Epi Research Report

New York City Department of Health and Mental Hygiene March 2013

Increased Life Expectancy in New York City: What Accounts for the Gains?

Life expectancy has increased faster in New York City (NYC) than in the United States (US) over the past decade. To describe and investigate this increase, this Epi Research Report examines changes in NYC life expectancy over time by sex, race/ethnicity and neighborhood poverty and at selected ages. The report also explores which age groups and causes of death have contributed the most to NYC life expectancy increases.

Life expectancy (LE) is a widely used measure of the overall health of a population.[1] It attempts to estimate the average number of years an individual of a particular age can expect to live given current mortality rates. Life expectancy in New York City (NYC) has been increasing faster than LE in the United States (US) over the past decade. The five counties (boroughs) that make up New York City — Bronx, Kings (Brooklyn), New York (Manhattan), Queens, and Richmond (Staten Island) — have had higher rates of increase than other urban counties in the US.[2,3]

This report describes changes in LE in NYC from 2001 through 2010. First, it outlines the calculation of LE with a brief discussion of how complete life tables are constructed. The report then examines LE trends in NYC and the US and presents changes in NYC LE over time by sex, race/ethnicity, neighborhood poverty, and selected ages. It next breaks down LE to examine the contributions of individual age groups and underlying causes of death to NYC's LE increase. The report interprets these trends with a discussion of how public health

Key Findings:

- Gains in life expectancy in New York City have outpaced gains in national life expectancy over the past decade.

In New York City:

- Life expectancy has increased for both males and females, across all racial/ethnic groups, and neighborhood-poverty levels.
- Disparities in life expectancy by sex, race/ethnicity and neighborhood-poverty persisted in 2010, but have decreased over the past decade.
- Decreased mortality among older adults and from heart disease, cancer, and HIV infection account for most of the life expectancy increases.

1 US Department of Health and Human Services. Healthy People 2020. *http://healthypeople.gov/2020/about/GenHealthAbout.aspx*. Accessed December 3, 2012.
2 Alcorn T. Redefining public health in New York City. *Lancet*. 2012;379(9831):2037-2038.
3 Kulkarni SC, Levin-Rector A, Ezzati M, Murray CJL. Falling behind: life expectancy in US counties from 2000 to 2007 in an international context. *Popul Health Metr*. 2011; 9(1):16

NYC Health

interventions that have been implemented in NYC may relate to the increase in life expectancy.

Methods

Data Sources

Line-list mortality data (2001–2010) and aggregate-level live-birth data (2000-2010) for all NYC residents were obtained from the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS), the New York State Department of Health, and the NYC Department of Health and Mental Hygiene's Bureau of Vital Statistics. These data include all NYC resident deaths and births, regardless of where the deaths or births occurred. Population data by sex and racial/ethnic group were obtained from the US Census 2000 and 2010 counts, provided by the NYC Department of City Planning. Population data for the years between 2000 and 2010 were generated by linear interpolation based on the Census 2000 and 2010 populations.

NYC Life Expectancy Calculations

Life expectancy, an estimate of how many more years a person of a certain age can expect to live, is most often reported as LE at birth. A newborn's LE is equal to his/her expected age at death. Life expectancy at age 40 indicates, on average, how many additional years a person who has already lived to age 40 might expect to live (i.e., 40 + life expectancy at 40 = expected age at death).

For this report, LE was calculated using life tables, similar to the methods NCHS uses to calculate the US life tables.[4] Life tables use current mortality rates to compute the estimated probability that a person of a given age will die before his or her next birthday. To calculate LE, these mortality rates by single year of age are applied to a hypothetical population (i.e., a synthetic cohort). This approach assumes that the current age-specific mortality rates across all age groups will remain the same for all future years. If the age-specific mortality rates actually improve or worsen over time, these estimates will increase or decrease accordingly.

Life tables are categorized in two different ways, according to the length of the age intervals in which mortality rates and data are presented. A complete life table contains mortality rates and data for every single year of age.[5] An abridged life table usually contains mortality rates and data by five- or 10-year age intervals. The complete life table offers greater accuracy and greater age detail (see Box 1 for more information on life table structure).

For this report, complete life tables were calculated for NYC from 2001 through 2010, overall and by sex. Persons who died at age 100 years or older were assigned an age of 100 at death because reported age at death for decedents older than 100 years of age is not considered reliable.[6] The few NYC death records with unknown ages (16 deaths or fewer per year out of more than 50,000) were assigned an age category based on the proportion of each age group relative to the known age distribution. Complete life tables were also calculated for NYC Hispanic, non-Hispanic white, and non-Hispanic black populations for the same time period. Separate analyses of Asians were not conducted because the number of deaths in this population was not sufficient to construct reliable, complete life tables that would be comparable to the other racial/ethnic groups.

Abridged life tables were used to perform decomposition (breakdown) of LE by five-year age groups and cause of death. These life tables were directly derived from the complete life tables for

4 Arias E. United States life tables, 2008. *Natl Vital Stat Rep.* 2012; 61(3):1-63.
5 Anderson RN. A method for constructing complete annual U.S. life tables. National Center for Health Statistics. *Vital Health Stat* 2. 1999:129.
6 Coale AJ, Kisker EE. Defects in data on old-age mortality in the United States: new procedures for calculating mortality schedules and life tables at the highest ages. *Asian Pacific Popul Forum.* 1990; 4:1–31.

