

# **Cardiovascular Disease Mortality in New York State**

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**Results from the  
New York State Vital Records Death Statistics  
and the Bureau of Vital Statistics  
New York City Department of Health and Mental Hygiene**

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Bureau of Chronic Disease Evaluation and Research  
New York State Department of Health

# Executive Summary

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*Cardiovascular Disease Mortality in New York State* examines an important indicator of the burden of cardiovascular disease (CVD) in the New York State (NYS) population. This report compares NYS CVD mortality trends to United States (US) data for 1980 – 2007. It also provides information regarding the differences in CVD mortality by gender, race and age. When appropriate, this report includes the Healthy People 2010 CVD mortality-specific objectives<sup>1</sup> as well as the NYS Prevention Agenda CVD mortality-specific targets.<sup>2</sup>

CVD is a general category of diseases that affect the heart and the circulatory system. Specific CVD categories included in this report are coronary heart disease (including acute myocardial infarction, also known as heart attack), stroke (also known as cerebrovascular disease), congestive heart failure, major CVD associated with hypertensive diseases and major CVD associated with hyperlipidemia.

This Executive Summary offers highlights of the CVD-related information detailed throughout the report.

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- Although total CVD mortality rates in NYS have steadily declined (from 588.9 per 100,000 in 1980 to 267.5 per 100,000 in 2007), it remains the primary cause of death for NYS citizens, both men and women, as well as all races.
  - Total CVD accounted for almost 40% of all deaths in NYS in 2008 and accounted for a greater percentage of deaths than the next four leading causes combined (cancer, chronic lower respiratory disease, accidents and pneumonia).
  - The NYS age-adjusted mortality rate of total CVD was higher than the US rate (588.9 versus 543.7 per 100,000) in 1980 and remained consistently higher through 2007 (267.5 versus 251.2 per 100,000).
  - The 2008 NYS BHF BEK/TUFE coronary heart disease mortality rate of 179.2 exceeded the Healthy People 2010 target of 166 per 100,000.
  - Though the NYS age-adjusted stroke mortality rate has consistently been lower than the US rate and has consistently been declining, the NYS 2008 rates for both men and women (27.3 and 25.2 respectively) exceeded the NYS Prevention Agenda goal of 24 per 100,000.
  - Congestive heart failure, major CVD associated with hypertensive disease and major CVD associated with hyperlipidemia were the only reported CVD categories that did not show a steady decline in mortality rates.
  - CVD is a problem for all adults, though mortality is especially high in older age groups.
  - In 2008, among NYS residents, black adults had higher premature mortality (death between ages 35 and 74) rates than white adults for all reported categories of CVD.
  - In 2008 a greater number of women died from CVD than men (31,877 versus 26,752). This is partly explained by the large number of women in the older age groups, where CVD deaths were concentrated.

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# Introduction

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Cardiovascular disease (CVD) is a general category of diseases that affect the heart and the circulatory system. Specific CVD categories included in this report are coronary heart disease (including acute myocardial infarction), acute myocardial infarction (heart attack), stroke (also known as cerebrovascular disease), congestive heart failure, major CVD associated with hypertensive diseases and major CVD associated with hyperlipidemia.

Coronary heart disease occurs when the arteries supplying blood to the heart narrow or harden from the build-up of plaque (fat, cholesterol and other substances found in the blood).<sup>3</sup> A complete cutoff of the blood supply causes the death of heart muscle cells and results in a heart attack.<sup>4</sup> Stroke occurs when a blood vessel bringing oxygen and nutrients to the brain bursts or is cut off by a blood clot.<sup>5</sup> Congestive heart failure is a disorder in which the heart loses its ability to pump blood efficiently.<sup>6</sup> Hypertension is high blood pressure. Blood pressure is the force of blood against your artery walls as it circulates through your body. Blood pressure normally rises and falls throughout the day<sup>7</sup>, but high blood pressure<sup>8</sup> has been shown to be associated with CVD mortality.<sup>9</sup> Unlike the other conditions highlighted in this report, hyperlipidemia is not a category of CVD. It is included in this report because it is an important risk factor for CVD mortality.<sup>10</sup> Hyperlipidemia is a general term for elevated concentrations of any or all of the lipids in plasma.<sup>11</sup>

## Data Sources

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The 2008 NYS death counts and rates reflect data obtained from the NYS Department of Health (NYSDOH) Vital Records Death Statistics file and the Bureau of Vital Statistics, New York City Department of Health and Mental Hygiene. Death data for total CVD, coronary heart disease (including acute myocardial infarction), acute myocardial infarction, stroke and congestive heart failure reported in the figures and tables that follow are presented according to the principal underlying cause of death identified on death certificates. Death counts were combined with NYS population estimates from the NYSDOH Bureau of Biometrics to calculate crude rates. The 2000 Census US standard population<sup>12</sup> was used to calculate the age-adjusted rates reported.

More information about the NYSDOH Vital Records Death Statistics file can be obtained at the following link:

[http://www.health.state.ny.us/nysdoh/vital\\_statistics/2008/technote.htm](http://www.health.state.ny.us/nysdoh/vital_statistics/2008/technote.htm)

More information about the Bureau of Vital Statistics, New York City Department of Health and Mental Hygiene death data can be obtained at the following link:

<http://home2.nyc.gov/html/doh/html/vs/vs-epiquery.shtml>

More information about the 2000 US standard population can be obtained at the following link:

<http://www.cdc.gov/nchs/data/statnt/statnt20.pdf>

The Centers for Disease Control and Prevention, National Center for Health Statistics Compressed Mortality File<sup>13</sup> was used to generate the figures and tables depicting trends comparing NYS and US rates for total CVD, coronary heart disease (including acute myocardial infarction), acute myocardial infarction, stroke and congestive heart failure. The method for identifying disease conditions in the Compressed Mortality File was changed in 1999. Data from 1980 to 1998 represent conditions identified by International Classification of Disease Version 9 (ICD9)<sup>14</sup> codes, while data from 1999 to 2007 represent conditions identified by ICD10<sup>15</sup> codes.

The Centers for Disease Control and Prevention, National Center for Health Statistics Multiple Cause of Death File<sup>16</sup> generated the trend data for major CVD associated with hypertensive diseases reported in figure 7. Data is based on death certificates for US residents. Each death certificate contains a single underlying cause of death and up to twenty additional multiple causes. Data reported in figure 7 is based on major CVD as the principal underlying cause of death and hypertensive diseases as at least one of the additional multiple causes. The Multiple Cause of Death File was also the source of trend data for major CVD associated with hyperlipidemia reported in figure 8. This data is based on major CVD as the principal underlying cause of death identified on death certificates when at least one of the additional multiple causes is hyperlipidemia. Disease conditions are identified by International Classification of Disease Version 10 (ICD10) codes.<sup>15</sup>

More information about the Compressed Mortality File is available at the following link:

<http://wonder.cdc.gov/mortSQL.html>

More information about the Multiple Cause of Death File is available at the following link:

<http://wonder.cdc.gov/mcd.html>

## Conditions

A long history exists of assigning codes to diseases in order to standardize data associated with medical conditions.<sup>14</sup> The World Health Organization's International Classification of Diseases Version 9 (ICD9) and Version 10<sup>15</sup> (ICD10) are the coding rules most commonly used today. Data sources utilized by this report employ either ICD9 or ICD10 coding to classify the categories of CVD covered in this report. The following table presents the categories of CVD and their ICD codes in the order in which they are found in the report. The final condition presented, hyperlipidemia, is not a category of CVD, but is seen by the Centers for Disease Control and Prevention as an important risk factor for CVD.

