risk. • *Limit alcohol intake* • *Avoid tobacco* • *Control diabetes*	• Family history including hereditary colon cancer syndromes • Age • History of inflammatory bowel disease • Race/ethnicity
Cervical	• *Get vaccinated against the Human papilloma virus (HPV).* HPV, a sexually transmitted infection, is the cause of most cervical cancers. The best protection against cervical cancer is vaccination with HPV vaccine. • *Practice safe sex:* Using a condom during sex can reduce the risk of getting HPV. • *Avoid tobacco:* Smoking increases the likelihood of a chronic HPV infection that can then develop into cancer.	• Age • Number of children • Age at first sexual intercourse • Lifetime number of sexual partners

Unlike cervical cancer for which the cause and risk factors are clear, the exact causes of breast and colorectal cancer are unknown, but a number of potential risk factors have been identified. Some of these factors are modifiable or can be changed — such as alcohol use, smoking or weight — while others cannot — such as age, family history and genetics.

● While non-modifiable factors play an important role in cancer risk, everyone can actively engage in behaviors that may reduce their risk of breast, colorectal and cervical cancers. The NYC Health Department has initiated and continues to support policy and interventions to make the environment supportive of healthy choices related to these modifiable risk factors for cancer, like smoking cessation, promotion of weight control and physical activity, and condom distribution.

● In 2009, 16% of adult New Yorkers were current smokers, 23% were obese, 27% reported doing no physical activity in the past month, and 42% of those with two or more sex partners in the past year reported not using a condom the last time they had sex.

● Citywide progress has been made in decreasing rates of smoking, a known risk factor for all three cancers. However, since 2002, rates of obesity have increased and rates of physical activity and condom use have remained unchanged.

● Disparities by race/ethnicity and poverty exist for many modifiable risk factors in New York City, and may put some groups at higher risk for diseases, including cancer. Interventions to improve environments for all residents are important, and certain groups should be particularly targeted in this effort.

Colorectal cancer screenings have increased, and breast and cervical cancer screenings remain stable but high

● Overall colorectal cancer screening in NYC has risen 32% since 2002 and increased in all racial/ethnic groups. Screening rates for breast and cervical cancers have remained steady since 2002.

● In 2009, white women ages 40 and older were less likely to be screened for breast cancer (75%) than black (81%) and Hispanic (84%) women, and data suggest that Asian rates were also low (76%).

● Cervical cancer screening rates are similar among black and Hispanic women (81% and 84%, respectively). Whites and Asians, however, lag behind in screening, with 77% and 68% of women, respectively, reporting a Pap test in the past three years.

Cancer screenings in NYC 2002-2009

Legend:
- Cervical, women 18+
- Breast, women 40+
- Colorectal, men and women 50+
- Data not available for that year

Source: NYC Community Health Survey (CHS) 2002-2009. CHS has included adults with landline phones since 2002 and, starting in 2009, also has included adults who can be reached only by cell-phone. Vertical lines represent the 95% CI: 95% confidence intervals are a measure of estimate precision. The wider the confidence interval, the more imprecise the estimate.
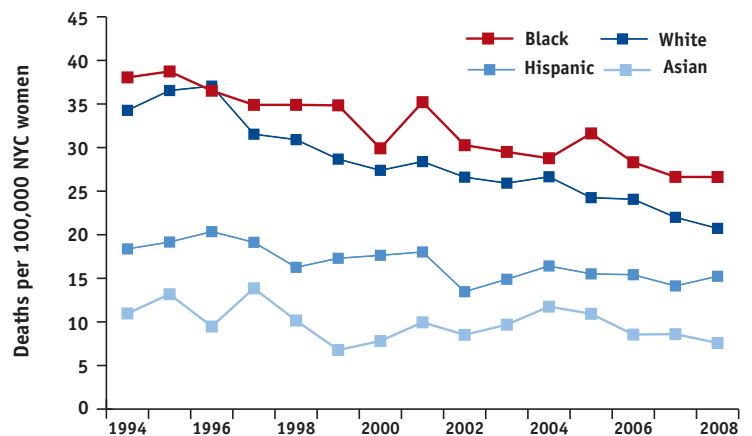
BREAST CANCER
Both new cases and deaths are declining in New York City

MAMMOGRAMS CAN HELP SAVE LIVES. Women ages 40 and older should be screened for breast cancer with a mammogram every one to two years. In 2009, nearly eight in ten women ages 40 and older reported being screened for breast cancer in the past two years. Mammography rates have remained relatively stable since 2002, although data suggest that rates have increased among black women (75% in 2002 vs. 81% in 2009). Disparities in breast cancer screening remain by income, with lower rates among those living in poverty. In addition to secondary prevention via routine mammography screening, women can reduce their risk for breast cancer by limiting their alcohol and tobacco intake as well as maintaining a healthy weight and getting the appropriate amount of physical activity. For more information about breast cancer screening, call 311.

