September 2017

Connecticut Cardiovascular Disease Statistics Report

Estimates of the burden of cardiovascular diseases and their risk factors in Connecticut

Connecticut Department of Public Health
Community, Family Health, & Prevention Section
410 Capitol Avenue
Hartford, CT 06134-0308
Phone: (860) 509-8251
www.ct.gov/dph/HeartStrokeData

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Suggested citation: Poulin, S. M. (2017). *Connecticut Cardiovascular Disease Statistics Report*. Hartford, CT: Connecticut Department of Public Health.

This report was completed by the Connecticut Department of Public Health and supported by a cooperative agreement with the Centers for Disease Control and Prevention (State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health, DP13-1305).

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Acknowledgements

Connecticut Department of Public Health

Raul Pino, MD, MPH
Commissioner

Janet Brancifort, MPH
Deputy Commissioner

Rosa Biaggi, MPH, MPA
Section Chief - Community, Family Health and Prevention Section

Mark Keenan, RN, MBA
Section Chief - Community, Family Health and Prevention Section

Mehul Dalal, MD, MSc, MHS
Chronic Disease Director

Justin Peng, MPH
Epidemiologist

Stephanie M. Poulin, MPH
Epidemiologist

The author is grateful for the data, technical assistance, and/or critical review of the text provided by Luis Arroyo, Karyn Backus, Monica Jensen, Celeste Jorge, Jon Olson, Dawn Sorosiak, and Xi Zheng. These individuals are Connecticut Department of Public Health staff.

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Cardiovascular Disease Burden in Connecticut at a Glance

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- Heart disease and stroke are the first and fifth leading causes of death in Connecticut.[1]
- Cardiovascular diseases (CVD), including stroke, and coronary heart disease (CHD), age-adjusted mortality rates (AAMRs) and years of potential life lost (YPLL) decreased from 1999 to 2014.[1]
- Heart disease was the first-listed diagnosis for over 35,000 inpatient hospital discharges and associated with nearly $2 billion in hospital charges in 2014.[2]
- Many Connecticut adults have modifiable risk factors for CVD – 37.4% of adults have diagnosed high cholesterol, 30.4% have diagnosed high blood pressure, 25.3% are obese, 23.5% do not participate in leisure time physical activity, 13.5% are current cigarette smokers, and 9.3% have diabetes.[3]
- Many Connecticut youth have risk factors for CVD – 12.3% of high school students are obese and 14.3% did not participate in at least sixty (60) minutes of physical activity on at least one (1) day during the last week.[4]
- The CVD burden in Connecticut varies by race and ethnicity, age, gender, and socioeconomic status.
    - Black or African American residents have significantly higher CVD AAMR and YPLL compared with White, Asian, and Hispanic or Latino residents.
    - Black or African American residents have significantly higher CVD, stroke, and heart failure age-adjusted hospitalization rates (AAHRS) compared with White and Hispanic or Latino residents.
    - Black or African American and Hispanic or Latino residents are more likely to have diagnosed high blood pressure and diabetes and to be obese and inactive compared with White adults.[1,2,3]
    - Eighty-five (85%) of heart disease and 89% of stroke deaths are among adults 65 years and older. Additionally, the prevalence of many CVD risk factors increase with age.
    - CVD AAMRs and AAHRs and the prevalence of many risk factors are higher among males compared with females.
    - Adults with lower levels of educational attainment and lower annual household incomes are more likely to have diagnosed high blood pressure, high cholesterol, and diabetes, to not have had their cholesterol tested, to be obese and inactive, and not have healthcare coverage compared to adults with higher levels of educational attainment and annual household incomes.[3]
- The burden of CVD can be lessened through widespread access to appropriate and timely primary care services and to wellness resources that can prevent the onset of CVD and its risk factors.

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[1] Connecticut Death Registry
[2] 2014 Hospital Inpatient Discharge Data
[3] 2015 Behavioral Risk Factor Surveillance System Data
[4] 2015 Connecticut School Health Survey

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410 Capitol Avenue, Hartford, CT 06134
www.ct.gov/dph/heartstrokedata

Introduction

Cardiovascular disease (CVD) refers to a wide variety of heart and blood vessel diseases. The most common forms of cardiovascular disease are coronary heart disease (CHD) and cerebrovascular disease (stroke). CVD are of great public health concern because they are leading causes of deaths and hospitalizations and because prevention efforts have shown great potential in reducing the deaths, hospitalizations, and disability associated with CVD (1).

This report presents Connecticut-specific data describing the burden of CVD and CVD risk factors in the state with a focus on select social determinants of health. This report also provides brief descriptions of some evidence-based practices that promote wellness and potentially address the social determinants of health that the Connecticut Department of Public Health (DPH) is currently implementing.

Mortality

Leading Causes of Death

Heart disease and stroke are leading causes of death in the nation and in the state. In 2014, heart disease and stroke were the first and fifth leading causes of death in Connecticut, accounting for 27.6% of deaths. The number of deaths from heart disease and stroke increase with age. The majority of these deaths are among adults 65 years and older – 85% of heart disease deaths and 89% of stroke deaths. (Table 1)

Table 1. Ten Leading Causes of Death among Connecticut Residents by Age, 2014. Data source: DPH Vital Statistics Mortality Files, 2014 data.

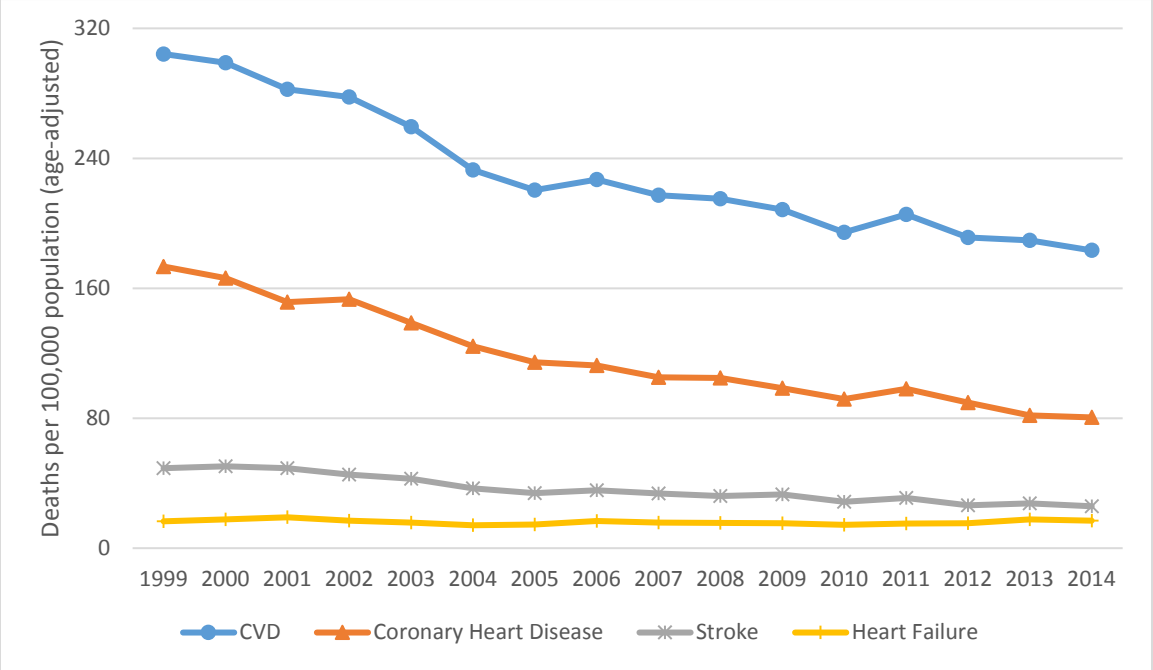
Rank	All Ages (N = 29,866)	<65 years (N = 6,341)	65-84 years (N = 11,296)	85+ years (N = 12,227)
1	**Diseases of heart (7,019)**	Cancer (1,750)	Cancer (3,415)	**Diseases of the heart (3,586)**
2	Malignant neoplasms (6,643)	**Diseases of the heart (1,037)**	**Diseases of the heart (2,394)**	Cancer (1,478)
3	Unintentional injuries (1,634)	Unintentional injuries (939)	Chronic lower respiratory diseases (718)	**Stroke (680)**
4	Chronic lower respiratory diseases (1,374)	Suicide (298)	**Stroke (443)**	Alzheimer's disease (663)
5	**Stroke (1,256)**	Chronic liver disease & cirrhosis (242)	Diabetes (311)	Chronic lower respiratory diseases (522)
6	Alzheimer's disease (925)	Diabetes (164)	Unintentional injuries (301)	Unintentional injuries (394)
7	Diabetes (687)	Chronic lower respiratory diseases (134)	Nephritis, nephrotic syndrome, nephrosis (262)	Influenza and pneumonia (364)
8	Influenza and pneumonia (640)	**Stroke (133)**	Alzheimer's disease (259)	Nephritis, nephrotic syndrome, nephrosis (284)
9	Nephritis, nephrotic syndrome, nephrosis (607)	Homicide (93)	Septicemia (257)	Septicemia (243)
10	Septicemia (579)	Septicemia (79)	Influenza and pneumonia (210)	Pneumonitis due to solids and liquids (217)

Age-adjusted Mortality Rates (AAMRs)

AAMRs: All residents

Figure 1 displays the CVD, CHD, and stroke age-adjusted mortality rates (AAMRs) for Connecticut residents from 1999 to 2014. Stroke AAMRs decreased throughout the entire time period, decreasing 47.7% from 1999 to 2014. Both CVD and CHD AAMRs also declined throughout the time period; however, the annual percentage change of both the CVD and CHD AAMRs decelerated after 2005. While heart failure AAMRs decreased from 1999 to 2010, heart failure AAMRs increased from 2010 to 2014. This increase did not reach statistical significance.

Figure 1. Age-Adjusted CVD Mortality Rates, Connecticut, 1989-2014. Data source: DPH Vital Statistics Mortality Files, 1999-2014 data.



Note about race and ethnicity

Throughout this report, all racial groupings (e.g., Black or African American, White, Asian) exclude persons of Hispanic ethnicity. A Hispanic or Latino ethnicity category is included in figures and tables reflecting data separate from race categories. Therefore, the modifier "Non-Hispanic or Latino" is assumed.

AAMRs: Race and ethnicity

CVD, CHD, stroke, and heart failure AAMRs vary by race and ethnicity. Figure 2 displays the CVD, CHD, stroke, and heart failure AAMRs of Connecticut residents by race and ethnicity with 95% confidence intervals.

