



2023 Heart Disease and Stroke Report

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Introduction and Background

This Heart Disease and Stroke Report presents the mortality and morbidity of heart disease and stroke in Iowa and describes the current initiatives in place at the Iowa Department of Health and Human Services (Iowa HHS) to reduce the burden of disease across the state with support of community and health system partners.

Heart Disease

Cardiovascular disease (CVD), commonly referred to as heart disease, is the leading cause of death in the United States [1] and Iowa [2]. It refers to several types of disease which affects the heart or blood vessels such as heart failure, structural problems, and cardiac events [1]. The most common type of heart disease in the United States is coronary artery disease (CAD) also known as coronary heart disease (CHD). CAD occurs when the arteries supplying blood to the heart muscle become narrowed or blocked, reducing blood flow. This restriction can lead to serious conditions, such as heart attack (myocardial infarction, or MI) or angina (chest pain) [1].

While there are genetic causes exist, there are several modifiable risk factors which contribute to the development of CAD, including tobacco use, physical inactivity, and poor diet [1]. While many of these factors are influenced by personal lifestyle choices, social determinants of health (SDOH) - such as access to nutritious foods, safe environments for exercise, and timely healthcare - also play a crucial role in an individual's ability to reduce risk.

Throughout this report, "CAD" or "CHD" will specifically refer to coronary artery or heart disease following the source data, while the term "heart disease" will be used more broadly to encompass all forms of cardiovascular disease.

Stroke

Stroke is the fifth leading cause of death in Iowa [2]. It occurs when a blood vessel supplying oxygen and nutrients to the brain becomes either blocked by a clot or ruptures [3]. When blood flow to part of the brain is interrupted, brain cells begin to die due to a lack of oxygen. There are three types of strokes including ischemic stroke when there is an obstruction within a blood vessel that supplies blood to the brain, hemorrhagic stroke when a weakened blood vessel ruptures, and transient ischemic attack often called a "mini stroke", or TIA, that is caused by a temporary clot [3].

Stroke shares many of the same risk factors as heart disease, such as tobacco use, physical inactivity, and poor diet [4]. In addition to individual health behaviors, social determinants of health (SDOH) play a significant role in both the risk of stroke and recovery outcomes. Factors such as access to emergency services, proximity to a treatment center, and social stigmas around seeking help can all influence the timeliness of treatment and the effectiveness of recovery efforts. Prompt medical intervention is crucial in minimizing brain damage and improving long-term outcomes after a stroke.

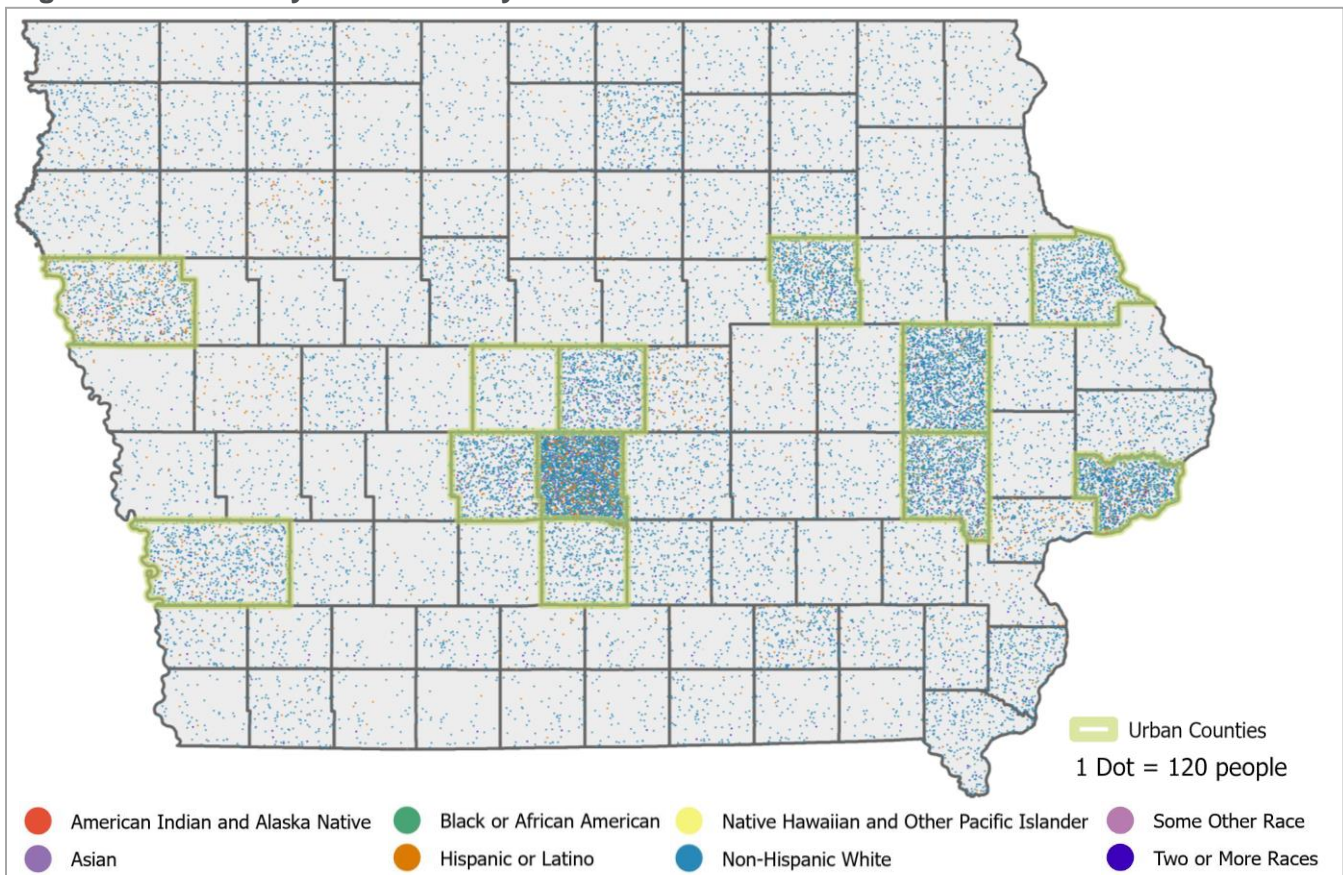
Social Determinants of Health and Health Disparities

Social determinants of health (SDOH) are defined as nonmedical factors which influence health outcomes [5]. They are the conditions in which people are born, grow, work, live, worship, and age. These conditions include a wide set of forces and systems that shape daily life such as economic policies and systems, development agendas, social norms, social policies, and political systems. SDOH contribute to health disparities. For example, if someone does not have access to a car or public transportation, they may not be able to go to a grocery store to purchase nutritious foods or travel to a doctor's appointment many miles away. When reviewing health outcomes information, it is important to remember how SDOH impacts the decisions that individuals make every day and may create barriers to making healthy choices.

About Iowa

Iowa is located in the upper Midwest region of the United States, bordered by the Mississippi River to the east and the Missouri River to the west. In 2023, Iowa's estimated population was 3,207,004 people. The state's three largest racial and ethnic groups are: 90.4% White non-Hispanic, 7.3% Hispanic/Latino, and 5.5% Black or African American non-Hispanic (Figure 1). Iowa's adult population is split nearly even among sexes with 1,248,335 women and 1,233,122 males in the state. Iowa is predominantly rural, with rural areas defined by the Census as those not within urban areas, where an urban core has a population of 50,000 or more people [6]. While counties are designated as rural, certain areas or census tracts within these counties may exhibit more urban characteristics.

Figure 1: Dot Density Race/Ethnicity and Urban Counties



Source: U.S. Census Bureau, USDA

Key Findings

The following section highlights key findings of this report. The most recent data available at the time of this report is used throughout.

Mortality

Heart Disease

- ▶ Heart disease was the leading cause of death among adults in Iowa, accounting for 23.5% of all 2023 deaths. In 2023, 7,644 Iowa residents died of heart disease with just more than half (4,023) dying of CAD.
- ▶ Iowa's heart disease mortality rates remain higher than the national average. In 2023, the age-adjusted mortality rate due to heart disease in Iowa was 176.3 per 100,000, an increase from 157.3 in 2014. The heart disease mortality rate in the state was below the national average from

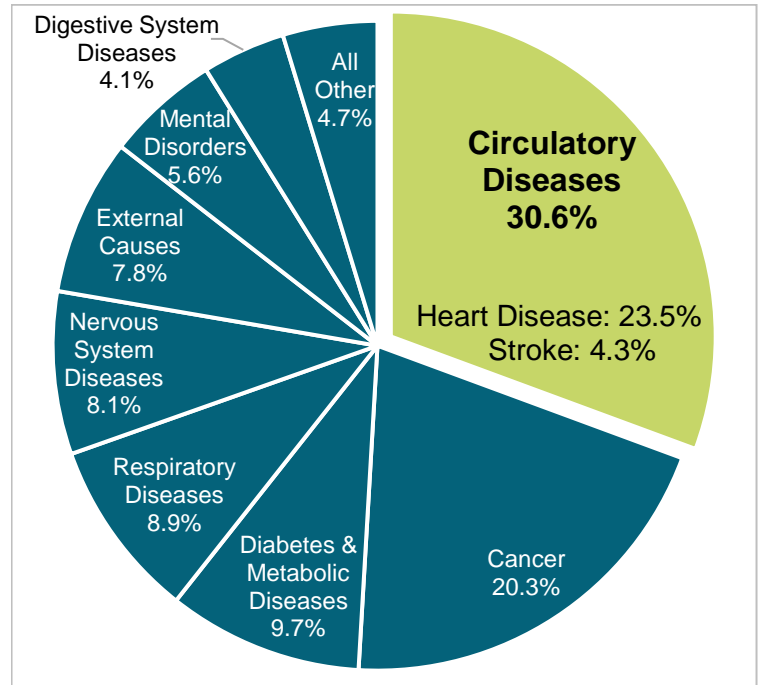
2014 to 2016, before consistently staying above the national average since 2017. The age-adjusted mortality rates due to CAD have been on the decline slightly decreasing from 107.4 per 100,000 in 2014 to 92.6 per 100,000 in 2023. Throughout the decade, Iowa's CAD mortality rates were consistently higher than the national average.