Black women in NYC are more likely than others to die from breast cancer

- Since 1994, breast cancer death rates have decreased in NYC among whites, blacks, Hispanics and Asians (decreases of 35%, 23%, 17%, and 37%, respectively).

- Both black and white women die from breast cancer at much higher rates than Hispanic and Asian women. Blacks consistently experience the highest breast cancer death rate, which in 2008 was triple the rate among Asians (27 vs. 8 per 100,000).

- Although Asians have the lowest overall breast cancer death rates, some Asian women are more at risk than others. Death rates among Asians living in the richest neighborhoods have more than doubled since 1994 (8 deaths per 100,000 in 1994-1998 vs. 17 deaths in 2003-2007 per 100,000).

**Breast cancer death rates vary by race/ethnicity**

Rates are age-adjusted.

Sources: US Census 1990 and 2000; NYC DOHMH neighborhood population estimates, 2000-2008; Bureau of Vital Statistics, NYC DOHMH, 1994-2008.

New cases of breast cancer are highest among high-income white women, but low-income black women have the highest death rates

- New cases of breast cancer (incidence rates) have declined in NYC, from 121 per 100,000 in 2000 to 108 per 100,000 in 2006, caused mainly by a large drop in incidence rates among white women. New cases among black women rose over the same period, while rates among Hispanics and Asians remained stable.

- On average from 2002 to 2006, women in the richest neighborhoods experienced the highest breast cancer incidence rates compared with those in the poorest (133 vs. 99 per 100,000 respectively), but this did not hold true for black women. Hispanics experienced the most extreme incidence gap (33%) between the poorest and richest neighborhoods (83 vs. 123 per 100,000).

- The highest breast cancer incidence rates occurred among white women in the wealthiest neighborhoods. Death rates were highest among black women in the poorest neighborhoods. Overall, except for Asians, death rates were highest in the poorest neighborhoods.

New cases of breast cancer and death rates vary by race/ethnicity and neighborhood income
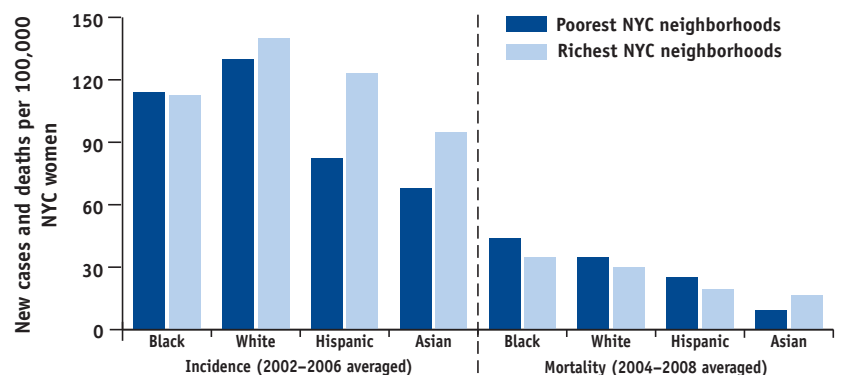
Rates are age-adjusted.

Sources: Bureau of Vital Statistics, NYC DOHMH, 2004–2008 averaged; NYC DOHMH neighborhood population estimates, 2004–2008 averaged; New York State Department of Health, Cancer Registry, 2002–2006 averaged.
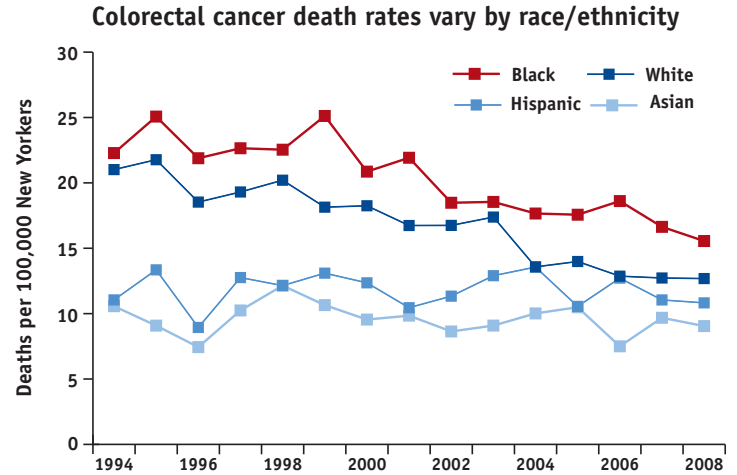
COLORECTAL CANCER
Both new cases and deaths are declining in New York City