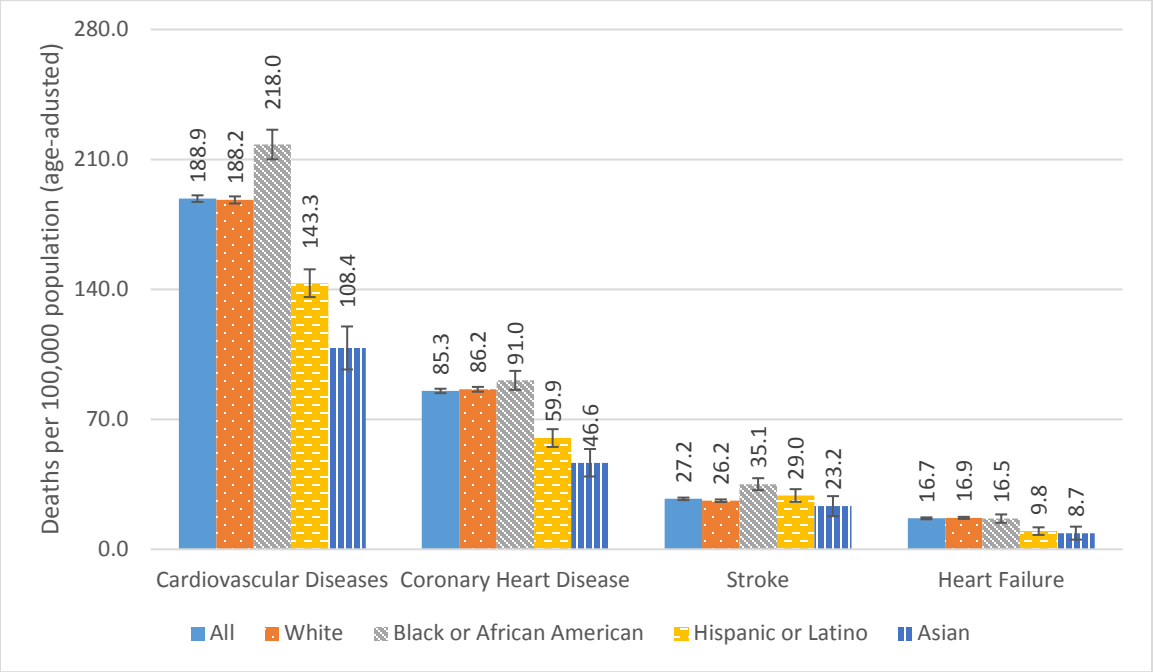
Asian residents have a significantly lower CVD AAMR compared with White, Black or African American, and Hispanic or Latino residents. Black or African American residents have a significantly higher CVD AAMR compared with White, Hispanic or Latino, or Asian residents. The CVD AAMR of Hispanic or Latino residents is significantly lower than the CVD AAMRs of White and Black or African American residents.

The CHD AAMR of Asian residents is significantly lower than the CHD AAMRs of White, Black or African American, and Hispanic or Latino residents. While the CHD AAMRs of White and Black or African American residents did not vary significantly, both had CHD AAMRs that were significantly higher than Hispanic or Latino residents.

Black or African American residents have significantly higher stroke AAMRs than White and Asian residents. The difference in stroke AAMRs among Black or African American and Hispanic or Latino residents did not reach statistical significance. Also, the differences in the stroke AAMRs among White, Hispanic or Latino, and Asian residents did not reach statistical significance.

Both White and Black or African American residents have significantly higher heart failure AAMRs than Hispanic or Latino and Asian residents. The differences in heart failure AAMRs among White and Black or African American residents did not reach statistical significance. Furthermore, the differences in heart failure AAMRs among Hispanic or Latino and Asian residents did not reach statistical significance.

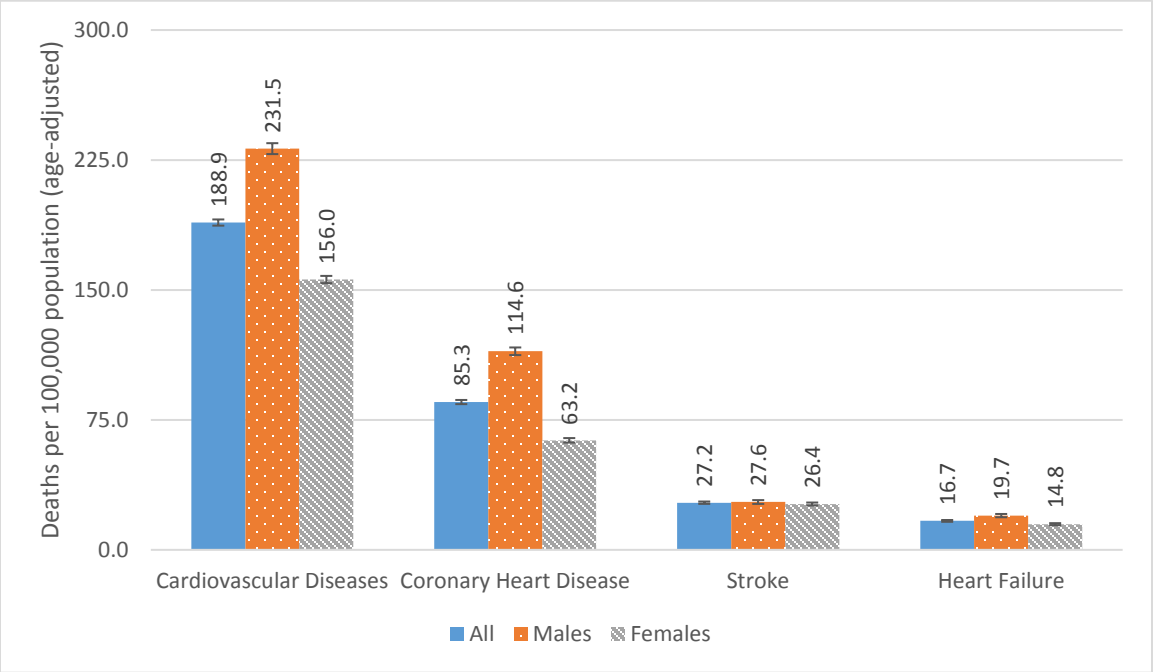
Figure 2. CVD, CHD, Stroke, and Heart Failure Age-adjusted Mortality Rates by Race and Ethnicity, Connecticut. Data source: DPH Vital Statistics Mortality Files, 2011-2015 data.



AAMRs: Gender

CVD, CHD, and CVD AAMRs vary by gender. Male residents have significantly higher CVD, CHD, and heart failure AAMRs compared with females. The stroke AAMRs for males and females do not vary significantly. However, it is important to note that 61% of the stroke deaths from 2011-2015 were among women. This is because stroke risk increases with age, and women tend to live longer than men (2). (Figure 3)

Figure 3. CVD, CHD, Stroke, and Heart Failure Age-adjusted Mortality Rates by Gender, Connecticut. Data source: DPH Vital Statistics Mortality Files, 2011-2015 data.



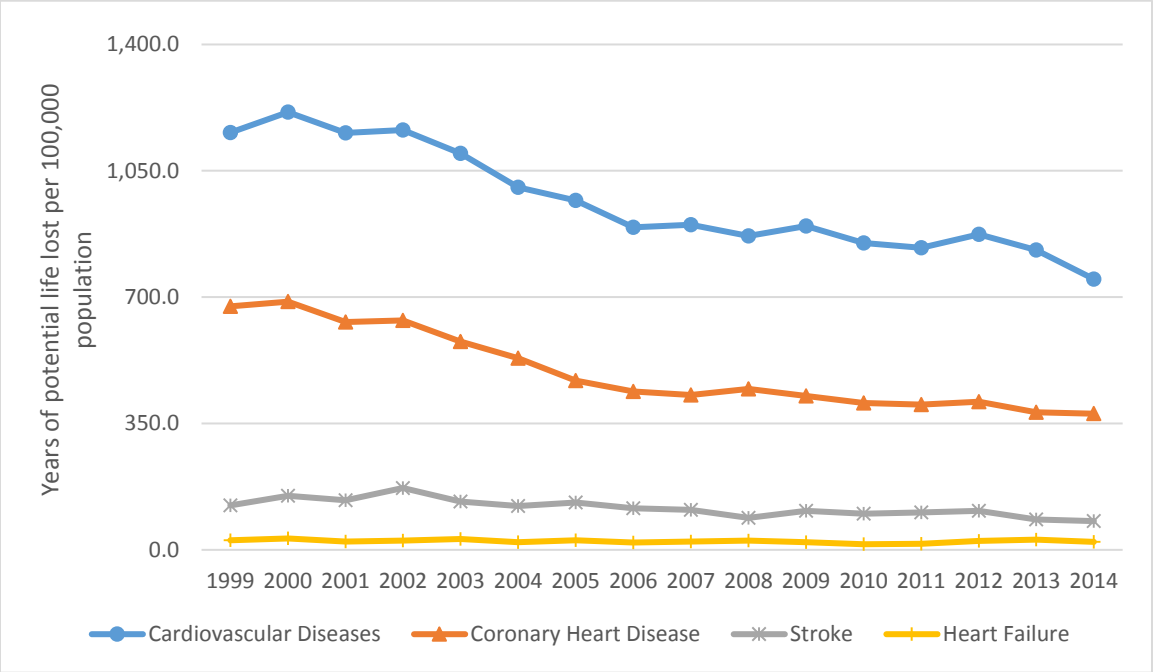
Premature Mortality

CVDs are also associated with premature death. One measure of premature death is the years of potential life lost (YPLL). YPLL represent the number of years of potential life lost by each death before a predetermined end point (e.g., 75 years of age). The YPLL statistic is derived by summing age-specific years of life lost figures over all age groups up to 75 years. YPLL is presented for persons less than 75 years of age because the average life expectancy in the United States is over 75 years.

YPLL: All residents

Figure 4 displays age-adjusted YPLL from 1999 to 2014. Both CVD and CHD age-adjusted YPLL decreased significantly throughout the time period with the annual percent change decelerating from 2006-2014. The age-adjusted YPLL for stroke decreased significantly throughout the entire time period. The annual percent change of the heart failure age-adjusted YPLL was not significant.

Figure 4. CVD, CHD, Stroke, and Heart Failure Age-adjusted Years of Potential Life Lost (YPLL), Connecticut. Data source: DPH Vital Statistics Mortality Files, 2009-2014 data.



YPLL: Race and ethnicity

Age-adjusted YPLL for CVD, CHD, stroke, and heart failure vary by race and ethnicity. Figure 5 displays the CVD, CHD, stroke, and heart failure age-adjusted YPLL of Connecticut residents by race and ethnicity with 95% confidence intervals.

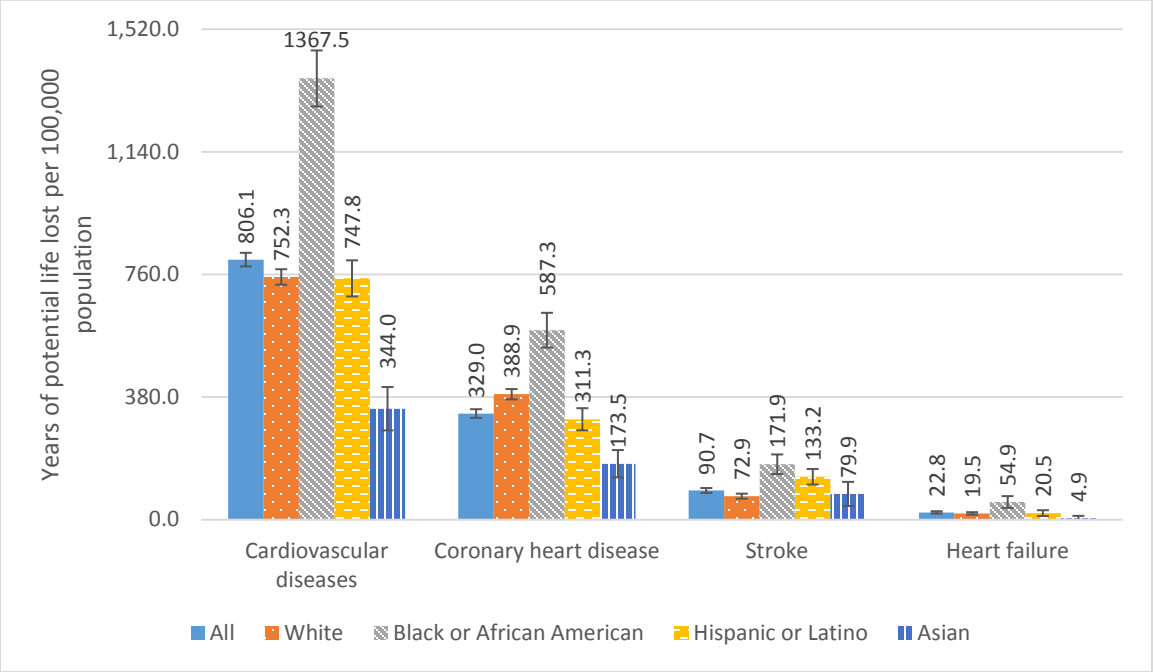
Asian residents have the lowest age-adjusted YPLL for CVD while Black or African American residents have the highest. The difference in CVD YPLL among White and Hispanic or Latino residents did not meet statistical significance.