<b>Cardiovascular Disease Category</b>	<b>Description</b>	<b>ICD 9</b>	<b>ICD 10</b>
<b>Total Cardiovascular Disease (Total CVD)</b>	A general category of diseases that affect the heart and the circulatory system	390 – 459	I00 – I99
<b>Coronary Heart Disease (CHD)</b>	CHD occurs when the arteries supplying blood to the heart narrow or harden from the build-up of plaque <sup>3</sup>	402, 410 – 414, 429	I20 – I25, I11
<b>Stroke (cerebrovascular disease)</b>	Stroke occurs when a blood vessel bringing oxygen and nutrients to the brain bursts or is cut off by a blood clot <sup>5</sup>	430 – 438	I60 – I69
<b>Acute Myocardial Infarction (AMI)</b>	Heart attack	410	I21 – I22
<b>Congestive Heart Failure (CHF)</b>	CHF is a disorder in which the heart loses its ability to pump blood efficiently <sup>6</sup>	428	I50
<b>Major Cardiovascular Disease (Major CVD)</b>	Major CVD includes the main disease conditions that affect the heart and circulatory system	390 – 434, 436 – 448	I00 – I78
<b>Hypertension and hypertensive diseases (HTN)</b>	High blood pressure	401 – 405	I10 – I15
<b>Hyperlipidemia</b>	High cholesterol	272	E78

# Data Standards and Objectives

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## NYS Department of Health Prevention Agenda Toward the Healthiest State

In 2008, the NYS Department of Health (NYSDOH) launched a Prevention Agenda Toward the Healthiest State to support the goals of health care reform. The Prevention Agenda established ten statewide public health priorities and called upon local health departments, hospitals and other community partners to work together to address these priorities. The emphasis of this public health initiative is on prevention strategies to improve the health of all New Yorkers and foster healthy communities. The Prevention Agenda established a goal of reducing the age-adjusted proportion of NYS citizens dying from stroke from 32.6 to 24 per 100,000 by 2013.

More information about the NYSDOH Prevention Agenda is available on the Prevention Agenda page of the NYSDOH website. [http://www.health.ny.gov/prevention/prevention\\_agenda/index.htm](http://www.health.ny.gov/prevention/prevention_agenda/index.htm)

## Healthy People 2010

Healthy People 2010 (HP2010) represents a comprehensive set of disease prevention and health promotion objectives for the Nation to achieve by 2010. These objectives include a target related to reducing the proportion of US citizens dying from coronary heart disease from 208 to 166 per 100,000 by 2010.

For more information about HP2010, go to the following link:  
<http://wonder.cdc.gov/data2010/>

## Statistics

*Mortality Count:* Mortality counts reflect the number of deaths in which cardiovascular disease or one of the specific categories of cardiovascular disease covered in this report was listed as the principal underlying cause of death.

*Crude Mortality Rate:* A crude mortality rate reflects the number of deaths for a specific condition in a particular population, divided by the total number of people in that population. Crude mortality rates in this report are per 100,000 residents.

*Age-adjusted Mortality Rate:* Age-adjustment is a statistical technique that applies data collected from different populations or the same population at different times to a standard population with a fixed age-distribution. This technique allows comparisons between rates over time or between different populations. The age-adjusted mortality rates included in this report use the 2000 US Census as the standard population and were calculated by the direct method. Age-adjusted mortality rates in this report are per 100,000 residents.

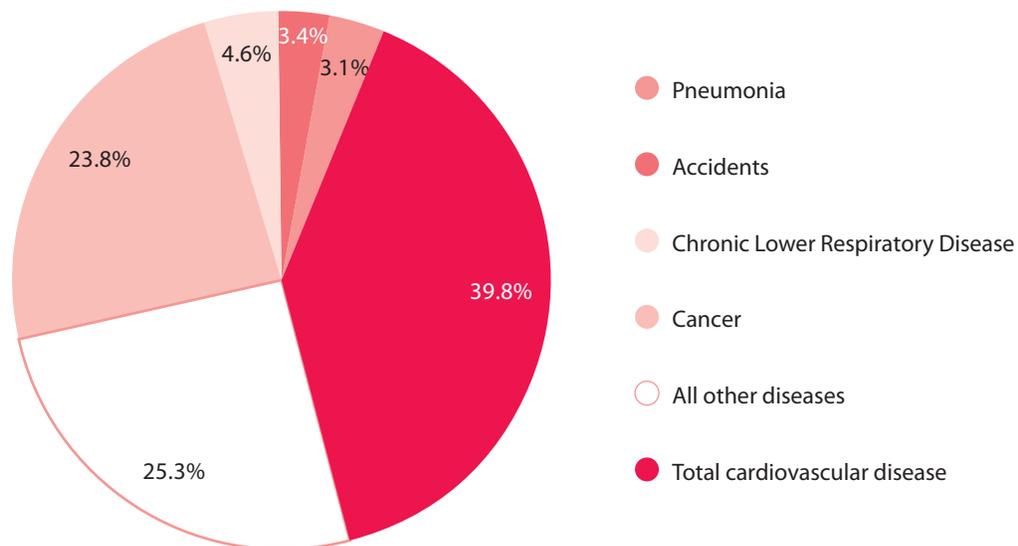
*Premature Mortality Rate:* Premature mortality rate is an age-adjusted mortality rate for a particular condition among those aged 35 to 74. As with age-adjusted mortality rates, the 2000 US Census population is used as the standard population and rates are per 100,000 residents.

For more information about the statistics included and how they are calculated please use the following link: [http://www.nyhealth.gov/statistics/teaching\\_tools.htm](http://www.nyhealth.gov/statistics/teaching_tools.htm)

# Impact of Cardiovascular Disease Mortality

## Leading Causes of Death in NYS

**Figure 1** Leading causes of death in NYS, 2008



Rank	Cause of Death	Deaths	Percent
1	Total Cardiovascular Disease	58,630	39.8
	Coronary Heart Disease	40,368	27.4
	Stroke	5,883	4.0
	Other Cardiovascular Diseases	12,379	8.4
2	Cancer	35,101	23.8
3	CLRD*	6,841	4.6
4	Accidents	4,988	3.4
5	Pneumonia	4,548	3.1
	All Other Diseases	37,361	25.3

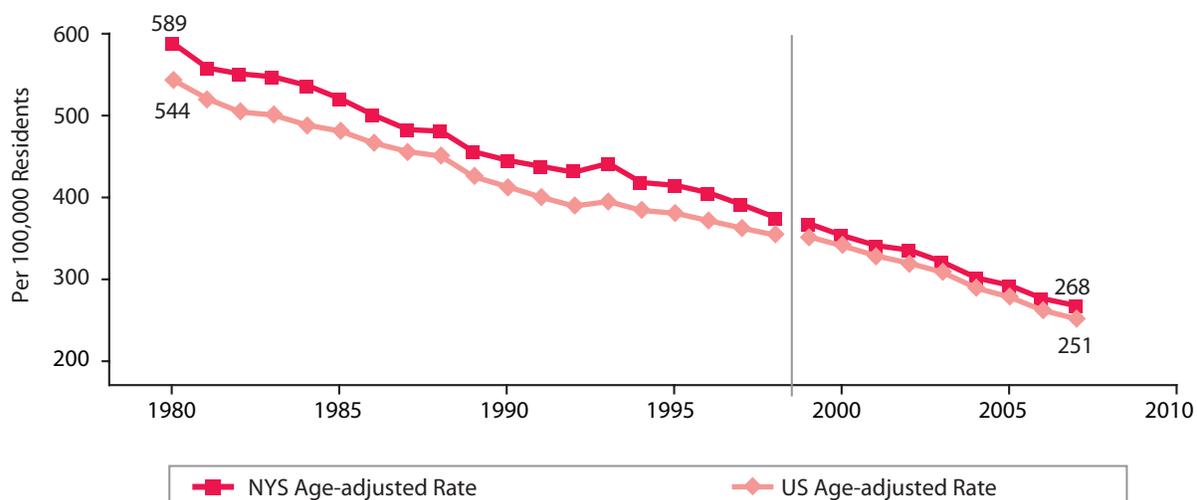
\*CLRD = Chronic Lower Respiratory Disease

**Total cardiovascular disease accounted for almost 40% of the deaths in NYS in 2008 and accounted for a greater percentage of the deaths than the next four leading causes combined (cancer, chronic lower respiratory disease, accidents and pneumonia).**