- ▶ Mortality rates for males in Iowa were more than two times the rate for CAD and just under two times the rate for heart disease compared to females. Native Hawaiian or other Pacific Islander individuals had the highest heart disease mortality rates of 298.6 per 100,000 compared with all other racial/ethnic groups in Iowa.

Stroke

- ▶ Stroke was the fifth leading cause of death among Iowa residents in 2023 with 1,388 stroke deaths.
- ▶ Iowa's stroke mortality rate has remained consistently lower than the national average over the last decade. In 2023, the age-adjusted mortality rate due to stroke in Iowa was 318 per 100,000, a slight decrease from 34.0 per 100,000 in 2014.
- ▶ Mortality rates were higher among males and Black or African American individuals in Iowa. The age-adjusted mortality rate for stroke was higher among males (33.1 per 100,000) compared with females (30.2 per 100,000). Black or African American individuals had the highest stroke mortality rate of 55.3 per 100,000 compared with all other racial/ethnic groups in Iowa.

Figure 2: Causes of Death in Iowa, 2023



Prevalence

Heart Disease

- ▶ Heart disease prevalence in Iowa has remained relatively stable over the past decade. In 2023, about 159,000 (6.4%) adults in Iowa or had been told by a health professional that they have had a heart attack or CHD compared to 6.0% in 2015. American Indian\Alaska Native, non-Hispanic adults in Iowa had the highest prevalence of CHD or heart attack among all other racial/ethnic groups analyzed.

Stroke

- ▶ The prevalence of stroke in Iowa has remained relatively stable over the past decade. Approximately 69,500 adults (2.8%) adults in Iowa reported being told by a health professional that they have had a stroke, while 2.7% reported being told by a health professional that they have had a stroke in 2014. In 2023, American Indians/Alaska Native, non-Hispanics adults had the highest prevalence of stroke among all other racial/ethnic groups analyzed

Hospitalization

Heart Disease

- ▶ Heart disease was the leading cause of inpatient hospitalization among Iowa residents. In 2023, there were 26,746 hospitalizations due to heart disease (primary diagnosis) with over \$1.8 billion in total charges. More than 7,400 of those hospitalizations were due to CHD with \$677 million in total charges. Males (25.3 per 10,000) had nearly two times the rate of CHD compared to females (12.2 per 10,000) and had higher rates for heart disease (79.7 per 10,000 and 53.0 per 10,000 respectively).
- ▶ The majority of health care costs associated with cardiac events were primarily covered by government funds (Medicare, Medicaid, and other government programs), accounting for nearly 70% of the charges related to CHD and 80% of charges related to heart disease.

Stroke

- ▶ Stroke hospitalizations were longer but less frequent than heart disease hospitalizations. In 2023, there were 7,236 hospitalizations due to stroke (primary diagnosis) with total charges of more than \$443 million. The overall age-adjusted stroke hospitalization rate was 17.9 per 10,000. Males had a higher rate of 19.8 per 10,000 compared to females with a rate of 16.2 per 10,000.
- ▶ More than 80% of the health care costs related to strokes were primarily covered by government funds.

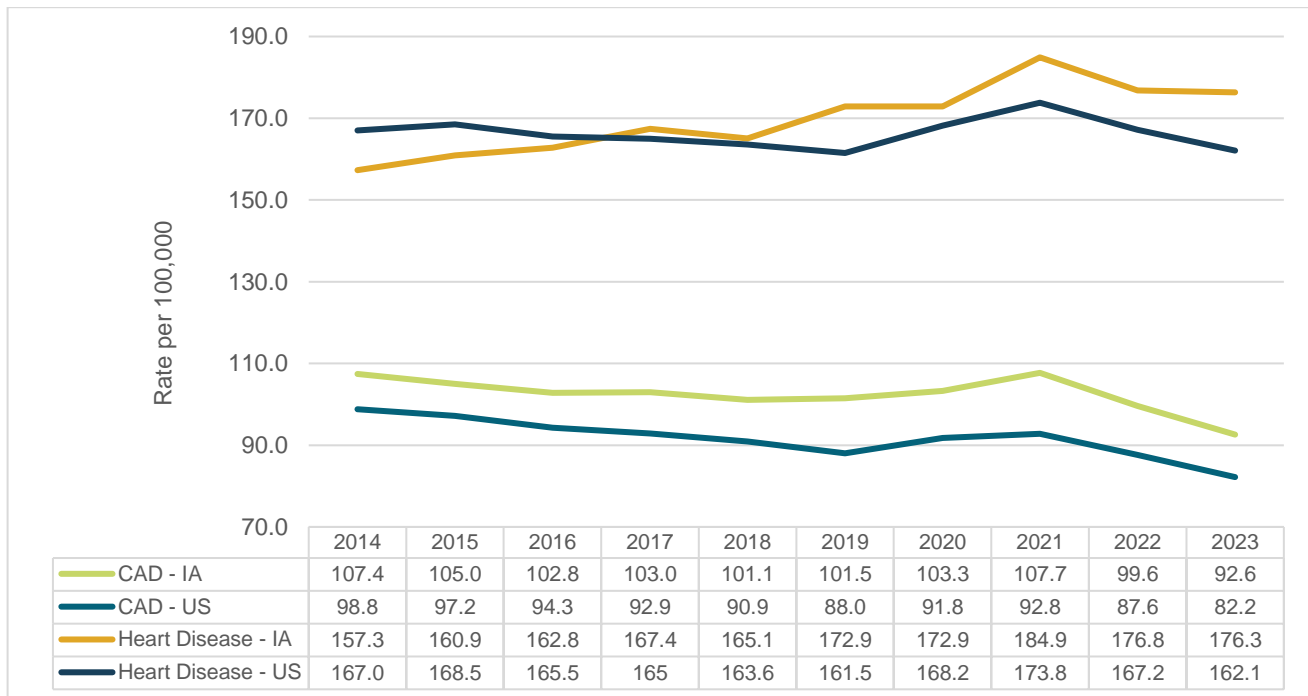
Mortality

This section examines the mortality, or death rates, from heart disease and stroke in Iowa over the last decade, 2014 through 2023. Mortality data in the U.S. are regularly collected and made available through the CDC WONDER (Wide-ranging Online Data for Epidemiologic Research) database, a comprehensive resource maintained by the Centers for Disease Control and Prevention (CDC). The database provides access to mortality data on a national, state, and local level, covering a range of causes of death, including heart disease, cancer, stroke, and unintentional injuries. In the CDC WONDER system, race and ethnicity are treated as separate data points, which allows for more granular and specific analyses. Race is categorized based on physical characteristics such as skin color or facial features, but it is also shaped by social and historical contexts. Ethnicity is treated separately and focuses on cultural factors, particularly whether a person has a heritage from a Spanish-speaking country or region.

Heart Disease

As the leading cause of death in Iowa, heart disease caused 7,644 deaths in 2023, accounting for 23.5% of total deaths, while CAD caused 4,023 deaths, accounting for 52.6% of the state's heart disease related deaths [7]. In 2023, the overall age-adjusted mortality rate due to heart disease in Iowa was 176.3 per 100,000 people (Figure 3), a 12.1% increase from 157.3 in 2014. The mortality rate due to CAD decreased 13.8% from 107.4 per 100,000 in 2014 to 92.6 per 100,000 in 2023 (Figure 3) [7]. Throughout the decade, Iowa's CAD mortality rate was higher than the national average.