CHD age-adjusted YPLL are lowest among Asian residents and highest among Black or African American residents. Additionally, Hispanic or Latino residents have a CHD age-adjusted YPLL that is lower than White and Black or African American residents. Furthermore, White residents have a CHD age-adjusted YPLL that is lower than the CHD age-adjusted YPLL among Black or African American residents.

The age-adjusted stroke YPLL among Black or African American residents is significantly higher than Asian and White residents. Hispanic or Latino residents have higher age-adjusted stroke YPLL compared with White residents. The difference in age-adjusted stroke YPLL of Asian and White residents did not reach statistical significance. Similarly, neither the difference in the age-adjusted stroke YPLL of Asian and Hispanic or Latino residents nor the difference in the age-adjusted stroke YPLL of Black or African American and Hispanic or Latino residents reached statistical significance.

Black or African American residents have significantly higher heart failure age-adjusted YPLL compared with White, Hispanic or Latino, and Asian residents. In addition, White residents have higher heart failure age-adjusted YPLL compared with Asian residents. Neither the difference in the age-adjusted heart failure YPLL of Asian and Hispanic or Latino residents nor the difference in the age-adjusted stroke YPLL of White and Hispanic or Latino residents reached statistical significance.

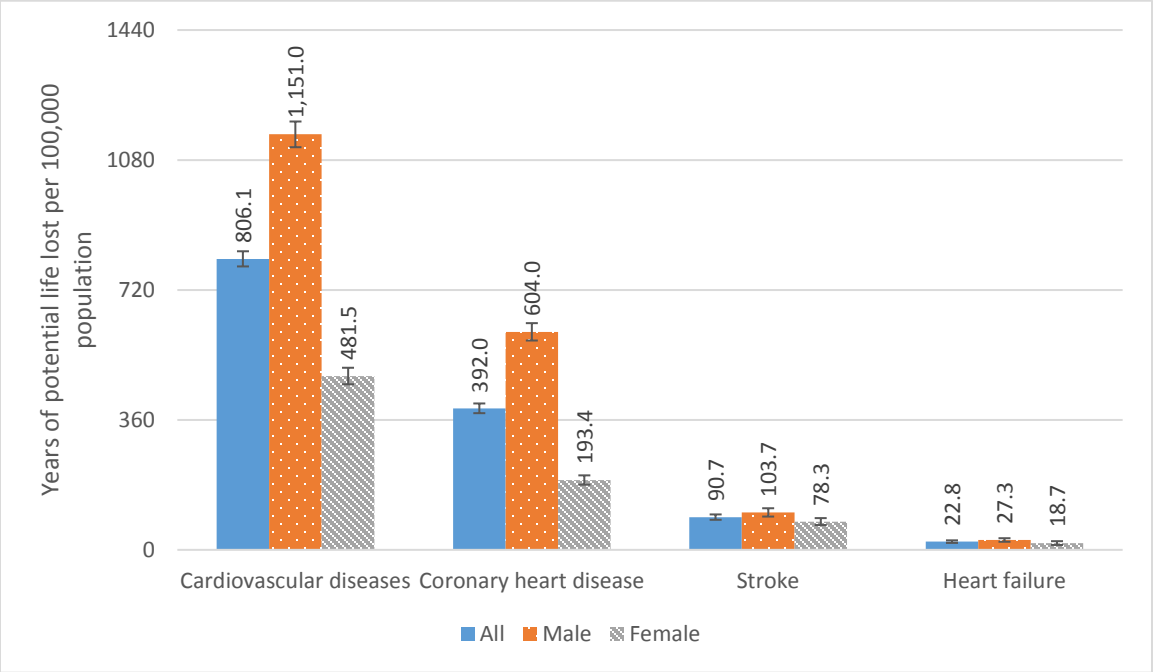
Figure 5. CVD, CHD, Stroke, and Heart Failure Age-adjusted Years of Potential Life Lost by Race and Ethnicity, Connecticut. Data source: DPH Vital Statistics Mortality Files, 2011-2015 data.



YPLL: Gender

CVD, CHD, stroke, and heart failure age-adjusted YPLL are displayed in Figure 6. Male residents have significantly higher CVD, CHD, and stroke age-adjusted YPLL compared with females. The difference in heart failure age-adjusted YPLL among males and females did not reach statistical significance.

Figure 6. CVD, CHD, Stroke, and Heart Failure Age-adjusted Years of Potential Life Lost by Gender, Connecticut. Data source: DPH Vital Statistics Mortality Files, 2011-2015 data.



Mortality: Discussion

The literature suggests that the greater declines in CVD, CHD, and heart failure AAMRs and CVD and CHD YPLL from 1999 to 2005 may be attributed to individual and community level efforts to reduce CVD risk factors, such as public bans on smoking and more aggressive targets for blood pressure and cholesterol control. The slowing in the decline of AAMRs and YPLLs from 2006 to 2014 may be a result of the individual and community level efforts reaching a point of saturation in communities (3).

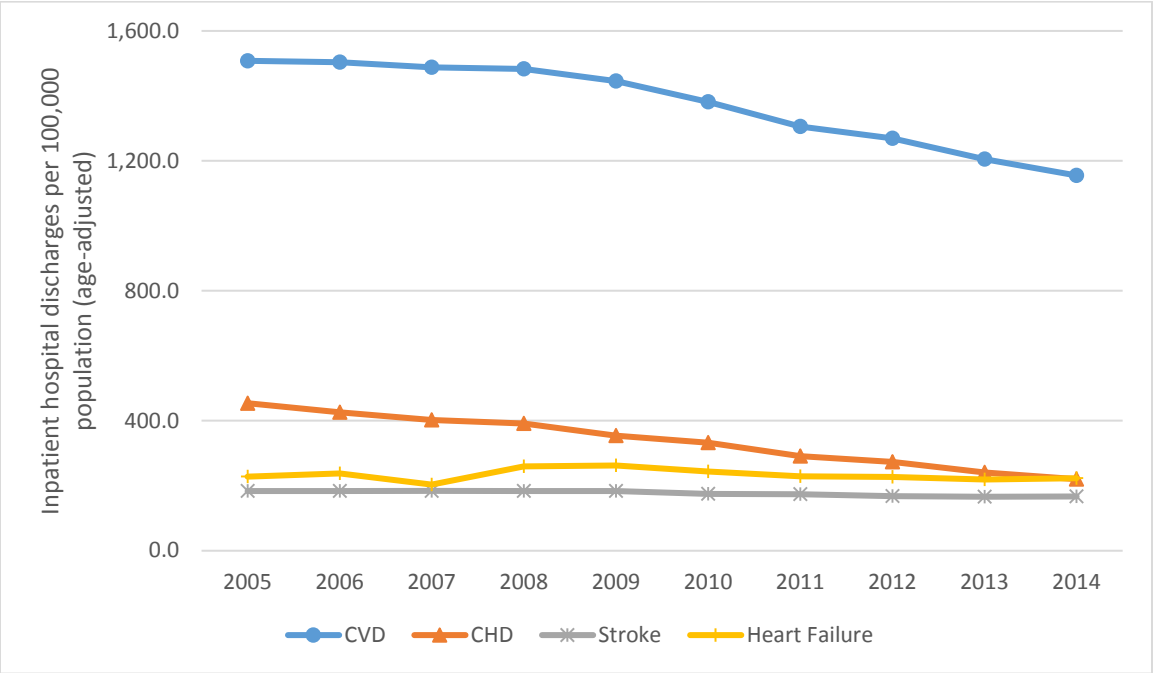
Addressing disparities in CVD mortality is essential in continuing the decline in AAMRs. Improving the access to and quality of health care for at-risk population groups is important to reducing disparities.

Hospitalization

Mortality only represents a part of the CVD burden. In addition to being a leading cause of death, heart disease is also a leading cause of hospitalization. Heart disease was the second leading cause of hospitalization in 2014 in Connecticut. Heart disease was the first-listed diagnosis for 35,105 inpatient hospital discharges and was associated with nearly $2 billion in hospital charges. In addition, stroke was the first-listed diagnosis for 7,558 inpatient hospital discharges and was associated with $394 million in hospital charges. Overall, CVD was the first-listed diagnosis for 51,722 inpatient hospital discharges for CVD with nearly $2.8 billion in hospital charges.

CVD, CHD, and stroke age-adjusted hospitalization rates (AAHR) decreased significantly from 2008-2014. CHD AAHRs also decreased significantly from 2005-2008. The change in heart failure AAHRs from 2005-2014 did not reach statistical significance. (Figure 7)

Figure 7. CVD, CHD, Stroke, and Heart Failure Age-adjusted Inpatient Hospital Discharge Rate, Connecticut. Data source: Hospital Inpatient Discharge Database (HIDD), 2005-2014 data.



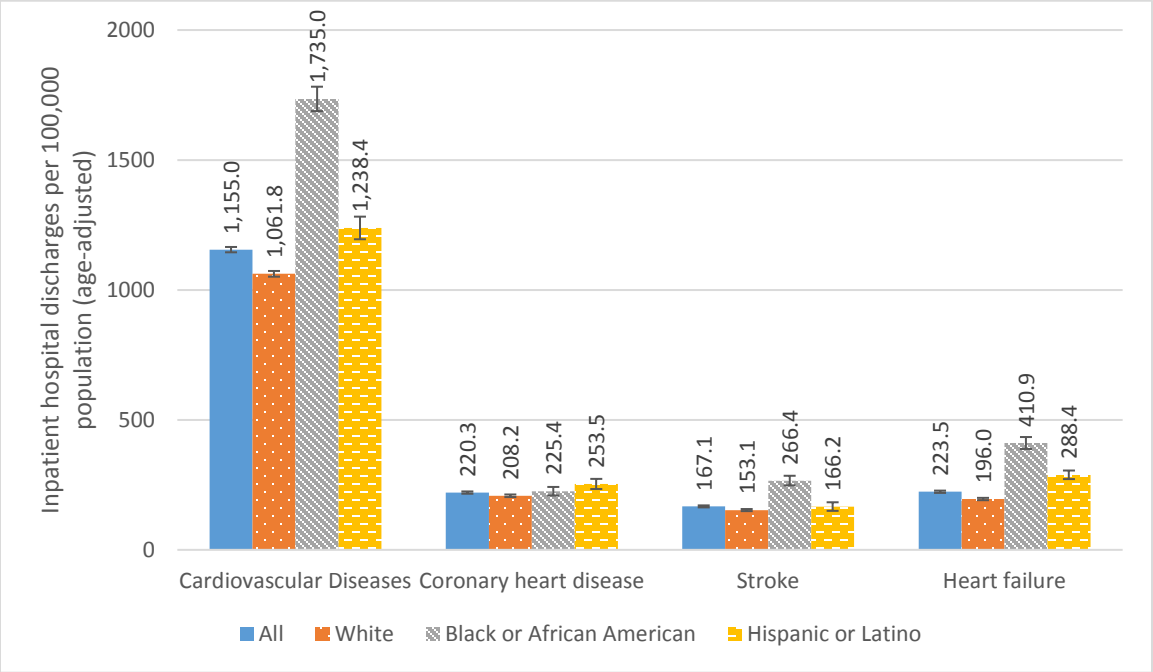
Hospitalization: Race and Ethnicity

CVD, CHD, stroke, and heart failure AAHR vary by race and ethnicity. Figure 8 displays the AAHRs by race and ethnicity and the 95% confidence intervals.