BOX 1: Life Table Structure

A typical life table consists of at least seven columns: age interval (x, x+n) beginning with exact age (x) for interval length n; probability of dying between x and x+n (q_x); number surviving to age x (l_x); number dying between ages x and x+n (d_x); person-years lived between ages x and x+n (L_x); total number of person-years lived above age x (T_x); and expectation of life at age x (e_x) (i.e., the average number of years remaining to be lived by those surviving to that age). The reference population is a hypothetical cohort of 100,000 newborns (l_0), and it is generally considered acceptable to assume that deaths occur on average at the midpoint of the year (i.e., age x + ½), except for the first year of life. Further detailed descriptions on calculating a life table are available in "United States Life Tables, 2008".[4]

Example of a Life Table when n=1 (Complete Life Table)

Age interval (x, x+1)	Proportion dying in the interval (q_x)	Number living at age x (l_x)	Number dying in the interval (d_x)	Number of person-years lived in the interval (L_x)	Total number of person-years lived beyond x (T_x)	Observed expectation of life at age x (e_x)
0–1	0.00503	100,000	503	99,548	8,059,683	80.6
1–2	0.00033	99,497	33	99,480	7,960,134	80.0
2–3	0.00013	99,463	13	99,457	7,860,654	79.0
⋮	⋮	⋮	⋮	⋮	⋮	⋮
40–41	0.00146	97,672	143	97,600	4,102,626	42.0
⋮	⋮	⋮	⋮	⋮	⋮	⋮
70–71	0.01656	80,153	1,327	79,490	1,353,307	16.9
⋮	⋮	⋮	⋮	⋮	⋮	⋮
99–100	0.23254	5,875	1,366	5,192	7,447	1.3
100 and over	1.00000	4,509	4,509	2,255	2,255	0.5

greater accuracy. For the abridged life tables, the upper age cut-off was set at 85 years and older, following current conventions in abridged life table presentation.

Decomposition of Differences in Life Expectancies

Decomposition (breakdown) of LE increases was computed by age to estimate which age groups contributed most to the overall changes in LE over time using the discrete approach.[7]

Specifically, the total effect, ${}_n\Delta_x$, of a difference in mortality rates between ages x and x+n on the change in LE can be expressed as:

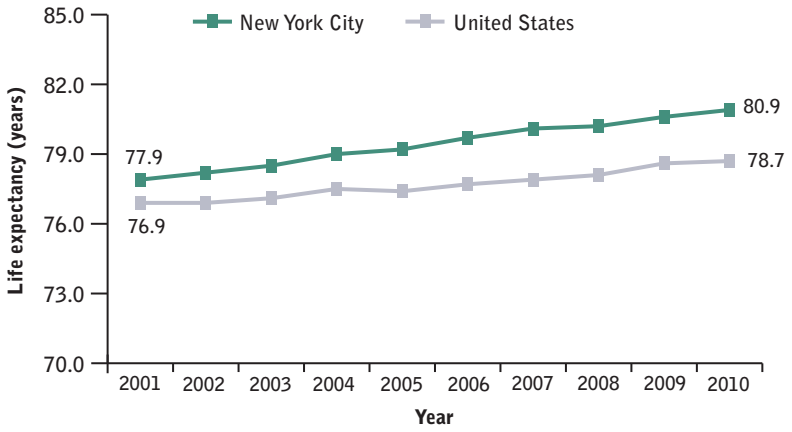
$$ {}_n\Delta_x=(l_{1x}/\ l_{10}) \cdot ({}_nL_{2x}/l_{2x} - {}_nL_{1x}/l_{1x}) + (T_{2(x+n)}/l_{10}) \cdot (l_{1x}/l_{2x} - l_{1(x+n)}/l_{2(x+n)}) $$

Where l_x, ${}_nL_x$ and T_x are conventional functions of the life tables as described in Box 1 where subscripts 1 and 2 refer to time 1 and time 2.

7 Arriaga E. Measuring and explaining the change in life expectancies. *Demography,* 1984, Vol. 21, No. 1, 83-96.

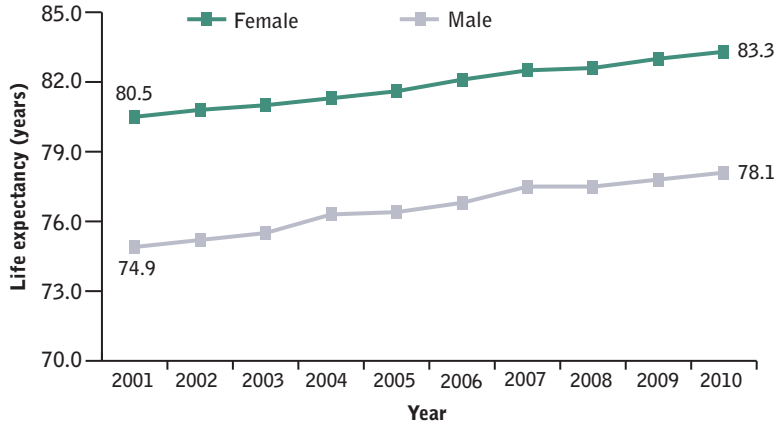
The method for estimating the contribution of age-specific mortality differences to the change in LE was extended to estimate the contribution of specific causes of death. This method assumes that the distribution of deaths by cause is constant over time within each age group's population. Under this assumption, the overall contributions by cause can be computed by adding the contributions of each cause by age group, proportionate to each age group's contribution to overall mortality.[8] These analyses used a single cause for each death known as the underlying cause of death, which the World Health Organization defines as "the disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury".[9]

Figure 1 Life Expectancy at Birth, New York City and United States, 2001–2010



Sources: NYC DOHMH Bureau of Vital Statistics; National Center for Health Statistics

Figure 2 Life Expectancy at Birth by Sex, New York City, 2001–2010



Source: NYC DOHMH Bureau of Vital Statistics

Results

Life Expectancy at Birth

The most commonly reported measure of LE is LE at birth, which indicates how many years a newborn can expect to live.