COLONOSCOPY CAN PREVENT COLORECTAL CANCER. People ages 50 and older should have a colonoscopy every 10 years to screen for cancer and pre-cancerous polyps. Screening rates in NYC have increased overall by 32% since 2002. In 2009, blacks, whites and Hispanics were being screened at similar rates (around 66%); Asian New Yorkers, however, were less likely to get timely colonoscopies (49%). In addition to routine screening, individuals can reduce their colorectal cancer risk by limiting alcohol and tobacco intake and maintaining a healthy weight and getting the appropriate amount of physical activity. For more information about colorectal cancer screening, call 311.

Black men and women are more likely than others to die from colorectal cancer

- Nationally, black Americans die from colorectal cancer at much higher rates than white, Hispanic and Asian Americans. In 2002-2006 (combined), black women in the U.S. died at a rate twice that of white and Asian women (4.9 vs. 2.3 and 2.4 per 100,000, respectively).

- In NYC, colorectal cancer death rates dropped from 1994 to 2008, among whites, blacks and Asians by 40%, 30%, and 14% respectively. Death rates among Hispanics remained unchanged.

- Although the black/white gap in the death rate varied over time, black New Yorkers have experienced the highest death rates from colorectal cancer since 1994. The black/white gap as of 2008 was 22%.

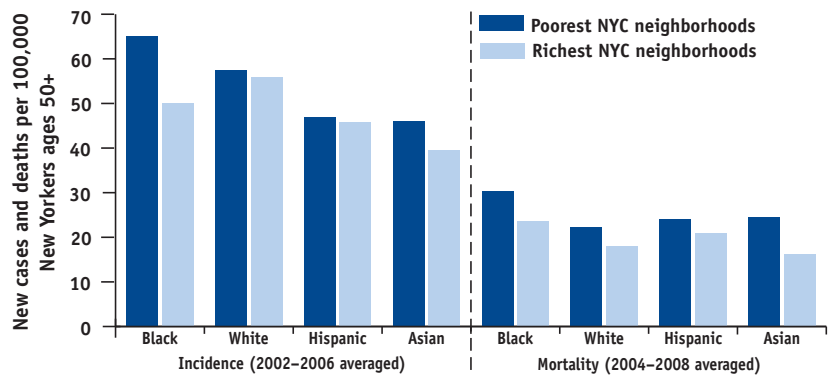**Colorectal cancer death rates vary by race/ethnicity**

Rates are age-adjusted.

Sources: US Census 1990; NYC DOHMH neighborhood population estimates, 2000-2008; Bureau of Vital Statistics, NYC DOHMH, 1994-2008.

New cases and deaths from colorectal cancer are influenced by neighborhood poverty for some racial/ethnic groups — but not all

- Overall, new cases of colorectal cancer (incidence rates) declined almost 20% from 2000 to 2006 (from 57 to 46 per 100,000). While men and women younger than 50 have similar colorectal incidence rates, men ages 65 and older are more likely to be diagnosed with colorectal cancer than women in the same age group (318 vs. 231 per 100,000 in 2002–2006).

- On average from 2002 to 2006, colorectal cancer incidence was highest among blacks and whites (65 and 57 per 100,000, respectively) and somewhat lower among Hispanics and Asians (47 and 45 per 100,000, respectively).

- Overall, incidence varied only slightly between neighborhoods of differing wealth (53 per 100,000 in the poorest vs. 50 in the richest). However, poverty had a dramatic impact on the rate of colorectal cancer incidence among blacks, with 30% higher rates among those living in the poorest neighborhoods.

New cases of colorectal cancer and death rates vary by race/ethnicity and neighborhood income

Rates are age-adjusted.