Black or African American residents have significantly higher CVD, stroke, and heart failure AAHRs compared with White and Hispanic or Latino residents. The differences in the CHD AAHRs of Black or African American residents compared with White and Hispanic or Latino residents did not reach statistical significance.

Hispanic or Latino residents have significantly higher CVD, CHD, and heart failure AAHRs compared with White. The differences in the stroke AAHRs among Hispanic or Latino and White residents did not reach statistical significance.

Figure 8. CVD, CHD, Stroke, and Heart Failure Age-adjusted Inpatient Hospital Discharge Rate by Race and Ethnicity, Connecticut. Data source: Hospital Inpatient Discharge Database (HIDD), 2014 data.*

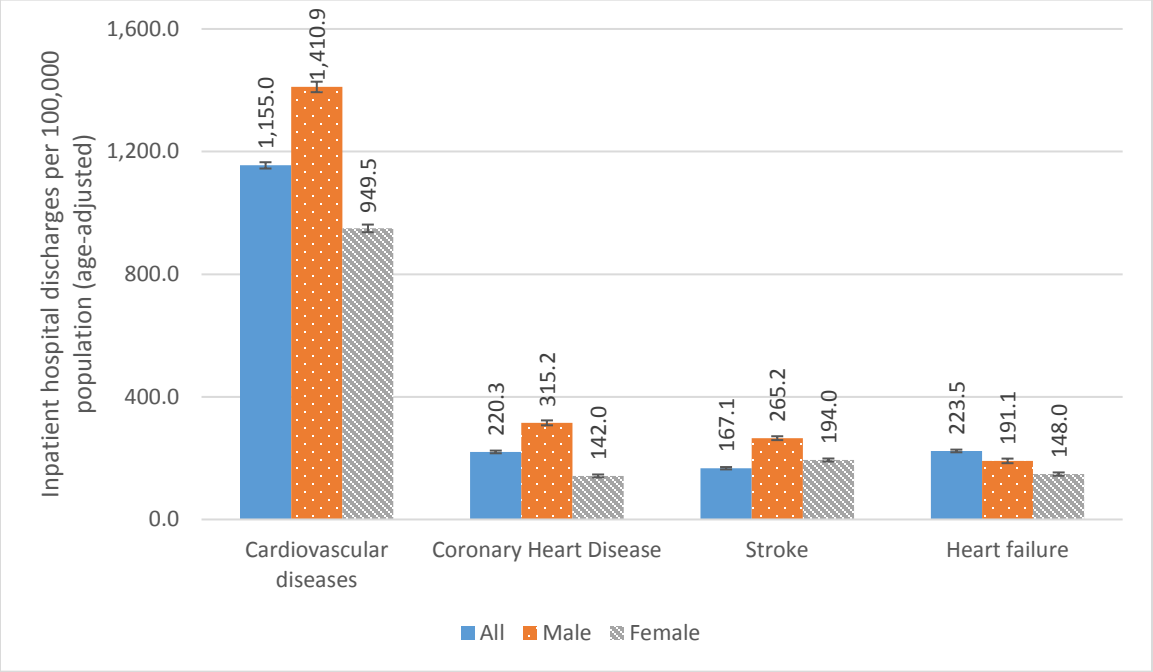


* Figure 8 does not display rates for Asian, Pacific Islander, and American Indian residents because there were too few CVD, CHD, stroke, and heart failure hospitalizations among these residents to calculate reliable rates.

Hospitalization: Gender

Male residents have significantly higher CVD, CHD, stroke, and heart failure AAHRs compared with women. Figure 9 displays CVD, CHD, stroke, and heart failure AAHRs by gender.

Figure 9. CVD, CHD, Stroke, and Heart Failure Age-adjusted Inpatient Hospital Discharge Rate by Gender, Connecticut. Data source: Hospital Inpatient Discharge Database (HIDD), 2014 data.



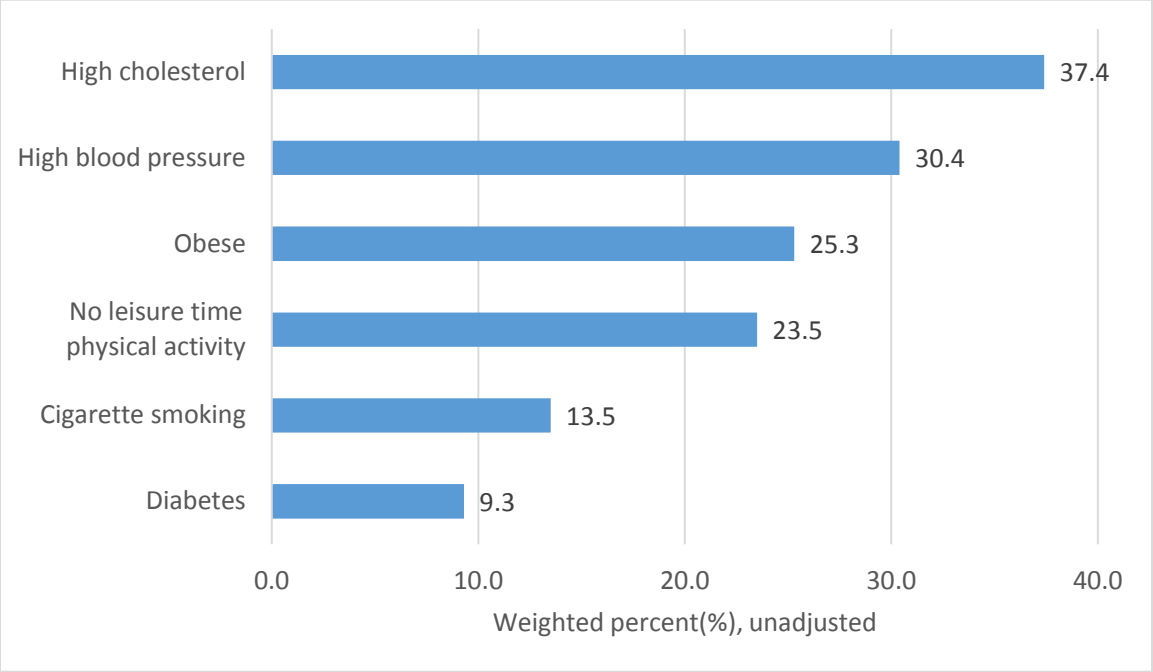
Hospitalization: Discussion

Despite the decline in CVD, CHD, stroke, and heart failure AAHRs from 2005 to 2014 disparities still exist by race and ethnicity and by gender. DPH collaborates with Community Health Centers, Community Health Workers, Pharmacists, YMCAs, senior centers, and other partners to offer culturally and linguistically appropriate services aimed at preventing and controlling CVD and its risk factors and potentially reducing hospitalizations.

Cardiovascular Disease Risk Factors

There are a number of factors that increase the risk of developing CVD. Some population groups are more likely to develop CVD and its risk factors. These high risk populations include the elderly, poor, less educated, racial and ethnic minorities, and people with a family history of CVD or its risk factors. Alternatively, many CVD risk factors are modifiable, meaning they are preventable or controllable. Modifiable risk factors include high blood pressure; high LDL cholesterol or high triglycerides along with low HDL cholesterol; diabetes; obesity; and lack of physical activity. Many Connecticut residents have risk factors for CVD (1). (Figure 10)

*Figure 10. CVD Risk Factors, Connecticut Adults (18+ years), 2015. Data source: Behavioral Risk Factor Surveillance System (BRFSS), 2015 data.**



* This report does not present detailed statistics or other information on tobacco use. For more information on tobacco use, visit www.ct.gov/DPH/Tobacco.

High Blood Pressure

High blood pressure (HBP) is a condition where the pressure in the arteries – blood vessels that carry blood away from the heart – is too high. HBP damages or weakens the arteries increasing the risk of rupture or clog. HBP also forces the heart to pump harder, which ultimately weakens the heart muscle.

An estimated 30.4% of Connecticut adults have ever been told by a healthcare professional that they have HBP. The age-adjusted prevalence of diagnosed HBP varies by sociodemographic factors, such as gender and age. Males are more likely to have HBP compared with females. Also, diagnosed HBP prevalence increases with age. (Table 2)

Age-adjusted diagnosed HBP prevalence also varies by race and ethnicity. The age-adjusted prevalence of diagnosed HBP among Black or African American adults and Hispanic or Latino adults is higher compared with White or Other adults. The difference in the age-adjusted prevalence of diagnosed HBP among Black or African American adults and Hispanic or Latino adults did not reach statistical significance. Similarly, the difference in the age-adjusted prevalence of diagnosed HBP among White and Other adults did not reach statistical significance. (Table 2)

In addition, age-adjusted diagnosed HBP prevalence varies by educational attainment and annual household income. Adults who are college graduates have the lowest age-adjusted prevalence of diagnosed HBP. The differences in the age-adjusted diagnosed HBP prevalence among adults who did not graduate high school, who are high school graduates, and who attended some college did not reach statistical significance. Also, adults with lower annual household incomes have a higher age-adjusted prevalence of diagnosed HBP. For example, 33.7% of adults with an annual household income of less than $25,000 and 22.7% of adults with an annual household income of $75,000 or more have diagnosed HBP. (Table 2)

Table 2. Prevalence of High Blood Pressure among Adults (18+y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	4,665	858,000	30.4 (29.3-31.5)	27.3 (26.3-28.3)
Gender				
Male	2,046	438,000	32.2 (30.5-33.9)	30.1 (28.5-31.6)
Female	2,619	420,000	28.7 (27.2-30.1)	24.6 (23.3-26.0)
Race & Ethnicity§				
White	3,512	615,000	31.4 (30.1-32.6)	25.6 (24.5-26.8)
Black or African American	521	99,000	37.9 (33.2-42.6)	37.5 (33.4-41.6)
Hispanic or Latino	369	95,000	24.8 (21.4-28.3)	30.4 (27.1-33.8)
Other	165	34,000	20.6 (16.1-25.1)	27.1 (22.5-31.8)
Age (in years)				
18-44	322	134,000	11.0 (9.5-12.4)	- -
45-64	1,715	365,000	36.8 (34.9-38.6)	- -
65+	2,564	348,000	60.4 (58.4-62.3)	- -
Educational Attainment				
Less than High School Graduate	419	135,000	42.2 (37.5-47.0)	36.5 (32.1-40.9)
High School Graduate/ G.E.D.	1,341	277,000	35.0 (32.7-37.3)	30.2 (27.9-32.4)
Some College	1,123	223,000	29.0 (26.9-31.1)	28.7 (26.7-30.7)
College Graduate	1,768	222,000	23.7 (22.4-25.0)	21.6 (20.3-22.9)
Annual Household Income				
<$25,000	1,053	188,000	37.0 (34.1-39.9)	33.7 (31.1-36.3)
$25,000-49,999	901	163,000	38.3 (35.2-41.4)	32.3 (29.2-35.4)
$50,000-74,999	538	100,000	30.3 (27.0-33.5)	26.0 (23.5-28.5)
≥$75,000	1,259	239,000	23.7 (22.1-25.3)	22.7 (21.2-24.2)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents.

High Cholesterol

Cholesterol is a waxy, fat-like substance that the human body needs to function normally. However, when there is an excess of cholesterol in the blood, it builds up on artery walls and is called plaque. This build-up of plaque narrows and hardens the arteries and is a major risk factor for coronary heart disease (1, 4).