Figure 3: Age-adjusted CAD and Heart Disease Mortality Rates, Iowa vs. U.S., 2014-2023



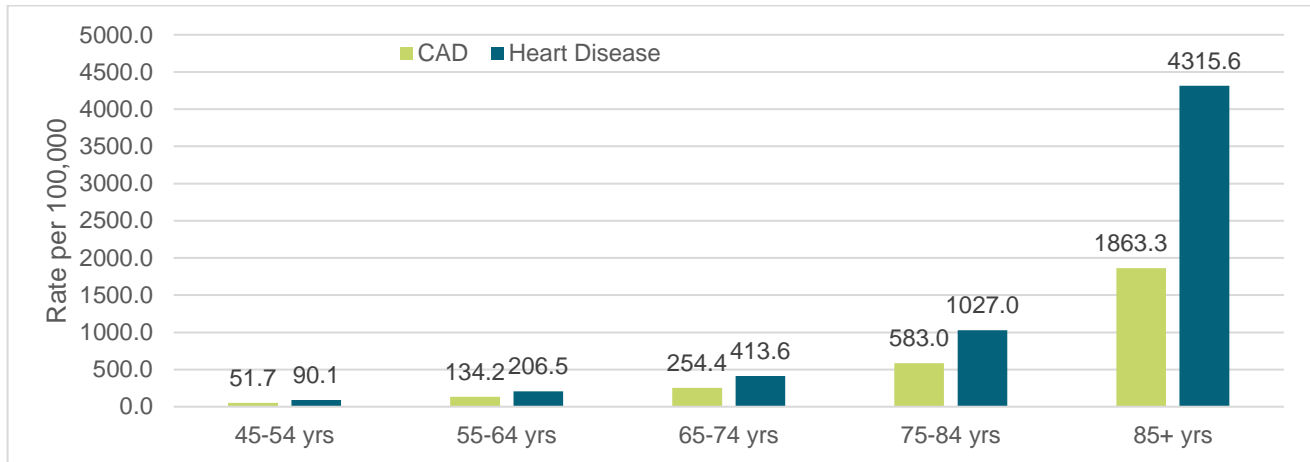
Source: CDC WONDER

Age, Sex, Race/Ethnicity, and Geographic Variations

Mortality rates differ among segments of the population. The death rate increases as age increases for both heart disease and CAD, with the highest rates occurring in individuals in Iowa 85 years and older (Figure 4). In 2023, CAD was the cause of death for 1,332 adults in

Iowa over the age of 85, while 3,085 adults in Iowa 85 years and older died due to heart disease. In comparison CAD was the cause of death for 187 adults in Iowa ages 45-54, while 326 adults in Iowa ages 45-54 died due to heart disease [7].

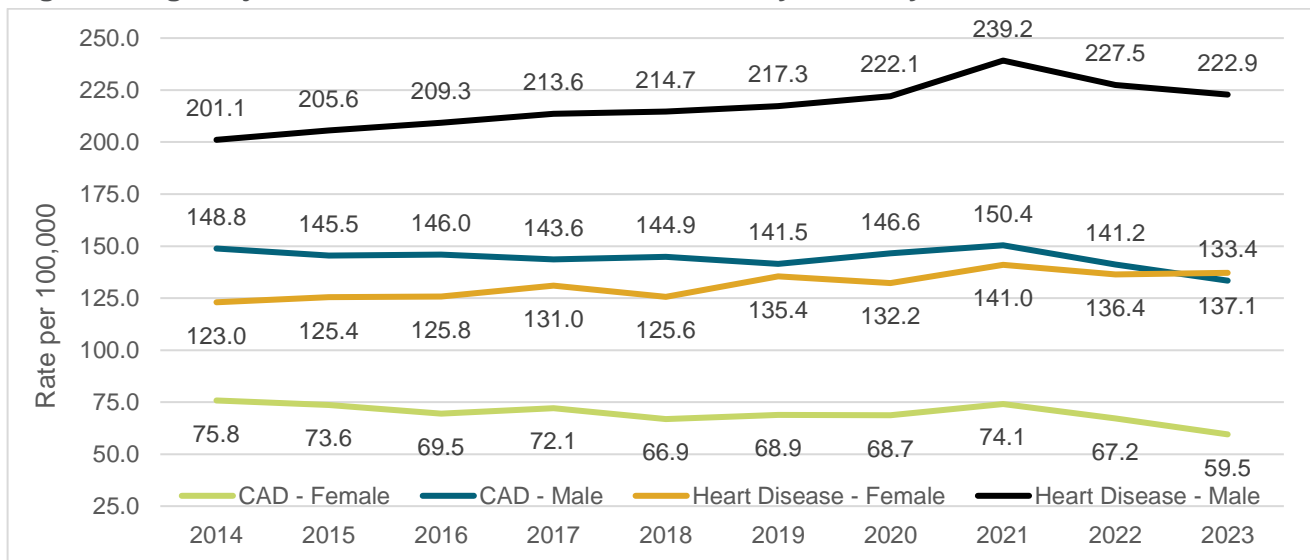
Figure 4: CAD and Heart Disease Mortality Rates by Age in Iowa, 2023



Source: CDC WONDER

The age-adjusted mortality rates for CAD and heart disease were both higher among males compared with females throughout the decade (Figure 5) [7]. CAD rates for males (133.4 per 100,000) are more than two times higher than female CAD rates (59.5 per 100,000).

Figure 5: Age-adjusted CAD and Heart Disease Mortality Rates by Sex in Iowa, 2014-2023

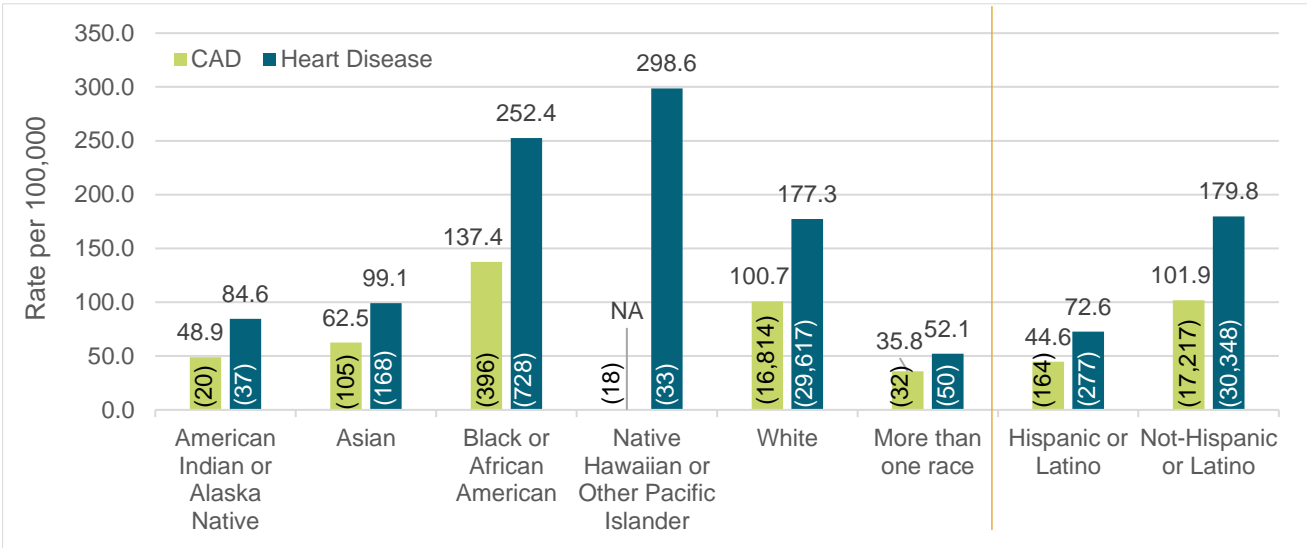


Source: CDC WONDER

There were variations in age-adjusted mortality rates based on race and ethnicity for both CAD and heart disease. People who identified as Black or African American had the highest rate (137.4 per 100,000) of CAD followed by White (100.7 per 100,000) and Asian individuals (62.5 per 100,000). People who identified as Native Hawaiian or other Pacific Islander had the highest rate (298.6 per 100,000) of heart disease followed by Black or African American (252.4 per 100,000) and then White (177.3 per 100,000) (Figure 6) [7].¹

¹ The rates for people who identified as Native Hawaiian or other Pacific Islander were suppressed for data confidentiality.

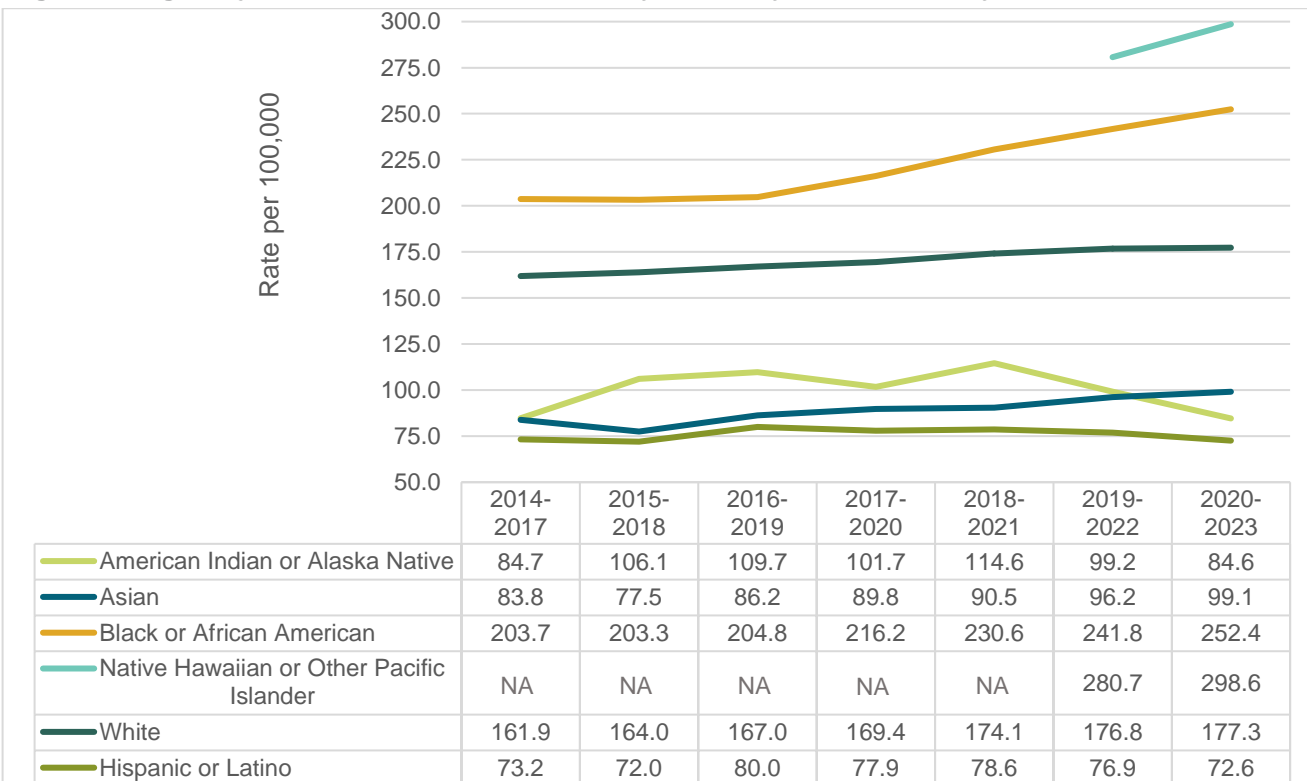
Figure 6: Age-adjusted CAD and Heart Disease Mortality Rates and Counts (in parenthesis) by Race/Ethnicity in Iowa, 2020-2023