Sources: Bureau of Vital Statistics, NYC DOHMH, 2004–2008 averaged; NYC DOHMH neighborhood population estimates, 2004–2008 averaged; New York State Department of Health, Cancer Registry, 2002–2006 averaged.

- New Yorkers living in the poorest areas were more likely to die from colorectal cancer (26 vs. 19 per 100,000 for the richest). The largest disparity in death rates by neighborhood income is seen among Asians — a gap of 51%.
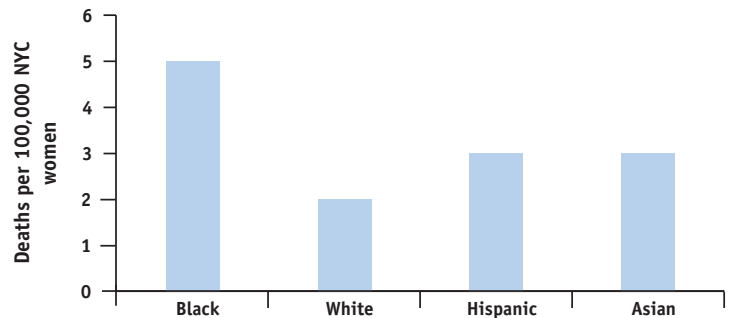
CERVICAL CANCER
New cases are declining in New York City, while deaths are stable

PAP TESTS CAN HELP SAVE LIVES. Sexually active women should have a Pap test at least every three years to screen for cervical cancer. In 2009, 82% of all NYC women ages 18 and older reported having had a Pap test in the past three years. Asian women, however, had significantly lower screening rates (68%) than other racial/ethnic groups. Persistent infection with certain strains of the human papillomavirus (HPV) – a sexually transmitted infection – is the cause of most cervical cancer. HPV vaccine is very effective in preventing the types of HPV that cause most cervical cancer. HPV vaccination is recommended for females ages 9 to 26 and is also available for males in the same age group. For more information about cervical cancer screening and the HPV vaccine, call 311.

Black women are more likely than others to die from cervical cancer

- Deaths due to cervical cancer have remained relatively stable in the US and in NYC for the past eight years, at approximately 3 per 100,000.

- Nationally and in NYC, black women die from cervical cancer at much higher rates than white, Hispanic and Asian women. In 2008, NYC black women died at a rate two and half times that of whites (5 vs. 2 per 100,000).

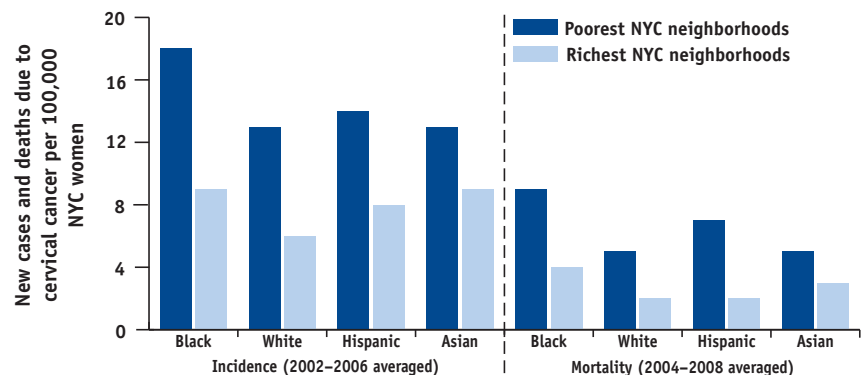**Cervical cancer deaths vary by race/ethnicity**

Rates are age-adjusted.
Sources: Bureau of Vital Statistics, NYC DOHMH, 2008; NYC DOHMH neighborhood population estimates, 2008.

New Yorkers in the poorest neighborhoods have the most new cases of cervical cancer and the highest death rates

- Regardless of race/ethnicity, New Yorkers living in the poorest neighborhoods have the highest overall rates of both newly diagnosed cases of cervical cancer (15 per 100,000 vs. 7 in the richest neighborhoods) and deaths (6 per 100,000 vs. 2 in the richest neighborhoods).

- Black women who live in the poorest neighborhoods are diagnosed with and die from cervical cancer at higher rates than any other racial/ethnic or neighborhood-income group in NYC.

New cervical cancer cases and deaths vary by race/ethnicity and neighborhood income


Rates are age-adjusted.
Sources: Bureau of Vital Statistics, NYC DOHMH, 2004–2008 averaged; NYC DOHMH neighborhood population estimates, 2004–2008 averaged; New York State Department of Health, Cancer Registry, 2002–2006 averaged.