An estimated 37.4% of Connecticut adults have had their cholesterol tested and were told that it was high. The age-adjusted prevalence of high cholesterol varies by gender and age. Males are more likely to have high cholesterol compared with females. Also, the prevalence of high cholesterol increases with age. (Table 3)

Additionally, the prevalence of high cholesterol varies by race and ethnicity. The age-adjusted prevalence of high cholesterol is higher among Hispanic or Latino adults compared with White and Black or African American adults. The difference in the age-adjusted prevalence of high cholesterol among White and Black or African American adults did not reach statistical significance. Also, the difference in the age-adjusted prevalence among adults in the "Other" category and White, Black or African American, and Hispanic or Latino adults did not reach statistical significance. (Table 3)

Furthermore, the age-adjusted prevalence of high cholesterol varies by educational attainment and annual household income. For example, the age-adjusted prevalence of high cholesterol among adults who are less than high school graduates is approximately 1.5 times higher than the prevalence among adults who are college graduates. Also, the age-adjusted prevalence of high cholesterol among adults with annual household incomes of less than $25,000 is 1.2 times higher than the prevalence among adults with annual household incomes of $75,000 or more. (Table 3)

Table 3. Prevalence of Having Cholesterol Tested and Told by a Doctor, Nurse, or Other Health Professional That It Was High among Adults (18+y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	4,470	875,000	37.4 (36.1-38.7)	32.9 (31.6-34.3)
Gender				
Male	1,972	439,000	40.2 (38.2-42.2)	35.9 (33.9-37.9)
Female	2,498	436,000	34.9 (33.3-36.6)	30.5 (28.7-32.4)
Race & Ethnicity§				
White	3,485	642,000	38.0 (36.6-39.3)	32.3 (30.7-33.9)
Black or African American	363	69,000	33.8 (28.7-38.9)	30.2 (26.2-34.3)
Hispanic or Latino	370	107,000	39.8 (35.3-44.3)	40.8 (36.5-45.1)
Other	167	42,000	32.4 (26.1-38.8)	34.2 (28.2-40.1)
Age (in years)				
18-44	443	177,000	21.5 (19.2-23.7)	- -
45-64	1,847	398,000	42.5 (40.6-44.4)	- -
65+	2,126	291,000	53.0 (51.0-55.1)	- -
Educational Attainment				
Less than High School Graduate	347	121,000	50.9 (45.3-56.5)	44.6 (38.1-51.0)
High School Graduate/ G.E.D.	1,085	243,000	38.8 (36.2-41.4)	32.6 (29.6-35.5)
Some College	1,036	233,000	37.3 (34.7-39.9)	34.6 (31.9-37.3)
College Graduate	1,993	277,000	32.8 (31.2-34.4)	28.6 (27.1-30.0)
Annual Household Income				
<$25,000	858	164,000	43.1 (39.7-46.4)	37.8 (34.3-41.2)
$25,000-49,999	753	143,000	40.9 (37.5-44.3)	34.5 (30.5-38.4)
$50,000-74,999	536	103,000	36.5 (32.8-40.1)	30.5 (27.0-34.0)
≥$75,000	1,501	307,000	34.0 (32.1-35.9)	31.5 (29.5-33.5)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents.

Cholesterol Tested in the Past Five (5) Years

According to the American Heart Association, all adults age 20 or older should have their cholesterol and other traditional risk factors checked every four (4) to six (6) years or as recommended by a healthcare provider. The BRFSS collects data on adults who have had their blood cholesterol checked in the past five (5) years. An estimated 83.3% of all adults have had their cholesterol checked in the past five (5) years.

The prevalence of having cholesterol tested in the past five (5) years varies by gender and age. The age-adjusted prevalence of having cholesterol tested in the past five (5) years is higher among females compared with males. Also, the prevalence increases with age. (Table 4)

In addition, the age-adjusted prevalence of having cholesterol tested in the past five (5) years varies by race and ethnicity. Hispanic or Latino adults have the lowest age-adjusted prevalence of having cholesterol tested in the past (5) years. The differences in the age-adjusted prevalence among White, Black or African American, and "Other" adults did not reach statistical significance. (Table 4)

The age-adjusted prevalence of having cholesterol tested in the past (5) years also varies by educational attainment and annual household income. For example, 76.7% of adults who are high school graduates have had their cholesterol checked in the past five (5) years compared with 87.6% of adults who are college graduates. Also, 72.2% of adults with annual household incomes of less than $25,000 have had their cholesterol tested in the past (5) years compared to 88.2% of adults with annual household incomes of $75,000 or more. (Table 4)

Access to health care is another important factor for having cholesterol tested in the past five (5) years. The age-adjusted prevalence of having cholesterol tested among adults with health care coverage is 81.0% compared with only 52.7% among adults without health care coverage. (Not shown)

Table 4. Prevalence of Having Cholesterol Tested in the Past Five (5) Years among Adults (18+y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	10,348	2,256,000	83.3 (82.1-84.5)	81.0 (79.8-82.3)
Gender				
Male	4,278	1,044,000	80.5 (78.7-82.3)	78.2 (76.3-80.1)
Female	6,070	1,212,000	85.8 (84.3-87.4)	83.7 (82.1-85.3)
Race & Ethnicity§				
White	7,997	1,633,000	86.5 (85.2-87.8)	82.9 (81.3-84.4)
Black or African American	833	193,000	79.9 (75.5-84.3)	79.7 (75.5-83.9)
Hispanic or Latino	846	260,000	69.8 (65.9-73.7)	72.0 (68.4-75.5)
Other	457#	127,000#	82.6 (77.1-88.1)#	85.7 (81.9-89.5)#
Age (in years)				
18-44	1,907	782,000	69.2 (66.8-71.6)	- -
45-64	4,271	905,000	92.1 (91.1-93.1)	- -
65+	4,004	537,000	95.8 (94.8-96.8)	- -
Educational Attainment				
Less than High School Graduate	599	223,000	71.5 (66.8-76.2)	67.7 (62.7-72.8)
High School Graduate/ G.E.D.	2,391	604,000	80.7 (78.3-83.1)	76.7 (73.9-79.5)
Some College	2,345	602,000	82.4 (79.9-84.9)	82.6 (80.4-84.9)
College Graduate	4,977	820,000	90.2 (89.1-91.4)	87.6 (85.9-89.2)
Annual Household Income				
<$25,000	1,758	359,000	74.8 (71.7-77.9)	72.2 (69.0-75.4)
$25,000-49,999	1,650	336,000	81.4 (78.2-84.6)	77.8 (74.4-81.3)
$50,000-74,999	1,238	271,000	84.5 (81.2-87.9)	81.0 (77.0-84.9)
≥$75,000	3,824	880,000	89.9 (88.2-91.6)	88.2 (86.4-90.0)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents. #Estimate may be of limited validity due to a high coefficient of variation (15.0% ≤ CV ≤ 20%).

Obesity among Adults

Body Mass Index (BMI) is used to assess adult weight status. BMI is calculated by dividing weight in kilograms by the squared value of height in meters. An adult with a BMI of 30 or above is considered obese. (1) Obesity is associated with the leading causes of death, including diabetes, heart disease, and stroke. (2) An estimated 25.3% of adults in Connecticut are obese.

The prevalence of obesity among Connecticut adults varies significantly by age, but not by gender. The prevalence of obesity among adults age 45 to 64 years is higher compared with adults age 18 to 44 years and adults age 65 years or greater. Also, adults age 65 or greater have a higher prevalence of obesity compared with adults age 18 to 44 years. The difference in the age-adjusted prevalence of obesity among males and females did not reach statistical significance. (Table 5)

The age-adjusted prevalence of obesity varies by race and ethnicity. Black or African American and Hispanic or Latino adults are more likely to be obese compared with White adults or adults categorized as other race and ethnicity. The difference in obesity among Black or African American and Hispanic or Latino adults did not reach statistical significance. (Table 5)

Also, the age-adjusted prevalence of obesity varies by educational attainment and annual household income. For example, 18.4% of adults who are college graduates are obese compared with 35.4% of adults who have not graduated high school. Furthermore, 22.0% of adults with annual household incomes of greater than or equal to $75,000 are obese compared to 34.3% of adults with annual household incomes of less than $25,000. (Table 5)

Table 5. Prevalence of Obesity among Adults (18+y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	2,840	654,000	25.3 (24.1-26.4)	25.1 (23.9-26.4)
Gender				
Male	1,312	346,000	26.6 (24.9-28.4)	26.4 (24.5-28.2)
Female	1,528	309,000	23.9 (22.4-25.4)	23.8 (22.2-25.5)
Race & Ethnicity§				
White	1,975	432,000	23.7 (22.4-25.0)	23.1 (21.7-24.6)
Black or African American	354	87,000	36.8 (31.8-41.7)	36.9 (32.0-41.8)
Hispanic or Latino	348	103,000	30.3 (26.4-34.2)	30.8 (27.0-34.6)
Other	116	24,000	16.2 (12.2-20.2)	17.4 (13.4-21.4)
Age (in years)				
18-44	571	242,000	21.8 (19.8-23.9)	- -
45-64	1,263	272,000	29.4 (27.6-31.2)	- -
65+	991	137,000	25.5 (23.6-27.4)	- -
Educational Attainment				
Less than High School Graduate	274	96,000	34.5 (29.6-39.4)	35.4 (29.9-41.0)
High School Graduate/ G.E.D.	815	210,000	28.9 (26.5-31.2)	29.3 (26.6-32.0)
Some College	737	186,000	26.0 (23.7-28.3)	27.6 (25.1-30.0)
College Graduate	1,013	162,000	18.8 (17.4-20.2)	18.4 (16.7-20.1)
Annual Household Income				
<$25,000	694	157,000	34.0 (30.9-37.1)	34.3 (31.1-37.5)
$25,000-49,999	534	113,000	28.3 (25.3-31.2)	28.5 (25.1-31.8)
$50,000-74,999	364	80,000	25.2 (22.0-28.3)	24.1 (20.8-27.40
≥$75,000	856	217,000	22.6 (20.8-24.5)	22.0 (20.0-24.0)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents.

Obesity among Youth

For children and teens, weight status is determined using an age- and sex-specific percentile for BMI rather than the BMI categories used for adults. A BMI in the 95th percentile or greater is considered obese (7).

The Youth Risk Behavior Surveillance System (YRBSS) collects data on the weight status of high school students. An estimated 12.3% of Connecticut's high school students are obese. The prevalence of obesity among high school students varies by gender and is significantly higher among males (15.2%) than among females (9.3%). Also, the prevalence of obesity among high school students varies by race and ethnicity. Hispanic or Latino students are more likely to be obese than White students (Hispanic or Latino: 15.7%; White: 11.1%). The difference in obesity prevalence among Black or African American and White students did not reach statistical significance (Black or African American: 12.5%; White: 11.1%). In addition, the prevalence of obesity does not vary significantly by grade. (8) (2015 YRBSS data not shown)

The BRFSS estimates obesity among children based on the child's weight and height as reported by the adult respondent. Based on 2013-2015 BRFSS data, approximately 15.6% of Connecticut children 5-12 years old are obese. The prevalence of obesity among children varies by gender, race and ethnicity, and annual household income. Male children have a higher prevalence of obesity compared with female children; however, this difference did not reach statistical significance. Hispanic or Latino children are 2.5 times more likely to be obese than White children. Children from households with annual incomes of less than $25,000 are approximately 3.2 times more likely to be obese than children from households with annual incomes of $75,000 or more. (Table 6)

Table 6. Prevalence of Obesity among Children (5-12y), Connecticut, 2015. Data source: BRFSS, 2013-2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)
Children 5-12 years old	251	33,000	15.6 (13.0-18.1)
Gender			
Male	144	19,000	18.4 (14.6-22.2)
Female	107	13,000	12.7 (9.5-16.0)
Race & Ethnicity§			
White	128	14,000	11.1 (8.7-13.6)
Black or African American	¶	¶	¶
Hispanic or Latino	67#	12,000#	28.0 (19.7-36.3)#
Other	¶	¶	¶
Annual Household Income			
<$25,000	63	10,000	35.2 (25.3-45.1)
$25,000-49,999	45#	3,000#	20.5 (13.0-28.1)#
$50,000-74,999	¶	¶	¶
≥$75,000	108	2,000	11.1 (8.4-13.8)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents. #Estimate may be of limited validity due to a high coefficient of variation (15.0% ≤ CV ≤ 20%). ¶The prevalence estimate has a coefficient of variation greater than 20.0% indicating poor validity; therefore, the estimate is suppressed.