**Coronary heart disease accounted for over 27% of all deaths in NYS in 2008.**

## Mortality Trends in NYS and the US

**Figure 2** Trends in total cardiovascular disease mortality in NYS and the US, 1980 – 1998, 1999 – 2007

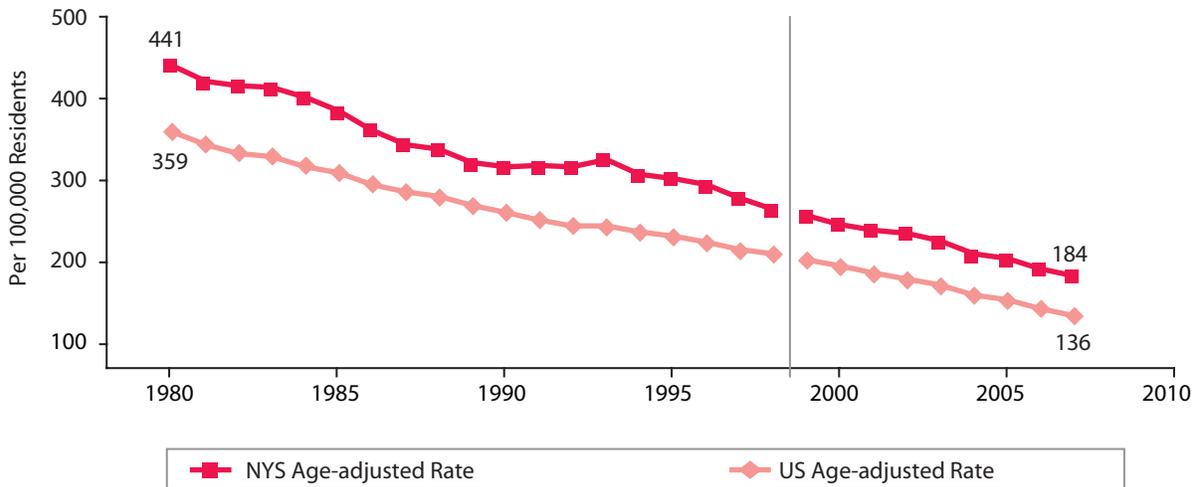


Note: The break in the lines indicates ICD9 codes were used to define the disease category for data from 1980 to 1998, ICD10 codes were used for data from 1999 to 2007 (the most current available US data)

The age-adjusted rate of total cardiovascular disease (total CVD) mortality in NYS (589 per 100,000) was higher than the US rate (544 per 100,000) in 1980 and remained consistently higher through 2007, with 268 per 100,000 in NYS versus 251 per 100,000 in the US.

Although total CVD mortality declined in NYS from a rate of 589 per 100,000 in 1980 to 268 per 100,000 in 2007, it remains the primary cause of death in NYS.

**Figure 3** Trends in coronary heart disease mortality (including acute myocardial infarction) in NYS and the US, 1980 – 1998, 1999 – 2007

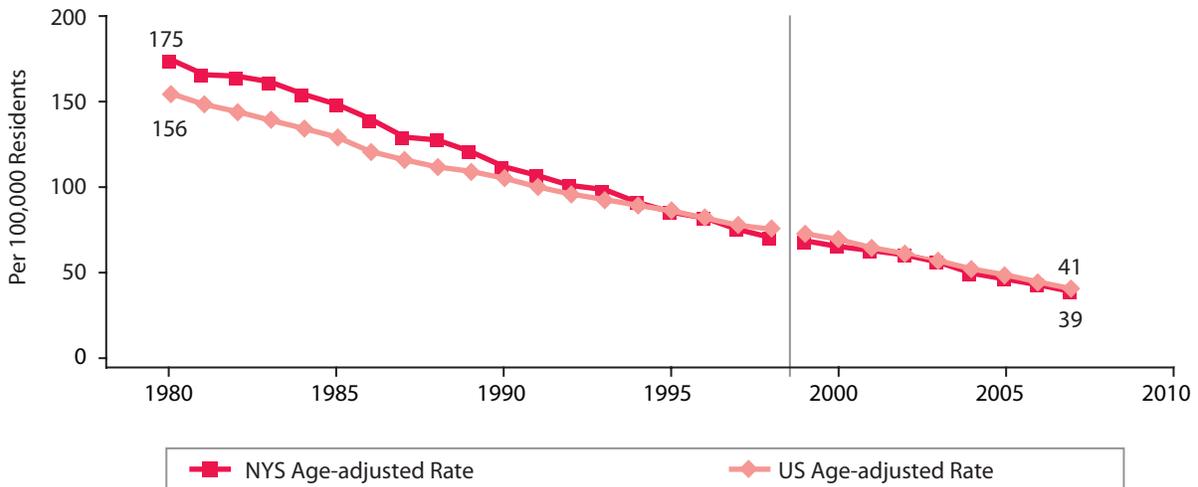


Note: The break in the lines indicates ICD9 codes were used to define the disease category for data from 1980 to 1998, ICD10 codes were used for data from 1999 to 2007 (the most current available US data)

**In 2007, the age-adjusted rate of coronary heart disease mortality was higher in NYS (184 per 100,000) than in the US (136 per 100,000).**

**Coronary heart disease age-adjusted mortality rates declined from 1980 to 2007.**

**Figure 4** Trends in acute myocardial infarction mortality in NYS and the US, 1980 – 1998, 1999 – 2007

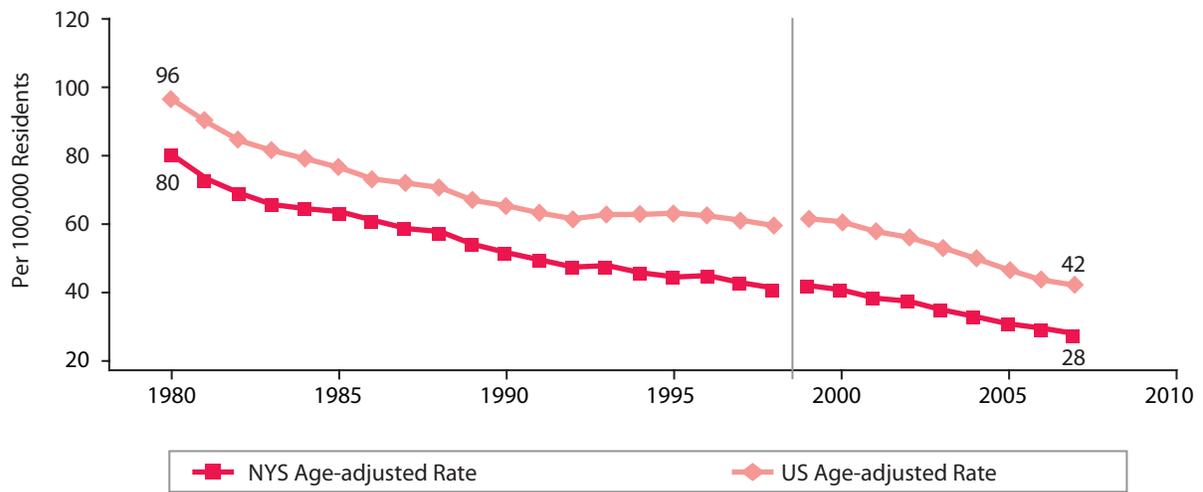


Note: The break in the lines indicates ICD9 codes were used to define the disease category for data from 1980 to 1998, ICD10 codes were used for data from 1999 to 2007 (the most current available US data)

**The age-adjusted mortality rate for acute myocardial infarction in NYS was higher than the US rate in 1980 (175 versus 156 per 100,000) and was comparable to the US rate in 2007 (39 versus 41 per 100,000).**