Source: CDC WONDER

All races and ethnicities have seen an increase in the past decade of heart disease mortality rates. Black or African American individuals not only have the one of the highest overall rates but have seen the highest increase (23.9%) starting at 203.7 per 100,000 in 2014-2017 and currently at 252.4 per 100,000 (Figure 7).

Figure 7: Age-adjusted Heart Disease Mortality Rates by Race/Ethnicity in Iowa, 2014-2023²

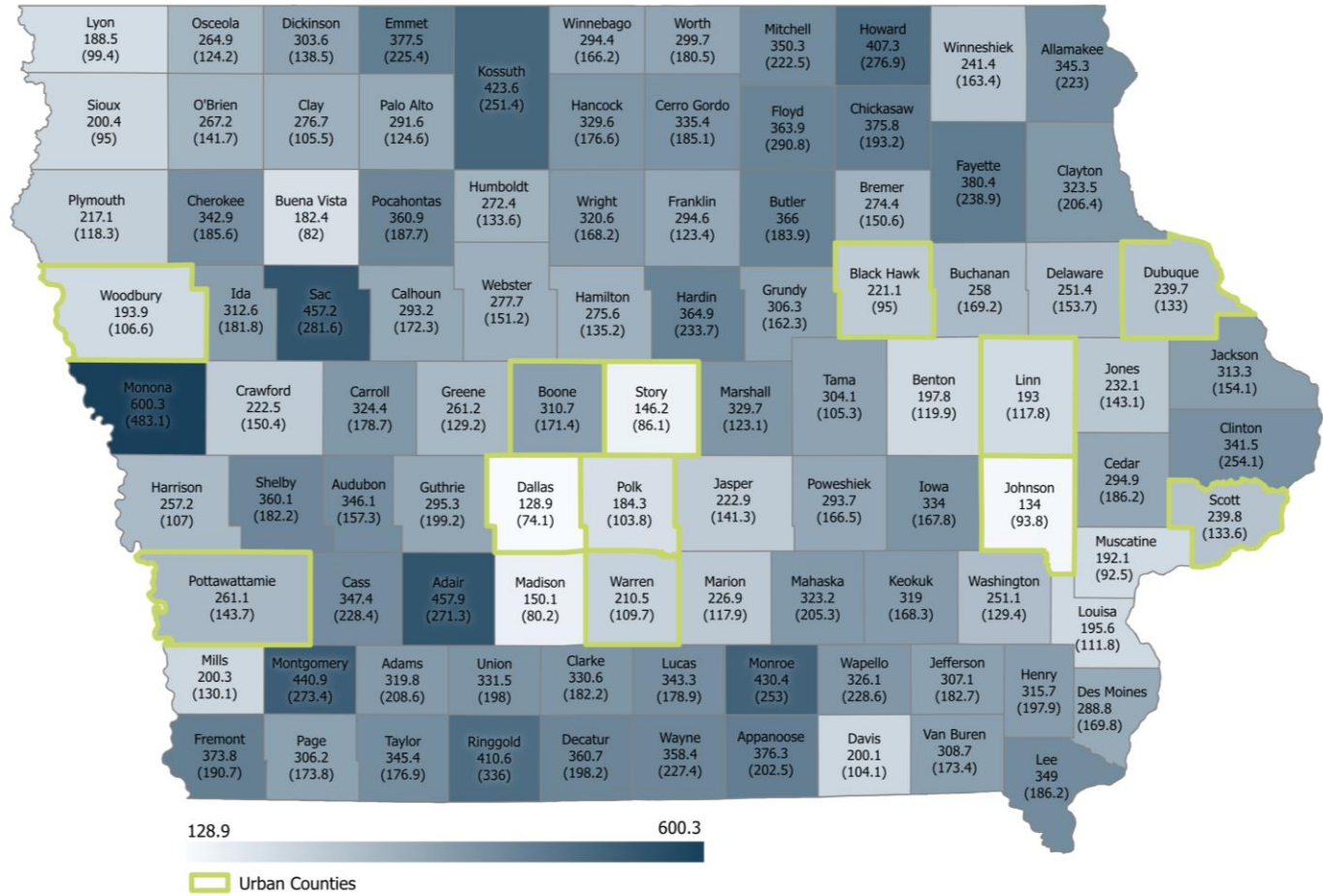


Source: CDC WONDER

² Native Hawaiian or Other Pacific Islander race data were not reported until 2018, 2018-2021 data was unreliable due to death counts fewer than 20.

Mortality rates for heart disease and CAD were also different across geographic locations across the state. Crude mortality rates for heart disease and CAD were reported higher in rural counties compared to urban counties [7]. Monona County, in western Iowa, had the highest rates for both CAD (483.1 per 100,000) and heart disease (600.3 per 100,000), while Dallas County, a county within the Des Moines metropolitan area, had the lowest rates for both CAD (74.1 per 100,000) and heart disease (128.9 per 100,000) (Figure 8).

Figure 8: Crude Mortality Rates for CAD (in parenthesis) and Heart Disease in Iowa, 2020-2023

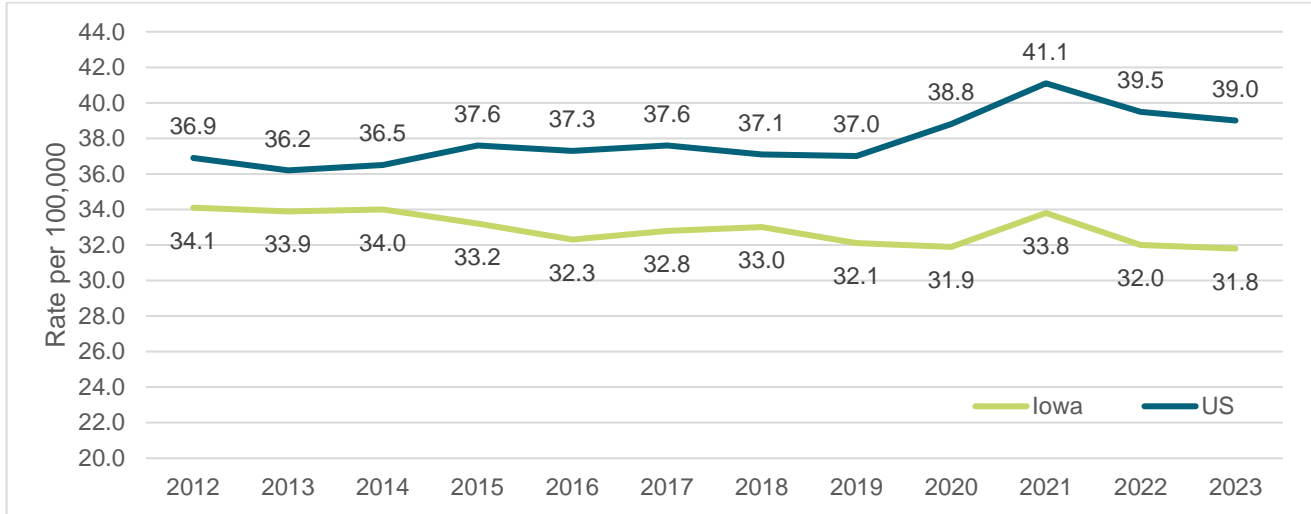


Source: CDC WONDER, USDA

Stroke

Stroke was the fifth leading cause of death in Iowa in 2023, with 1,388 deaths caused by stroke, accounting for 4.3% of the total deaths in the state [7]. The overall age-adjusted stroke mortality rate in 2023 was 31.8 per 100,000 people (Figure 9), a slight decrease from 34.0 per 100,000 in 2014. The stroke mortality rates have remained lower in Iowa than the national average [7].