Physical Inactivity among Adults

Regularly participating in physical activity (150 minutes a week of moderate-intensity aerobic activity) can lower a person's risk for heart disease, stroke, and diabetes. Regular physical activity may also improve blood pressure and cholesterol levels (9).

An estimated 23.5% of Connecticut adults participate in no leisure time physical activity. The prevalence of no leisure time physical activity increases with age. For example, 30.4% of adults 65 years and older do not participate in leisure time physical activity compared with 20.3% of adults 18 to 44 years old. The difference in the age-adjusted prevalence of no leisure time physical activity among males and females did not reach statistical significance. (Table 7)

The age-adjusted prevalence of no leisure time physical activity varies by race and ethnicity. White adults have the lowest age-adjusted prevalence (18.2%). The differences in the age-adjusted prevalence of no physical activity among Black or African American, Hispanic or Latino, and "Other" adults did not reach statistical significance. (Table 7)

Additionally, the age-adjusted prevalence of no leisure time physical activity varies by educational attainment and annual household income. For example, 46.1% of adults who are not high school graduates do not participate in leisure time physical activity compared with 11.5% of adults who are college graduates. Similarly, 35.7% of adults with annual household incomes of less than $25,000 participate in no leisure time physical activity compared to 14.3% of adults with annual household incomes of greater than or equal to $75,000. (Table 7)

Table 7. Prevalence of No Leisure Time Physical Activity among Adults (18+y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	2,475	581,000	23.5 (22.3-24.7)	23.1 (21.8-24.4)
Gender				
Male	920	256,000	21.5 (19.8-23.2)	21.3 (19.5-23.1)
Female	1,555	325,000	25.3 (23.6-26.9)	24.7 (22.9-26.6)
Race & Ethnicity§				
White	1,689	354,000	20.2 (19.0-21.3)	18.2 (16.9-19.5)
Black or African American	264	62,000	29.2 (24.3-34.1)	29.2 (24.2-34.2)
Hispanic or Latino	348	115,000	35.6 (31.3-39.9)	35.9 (31.7-40.2)
Other	120	39,000	27.4 (20.6-34.2)	27.0 (21.0-33.0)
Age (in years)				
18-44	482	211,000	20.3 (18.1-22.4)	- -
45-64	910	207,000	23.3 (21.5-25.0)	- -
65+	1,054	157,000	30.4 (28.4-32.5)	- -
Educational Attainment				
Less than High School Graduate	304	123,000	45.9 (40.5-51.4)	46.1 (39.9-52.2)
High School Graduate/ G.E.D.	853	211,000	31.3 (28.9-33.8)	30.4 (27.5-33.2)
Some College	629	146,000	21.4 (19.1-23.6)	22.8 (20.3-25.3)
College Graduate	678	99,000	11.7 (10.6-12.8)	11.5 (10.3-12.8)
Annual Household Income				
<$25,000	710	156,000	36.4 (33.2-39.7)	35.7 (32.2-39.1)
$25,000-49,999	489	110,000	29.5 (26.3-32.7)	28.2 (24.5-31.8)
$50,000-74,999	273	65,000	21.9 (18.4-25.4)	20.7 (16.9-24.5)
≥$75,000	498	133,000	14.4 (12.8-16.1)	14.3 (12.5-16.1)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents.

Physical Activity among Youth

The YRBSS collects data on physical activity among high school students. An estimated 14.3% of high school students did not participate in at least sixty (60) minutes of physical activity on at least one (1) day during the last week. Females are more likely to be physically inactive than males (females: 16.9%; males: 11.7%). The differences in the prevalence of physical inactivity among White, Black or African American, and Hispanic or Latino high school students did not reach statistical significance (White: 12.0%; Black or African American: 18.1%; Hispanic or Latino: 17.2%). (2015 YRBSS data not shown)

Diabetes

Diabetes is a disease in which blood glucose levels are above normal. Blood glucose levels are elevated in diabetes because either the body does not make enough insulin or the body does not use insulin as well as it should. The risk of death from heart disease for adults with diabetes is two to four times higher than adults who do not have diabetes (10).

Approximately 9.3% of Connecticut adults have been told by a doctor, nurse, or other health professional that they have diabetes (includes both Type 1 and Type 2). The prevalence of diagnosed diabetes varies by age. Older adults are more likely to have diabetes compared with younger adults. Also, the age-adjusted prevalence of diagnosed diabetes varies by gender. Males are more likely to have diagnosed diabetes than females. (Table 8)

Additionally, the age-adjusted prevalence of diagnosed diabetes varies by race and ethnicity. Black or African American and Hispanic or Latino adults are more likely to have diagnosed diabetes compared with White adults. The difference in the prevalence of diagnosed diabetes among Black or African American and Hispanic or Latino adults did not reach statistical significance. (Table 8)

The age-adjusted prevalence of diagnosed diabetes also varies by educational attainment and annual household income. For example, 16.4% of adults who are not high school graduates have diagnosed diabetes compared with 4.7% of adults who are high school graduates. Furthermore, 13.5% of adults with annual household incomes of less than $25,000 have diagnosed diabetes compared to 6.0% of adults with annual household incomes of greater than or equal to $75,000. (Table 8)

Table 8. Prevalence of Diagnosed Diabetes among Adults (18+y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	1,388	262,000	9.3 (8.6-9.9)	8.2 (7.6-8.9)
Gender				
Male	642	141,000	10.3 (9.2-11.4)	9.5 (8.5-10.5)
Female	746	122,000	8.3 (7.4-9.1)	7.1 (6.3-7.9)
Race & Ethnicity§				
White	897	162,000	8.2 (7.5-8.9)	6.6 (6.0-7.3)
Black or African American	202	38,000	14.3 (11.1-17.5)	13.8 (11.0-16.7)
Hispanic or Latino	191	44,000	11.5 (9.2-13.9)	14.6 (11.9-17.3)
Other	63#	13,000#	7.9 (5.2-10.6)#	12.7 (9.2-16.3)#
Age (in years)				
18-44	72#	32,000#	2.6 (1.9-3.4)#	- -
45-64	541	115,000	11.5 (10.3-12.8)	- -
65+	762	113,000	19.5 (17.8-21.2)	- -
Educational Attainment				
Less than High School Graduate	206	62,000	19.3 (15.8-22.7)	16.4 (13.1-19.7)
High School Graduate/ G.E.D.	446	84,000	10.6 (9.3-12.0)	8.9 (7.6-10.1)
Some College	340	66,000	8.5 (7.3-9.8)	8.5 (7.2-9.7)
College Graduate	388	50,000	5.3 (4.6-6.0)	4.7 (4.1-5.3)
Annual Household Income				
<$25,000	437	76,000	15.0 (13.0-16.9)	13.5 (11.6-15.4)
$25,000-49,999	264	47,000	11.1 (9.3-12.8)	9.0 (7.5-10.5)
$50,000-74,999	147	27,000	8.2 (6.4-10.0)	6.9 (5.3-8.4)
≥$75,000	274	63,000	6.2 (5.2-7.2)	6.0 (5.0-7.0)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents. #Estimate may be of limited validity due to a high coefficient of variation (15.0% ≤ CV ≤ 20%).

Risk Factor Discussion

Many CVD risk factors are modifiable or controllable. Addressing these risk factors involves promoting healthy eating and increased physical activity in schools, early childhood education services, worksites, state and local government agencies, and community settings as well as increasing access to quality health services. Linking clinical and community services that support the prevention, self-management and control of diabetes, high blood pressure, and obesity are also important (11).

Access to Healthcare

Accessible, appropriate, and timely primary care services are important in promoting wellness and managing CVD. Healthcare coverage, or health insurance, is needed to access most of these services. An estimated 91.3% of Connecticut adults 18 to 64 years of age have healthcare coverage. There are marked disparities in healthcare coverage among adults 18 to 64 years of age.

The prevalence of not having healthcare coverage among adults 18 to 64 years of age varies by gender and age. Males are nearly twice as likely to not have healthcare coverage as females. Similarly, adults 18 to 44 years old are nearly twice as likely to not have healthcare coverage as adults 45 to 64 years old. (Table 9)

The prevalence of not having healthcare coverage also varies by race and ethnicity. The age-adjusted prevalence of no healthcare coverage among Hispanic or Latino adults 18 to 64 years old is 5.5 times greater than the age-adjusted prevalence among White adults. (Table 9) The estimates of no healthcare coverage among Black or African American residents 18 to 64 years old is not reliable; however, the age-adjusted prevalence of no healthcare coverage among Black or African American adults 18 years old or older is about 2.5 times higher than the prevalence among White adults (9.9% vs. 4.0% – data not shown).

Additionally, the age-adjusted prevalence of no healthcare coverage among adults 18 to 64 years of age varies by educational attainment and annual household income. For example, 31.5% of adults who are not high school graduates have no healthcare coverage compared with only 2.4% of adults who are college graduates. Also, 23.6% of adults with annual household incomes of less than $25,000 do not have healthcare coverage compared with 4.5% of adults with annual household incomes of $25,000 or more. (Table 9)

Table 9. Prevalence of No Healthcare Coverage among Adults (18 to 64y), Connecticut, 2015. Data source: BRFSS, 2015 data.

Characteristic	Unweighted Number*	Weighted Number†	Unadjusted % (95% CI)	Age-adjusted % (95% CI)‡
All Adults	502	193,000	8.7 (7.8-9.7)	9.2 (8.1-10.2)
Gender				
Male	281	124,000	11.4 (9.7-13.0)	11.8 (10.1-13.5)
Female	221	70,000	6.2 (5.1-7.3)	6.6 (5.4-7.7)
Race & Ethnicity§				
White	197	66,000	4.5 (3.6-5.4)	4.6 (3.6-5.6)
Black or African American	60#	23,000#	10.8 (7.4-14.2)#	10.7 (7.3-14.0)#
Hispanic or Latino	202	90,300	25.8 (21.9-29.6)	25.2 (21.6-28.8)
Other	¶	¶	¶	¶
Age (in years)				
18-44	261	133,000	10.9 (9.4-12.5)	- -
45-64	241	60,000	6.1 (5.0-7.1)	- -
Educational Attainment				
Less than High School Graduate	110	69,000	30.1 (24.4-35.9)	31.5 (25.5-37.4)
High School Graduate/ G.E.D.	169	66,000	11.2 (9.2-13.3)	12.1 (9.7-14.5)
Some College	126	40,000	6.3 (5.0-7.7)	7.0 (5.5-8.5)
College Graduate	92	18,000	2.3 (1.7-2.9)	2.4 (1.7-3.1)
Annual Household Income				
<$25,000	222	89,000	22.8 (19.4-26.2)	23.6 (20.2-27.1)
≥$25,000	192	64,000	4.5 (3.6-5.3)	4.5 (3.6-5.5)

*Numbers may not sum to total due to missing data; †Data are weighted to make the responses representative of the state's population. The weighted frequency is rounded to the nearest thousand; ‡Percentages are age-adjusted to eliminate differences in crude rates in populations of interest that result from differences in the populations' age distributions. The percentages were age-adjusted using the 2000 Projected U.S. Population. §Asian, Pacific Islander, American Indian or Alaskan Native, other race, and multiracial adults are not reported in separate categories due to the small number of respondents. #Estimate may be of limited validity due to a high coefficient of variation (15.0% ≤ CV ≤ 20%). ¶The prevalence estimate has a coefficient of variation greater than 20.0% indicating poor validity; therefore, the estimate is suppressed.