- By 2010, NYC's LE at birth exceeded the US LE at birth by 2.2 years (80.9 versus 78.7 years)—substantially more than the 1-year difference seen in 2001 (Figure 1).
- Over the past decade (2001–2010), overall LE at birth in NYC increased 3 years from 77.9 to 80.9 years. For males, LE increased 3.2 years to 78.1 years, while for females, LE increased 2.8 years to 83.3 years (Figure 2). The disparity in LE at birth

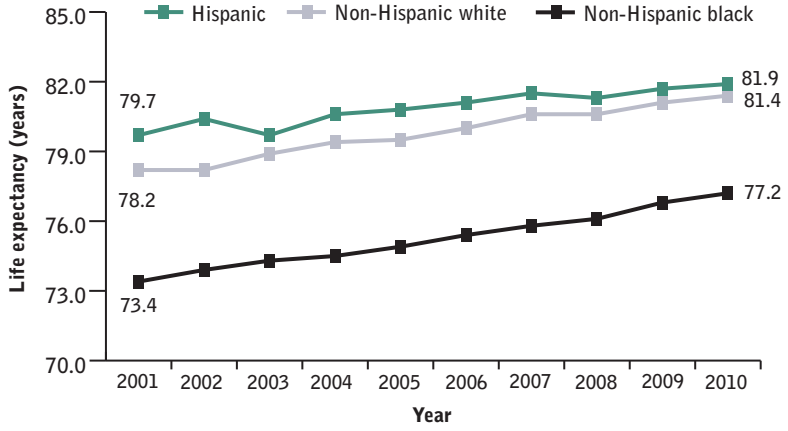
8 Arriaga E. Changing trends in mortality decline during the last decades. In: Ruzick L Wunsch G, Kane P, eds. *Differential Mortality: Methodological Issues and Biosocial Factors (International Studies in Demography)*. Oxford, England: Clarendon Press; 1989:105-129.

9 National Association for Public Health Statistics and Information Systems (NAPHSIS). Resources – statistical measures and definitions – common vital statistics terms: http://www.naphsis.org/Pages/StatisticalMeasuresandDefinitions.aspx/ (Accessed on February 8, 2013).

between males and females decreased from 5.6 years in 2001 to 5.2 years in 2010.

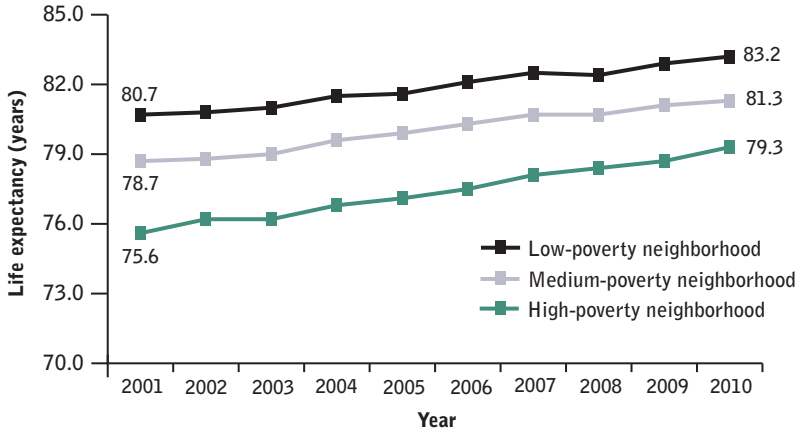
- From 2001 through 2010 in NYC, Hispanics had the highest LE among racial/ethnic groups, followed by non-Hispanic whites and non-Hispanic blacks (Figure 3). During this time, LE at birth increased 2.2 years for Hispanics, 3.2 years for non-Hispanic whites, and 3.8 years for non-Hispanic blacks. The disparity in LE at birth by race/ethnicity declined by 1.6 years between Hispanics and non-Hispanic blacks, and by 0.6 year (7.2 months) between non-Hispanic blacks and non-Hispanic whites. As noted in the Methods section, Asians are not included in the analysis due to the small number of deaths.
- LE also varied widely by neighborhood poverty (Figure 4). In 2010, LE at birth was 83.2 years in low-poverty neighborhoods, 81.3 years in medium poverty neighborhoods, and 79.3 years in high-poverty neighborhoods (See Technical Notes for how poverty levels were defined). The 3.9 year difference in LE between low-poverty and high-poverty neighborhoods was an improvement from 2001, when the difference in LE was 5.1 years.

Figure 3 **Life Expectancy at Birth by Race/Ethnicity, New York City, 2001–2010**



Source: NYC DOHMH Bureau of Vital Statistics

Figure 4 **Life Expectancy at Birth by Neighborhood-Poverty Level, New York City, 2001–2010**



Neighborhoods were ranked based on the percent of residents living below 200% of the federal poverty level, according to the Census 2000, and categorized into three equal groups as low-, medium-, and high-poverty based on relative levels of poverty across the city.