Black New Yorkers have the lowest rates of early diagnosis for breast and cervical cancers

- Cancers that are diagnosed early are at a local stage of disease, affecting only the site of the cancer's origin, and are more amenable to successful treatment. Increasing the percent of early diagnoses for most cancers will improve survival outcomes and, in some cases, may help to narrow disparities.

- For all three cancers examined in this report, New Yorkers are less likely on average to be diagnosed early than US adults.

- Early detection of colorectal cancer is low (approximately one third of these cancers), but with no disparities by race/ethnicity.

- A much smaller percentage of breast cancers in black women (48%) are diagnosed at earlier stages than in other race/ethnicities (Asians 61%, whites 58%, and Hispanics 53%).

- Cervical cancers in black women are also diagnosed later than in other racial/ethnic groups. A larger percentage of cervical cancers are diagnosed as metastatic (the most difficult to treat) in residents of the poorest neighborhoods than the richest (12% vs. 5%).

Percent of local-stage diagnoses by race/ethnicity and cancer type
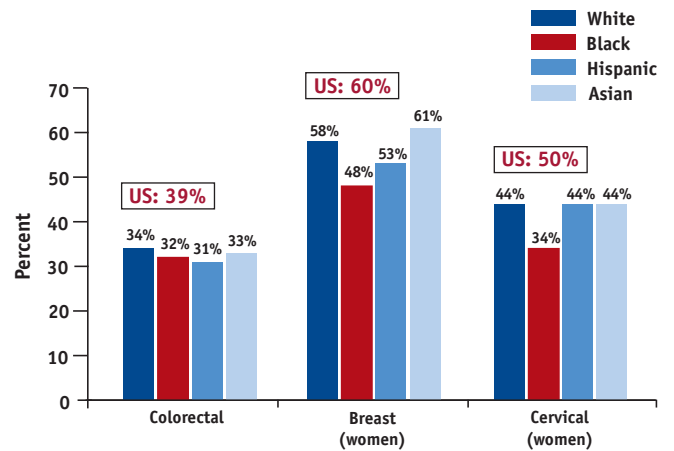
Sources: New York State Department of Health, Cancer Registry 2002-2006 combined. Surveillance Epidemiology and End Results, SEER stat fact sheets for breast, cervix uteri, and colon and rectum cancers, http://seer.cancer.gov/statfacts/index.html.

Why are black New Yorkers dying more often from cancer than other New Yorkers?

Higher cancer mortality among blacks is a longstanding problem and the reasons behind it are complex. Explanations include greater prevalence of risk factors for cancer (1-3), differential exposure to stress (4), differential access to healthcare, mistrust of and discrimination within the healthcare system leading to delayed or inadequate diagnosis or treatment (5), and greater prevalence of co-morbid conditions that worsen cancer treatment outcomes (6). Because each of these factors is complex and inter-related, reducing disparities in cancer outcomes will require interventions that act on multiple causative factors across the cancer continuum. Cancer risk factors (e.g. obesity, unhealthy diet, lack of physical activity, smoking and alcohol consumption) vary by race/ethnicity and neighborhood poverty. Black and poor New Yorkers especially tend to have more risk factors that may increase cancer incidence and worsen outcomes. Further study and evidence-based interventions focused on policy and health systems are needed to reduce the cancer burden on black New Yorkers.

In 2008, 2,652 New Yorkers died from colorectal, breast, and cervical cancers combined — reducing disparities could save more than one third of those lives

Lives that could be saved by reducing disparities

Type of cancer	# of deaths in 2008 among white, black, Hispanic and Asian New Yorkers	Lowest death rate per 100,000 population	Highest death rate per 100,000 population	# of lives saved if all race/ethnicities had the lowest death rate
Colorectal	1419	Asians: 9	blacks: 15	638
Breast	1095	Asians: 9	blacks: 27	227
Cervical	138	whites: 2	blacks: 5	86
TOTAL	**2652**			**951**

- For all three cancers examined in this report, black New Yorkers have the highest death rate. Asian New Yorkers experience the lowest death rates for breast and colorectal cancers, while whites have the lowest cervical cancer death rate.

- If cancer rates for all groups were reduced to the rate experienced by the racial/ethnic group with the lowest rate in 2008, 36% of the deaths due to cancer could have been averted — about 951 lives saved per year.