Figure 9: Age-adjusted Stroke Mortality Rates, Iowa vs. U.S., 2014-2023

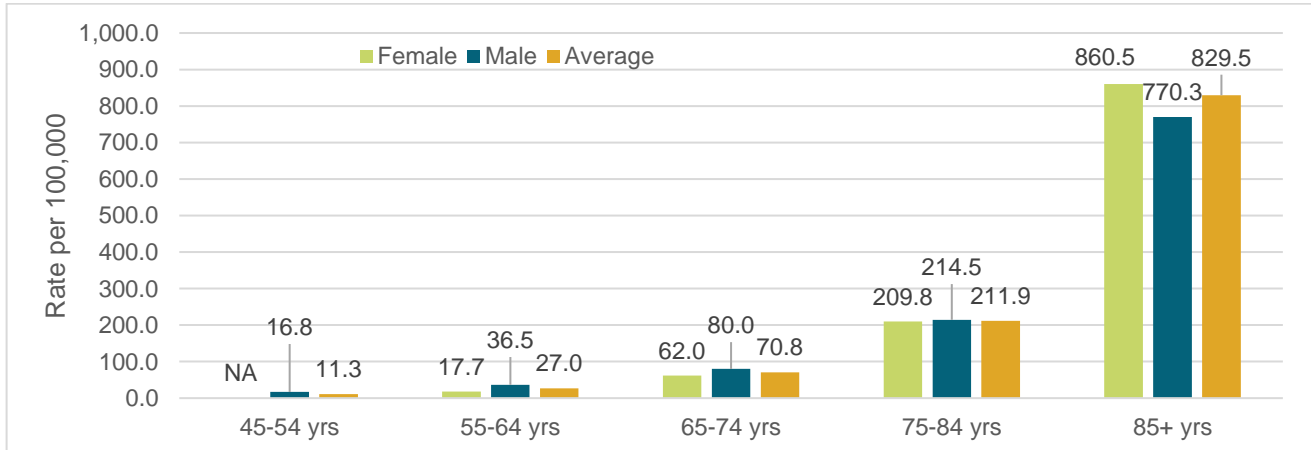


Source: CDC WONDER

Age, Sex, Race/Ethnicity, and Geographic Variations

Similar to heart disease, stroke mortality rates increased with age. Most deaths caused by stroke in 2023 were among both men and women ages 75 years and older in Iowa (Figure 10) [7].

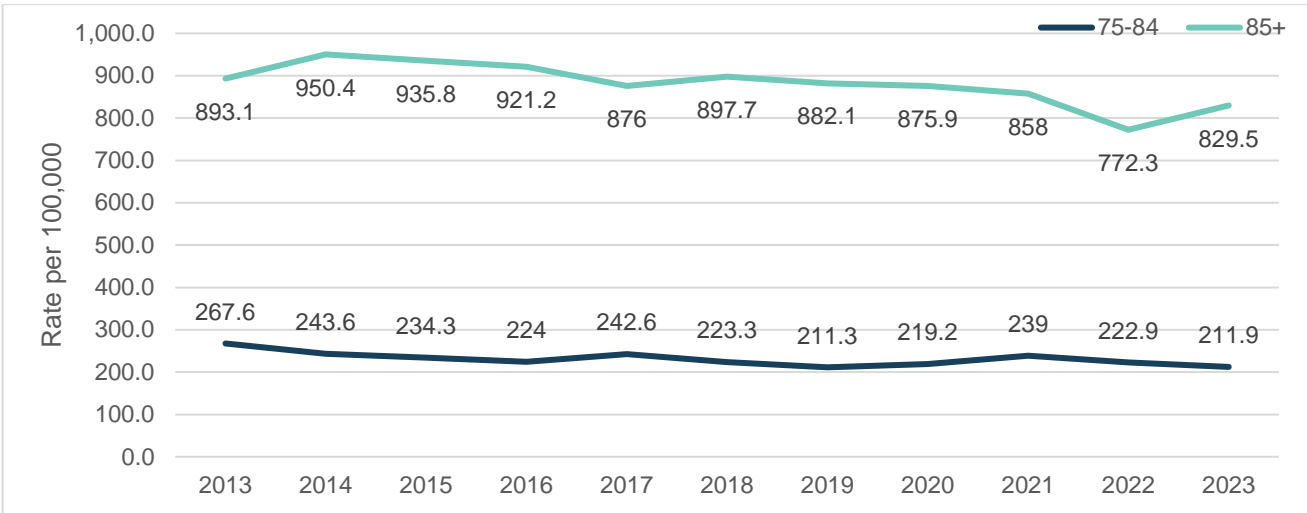
Figure 10: Stroke Mortality Rates by Age in Iowa, 2023



Source: CDC WONDER

Stroke death rates in older adults have been decreasing over the past decade. For adults over the age of 85, a 12.7% decrease in stroke death rates was seen over the past decade. For adults ages 75 to 84, the stroke rate was 243.6 per 100,000 in 2014 and decreased to 211.9 per 100,000 in 2023. For adults 85 years and older, the stroke rate was the highest at 950.4 per 100,000 in 2014 and has declined to 829.5 per 100,000 in 2023 (Figure 11) [7].

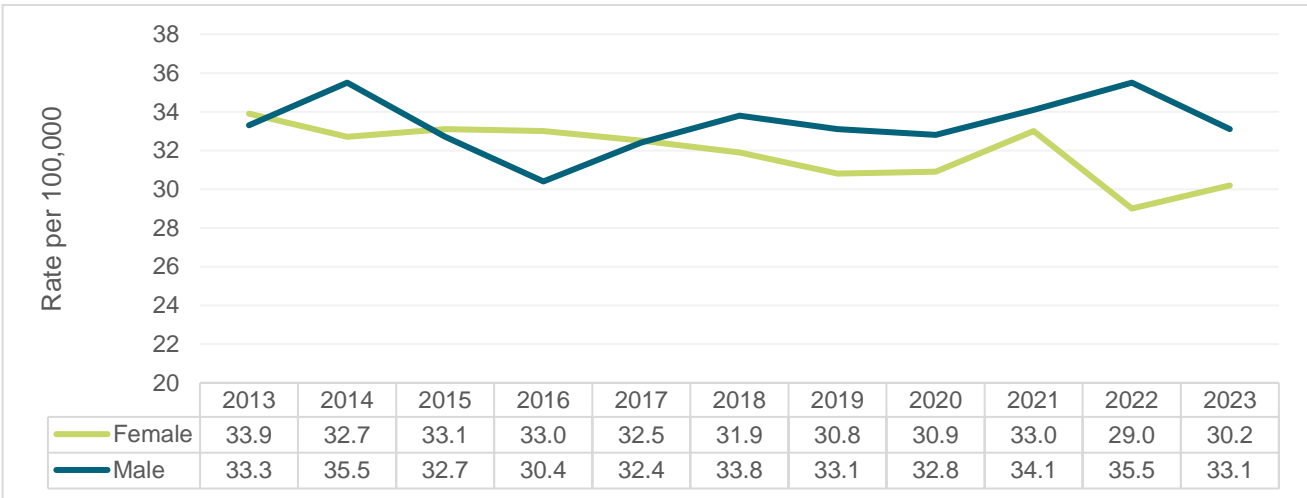
Figure 11: Stroke Mortality Rates by Age in Iowa, 2014-2023



Source: CDC WONDER

Over the past decade, males in Iowa have had higher age-adjusted rates of stroke for a majority of the time compared to females (Figure 12) [7].

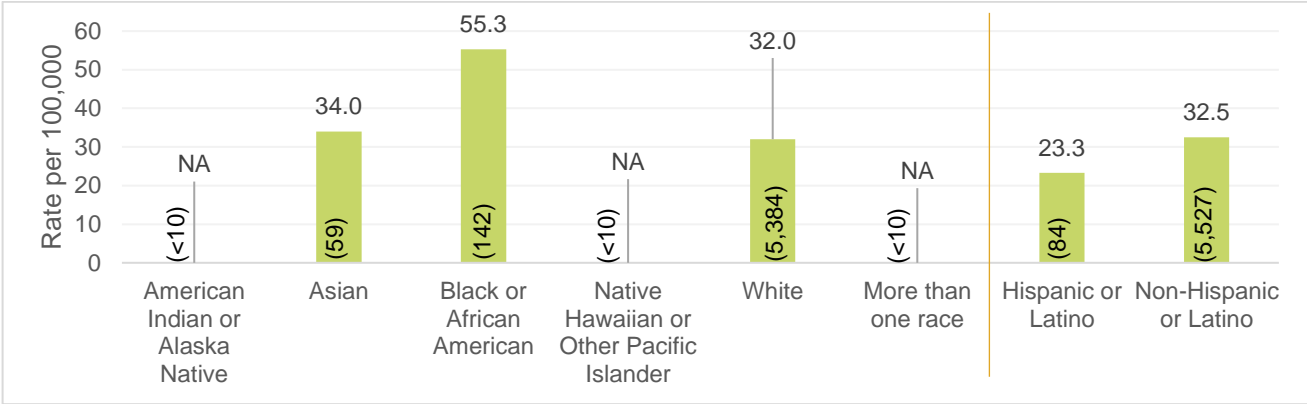
Figure 12: Age-adjusted Stroke Mortality Rate by Sex in Iowa, 2014-2023



Source: CDC WONDER

Black or African American adults in Iowa had the highest stroke mortality rate of 55.3 per 100,000, followed by Asian (34.0 per 100,000), White (32.0 per 100,000), and Hispanic adults in Iowa (23.3 per 100,000) (Figure 13) [7].