Source: NYC DOHMH Bureau of Vital Statistics

Life Expectancy at 40

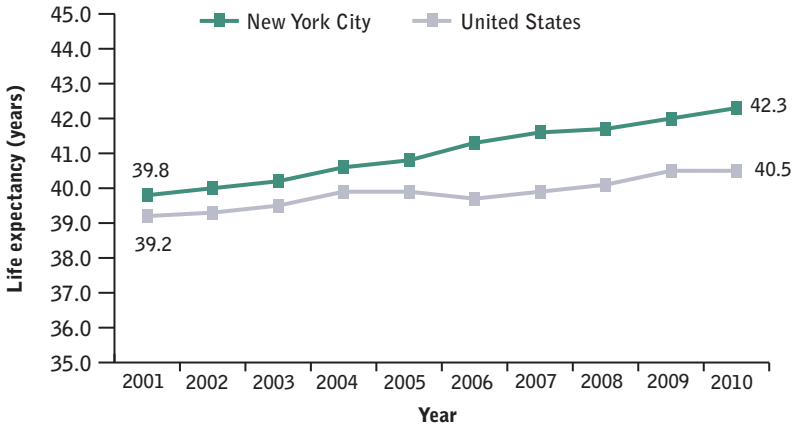
Life expectancy at 40 is defined as the number of additional years on average a typical 40-year-old New Yorker is expected to live. Forty is close to the average age of New Yorkers (38.6 years during 2006 to 2010, according to the American Community Survey), making this statistic more meaningful to many New Yorkers than LE at birth. When a person has already survived 40 years, his

or her expected age at death will be greater than a newborn's. For example, in 2010 a newborn in NYC could expect to live to 80.9 years whereas a 40-year-old could expect to live to age 82.3 years.

New Yorkers aged 40 can expect to live longer on average than Americans of the same age, and this difference has increased since 2005 (Figure 5). In 2001, NYC LE at age 40 was 39.8 additional years, 0.6 years longer than the 39.2 years observed for the US overall. By 2010, that difference had increased to 1.8 years.

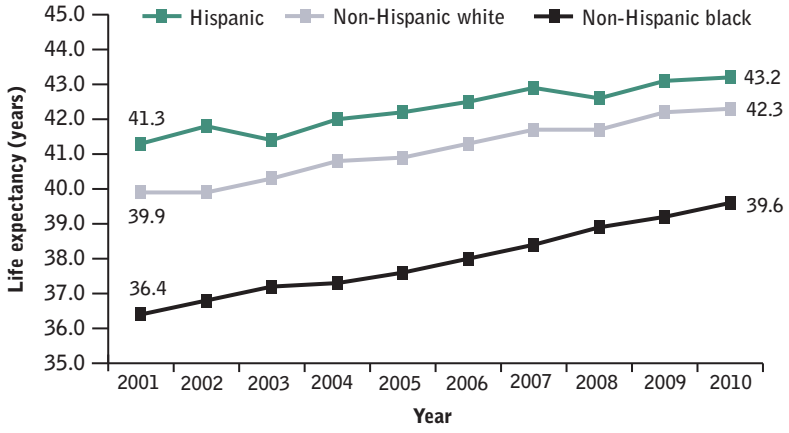
- Life expectancy at age 40 varied by race/ethnicity in NYC (Figure 6). In 2010, LE at age 40 was 43.2 additional years for Hispanics, 42.3 for non-Hispanic whites and 39.6 for non-Hispanic blacks. Although LE at 40 increased for all three races/ethnicities during the 2001-2010 time period, non-Hispanic blacks showed the largest improvement (3.2 years), followed by non-Hispanic whites (2.4 years) and Hispanics (1.9 years).

Figure 5 **Additional Years of Expected Life (Life Expectancy) at Age 40, New York City and United States, 2001–2010**



Sources: NYC DOHMH Bureau of Vital Statistics; National Center for Health Statistics

Figure 6 **Additional Years of Expected Life (Life Expectancy) at Age 40 by Race/Ethnicity, New York City, 2001–2010**



Source: NYC DOHMH Bureau of Vital Statistics

Life Expectancy at 70

New Yorkers are living longer than ever before. With LE at birth in NYC exceeding 80 years, a person who dies before age 70 may be considered to have died prematurely.

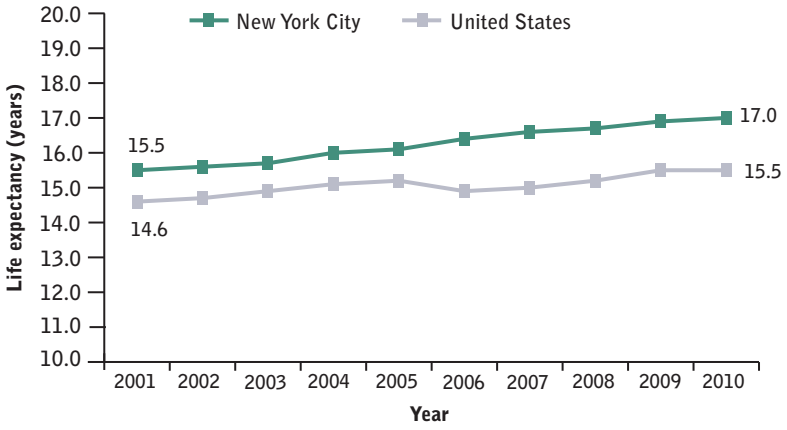
- NYC LE at age 70 also steadily increased in the past decade, although the increase was not as steep as for LE at birth or at age 40 (1.5 versus 3.0 and 2.5 years, respectively). The 0.9 year gap between the US and NYC LE at age 70 in 2001 widened to 1.5 years by 2010 (Figure 7).
- As seen with LE at birth and at age 40, NYC LE at age 70 varied by race/ethnicity (Figure 8). In 2010, LE at age 70 was 17.8 additional years for Hispanics, 16.8 for non-Hispanic whites, and 16.1 for non-Hispanic blacks. Again, the increase in LE was greater for non-Hispanic blacks than for non-Hispanic whites or Hispanics.