REDUCE THE GAP: Conclusions and Recommendations

The burden of cancer incidence and death is unequally distributed by wealth, race and ethnicity in New York City. This report shows that black New Yorkers living in the poorest neighborhoods are the most likely to die from colorectal, breast and cervical cancers, followed by Hispanics. While black and Hispanic New Yorkers get screened for these cancers at the same or sometimes higher rates than whites, good screening rates are not sufficient to increase survival times. We must strive to reduce modifiable risk factors for developing cancer and improve timely receipt of quality diagnoses, treatment and high-quality screening for all.

The data cited in this report cannot fully elucidate each phase in the cancer continuum, but these data demonstrate that disparities in cancer deaths may, in part, be due to the diagnostic and treatment phases of the cancer continuum. While genetics play a role in the development of cancer, social and environment factors and co-morbidities, such as diabetes and hypertension, undoubtedly influence the timing and quality of treatment. A focus on health behaviors would help reduce the risk for multiple diseases.

Regardless of the exact mechanisms through which poverty and race/ethnicity affect health, reductions in cancer mortality depend upon interventions along the cancer continuum focusing both on improved early detection of cancer and good continuity and quality of care after diagnosis. The following strategies may help reduce disparities in colorectal, breast and cervical cancer in NYC:

Promote lifestyle changes and healthy behaviors that help prevent breast, colorectal and cervical cancers.

Primary cancer prevention refers to the prevention of cancer through health promotion and risk reduction strategies. Avoiding cancer-causing agents (carcinogens) like tobacco and adapting healthy lifestyle activities like daily physical activity and well-balanced nutritional diets may reduce an individual's risk of developing breast and colorectal cancers. Additionally, consistent condom use and use of HPV vaccine protects against HPV infection and cervical cancer.

- Educate New Yorkers about the importance of not smoking, avoiding second-hand smoke, and maintaining physical activity and a healthy weight, in reducing risk of many serious diseases, including cancer; these lifestyle changes also reduce the risk of diabetes and hypertension.
- Continue to promote condom use among all sexually active individuals. Further, continue to support the HPV vaccination campaign and monitor vaccination rates throughout the city.

Ensure quality and timely cancer screening, diagnoses and treatment for all New Yorkers.

Accessing care is imperative to positive outcomes, but care must be timely, high quality and continual in order to have an impact on improved morbidity and mortality.

- Improve access to quality screening for all segments of the population.
- Promote timely follow-up for those who screen positive for cancer and appropriate care for those who need treatment.
- Ensure the quality of cancer-related services provided in NYC.

Commit public health resources to support targeted campaigns on early detection and timely treatment in high-risk communities.

A combination of culturally relevant community education and outreach coupled with targeted media campaigns about the importance of early detection and treatment of cancer is needed for populations most affected by breast, cervical and colorectal mortality.

- Support community-based outreach efforts that use culturally appropriate techniques to encourage screening and sustained care in black and poor communities, as well as those with low screening rates. Community-based outreach and interventions should involve health care providers and consumers in order to be effective.
- Create programs that link cancer outreach with other disease outreach initiatives. For example, include cancer screening reminders in care management protocols for diabetes or hypertension.

Expand efforts to measure and track barriers to cancer screening and treatment in at-risk populations.

Quality surveillance and improvement initiatives are important to pinpoint problems in capacity and appropriateness and timeliness of care. In addition, to better understand the potential barriers to screening and treatment among sub-populations, improvements are needed in the collection of racial/ethnic and socioeconomic information across federal, state, and city cancer screening, incidence, treatment, and death data systems.

- Collect, analyze and disseminate information about quality in health care practice settings.
- Improve consistency of race/ethnicity data across Federal, State and City registries and other systems. Develop research and data collection tools to understand barriers specific to country-of-origin subgroups within broader race/ethnicity categories.

● Support collaboration to develop community-based and participatory research to uncover subgroup difference among groups experiencing disparities in screening, incidence and mortality. Of particular importance are programs to address treatment disparities among black, Hispanic and poor New Yorkers.