**Acute myocardial infarction age-adjusted mortality rates declined from 1980 to 2007.**

**Figure 5** Trends in stroke mortality in NYS and the US, 1980 – 1998, 1999 – 2007

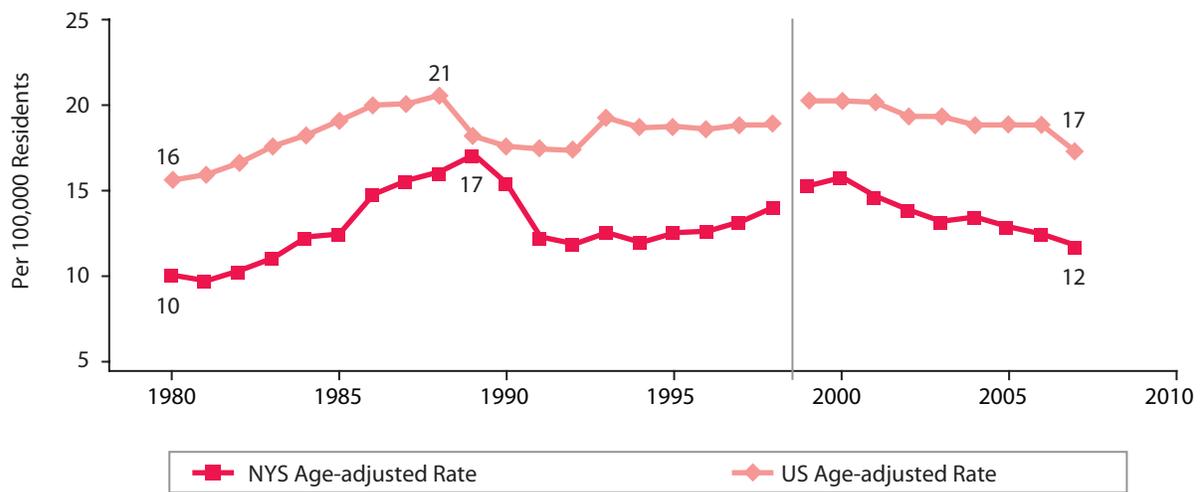


*Note: The break in the lines indicates ICD9 codes were used to define the disease category for data from 1980 to 1998, ICD10 codes were used for data from 1999 to 2007 (the most current available US data)*

**The 1980 NYS age-adjusted rate of stroke mortality was lower than the US rate (80 versus 96 per 100,000) and remained consistently lower through 2007, with 28 in NYS versus 42 per 100,000 in the US.**

**Stroke age-adjusted mortality rates declined from 1980 to 2007.**

**Figure 6** Trends in congestive heart failure mortality in NYS and the US, 1980 – 1998, 1999 – 2007

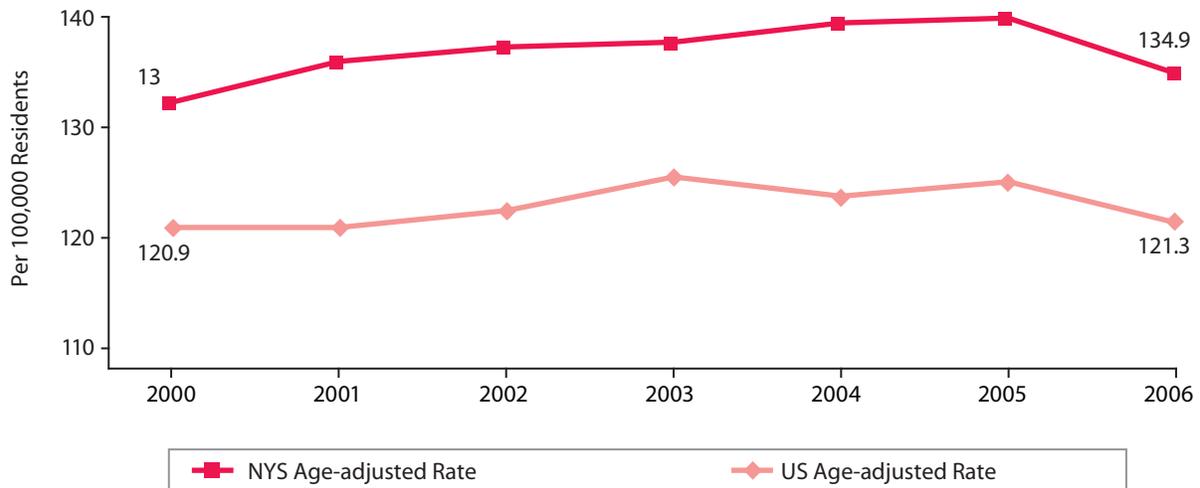


Note: The break in the lines indicates ICD9 codes were used to define the disease category for data from 1980 to 1998, ICD10 codes were used for data from 1999 to 2007 (the most current available US data)

**In 2007, the age-adjusted mortality rate for congestive heart failure was lower in NYS (12 per 100,000) than in the US (17 per 100,000).**

**Unlike mortality rates for coronary heart disease and stroke, congestive heart failure mortality rates were higher in 2007 than they were in 1980 (12 per 100,000 in 2007 compared to 10 per 100,000 in 1980 for NYS, and 17 per 100,000 in 2007 versus 16 per 100,000 in 1980 for the US).**

**Figure 7** Trends in major cardiovascular disease mortality associated with hypertension and hypertensive diseases, among residents 35 years and older, in NYS and the US, 2000 – 2006

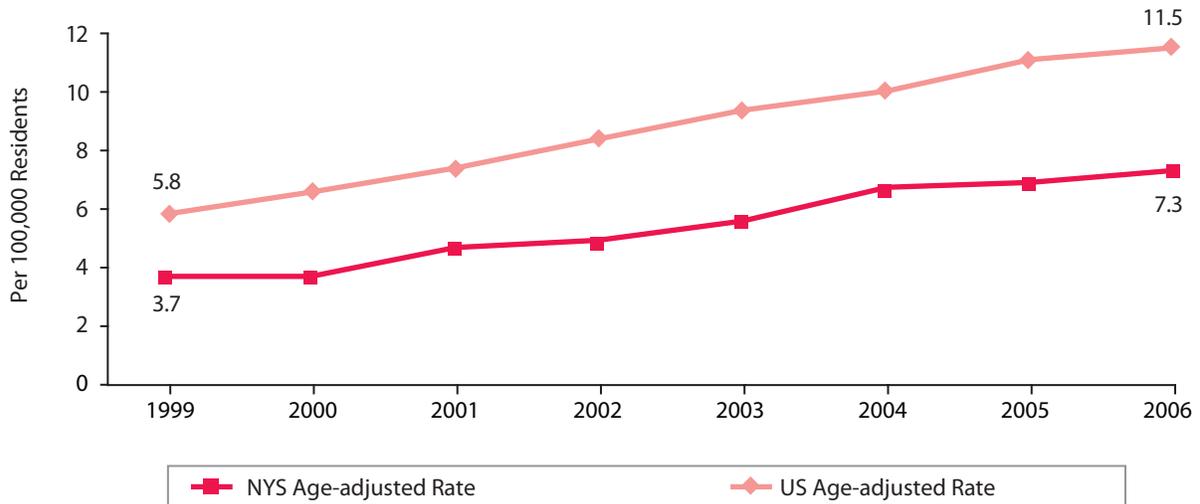


Age-adjusted Mortality Rate (per 100,000)		
Year	NYS	US
2000	132.4	120.9
2001	136.0	120.8
2002	137.3	122.5
2003	137.8	125.5
2004	139.6	123.7
2005	139.9	125.0
2006	134.9	121.3

**New York State consistently has a higher age-adjusted rate of major cardiovascular disease mortality associated with hypertension and hypertensive diseases than the US.**

**Age-adjusted mortality rates for major cardiovascular disease associated with hypertensive diseases did not change dramatically between 2000 and 2006 (from 132.4 to 134.9 per 100,000 in NYS and from 120.9 to 121.3 per 100,000 for the US).**

**Figure 8** Trends in major cardiovascular disease mortality associated with hyperlipidemia, among residents 35 years and older, in NYS and the US, 1999 – 2006