Contributions to Gains in Life Expectancy by Age Group

Breaking down the change in LE at birth from 2001 to 2010 by the contribution of each age group

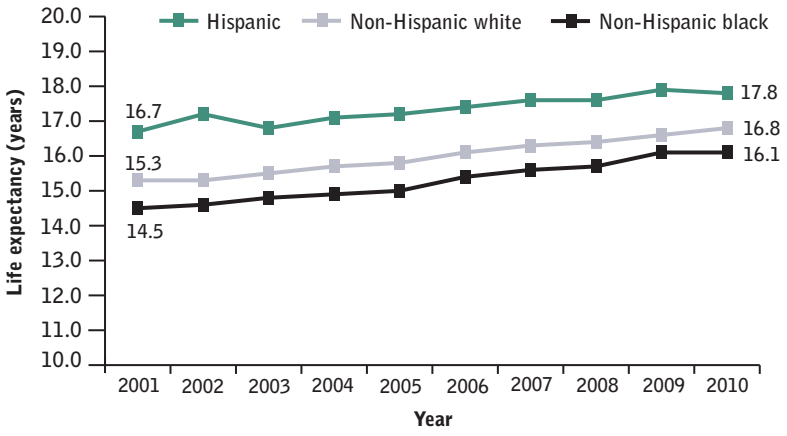
demonstrated that all age groups contributed to the increase (Figure 9). However, decreased mortality in the five age groups among those aged 65 years and older contributed the most — between 7.9% and 10.5% — and accounted for 45.6% of the rise in LE. Reduction in mortality rates among the middle six age groups (30–64 years) accounted for just over 44% of the increase, with each five-year age group contributing from 3.3% to 7.7% to the decrease. The first year of life accounted for 2.8% of the change, which was more than the contribution of any five-year age group less than 30 years of age. Children and young adults accounted for very little of the increase (≤2% contribution per age group).

Figure 7 **Additional Years of Expected Life (Life Expectancy) at Age 70, New York City and United States, 2001–2010**



Source: NYC DOHMH Bureau of Vital Statistics; National Center for Health Statistics

Figure 8 **Additional Years of Expected Life (Life Expectancy) at Age 70 by Race/Ethnicity, New York City, 2001–2010**



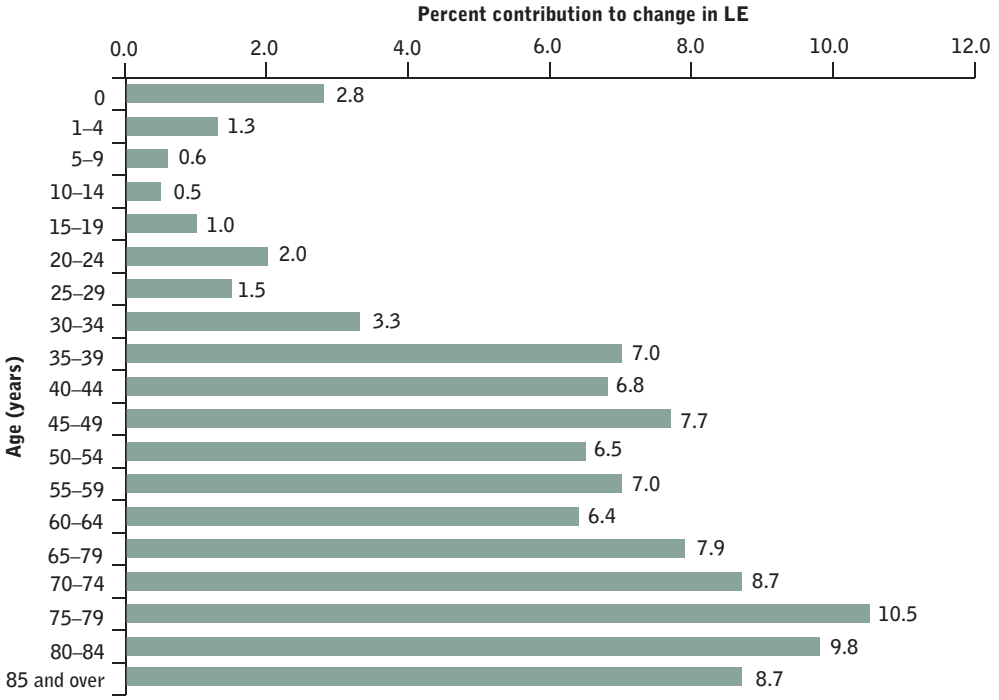
Source: NYC DOHMH Bureau of Vital Statistics

Contribution of Individual Causes of Death to the Change in Life Expectancy

When the increase in citywide LE at birth from 2001 through 2010 was broken down by underlying cause of death, decreased heart disease mortality contributed the most to the gains (50%), followed by declines in cancer (16%), HIV disease (11%), and stroke (4%) (Figure 10). Hypertension is the only cause that contributed negatively to the overall LE at birth, although only by –0.7%.