Select New York City Health Department Policy and Programming Initiatives on Cancer Prevention

The **Citywide Colon Cancer Control Coalition** (C5) and the **Breast Cancer Disparities Roundtable** are stakeholder groups convened by the Health Department starting in 2003 and 2008, respectively, to promote cancer screening and provide strategic direction and input for research, policy and program initiatives throughout the city. C5 supports the Health Department's annual educational conference for health care providers and ongoing provider grand rounds, assists with the development and promotion of clinical guidelines for colon cancer screening, and provides expert consultation to the Health Department for its colonoscopy patient navigation, quality and direct referral initiatives. The Breast Cancer Disparities Roundtable brings together a diverse group of stakeholders committed to ensuring equal access to quality screening and treatment. Roundtable activities include research efforts to identify gaps in and barriers to the timely and effective screening and treatment of breast cancer and policy efforts to expand access to screening and to streamline breast cancer treatment.

The **Colonoscopy Patient Navigator Program** has been in place since 2003 and provides technical assistance and training to public and private hospitals to implement and maintain patient navigator programs to improve the access to treatment and reduce disparities in colorectal screening rates. Currently, 16 NYC hospitals have navigator programs in place.

Community media and radio campaigns developed by the Health Department target communities with low colon cancer screening rates. This year's campaign focused on the Chinese and Russian speaking populations.

Vaccine for Children Program is a federally funded program which supplies doctors in private and public health care facilities with free vaccines for eligible children. As part of this program, the Health Department offers free HPV (human papilloma virus) vaccination to girls ages 9-26 at four Health Department walk-in immunization clinics throughout NYC. In 2010, the Health Department distributed nearly 104,000 doses of HPV vaccine to over 1,000 health care facilities for free vaccination of eligible girls. The 2012 Take Care New York goal for HPV vaccination coverage is 25% of all girls ages 13-17. As of 2010, 29% of NYC girls ages 13-17 have been vaccinated for HPV, exceeding the Take Care New York 2012 goal of 25% vaccination coverage of girls in this age group. The Health Department continues to promote the use of the Citywide Immunization Registry to identify girls in need of HPV vaccination or completion of the three-dose HPV vaccination series.

The Primary Care Information Project (PCIP) seeks to improve population health through health information technology and data exchange. The program supports the adoption and use of Electronic Health Records among New York City's primary care providers, especially in underserved communities. More than 2,600+ providers participate in the program and use prevention-oriented features of the Electronic Health Record, including quality measures and patient-specific, actionable decision support at the point of care which focus on key preventive services, including routine cancer screenings.

DESCRIBING CANCER: DEFINITION OF TERMS USED IN THIS REPORT

Incidence: Number of new colorectal, cervical, and female breast cancers that are diagnosed in NYC residents during the calendar year. Reported as a rate; i.e. the number of new cases per 100,000 population per year.

Mortality (or Death): Number of deaths attributed on the death certificate to colorectal, cervical, and female breast cancers that occurred within NYC among residents during the calendar year. Reported as a rate; i.e. the number of deaths per 100,000 population per year.

Screening: Cancer screening test performed for the purpose of detecting pre-cancerous cervical and colorectal lesions and early colorectal, cervical and female breast cancers, when they are most curable. NYC recommended screening tests are colonoscopy (for colorectal cancer) every 10 years starting at age 50 for men and women, Pap smear (for cervical cancer) every three years for all sexually active women, mammogram (for breast cancer) every two years for all women starting at age 40. Screening prevalence or "rate" is measured as the percent of NYC residents of the appropriate age and sex who report having had the recommended screening.

Neighborhood poverty is defined as the percent of residents in an area living below the federal poverty level, according to the U.S. Census 2000. In this report, a high-poverty neighborhood has at least 30% of its residents living below the poverty line, a medium-poverty neighborhood has between 20 and 29.9%, a low-poverty neighborhood has between 10 and 19.9% and a very low-poverty neighborhood has less than 10%. Neighborhood poverty is an indicator of resource availability and opportunities and also can serve as a proxy for individual income, both of which can greatly impact a person's health status.

METHODOLOGY

Data Sources: Death: New York City Department of Health and Mental Hygiene Bureau of Vital Statistics, 1994-2008. Incidence: New York State Department of Health, Bureau of Chronic Disease Epidemiology and Surveillance, 2000-2006; data provisional as of November 2008. New York State Department of Health, Cancer Registry 2002-2006. Screening: New York City Community Health Survey, 2002-2009. Population denominators: US Census Bureau, 1990 and DOHMH neighborhood population estimates modified from US Census Bureau vintage population estimates, 2000-2008.

Adjustments: All death, incidence and prevalence rates were age-adjusted to the year 2000 U.S. population. Percentages and rates have been rounded to the nearest whole number.

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