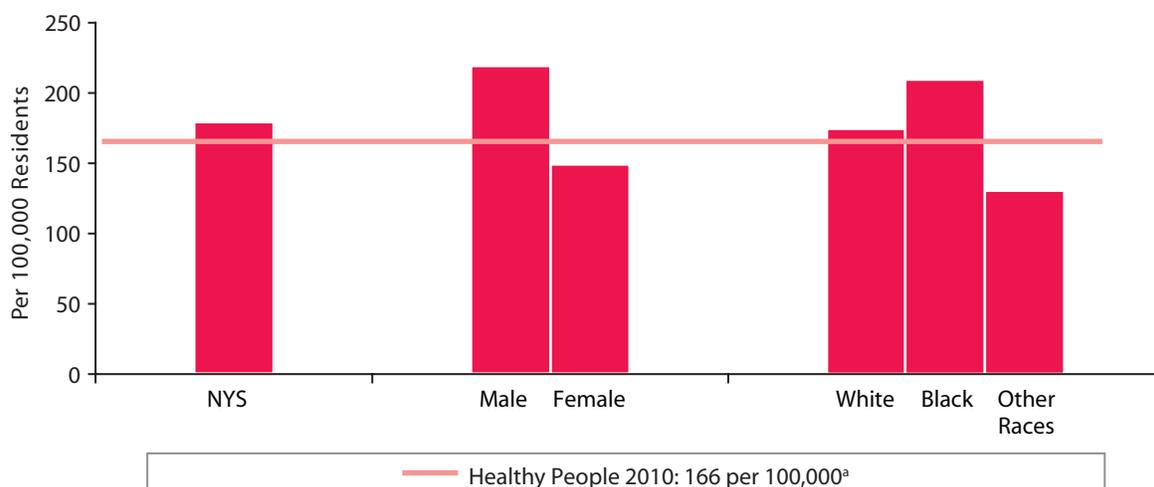
Age-adjusted Mortality Rate (per 100,000)		
Year	NYS	US
1999	3.7	5.8
2000	3.7	6.6
2001	4.7	7.4
2002	4.9	8.4
2003	5.6	9.4
2004	6.7	10.0
2005	6.9	11.1
2006	7.3	11.5

**New York State consistently has a lower age-adjusted rate of major cardiovascular disease mortality associated with hyperlipidemia than the US.**

**Age-adjusted mortality rates for major CVD associated with hyperlipidemia are increasing from 1999 to 2006 (from 3.7 to 7.3 per 100,000 for NYS and from 5.8 to 11.5 per 100,000 in the US).**

## Mortality by Gender and Race

**Figure 9.** Age-adjusted coronary heart disease mortality rates (including acute myocardial infarction) in NYS by gender and race, 2008



Population Segment	Age-adjusted Rate (per 100,000)
Healthy People 2010 <sup>a</sup>	166
NYS	179.2
Male	219.7
Female	148.7
White	174.9
Black	209.4
Other Races <sup>b</sup>	130.4

<sup>a</sup> A mid-course review changed the HP2010 coronary heart disease age-adjusted mortality target from 166 to 162 per 100,000. The original target is presented in this document.

<sup>b</sup> Cases missing race data are not included in the Other Races category.

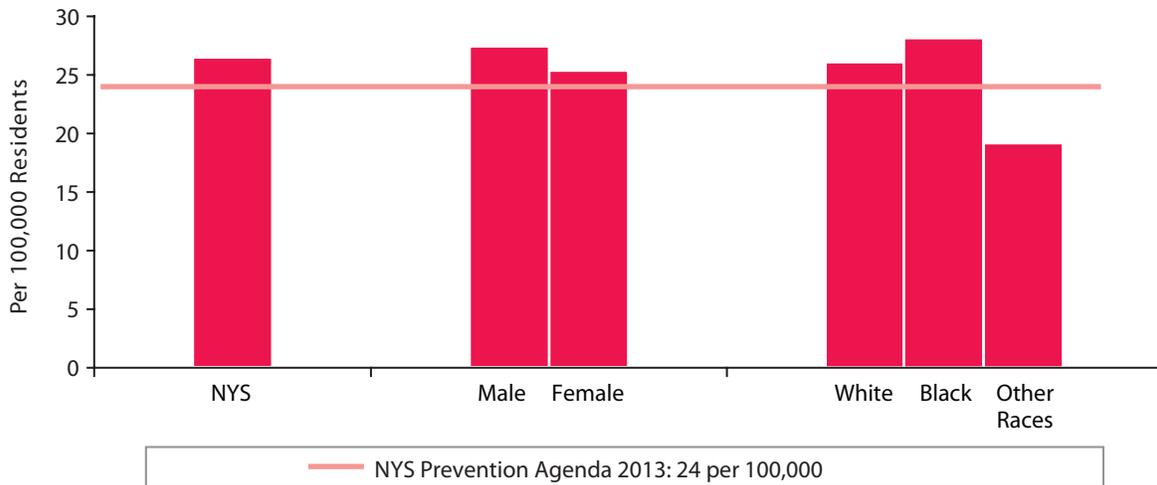
**In 2008, the NYS age-adjusted mortality rate for coronary heart disease (including acute myocardial infarction), 179.2 per 100,000 residents, remained above the goal established by Healthy People 2010, 166<sup>a</sup> per 100,000 people.**

**The 2008 NYS male age-adjusted mortality rate for coronary heart disease (219.7 per 100,000 including acute myocardial infarction) exceeded the Healthy People 2010 goal of 166<sup>a</sup> per 100,000 people.**

**Age-adjusted coronary heart disease (including acute myocardial infarction) mortality rates in 2008 for NYS whites and blacks (174.9 and 209.4 per 100,000 residents, respectively) remained above the Healthy People 2010 goal of 166<sup>a</sup> per 100,000 people.**

For more information regarding Healthy People 2010: <http://www.healthypeople.gov/2010/>

**Figure 10** NYS Prevention Agenda 2013 target for stroke mortality and age-adjusted stroke mortality rates in NYS by gender and race, 2008



Population Segment	Age-adjusted Rate (per 100,000)
NYS Prevention Agenda 2013	24
NYS	26.4
Male	27.3
Female	25.2
White	26.0
Black	28.0
Other Races <sup>a</sup>	19.1

<sup>a</sup> Cases missing race data are not included in the Other Races category.

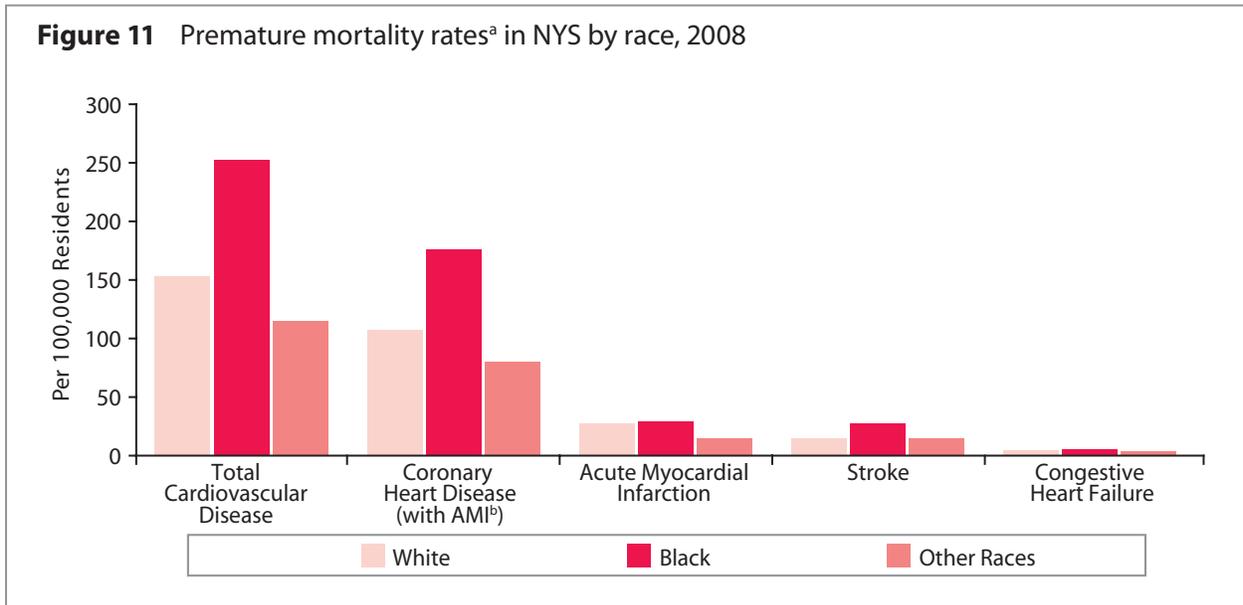
**In 2008, the NYS age-adjusted mortality rate for stroke of 26.4 per 100,000 residents remained above the goal established by the Prevention Agenda (24 per 100,000).**