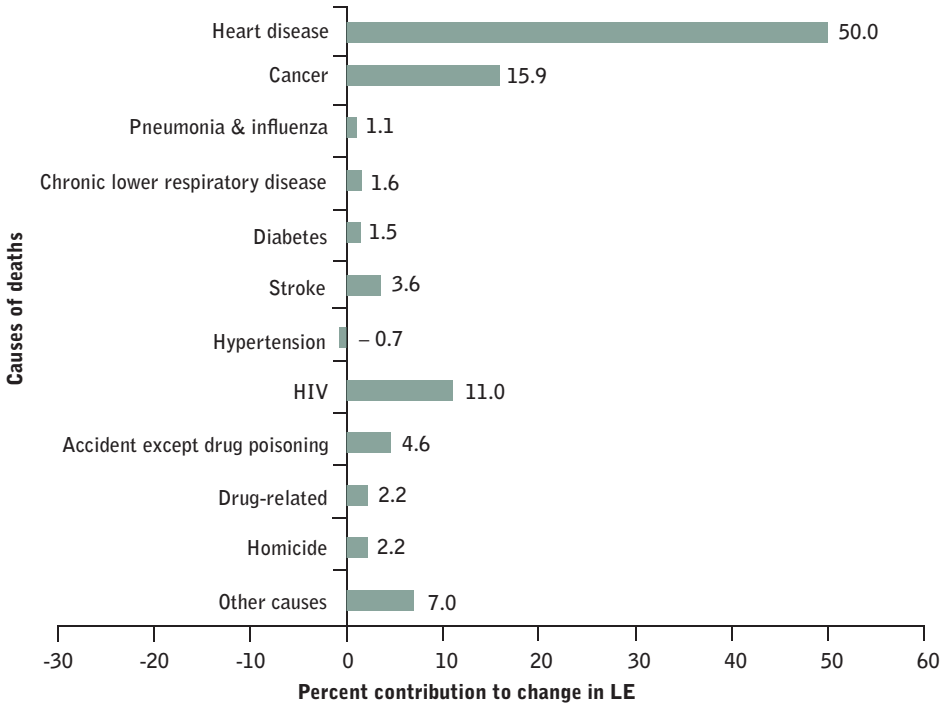
Examination by sex found that the top three contributors were the same for males and females, but the magnitude was different (Figure 11). Decreases in heart disease deaths contributed 44% to the increase in LE at birth for males and 56% for females; declines in cancer contributed 16% for males and 17% for females; and HIV contributed 13% for males and 9% for females. Increases in hypertension deaths for both males and females had negative effects on LE in the past years, cutting LE by 1.2% and 0.2%, respectively. Declines in drug-related deaths, which include deaths from chronic drug abuse and accidental drug poisoning, contributed 0.4% for males and 3.8% for females to the increase in LE during the past 10 years.

Figure 9 Percent Contribution to Changes in Life Expectancy at Birth by Age Group, New York City, 2001–2010



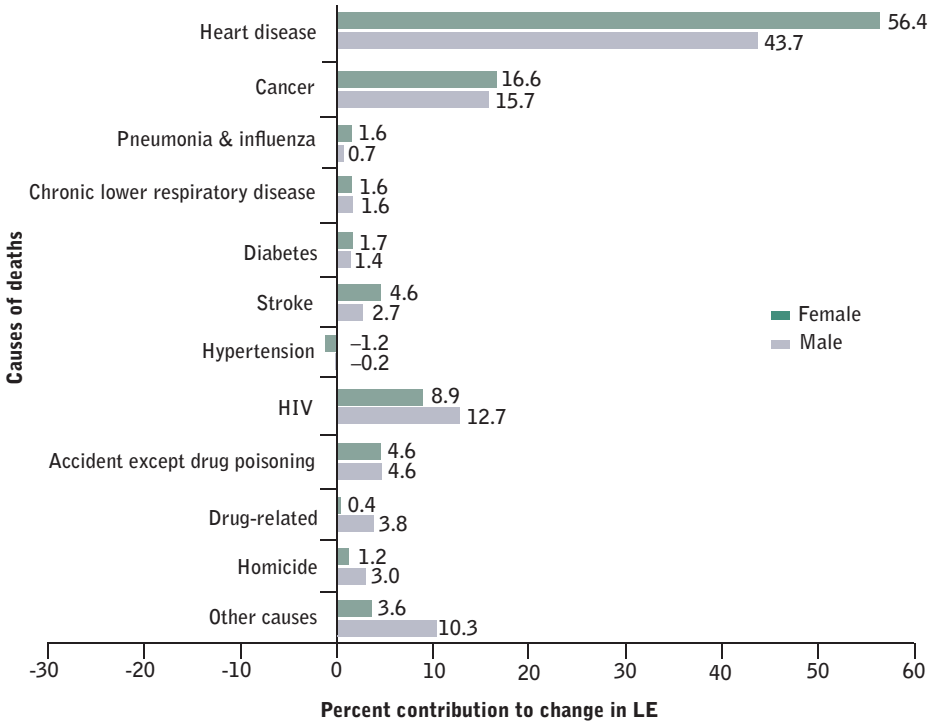
Source: NYC DOHMH Bureau of Vital Statistics

Figure 10 Percentage Contributions of Individual Causes of Death to the Change in Life Expectancy at Birth, New York City, 2001-2010



Drug-related deaths include chronic drug abuse and accidental poisoning.
Source: NYC DOHMH Bureau of Vital Statistics

Figure 11 Percentage Contributions of Individual Causes of Death to the Change in Life Expectancy at Birth by Sex, New York City, 2001-2010



Drug-related deaths include chronic drug abuse and accidental drug poisoning.
Source: NYC DOHMH Bureau of Vital Statistics

Discussion

From 2001 through 2010, LE in NYC increased steadily and at a faster rate than in the US as a whole. The NYC increase varied by sex, racial/ethnic group and neighborhood poverty. Life expectancy increased more for groups with a lower LE in 2001 (male, non-Hispanic blacks, and residents of high poverty neighborhoods) than for those with a higher LE at baseline, thereby reducing sex, racial/ethnic, and neighborhood-poverty disparities. Adults aged 65 years and older contributed the most to LE increases, and decreases in heart disease, cancer and HIV disease deaths accounted for more than 70% of the increase in LE at birth over the past decade in NYC.