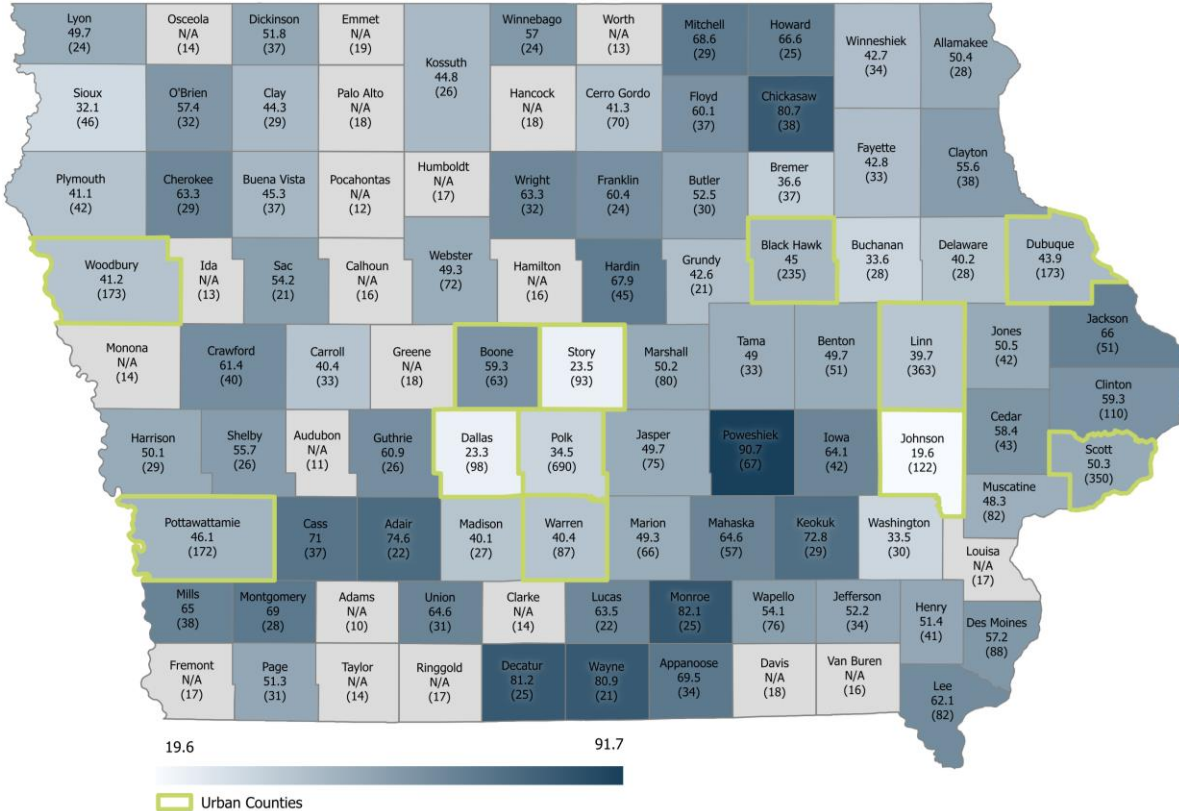
Figure 13: Age-adjusted Stroke Mortality Rates and Counts (in parenthesis) by Race/Ethnicity in Iowa, 2020-2023



Source: CDC WONDER

General trends show that Iowa rural counties had higher mortality rates from stroke compared to counties with higher populations (Figure 14). The top five counties with the highest mortality rates for stroke were all rural counties and included Poweshiek County (90.7 per 100,000), Monroe County (82.1 per 100,000), Decatur County (81.2 per 100,000), Wayne County (80.9 per 100,000), and Chickasaw County (80.7 per 100,000). Johnson County (19.6 per 100,000), Dallas County (23.3 per 100,000), Story County (23.5 per 100,000), Sioux County (32.1 per 100,000), and Washington County (33.5 per 100,000) had the lowest mortality rates for stroke which are all urban with the exception of Washington County [7].

Figure 14: Crude Mortality Rates and Counts (in parenthesis) for Stroke, 2020-2023³



Source: CDC WONDER, USDA

³ Many counties with smaller populations had unreliable mortality rates due to death counts is fewer than 20.

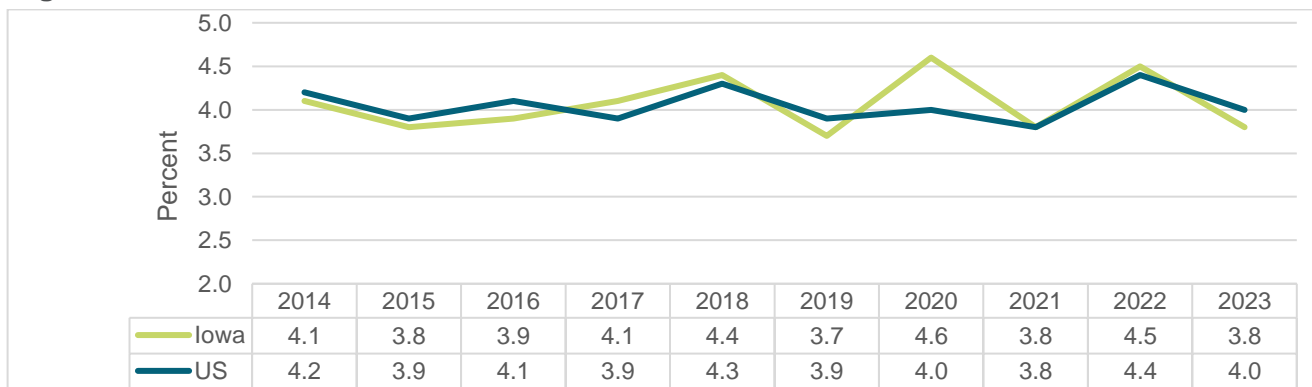
Prevalence

This section examines the prevalence, or proportion of a population with a specific characteristic in a given time period, of heart disease and stroke in Iowa from 2014 to 2023. Prevalence data in the U.S. is regularly collected and made available through the CDC Behavioral Risk Factor Surveillance System (BRFSS) database. BRFSS is the largest national health survey system collecting state data about health-related risk behaviors, chronic health conditions, and use of preventive services. In contrast to CDC WONDER data, BRFSS combines race and ethnicity data (e.g. Hispanic/Latino, Non-Hispanic Black) which are often presented together to analyze health behaviors within broader racial and ethnic categories.

Heart Disease

Approximately 159,000 (6.4%) of adults in Iowa have been told by a healthcare professional they have CHD or had a heart attack in 2023 [8]. The prevalence of CHD among adults in Iowa remained relatively stable over the last decade (Figure 15); 4.1% in 2014, 3.8% in 2023, although rates reached a high of 4.6% in 2020 [8].

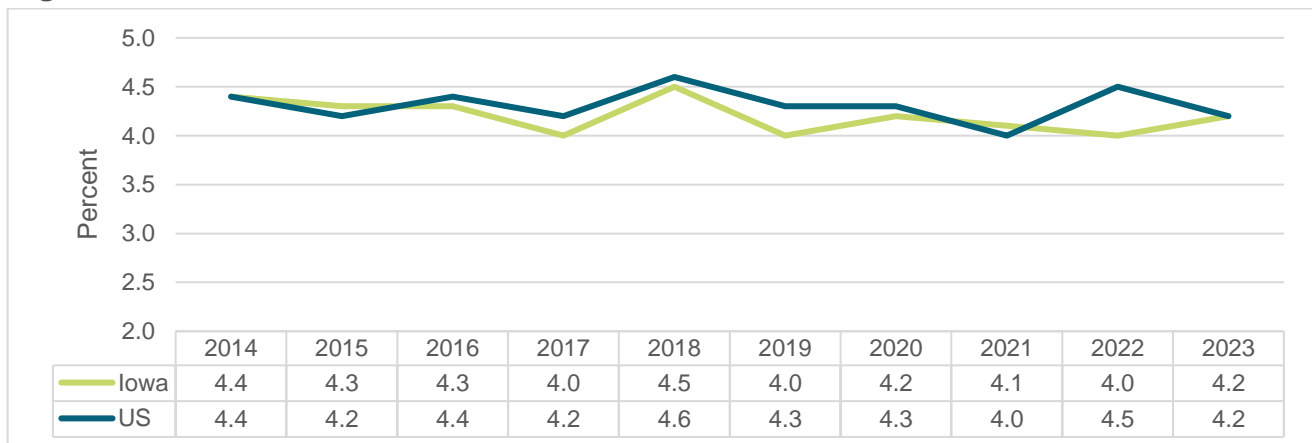
Figure 15: Prevalence of CHD, Iowa vs. U.S., 2014-2023



Source: BRFSS

The prevalence of heart attack also remained relatively stable: 4.4% in 2014, 4.2% in 2023 (Figure 16). Throughout the decade, heart attack rates in Iowa remained relatively consistent with national rates, except for 2019 and 2022 where Iowa was 0.3% and 0.5% respectively lower than the national rate [8].