**Age-adjusted mortality rates for stroke in 2008 exceeded the Prevention Agenda goal (24 per 100,000) for both men and women (27.3 and 25.2 per 100,000 residents, respectively).**

For more information regarding the NYS Prevention Agenda:

[http://www.nyhealth.gov/prevention/prevention\\_agenda/chronic\\_disease/index.htm](http://www.nyhealth.gov/prevention/prevention_agenda/chronic_disease/index.htm)

**Figure 11** Premature mortality rates<sup>a</sup> in NYS by race, 2008



	Total Cardiovascular Disease	Coronary Heart Disease (with AMI) <sup>b</sup>	Acute Myocardial Infarction	Stroke	Congestive Heart Failure
White	152.0	106.2	26.9	14.0	3.5
Black	252.1	175.3	28.5	27.1	4.6
Other Races <sup>c</sup>	113.9	80.0	14.1	14.5	2.4

<sup>a</sup> Premature mortality is defined as death in ages 35 to 74 years. Mortality rates are per 100,000 residents and are age-adjusted using the 2000 US standard population.

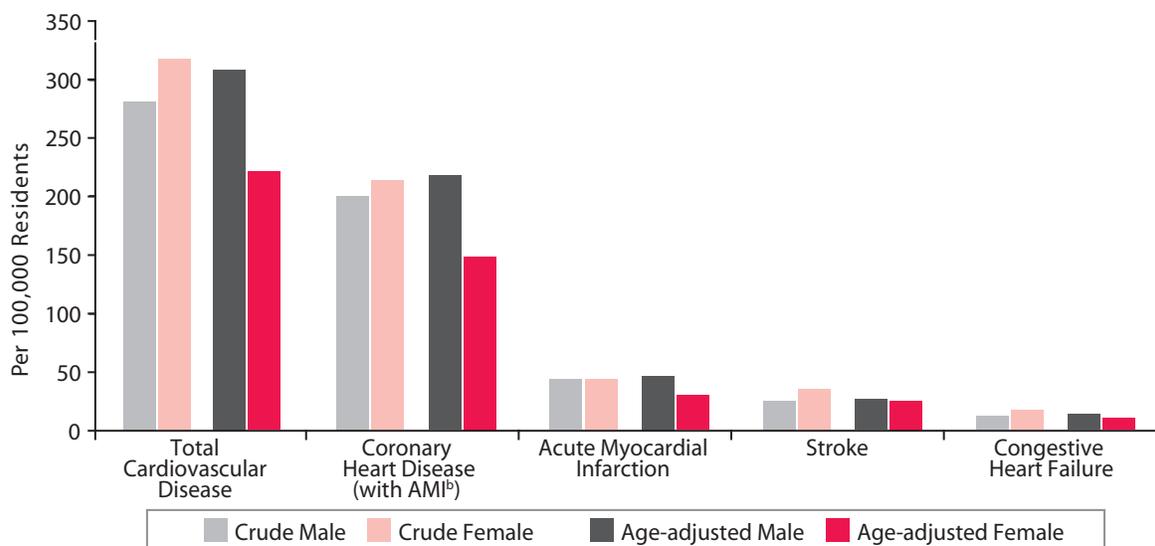
<sup>b</sup> AMI = Acute Myocardial Infarction

<sup>c</sup> Cases missing race data are not included in the Other Races category

**In 2008, black adults had higher premature mortality rates than white adults for all reported categories of cardiovascular disease.**

**The largest discrepancies in premature mortality between black and white adults occurred with coronary heart disease (175.3 compared to 106.2 per 100,000) and stroke (27.1 compared to 14.0 per 100,000).**

**Figure 12** Crude and age-adjusted<sup>a</sup> rates for cardiovascular disease mortality in NYS by gender, 2008



Mortality Rates <sup>a</sup>	Total Cardiovascular Disease		Coronary Heart Disease (including AMI <sup>b</sup> )		Acute Myocardial Infarction		Stroke		Congestive Heart Failure	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Crude Rate	282.7	317.9	200.4	213.4	42.3	42.7	24.7	35.3	11.6	16.2
Age-adjusted Rate <sup>c</sup>	310.5	222.6	219.7	148.7	45.9	30.2	27.3	25.2	13.4	10.7

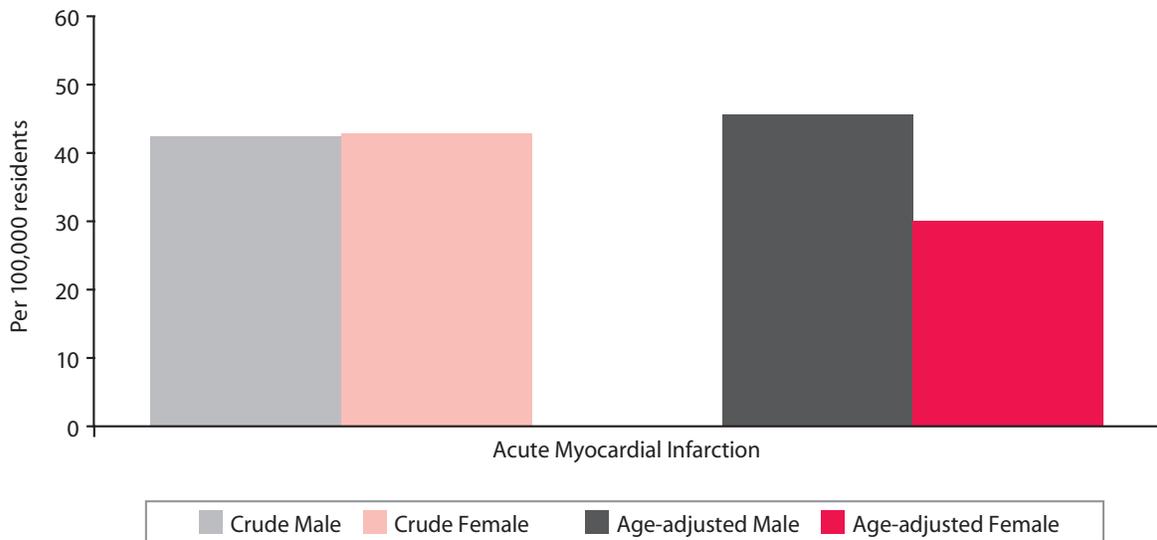
<sup>a</sup> Mortality rates are per 100,000 NYS residents  
<sup>b</sup> AMI = Acute Myocardial Infarction  
<sup>c</sup> Age-adjusted rates use the 2000 US standard population

**In 2008, the crude mortality rate was higher among women than men for total cardiovascular disease (317.9 compared to 282.7 per 100,000), coronary heart disease including acute myocardial infarction (213.4 compared to 200.4 per 100,000), stroke (35.3 compared to 24.7 per 100,000) and congestive heart failure (16.2 compared to 11.6 per 100,000), and was almost the same among women and men for acute myocardial infarction (42.7 versus to 42.3 per 100,000).**

**In 2008, the age-adjusted mortality rate was higher among men than women for total cardiovascular disease (310.5 compared to 222.6 per 100,000), coronary heart disease including acute myocardial infarction (219.7 compared to 148.7 per 100,000), acute myocardial infarction (45.9 compared to 30.2), stroke (27.3 compared to 25.2 per 100,000) and congestive heart failure (13.4 compared to 10.7 per 100,000).**

**The differences in crude and age-adjusted mortality rates between males and females reflect the fact that whereas more women than men died of cardiovascular disease in 2008, on average men died from cardiovascular disease at a younger age (76 years old) than did women (83 years old).**

**Figure 13** Crude and age-adjusted mortality rates for acute myocardial infarction in NYS by gender, 2008



Gender	Crude Mortality Rate	Age-adjusted Mortality Rate
Male	42.3	45.9
Female	42.7	30.2

In 2008, although the NYS crude mortality rate of acute myocardial infarction was nearly equivalent among men (42.3 per 100,000) and women (42.7 per 100,000), because men tend to die from acute myocardial infarction at a younger age, the NYS age-adjusted mortality rate was higher among men (45.9 per 100,000) than among women (30.2 per 100,000).