In NYC, females have a higher LE than males, and the gap in LE at birth by sex has narrowed in the past decade, consistent with findings for the US as a whole.[3] However, in more than 600 counties in the US, girls who were born in 2009 are projected to have shorter lives than their mothers.[10] In contrast, in NYC, both boys and girls born in 2010 are expected to have longer life spans than their parents.

10 Gray L. Girls born in 2009 will have shorter lives than their mothers in hundreds of U.S. counties. University of Washington, April 2012. http://www.washington.edu/news/2012/04/19/girls-born-in-2009-will-have-shorter-lives-than-their-mothers-in-hundreds-of-u-s-counties/ (Accessed on February 8, 2013)

The data show that Hispanics in NYC had a higher LE in 2010 than non-Hispanic whites (six months longer), despite the fact that they are more likely to live in neighborhoods of high poverty and low education.[11,12] Several factors may contribute to what is known as the "Hispanic Paradox", including the better health status of immigrant populations (the "healthy immigrant effect")[13] and the propensity of foreign-born populations to return to their home of origin at old age for retirement and death, the so-called "Salmon bias hypothesis".[14] However, these factors do not completely explain the longer LE among Hispanics,[15, 16] which remains poorly understood. Disparities by race/ethnicity have declined over time, both between Hispanics and non-Hispanic whites, and between non-Hispanic blacks and whites. Since the NCHS has only published LE at birth by race/ethnicity since 2006, we cannot yet definitively determine whether the decreases in disparities have also occurred at the national level.

An important methodological note regarding Hispanic LE is that the Health Department revised the death certificate in 2003 to improve reporting of Hispanic ancestry by including a check box in addition to the handwritten/typed literal entry that was used previously. As a result, reported deaths with Hispanic ancestry increased by 8.9% from 2002 to 2003, and this is likely the main reason that LE at birth for Hispanics decreased 0.7 year from 2002 to 2003.

It is well-established that high-poverty neighborhoods experience lower LE than low-poverty neighborhoods, although this disparity has decreased in NYC over time. Poverty can influence health through many mechanisms, including education, employment, access to quality health care and access to social services.[17] To address these concerns, the NYC Health Department focuses many of its programs in high-poverty neighborhoods, where the health need is greatest. For example, in 2003 the Department located its District Public Health Offices (DPHOs) in the three poorest areas of NYC (South Bronx, North and Central Brooklyn, and East and Central Harlem), with the aim of reducing health inequalities across NYC by targeting resources, programs and attention to high-need neighborhoods.

Breaking down the increase in LE at birth by age demonstrates that the age groups contributing most to the gains in LE were aged 65 and older (46%), while infants accounted for 2.8% of the increase. Generally, LE calculations are sensitive to deaths in younger age groups, especially reductions in infant deaths, because these deaths save more years of life. By contrast, the increases in LE in NYC are consistent with improvements in risk factors for or management of chronic diseases, which are the major killers in older adults.

Decreases in deaths due to heart disease, cancer, and HIV infection contributed to more than 70% of the increase in LE at birth. Improved prevention, screening, and medical treatment for these diseases all could have played an important role in prolonging lives, thereby helping to increase LE in NYC. Tobacco control is one example of successful prevention efforts that have likely contributed to the observed reduction in heart disease and cancer deaths. From 2002 through 2010 smoking declined at a faster rate in NYC than in the US as a whole (35% vs. 25%) as a result of aggressive

11 Stoops N. Educational attainment in the United States: 2003. *Curr Popul Rep.* June 2004.

12 DeNavas-Walt C, Proctor BD, Smith .C. Income, poverty, and health insurance coverage in the United States: 2011. *Curr Popul Rep.* September 2012.

13 Antecol H, Bedard K. Unhealthy assimilation: why do immigrants converge to American health status levels? *Demography.* 2006; 43(2):337-360.

14 Abrafdo-Lanza AF, Dohrenwend BP, Ng-Mak DS, Turner JB. The Latino mortality paradox: a test of the "Salmon Bias" and Healthy Migrant Hypotheses. *Am J Public Health.* 1999(10):1543-1548.

15 Borrell LN, Lancet EA. Race/ethnicity and all-cause mortality in US adults: Revisiting the Hispanic paradox. *Am J Public Health.* 2012; 102(5):836-843.

16 Blue L, Fenelon A. Explaining low mortality among US immigrants relative to native-born Americans: the role of smoking. *Int Epidemiol.* 2011; 40, No.(3):786-793.