Figure 16: Prevalence of Heart Attack, Iowa vs. U.S., 2014-2023

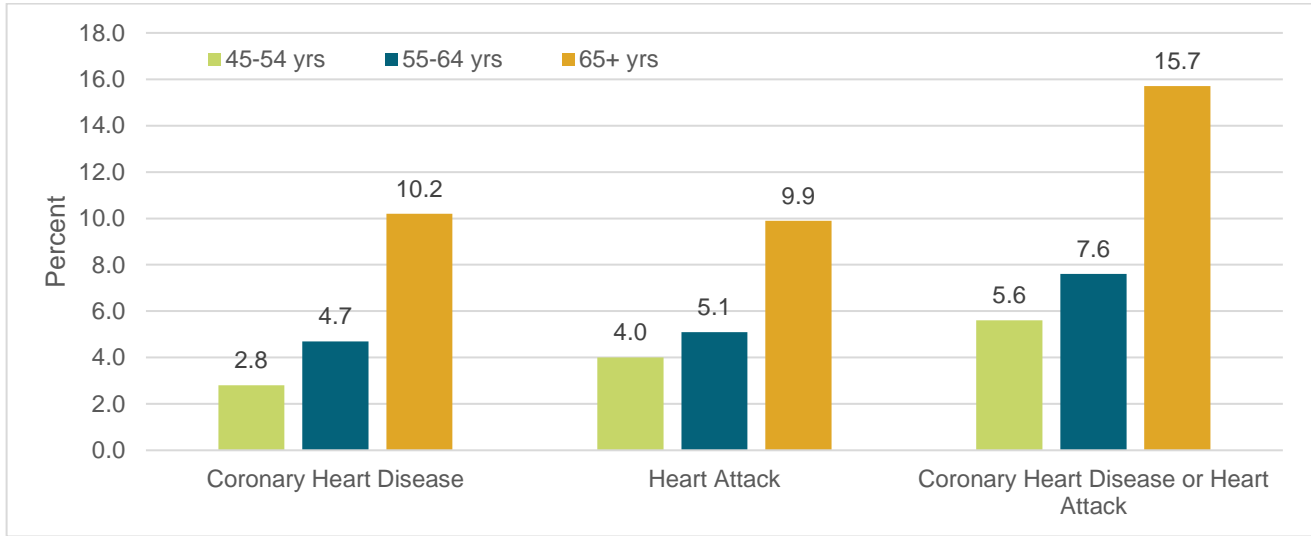


Source: BRFSS

Age, Sex, and Race/Ethnicity Variations

Like mortality, differences in CHD and heart disease prevalence also exist by age, sex, race and ethnicity, and geographic areas. CHD prevalence increases after 45 years of age in both men and women. The lifetime risk of developing CHD in men and women after 40 years of age nationally is 49% and 32%, respectively [9]. The prevalence of CHD and heart attacks increases with age. Adults in Iowa 65 years or older had 2-3 times the prevalence rate compared to younger adults to have been told by a health professional that they had CHD or a heart attack (Figure 17) [8].

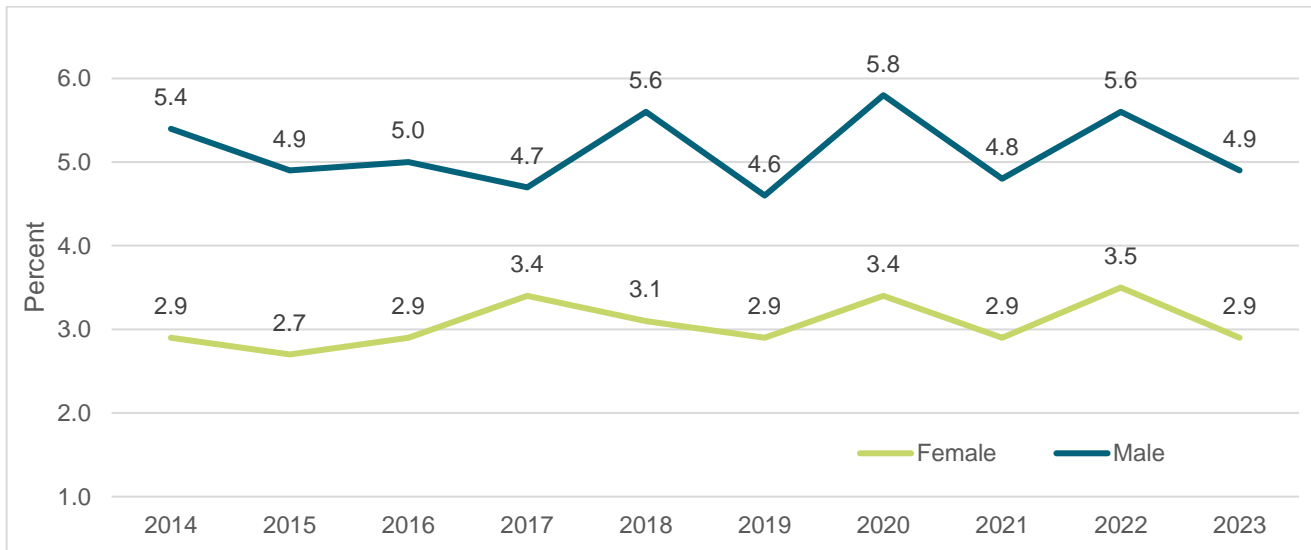
Figure 17. Prevalence of CHD or Heart Attack among Adults in Iowa by Age, 2023



Source: BRFSS

Over the past decade, males in Iowa consistently had higher prevalence rates of having been told by a health professional that they have CHD or had a heart attack compared to females (Figure 18). In 2023, 4.9% of males reported having CHD compared to 2.9% of females [8]. From 2019 to 2023, rates by sex fluctuated in similar patterns.

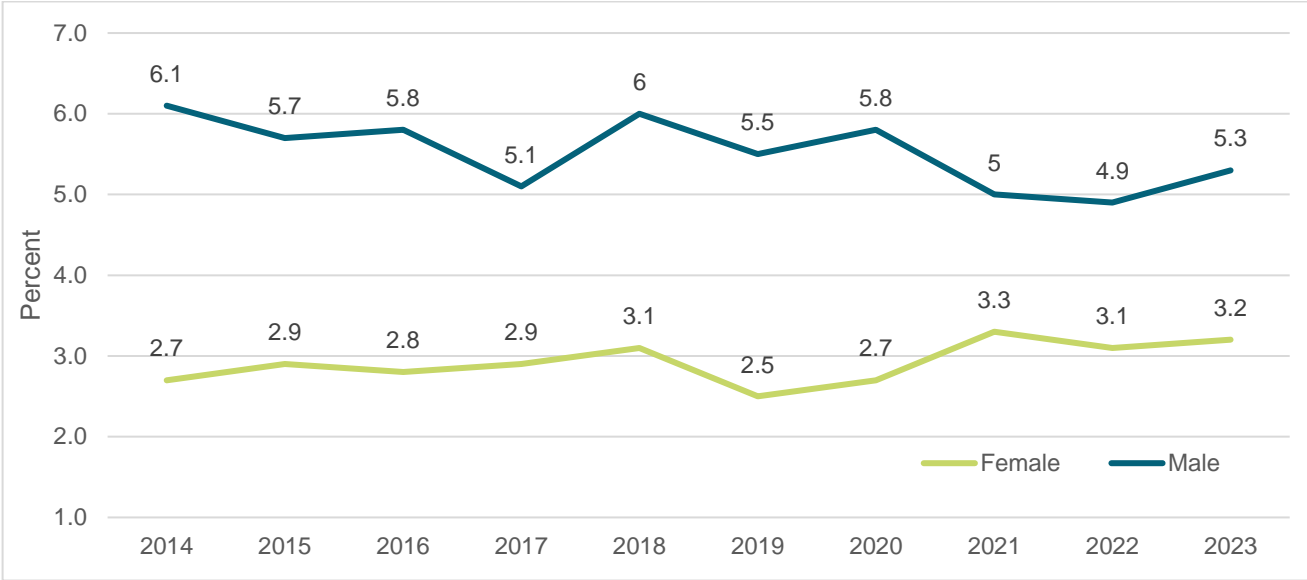
Figure 18: Prevalence of CHD among Adults in Iowa by Sex, 2014-2023



Source: BRFSS

In Iowa, 5.3% of males reported having a heart attack, a decrease from 6.1% in 2014. Conversely, 3.2% of females in 2023 reported having a stroke, an increase from 2.7% in 2014 (Figure 19).