**Table 1** Leading causes of death in NYS, by gender and race, 2008

Rank	Cause of Death	Deaths	Percent
<b>Male:</b>			
1	Total Cardiovascular Disease	26,752	38.0
2	Cancer	17,490	24.9
3	Accidents	3,255	4.6
4	Chronic Lower Respiratory Disease	2,930	4.2
5	Pneumonia	2,087	3.0
<b>Female:</b>			
1	Total Cardiovascular Disease	31,877	41.3
2	Cancer	17,611	22.8
3	Chronic Lower Respiratory Disease	3,911	5.1
4	Pneumonia	2,461	3.2
5	Diabetes	1,821	2.4
<b>White:</b>			
1	Total Cardiovascular Disease	48,436	39.9
2	Cancer	29,005	23.9
3	Chronic Lower Respiratory Disease	6,131	5.1
4	Accidents	4,132	3.4
5	Pneumonia	3,653	3.0
<b>#MBDL</b>			
1	Total Cardiovascular Disease	7,942	39.4
2	Cancer	4,634	23.0
3	Diabetes	875	4.3
4	AIDS	672	3.3
5	Pneumonia	649	3.2
<b>Other Races:</b>			
1	Total Cardiovascular Disease	1,930	37.6
2	Cancer	1,305	25.4
3	Accidents	245	4.8
4	Pneumonia	208	4.0
5	Diabetes	166	3.2

**Total cardiovascular disease (CVD) was the leading cause of death for both men and women in 2008, accounting for 38.0% of deaths among men and 41.3% of deaths among women.**

**Total CVD was the leading cause of death for both white and black residents of NYS in 2008.**

**Table 2** Percentage of total deaths accounted for by the ten leading causes of death<sup>a</sup> in NYS for major age categories, 2008

Rank	Ages 1-24		Ages 25-34		Ages 35-44		Ages 45-54	
	Cause	%	Cause	%	Cause	%	Cause	%
1	Accidents	31	Accidents	27	Total CVD <sup>b</sup>	20	Cancer	31
2	Homicide	16	Homicide	13	Cancer	20	Total CVD <sup>b</sup>	25
3	Cancer	10	Cancer	11	Accidents	16	Accidents	9
4	Suicide	8	Suicide	10	AIDS	7	AIDS	5
5	Total CVD <sup>b</sup>	6	Total CVD <sup>b</sup>	10	Suicide	7	Suicide	3
6	Congenital Anomalies	5	AIDS	5	Homicide	4	Cirrhosis of Liver	3
7	CLRD <sup>c</sup>	2	Diabetes	2	Cirrhosis of Liver	3	Diabetes	3
8	AIDS	1	Congenital Anomalies	1	Diabetes	2	CLRD <sup>c</sup>	2
9	Pneumonia	1	Cirrhosis of Liver	1	Septicemia	1	Pneumonia	1
10	Diabetes	1	Pneumonia	1	Pneumonia	1	Septicemia	1

Rank	Ages 55-64		Ages 65-74		Ages 75-84		Ages 85+	
	Cause	%	Cause	%	Cause	%	Cause	%
1	Cancer	38	Cancer	36	Total CVD <sup>b</sup>	41	Total CVD <sup>b</sup>	53
2	Total CVD <sup>b</sup>	30	Total CVD <sup>b</sup>	34	Cancer	26	Cancer	12
3	CLRD <sup>c</sup>	4	CLRD <sup>c</sup>	6	CLRD <sup>c</sup>	6	Pneumonia	5
4	Accidents	3	Diabetes	3	Pneumonia	3	CLRD <sup>c</sup>	4
5	Diabetes	3	Pneumonia	2	Diabetes	3	Alzheimers	3
6	Cirrhosis of Liver	2	Accidents	2	Nephritis	2	Nephritis	2
7	Pneumonia	2	Septicemia	2	Septicemia	2	Diabetes	2
8	AIDS	2	Nephritis	2	Alzheimers	2	Septicemia	2
9	Septicemia	1	Cirrhosis of Liver	1	Accidents	2	Accidents	2
10	Suicide	1	Suicide	1	Parkinsons	1	Parkinsons	1

<sup>a</sup> Percentage for each age group = (number of deaths from the disease cause / number of deaths in that age group) \* 100

<sup>b</sup> Total CVD = Total Cardiovascular Disease

<sup>c</sup> CLRD = Chronic Lower Respiratory Disease

**The leading cause of death among those aged 35 to 44 years was total cardiovascular disease (CVD), accounting for 20% of all deaths in this age group in 2008.**

**Total CVD is the second leading cause of death, following cancer, among adults between 45 and 74 years of age and accounted for 34% of all deaths among adults between 65 and 74 years of age in 2008.**

**Total CVD accounted for 53% of all deaths among adults 85 years of age and older in 2008.**

**Table 3** Trends in total cardiovascular disease mortality in NYS and the US, 1980 – 1998, 1999 – 2007

<b>Age-adjusted Mortality Rate</b> (per 100,000)		
<b>Year</b>	<b>NYS</b>	<b>US</b>
1980	588.9	543.7
1981	558.8	519.8
1982	550.8	505.0
1983	548.0	501.5
1984	537.5	487.5
1985	521.1	480.6
1986	500.8	466.4
1987	483.1	455.3
1988	480.9	450.4
1989	456.3	425.0
1990	445.3	412.5
1991	438.0	400.0
1992	431.6	389.6
1993	442.1	395.3
1994	418.2	384.3
1995	414.2	380.5
1996	406.0	372.1
1997	390.7	362.4
1998	375.0	353.8
1999	367.4	350.8
2000	354.0	341.4
2001	341.6	328.2
2002	335.0	319.0
2003	321.2	307.7
2004	300.7	288.0
2005	291.7	278.9
2006	277.1	262.5
2007	267.5	251.2

ICD9 codes of 390 – 459 define underlying cause of death for 1980 to 1998

ICD10 codes of I00 – I99 define underlying cause of death for 1999 to 2007

**Table 4** Trends in coronary heart disease mortality (including acute myocardial infarction) in NYS and the US, 1980 – 1998, 1999 – 2007

Age-adjusted Mortality Rate (per 100,000)		
Year	NYS	US
1980	440.8	359.3
1981	419.8	343.1
1982	415.5	333.4
1983	412.5	329.0
1984	400.7	316.6
1985	384.0	308.5
1986	361.3	295.4
1987	343.1	285.7
1988	338.7	280.3
1989	321.2	269.2
1990	316.9	261.1
1991	317.8	252.0
1992	317.1	244.0
1993	325.8	245.0
1994	306.5	236.6
1995	302.7	232.1
1996	294.2	224.7
1997	279.5	216.1
1998	264.5	209.8
1999	257.3	202.9
2000	246.7	195.4
2001	238.8	186.5
2002	236.1	180.0
2003	226.0	172.4
2004	209.5	159.6
2005	204.2	153.9
2006	193.3	144.3
2007	183.5	135.5

ICD9 codes of 402, 410-414, 429 define underlying cause of death for 1980 to 1998