Access to Healthcare Discussion

Provisions of the Patient Protection and Affordable Care Act (ACA) that went into effect on January 1, 2014, expanded health care coverage in many states, including Connecticut. According to Access Health CT (Connecticut Health Insurance Exchange), the current uninsured rate among all Connecticut residents is approximately 3.8%. (12) This estimate was calculated using a combination of Access Health CT enrollment data, Medicaid enrollment data, Kaiser Family Foundation statistics, and survey data and is not limited to adults aged 18-64 years, unlike the BRFSS estimate presented previously.

With the percent of uninsured residents decreasing, it is important for low- or no-cost chronic disease prevention and control services to be available in the community at low-or not-cost to participants. Additionally, referrals from healthcare providers may also help increase utilization of these services.

Prevention and Control of CVD in Connecticut

The burden of CVD can be lessened through accessible, appropriate, and timely primary care services, as well as through widespread access to wellness resources that can prevent the onset of CVD and its risk factors in the first place. The following lists examples of evidence-based programs and practices implemented by DPH and its partners to promote access to quality primary care and wellness resources and to decrease the burden of CVD.

- DPH partners with Connecticut's Regional Extension Center (REC) to assist large health care systems in reporting blood pressure and diabetes control measures and establishing quality improvement protocols related to these measures, identifying patients eligible for self-blood pressure monitoring, identifying patients with high blood pressure readings that do not have a diagnosis of hypertension, identifying patients with pre-diabetes and diabetes based on established evidence-based criteria, and integrating referrals to diabetes education and diabetes prevention programs into existing referral systems.
- DPH partners with the University of Connecticut, School of Pharmacy to promote and establish Medication Therapy Management programs in community pharmacies, focusing on assisting patients to adhere to medication regimens for hypertension and diabetes.
- DPH partners with a Self-Monitored Blood Pressure Program (SMBP) expert to provide Federally Qualified Health Center (FQHC) staff technical assistance to integrate SMBP as part of routine care for select patients with uncontrolled blood pressure. SMBP is an evidence-based approach to help patients monitor their BP at home and achieve better BP control.
- DPH offers all Connecticut residents access to the Tobacco Quitline, 1-800-QUIT NOW, including free Nicotine Replacement Therapy and services in various languages.
- The Diabetes Prevention and Control Program partners with local health departments, community-based organizations, and community health centers to increase the number of diabetes self-management programs in the state and the number of participants in these programs. Diabetes self-management programs are evidence-based programs that teach people with diabetes or their caregivers about how to modify food choices, increase physical

activity, perform blood sugar monitoring, set goals for health, take medications, and see a health care provider regularly.

- The Connecticut Diabetes Prevention and Control Program partners with the local YMCAs, hospitals, community health centers, and other community organizations to increase provider referrals to and participation in Diabetes Prevention Programs. Diabetes Prevention Programs are evidence-based, lifestyle change programs led by lifestyle coaches that help participants with prediabetes learn about healthy eating, physical activity, dealing with stress, coping with challenges, and setting goals to reduce their risk of type 2 diabetes and improve their overall health.
- DPH partners with local health departments, community partners and corner stores to increase the amount of healthier food options available in the corner stores.
- DPH and the Connecticut State Department of Education partner to provide professional development for school administrators and staff on creating a healthy environment through implementation of nationally recommended policies and best practices to prevent obesity among children.
- DPH also provides technical assistance on healthy eating and physical activity to early care and education centers (ECEs).
- DPH partners with Bike Walk Connecticut and the Department of Transportation to promote Complete Streets in communities to create streets that are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.

Glossary of Selected Terms

Age-adjusted rates and prevalence: Rates and prevalence where the effect of differing age distributions between the groups has been removed. Age-adjusted rates and prevalence are used to make comparisons across two or more population groups at the same point in time or to compare one population at two or more points in time. Since the effect of age has been removed, these rates and prevalence are called "age-adjusted". Age-adjusted rates and prevalence are calculated by using a standard population to weight age-specific rates.

Age-adjusted Behavioral Risk Factor Surveillance System (BRFSS) prevalence estimates: The BRFSS prevalence estimates presented in this report were age-adjusted using the direct method. The age distribution and age-adjustment weights, based on the 2000 Projected U.S. population, used for indicators for which the population is adults ≥18 years:

Age Group	Population in Thousands	Adjustment Weight
18-24 years	26,258	0.128810
25-44 years	81,892	0.401725
45-64 years	60,991	0.299194
65 years and over	34,710	0.170271
18 years and over	203,851	1.000000

The age distribution and age-adjustment weights, based on the 2000 Projected U.S. population, used for indicators for which the population is adults 18-64 years:

Age Group	Population in Thousands	Adjustment Weight
18-24 years	26,258	0.155243
25-34 years	37,233	0.220130
35-44 years	44,659	0.264034
45-64 years and over	60,991	0.360593
18-64 years	169,141	1.000000

Age-adjusted hospitalization rates (AAHRs): The AHRs presented in this report were age-adjusted using the direct method. The following age distributions, based on the 2000 U.S. Standard Population were used:

Age Group	2000 U.S. Standard Population
0-4 years	18,986,520
5-9 years	19,919,840
10-14 years	20,056,779
15-19 years	19,819,518
20-24 years	18,257,225
25-29 years	17,722,067
30-34 years	19,511,370
35-39 years	22,179,956
40-44 years	22,479,229
45-49 years	19,805,793
50-54 years	17,224,359
60-64 years	13,307,234
65-69 years	10,654,272
70-74 years	9,409,940
75-79 years	8,725,574
80-84 years	7,414,559
85+ years	4,900,234
Total	4,259,173

Age-adjusted mortality rates (AAMRs): The AAMRs presented in this report were age-adjusted using the direct method. The following age distributions, based on the 2000 U.S. Standard Million were used:

Age Group	2000 U.S. Standard Population
0-4 years	69,135
5-9 years	72,533
10-14 years	73,032
15-19 years	72,169
20-24 years	66,478
25-29 years	64,529
30-34 years	71,044
35-39 years	80,762
40-44 years	81,851
45-49 years	72,118
50-54 years	62,716
60-64 years	48,454
65-69 years	38,793
70-74 years	34,264
75-79 years	31,773
80-84 years	26,999
85+ years	17,842
Total	1,000,000

Coefficient of variation: The ratio of the standard deviation to the mean, expressed as a percentage (13).

Confidence interval: Range of values that describes the uncertainty surrounding an estimate. For example, more caution is needed when using an estimate with a large the confidence interval.

A confidence interval is also itself an estimate. It is made using a model of how sampling, interviewing, measuring, and modeling contribute to uncertainty about the relation between the true value of the quantity we are estimating and our estimate of that value.

In this report, 95% confidence intervals were presented. The 95% indicates that if new estimates were repeatedly made using exactly the same procedure (by drawing a new sample, conducting new interviews, calculating new estimates and new confidence intervals), the confidence intervals would contain the average of all the estimates 95% of the time (14).

Disparity: A noticeable and often unfair difference between people or things (15).

Hospital charges: The amount hospitals charge for services. Hospital charges include the actual cost of care plus a mark-up to generate additional income. This additional income is used by hospitals to recoup fixed costs, generate funds for future investment and to maintain profitability (16).

Hospital discharge: Release of a patient from a hospital after admission as a registered patient into one of Connecticut's acute care general hospitals, with a stay of twenty-four (24) hours or more (17).

Hospitalization: Any discharge from a non-federal, short-stay, acute-care, general hospital in Connecticut, and are expressed as number of discharges, not unduplicated patients. Thus, a single patient with multiple hospitalizations may be counted more than once (18).

Medication Therapy Management (MTM): MTM provides comprehensive medication therapy review by a pharmacist with the patient to identify potential areas of concern (medication appropriateness, effectiveness, safety, and patient adherence behavior and attitude about medications) that may affect adherence to the medication plan and patient outcomes (19).

Midyear resident population: The Connecticut state, county and town level populations that are estimated at the calendar year midpoint (July 1) each year. These July 1 estimates typically constitute the basis for determining birth, death, and other population based rates. The annual estimate represents the official Connecticut population estimate for the year (20).

Premature mortality: Death before a predetermined endpoint (e.g. 75 years old). One measure of premature mortality is Years of Potential Life Lost (YPLL).

Prevalence: The number of affected persons present in the population at a specific time divided by the number of persons in the population at that time (21).

Self-Monitored Blood Pressure Program (SMBP): SMBP is the regular measurement of blood pressure by the patient outside the clinical setting, either at home or elsewhere. SMBP requires the use of a

home blood pressure measurement device by the patient to measure blood pressure at different points in time.

SMBP plus clinical support can improve access to care and quality of care for individuals with hypertension while making blood pressure control more convenient and accessible across the population. Clinical support includes regular one-on-one counseling, web-based or telephonic support tools, and educational classes (22).

Social determinants of health: The conditions in which people are born, grow, live, work, age and die, including the health system. These circumstances are shaped by the distribution of money, power, and other resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities – the unfair and avoidable differences in health status seen within and between communities (15).

Statistical significance: The observed difference (e.g. the difference in the prevalence of diabetes among White adults and Black or African American adults) was not likely to have occurred due to chance. In this report, a p-value of 0.05 was used to determine statistical significance. A p-value is a measure of statistical significance which tells us the probability of an event occurring due to chance alone. Results larger than 0.05 were considered likely to be attributed to chance and not statistically significant (23, 24)

Underlying Cause of Death: The disease that initiated the chain of events leading directly to death. Every death is attributed to one underlying condition, based on information reported on the death certificate and using the international rules for selecting the "underlying cause of death" from the conditions stated on the death certificate. If more than one cause or condition of death is entered, the underlying cause is then determined by the sequence of conditions on the death certificate and selection rules of the International Classification of Diseases (ICD) (25).

Weighting: Weighting is a statistical process that attempts to remove bias in the sample. In regards to the 2015 BRFSS, landline and cell phone data were combined and weighted by CDC to adjust for differential selection probabilities. The weighted data were then adjusted to the distribution of the Connecticut adult population using iterative proportional fitting, or raking. Raking adjustments were made by telephone type, race/ethnicity, education, marital status, age by gender, gender by race/ethnicity, age by race/ethnicity, and renter/owner status. This weighting methodology was adopted by CDC in 2011 to accommodate the inclusion of cell phone interviews and to allow for adjustments to more demographics. As a result of these methodological changes, BRFSS data for 2011 and forward are not comparable to BRFSS data prior to 2011 (5, 26).

Years of Potential Life Lost: A measure of premature mortality. It represents the number of years of potential life lost by each death before a predetermined end point (75 years of age in this report). For example, the death of a person 15-24 years of age counts as 55.5 years of life lost. The YPLL statistic is derived by summing age-specific years of life lost figures over all age groups up to 75 years. YPLL is presented for persons less than 75 years of age because the average life expectancy in the United States is over 75 years (25).