17 Subcommittee on Primary Health and Aging, Sanders B, Chair. *Is Poverty a Death Sentence? The Human Cost of Socioeconomic Disparities.* U.S. Senate Committee on Health, Education, Labor & Pensions, September 13, 2011.

anti-smoking policies and campaigns in NYC.[18] Reductions in mortality from heart disease can be seen as quickly as two years after quitting smoking, suggesting that population-level changes in cardiovascular disease may happen soon after declines in smoking rates.[19]

Colon cancer is the second leading cause of cancer death, following lung cancer.[20] The Health Department has successfully promoted colonoscopy screening and reduced disparities in screening during the past decade.[21] Colon cancer age-adjusted death rates have fallen 19.3% from 20.7 per 100,000 New Yorkers in 2001[22] to 16.7 per 100,000 in 2010,[20] which likely contributed to the LE increases seen in this report. NYC's HIV age-adjusted death rate also declined 55.6% during the past decade, from 21.4 per 100,000 New Yorkers in 2001[22] to 9.5 per 100,000 in 2010,[20] likely due to widespread use of highly effective antiretroviral therapy and HIV prevention efforts.[23]

"Decreases in deaths due to heart disease, cancer and HIV infection contributed to more than 70% of the increase in LE at birth."

These analyses document that the health of New Yorkers is continually improving, and suggest potential associations with both citywide and targeted policies and programs to address disparities. It is essential to continue the City's focus on the leading causes of premature deaths in NYC, including heart disease, cancer, and HIV, and their risk factors, like smoking, physical inactivity and risky sexual behaviors, and to focus those efforts in high-poverty neighborhoods. These results also support the Health Department's focus on reducing sodium intake, given that hypertension-related deaths had a negative impact on LE during the last decade. If successful, these efforts should lead to additional improvement in life expectancy of New Yorkers in the future.

For life expectancy at other ages, please see Table 25 of Appendix A, Summary of Vital Statistics, 2011 at: http://www.nyc.gov/html/doh/downloads/pdf/vs/vs-appendix-a-2011.pdf

18 Mbamalu I, Coady MH, Johns M, Kansagra SM. Trends in cigarette use among adults in New York City, 2002-2010. New York City Department of Health and Mental Hygiene Epi Data Brief. November 2011, No. 12.

19 Land T, Rigotti NA, Levy DE, Paskowsky M, Warner D, Kwass JA, Wetherell L, Keithly L. A longitudinal study of Medicaid coverage for tobacco dependence treatments in Massachusetts and associated decreases in hospitalizations for cardiovascular disease. PLoS Med. 2010 Dec 7;7(12):e1000375.

20 New York City Department of Health and Mental Hygiene. Summary of Vital Statistics of New York City, 2010, December 2011.

21 Richards CA, Kerker BD, Thorpe L, Olson C, Krauskopf MS, Silver LS, Weber TK, Winawer SJ. Increased screening colonoscopy rates and reduced racial disparities in the New York Citywide campaign: an urban model. Am J Gastroenterol. 2011; 106(11):1880-1886.

22 New York City Department of Health and Mental Hygiene Epi-Query site: https://a816-healthpsi.nyc.gov/epiquery/ (Accessed on February 8, 2013)

23 New York City Department of Health and Mental Hygiene. HIV Epidemiol Field Serv Semiannual Rep. Oct 2011:6(2).

Technical Notes

- New York City population data for a single year of age are not available for intercensal years, 2001–2009. Population data for those years were estimated by linear interpolation.
- Since addresses were not available for deaths among NYC residents occurring outside of New York State from NCHS, life tables by neighborhood poverty levels were based only on data from NYC residents who died in New York State (about 98% of NYC resident deaths). Therefore, life tables by neighborhood poverty could be slightly overestimated.
- National Center for Health Statistics (NCHS) used a revised methodology for calculating LE beginning in 2005 and data may differ from those previously published. Per their report: "The methodology to estimate mortality for the population aged 66 and over was revised in three ways: Medicare data were used to supplement vital statistics and census data starting at age 66 rather than 85, as was done from 1997 through 2004; probabilities of death based on current Medicare data rather than rates of change of probabilities of death based on noncurrent Medicare data were used; and the smoothing and extrapolation of the probabilities of death for ages 66 and over were performed using a nonlinear least squares model rather than a linear model of the rate of change of the probabilities of death for ages 85 and over."[24]
- The neighborhood income/poverty level was constructed by using tertiles of percent of residents within a United Hospital Fund (UHF)[25] neighborhood who are <200% federal poverty level, based on data from the US Census 2000, Summary File 3.
- ICD-10 codes groupings used in this report follow NCHS standards and are as follows: Heart diseases: I00-I09, I11, I13, I20-I51; Cancer: C00-C97; Pneumonia & influenza: J09-J18; Chronic lower respiratory diseases: J40-J47; Diabetes mellitus: E10-E14; Stroke (Cerebrovascular diseases): I60-I69; Hypertension [Essential (primary / secondary) hypertension and hypertensive renal disease]: I10, I12, I15; HIV/AIDS: B20-B24; Accidents except drug poisoning: V01-X39, X43, X45-X59, Y85-Y86; Drug-related: F11-F16, F18-F19, X40-X42, X44; Homicide: X85-Y09, Y87.1; and Other causes: rest of A00-Y89.

24 Arias E, Rostron BL, Tejada-Vera B. United States Life Tables, 2005. *Natl Vital Stat Rep.* 2010 Mar 3; 58(10):1-132.

25 Sources, Methods, and Definitions, United Hospital Fund. New York City Community Health Atlas, 2002. Available at: http://www.uhfnyc.org/assets/592 (Accessed on February 8, 2013).

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