ICD10 codes of I20 – I25, I11 define underlying cause of death for 1999 to 2007

**Table 5** Trends in acute myocardial infarction mortality in NYS and the US, 1980 – 1998, 1999 – 2007

Age-adjusted Mortality Rate (per 100,000)		
Year	NYS	US
1980	174.8	155.6
1981	166.4	148.4
1982	164.9	144.7
1983	161.7	139.9
1984	154.3	134.2
1985	148.8	129.8
1986	140.1	121.5
1987	129.9	116.1
1988	128.0	111.9
1989	121.5	109.9
1990	112.5	105.2
1991	107.6	100.8
1992	101.3	96.2
1993	98.8	93.5
1994	91.4	89.7
1995	85.6	86.3
1996	82.6	82.8
1997	75.7	78.5
1998	71.2	76.0
1999	68.9	73.2
2000	66.2	69.9
2001	63.7	65.4
2002	61.0	62.1
2003	57.0	57.9
2004	50.0	52.3
2005	46.7	49.1
2006	43.4	45.0
2007	39.4	41.4

ICD9 code of 410 defines underlying cause of death for 1980 to 1998

ICD10 codes of I21 – I22 define underlying cause of death for 1999 to 2007

**Table 6** Trends in stroke mortality in NYS and the US, 1980 – 1998, 1999 – 2007

Age-adjusted Mortality Rate (per 100,000)		
Year	NYS	US
1980	80.2	96.4
1981	73.0	89.7
1982	69.1	84.4
1983	65.7	81.4
1984	64.6	78.9
1985	63.6	76.6
1986	61.0	73.3
1987	58.9	71.8
1988	57.7	70.8
1989	54.1	67.1
1990	51.6	65.5
1991	49.6	63.1
1992	47.6	61.6
1993	47.8	62.9
1994	46.0	62.8
1995	44.8	63.3
1996	45.0	62.6
1997	43.1	61.2
1998	41.2	59.4
1999	42.2	61.6
2000	40.9	60.9
2001	38.6	57.9
2002	37.6	56.2
2003	35.2	53.5
2004	33.1	50.0
2005	31.0	46.6
2006	29.6	43.6
2007	27.9	42.2

ICD9 codes of 430 – 438 define underlying cause of death for 1980 to 1998

ICD10 codes of I60 – I69 define underlying cause of death for 1999 to 2007

**Table 7** Trends in congestive heart failure mortality in NYS and the US, 1980 – 1998, 1999 – 2007

Age-adjusted Mortality Rate (per 100,000)		
Year	NYS	US
1980	10.1	15.6
1981	9.8	16.0
1982	10.3	16.6
1983	11.1	17.6
1984	12.3	18.3
1985	12.5	19.1
1986	14.8	20.0
1987	15.6	20.1
1988	16.1	20.6
1989	17.1	18.2
1990	15.5	17.6
1991	12.3	17.5
1992	11.9	17.4
1993	12.6	19.3
1994	12.0	18.7
1995	12.6	18.8
1996	12.7	18.6
1997	13.2	18.9
1998	14.1	18.9
1999	15.3	20.3
2000	15.8	20.3
2001	14.7	20.2
2002	13.9	19.4
2003	13.2	19.4
2004	13.5	18.9
2005	12.9	18.9
2006	12.5	18.9
2007	11.8	17.3

ICD9 code of 428 defines underlying cause of death for 1980 to 1998

ICD10 code of I50 defines underlying cause of death for 1999 to 2007

**Table 8** Counts and rates of total cardiovascular disease, coronary heart disease (including acute myocardial infarction), acute myocardial infarction, stroke and congestive heart failure mortality in NYS by age category, 2008

Age	Population	Total CVD <sup>a</sup>		CHD <sup>a</sup> (including AMI <sup>a</sup> )		AMI <sup>a</sup>	
		Deaths <sup>b</sup>	Mortality Rate <sup>c</sup>	Deaths <sup>b</sup>	Mortality Rate <sup>c</sup>	Deaths <sup>b</sup>	Mortality Rate <sup>c</sup>
All Ages	19,490,297	58,630	300.8	40,368	207.1	8,289	42.5
0 to 24	6,407,136	138	2.2	15	*	-	
25 to 34	2,560,346	193	7.5	90	3.5	22	0.9
35 to 44	2,794,889	814	29.1	468	16.7	101	3.6
45 to 54	2,911,367	2,492	85.6	1,687	57.9	371	12.7
55 to 64	2,208,887	5,009	226.8	3,591	162.6	859	38.9
65 to 74	1,332,093	7,793	585.0	5,541	416.0	1,246	93.5
75 to 84	877,625	16,280	1,855.0	11,130	1,268.2	2,362	269.1
85+	397,954	25,910	6,510.8	17,845	4,484.2	3,327	836.0

Age	Population	Stroke		CHF <sup>a</sup>	
		Deaths <sup>b</sup>	Mortality Rate <sup>c</sup>	Deaths <sup>b</sup>	Mortality Rate <sup>c</sup>
All Ages	19,490,297	5,883	30.2	2,719	14.0
0 to 24	6,407,136	23	0.4	-	*
25 to 34	2,560,346	23	0.9	-	*
35 to 44	2,794,889	95	3.4	10	*
45 to 54	2,911,367	273	9.4	28	1.0
55 to 64	2,208,887	457	20.7	98	4.4
65 to 74	1,332,093	739	55.5	213	16.0
75 to 84	877,625	1,793	204.3	721	82.2
85+	397,954	2,480	623.2	1,645	413.4

<sup>a</sup> Total CVD = Total Cardiovascular Disease, CHD = Coronary Heart Disease, AMI = Acute Myocardial Infarction, CHF = Congestive Heart Failure

<sup>b</sup> Death count for all ages includes cases with no known age, so the death count for all ages can be higher than the sum of deaths in each disease category

<sup>c</sup> Mortality rates are per 100,000 residents

- Counts of under 6 are suppressed to protect confidentiality

\* Rates based on fewer than 20 deaths are unstable

**In 2008, mortality from total cardiovascular disease (CVD), as well as all reported categories of CVD, were more frequent among older NYS residents.**

**Table 9** Counts and rates of total cardiovascular disease, coronary heart disease (including acute myocardial infarction), stroke and congestive heart failure mortality in NYS by gender and race, 2008

Population Segment	Death Count	Crude Rate (per 100,000)	Age-adjusted Rate (per 100,000)	Premature Rate <sup>a</sup> (per 100,000)
<b>Total Cardiovascular Disease</b>				
NYS	58,630	300.8	260.6	165.7
Male	26,752	282.7	310.5	225.3
Female	31,877	317.9	222.6	113.7
White	48,436	335.4	257.2	152.0
Black	7,942	228.4	288.1	252.1
Other Races <sup>b</sup>	1,930	122.9	179.4	113.9
<b>Coronary Heart Disease (including acute myocardial infarction)</b>				
NYS	40,368	207.1	179.2	115.8
Male	18,966	200.4	219.7	162.4
Female	21,401	213.4	148.7	75.0
White	32,999	228.5	174.9	106.2
Black	5,716	164.4	209.4	175.3
Other Races <sup>b</sup>	1,391	88.6	130.4	80.0
<b>Acute Myocardial Infarction</b>				
NYS	8,289	42.5	37.0	26.3
Male	4,001	42.3	45.9	37.1
Female	4,287	42.7	30.2	16.9
White	7,093	49.1	38.1	26.9
Black	931	26.8	34.3	28.5
Other Races <sup>b</sup>	222	14.1	20.5	14.1
<b>Stroke</b>				
NYS	5,883	30.2	26.4	16.2
Male	2,340	24.7	27.3	18.7
Female	3,543	35.3	25.2	13.9
White	4,859	33.6	26.0	14.0
Black	786	22.6	28.0	27.1
Other Races <sup>b</sup>	212	13.5	19.1	14.5
<b>Congestive Heart Failure</b>				
NYS	2,719	14.0	11.7	3.6
Male	1,098	11.6	13.4	4.5
Female	1,621	16.2	10.7	2.8
White	2,472	17.1	12.6	3.5
Black	193	5.6	7.2	4.6
Other Races <sup>b</sup>	46	2.9	4.5	2.4

<sup>a</sup> Premature mortality is defined as death in ages 35 to 74 years

<sup>b</sup> Cases missing race data are not included in the Other Races category

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