Data Sources Used in This Report

Behavioral Risk Factor Surveillance System (BRFSS): A state-based system of health surveys that generate information about health risk behaviors, clinical preventive practices, and health care access and utilization. The BRFSS, sponsored by the Centers for Disease Control and Prevention (CDC), is the world's largest telephone survey, and is conducted in all fifty (50) states. Respondents are randomly selected adults (aged 18 or older) within randomly selected households with landlines, or with cellular telephones owned by adults with no landline or who use their cellular phones for at least 90% of their calls. If any children lives in the same household as the respondent, one child is randomly selected and the adult respondent provides information about that child. Data are collected on an ongoing basis and are usually available six (6) months after data collection for the year is complete. Electronic data sets for individual years from 1990 to the present are available. www.cdc.gov/brfss or www.ct.gov/dph/brfss

Connecticut School Health Survey (CSHS): A comprehensive survey conducted by the Connecticut Department of Public Health (DPH) in cooperation with the Centers for Disease Control and Prevention (CDC), the Connecticut State Department of Education (CSDE), and partners from local school districts and health departments. The CSHS consists of the following two (2) components:

a. The *Youth Behavior Component* (YBC), also nationally known as the Youth Risk Behavior Surveillance System (YRBSS), collects data used to monitor priority health risk behaviors, and the prevalence of obesity and asthma among high school students, grades 9-12 in Connecticut. The YBC is administered to a representative sample of all regular public high school students in Connecticut. Electronic data sets are available for the years 1997, 2005, 2007, 2009, 2011, 2013, and 2015.
b. The Youth Tobacco Component (YTC), also known nationally as the Youth Tobacco Survey (YTS), is part of the CDC's survey of middle- and high-school students (grades 6-12) to monitor tobacco use, secondhand smoke exposure, and tobacco-related risk factors and health behaviors; YTC data have been collected as part of the CSHS since 2005. Electronic data sets are available for the years 2002, 2005, 2007, 2009, 2011, 2013, and 2015.

CSHS data are collected in odd-numbered years from students using a written questionnaire during class time. Results are presented at the state level due to small sample size and sampling design. New data are usually available six (6) months after data collection for the year is complete. www.cdc.gov/yrbs or www.ct.gov/dph/CSHS

Connecticut Vital Records Death Registry (Death Registry): Contains records pertaining to deaths that occur within the state, as well as deaths of Connecticut residents occurring in other states or in Canada. Mortality statistics are compiled in accordance with World Health Organization (WHO) regulations, which specify that deaths be classified by the current version of the *Manual of International Statistical Classification of Disease, Injuries, and Causes of Death*. Deaths from 1999 to the present are classified by the *Tenth Revision of the International Classification of Diseases* (ICD-10). The electronic database contains data from 1949 to the present. www.ct.gov/dph/Mortality

Hospital Inpatient Discharge Database (HIDD): Contains data regarding patient age, race, ethnicity, and gender; patient diagnosis; services provided and related charges; payer; provider; and length of stay from all of Connecticut's non-federal, acute care hospitals. The Connecticut Office of Health Care Access collects and maintains hospital inpatient discharge data for the purpose of monitoring the overall effectiveness of the state's health care system. www.ct.gov/ohca or www.ct.gov/HospitalDischargeData

Technical Notes

Leading Causes of Death: Cause of death rankings are based on National Center for Health Statistics List of 113 Selected Causes of Death (27). Ranks are based on the total number of deaths occurring during a specific time period. The leading causes of death presented in this report are for 2014.

Age-adjusted Mortality Rates (AAMR):

Population	All resident persons
Numerator	Deaths with International Classification of Diseases the following ICD-10 codes as the underlying cause of death among residents during a calendar year: • Cardiovascular diseases (CVD): I00-I78.9 • Coronary Heart Disease (CHD): I11, I20-I25 • Stroke: I60-69 • Heart failure: 150.0
Denominator	Midyear resident population for the same calendar year
Age-adjustment	Standardized by the direct method to the year 2000 standard U.S. million.
Data Source	• Numerator : death certificate data from the DPH Office of Vital Statistics • Denominator: July 1 population estimates created by DPH
Notes	Three-year and 5-year estimates are also available For race and ethnicity and gender, five-year estimates were used to increase the reliability of the measures

Years of Potential Life Lost (YPLL) before 75 Years of Age (premature mortality):

Population	All resident persons
Numerator	Sum of age-specific years of life lost figures over all age groups up to 75 years due to deaths with the following International Classification of Diseases (ICD)-10 codes as an underlying cause of death among residents during a calendar year: • Cardiovascular diseases (CVD): I00-I78.9 • Coronary Heart Disease (CHD): I11, I20-I25 • Stroke: I60-69 • Heart failure: 150.0
Denominator	Midyear resident population for the same calendar year
Age-adjustment	Age-adjusted YPLL are calculated using the methodology of Romeder and McWhinnie (1977). Single-, 3-, and 5-year estimates are available.
Data Source	Death certificate data from the DPH Office of Vital Statistics
Notes	For race and ethnicity and gender, five-year estimates were used to increase the reliability of the measures

Age-adjusted Hospitalization Rates:

Population	All resident persons
Numerator	Hospitalizations (not unduplicated) with a principal, or first-listed, diagnosis of the following International Classification of Diseases (ICD)-9-CM codes among residents during a calendar year: • Cardiovascular diseases (CVD): 390-459 • Coronary Heart Disease (CHD): 402, 410-414, and 429.2 • Stroke: 430-434 and 436-438 • Heart Failure: 428.0 and 428.2-428.4
Denominator	Midyear resident population for the same calendar year
Age-adjustment	Age-adjusted using the direct method to the year 2000 standard U.S.
Data Source	Acute Care Hospital Inpatient Discharge Database (HIDD) maintained by the Connecticut Office of Health Care Access (numerator) and population created by Connecticut Department of Public Health (denominator)
Notes	Median length of stay, median charge, and total charge overall for each year are available from HIDD

Prevalence of High Blood Pressure Awareness among Adults ≥ 18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who report having been told by a doctor, nurse, or other health professional of having high blood pressure
Denominator	Respondents aged ≥ 18 years (excluding respondents who reported they did not know if they were told their blood pressure is high, refused to answer if their blood pressure is high, and had missing responses)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	Data for this indicator are only collected in odd numbered years

Prevalence of High Blood Cholesterol Awareness among Adults ≥ 18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who report having had their cholesterol tested and have been told by a doctor, nurse, or other health professional they have high blood cholesterol.
Denominator	Respondents aged ≥ 18 years (excluding respondents who never had their blood cholesterol tested, reported they did not know if they had their blood cholesterol checked, reported they did not know if they had been told their blood cholesterol was high, refused to answer if they had their blood cholesterol checked, who refused to answer if they had been told that their blood cholesterol was high, and had missing responses)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	Data for this indicator are only collected in odd numbered years

Prevalence of Cholesterol Screening among Adults ≥ 18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who report having their cholesterol checked within the previous 5 years
Denominator	Respondents aged ≥ 18 years who report having or not having their cholesterol checked within the previous 5 years (excluding respondents who did not know if they had their cholesterol checked by a health professional, those who refused to answer, and those with missing responses)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	Data for this indicator are only collected in odd numbered years

Prevalence of Obesity among Adults ≥ 18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who have body mass index (BMI) ≥30.0 kg/m² calculated from self-reported weight and height
Denominator	Respondents aged ≥ 18 years for whom BMI can be calculated from their self-reported weight and height (excluding respondents with unknown, refused, or missing values for body mass index)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	BMI is calculated by dividing weight in kilograms by the squared value of height in meters

Prevalence of Obesity among High School Students:

Population	Public school students in grades 9–12
Numerator	Public school students in grades 9–12 with a body mass index (BMI) at or above the sex- and age-specific 95th percentile from CDC Growth Charts: United States (based on self-reported height and weight)
Denominator	Public school students in grades 9–12 who answer height, weight, sex and age questions
Age-adjustment	Not age-adjusted
Data Source	Connecticut School Health Survey (CSHS) Youth Behavior Component (YBC) / Youth Risk Behavior Surveillance System (YRBSS)
Notes	Data for this indicator are only collected in odd numbered years For children and teens, weight status is determined using an age- and sex-specific percentile for BMI rather than the BMI categories used for adults. A BMI in the 95th percentile or greater is considered obese.

Prevalence of Obesity among Children 5-12 Years:

Population	Resident children aged 5-12 years
Numerator	Children aged 5-12 years who have body mass index (BMI) in the 95th percentile or greater, calculated from weight and height as reported by adult survey respondent
Denominator	Children aged 5-12 years for whom BMI can be calculated from the weight and height reported by adult survey respondent (excluding respondents with unknown, refused, biologically implausible, or missing values for body mass index)
Age-adjustment	Not age-adjusted
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	For children and teens, weight status is determined using an age- and sex-specific percentile for BMI rather than the BMI categories used for adults. A BMI in the 95th percentile or greater is considered obese. Due to the small number of responses to the child questions, three (3) years of data are aggregated to improve the precision of the estimate of children who are obese.

Prevalence of No Leisure Time Physical Activity among Adults ≥18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who do not report participating in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise, other than their regular jobs, during the past month
Denominator	Respondents aged ≥ 18 years who report any or no leisure time physical activity within the previous month (excluding respondents with unknown, refused, or missing values)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	

Prevalence of Physical Inactivity among High School Students:

Population	Public school students in grades 9–12
Numerator	Public school students in grades 9–12 who report not participating in at least sixty (60) minutes of physical activity on at least one (1) day past 7 days before the survey
Denominator	Public school students in grades 9–12 who report doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of ≥60 minutes/day on 0 or more days during the 7 days before the survey
Age-adjustment	Not age-adjusted
Data Source	Connecticut School Health Survey (CSHS) Youth Behavior Component (YBC) / Youth Risk Behavior Surveillance System (YRBSS)
Notes	Data for this indicator are only collected in odd numbered years.

Prevalence of Diabetes among Adults ≥ 18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who report ever having a doctor, nurse, or other health professional tell them they have diabetes.
Denominator	Respondents aged ≥ 18 years who report or do not report ever having physician-diagnosed diabetes (excluding respondents who have prediabetes/borderline diabetes or diabetes only when they were pregnant, reported they did not know if they had been told they had diabetes, refused to answer if they had diabetes, and had missing responses)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	Includes Type 1 and Type 2 Diabetes

Prevalence of Current Cigarette Smoking among Adults ≥ 18 Years:

Population	Resident persons aged ≥ 18 years
Numerator	Respondents aged ≥ 18 years who report having smoked at least 100 cigarettes in their lifetime and currently smoke.
Denominator	Respondents aged ≥ 18 years who report ever or not ever smoking ≥100 cigarettes in their lifetime and report current or not current smoking (excluding respondents who did not know if they had smoked 100 cigarettes in their lifetime, refused to answer if they smoked 100 cigarettes in their lifetime, did not know if they now smoked every day, some days or not at all, or have missing responses)
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-44 years, 45-64 years, 65 years and over)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	

Prevalence of Current Lack of Health Insurance among Adults 18-64 Years:

Population	Resident persons aged 18-64 years
Numerator	Respondents aged 18-64 years who report having no current health insurance coverage.
Denominator	Respondents aged 18-64 years who report having current health insurance or having no current health insurance (excluding respondents who did not know, refused to report, or had missing responses for having health care coverage).
Age-adjustment	Age-adjusted by the direct method to the year 2000 standard U.S. population (age groups used: 18-24 years, 25-34 years, 35-44 years, 45-64 years)
Data Source	Behavioral Risk Factor Surveillance System (BRFSS)
Notes	

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