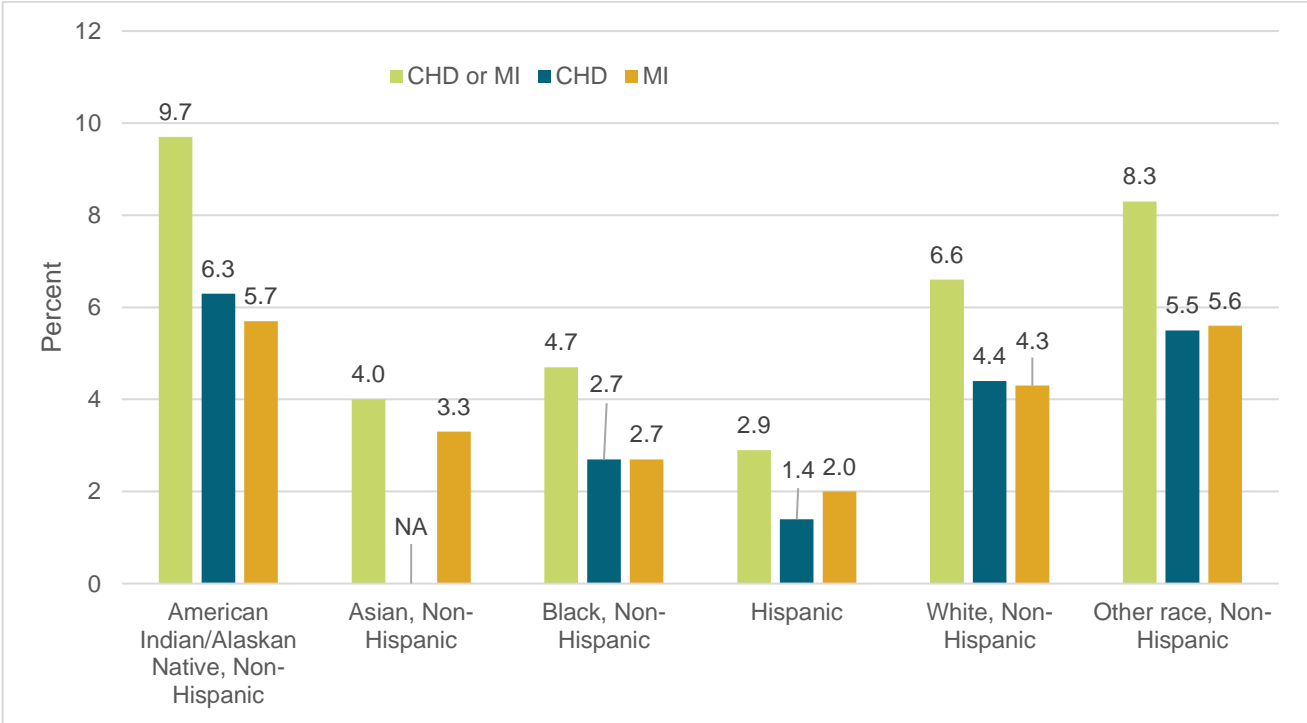
Figure 19: Prevalence of Heart Attack among Adults in Iowa by Sex, 2014-2023



Source: BRFSS

The prevalence of CHD and heart attack varied among racial/ethnic groups in Iowa, with American Indian/Alaskan Native adults having the highest prevalence rate of 9.7%, followed by 8.3% of adults with another race or multiracial, and 6.6% of White adults (Figure 20) [10].

Figure 20: Prevalence of CHD/Heart Attack among Adults in Iowa by Race/Ethnicity 2019-2023

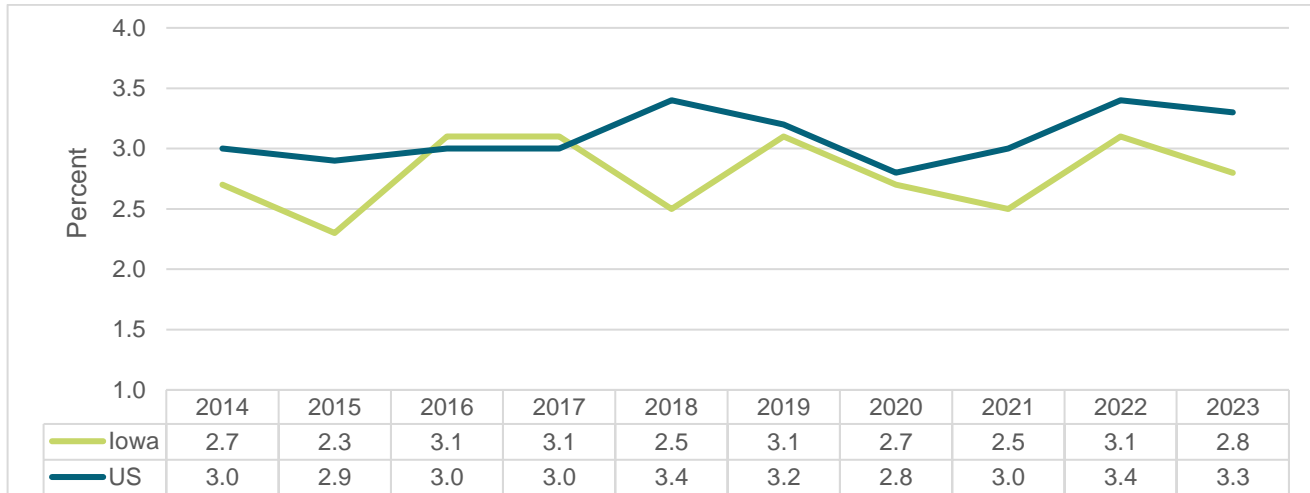


Source: BRFSS

Stroke

In 2023, approximately 69,500 (2.8%) adults in Iowa reported having a stroke [8]. Iowa generally had lower rates, but more variation, over the past decade than the U.S. overall prevalence rates of stroke (Figure 21).

Figure 21: Prevalence of Stroke among Adults, Iowa vs. U.S., 2014-2023

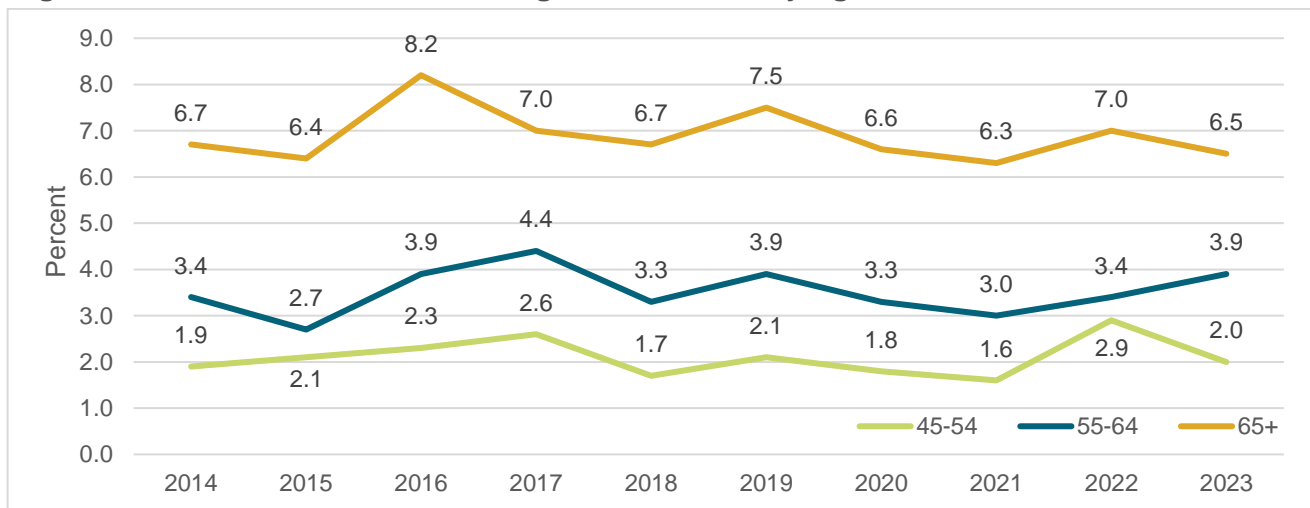


Source: BRFSS

Age, Sex, and Race/Ethnicity Variations

Like mortality, differences in stroke prevalence also exist by age, sex, race and ethnicity, and geographic areas. The prevalence of stroke increases with age, with adults over 65 years of age having the highest rates - more than three times the prevalence rates of 45- to 54-year-olds (Figure 22) [8].

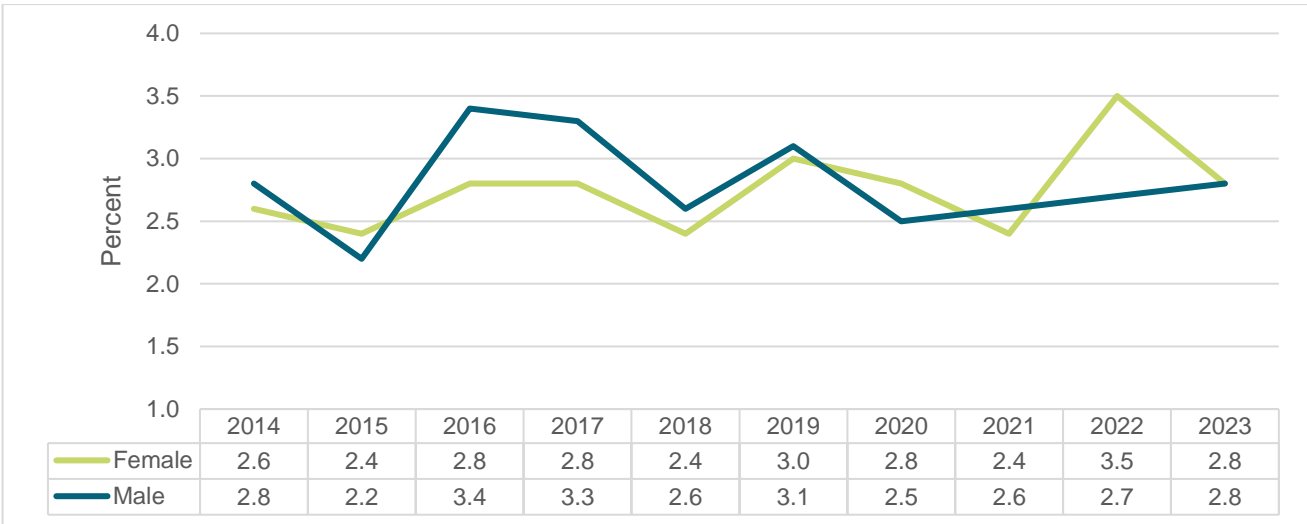
Figure 22. Prevalence of Stroke among Adults in Iowa by Age, 2014-2023



Source: BRFSS

Over the past 10 years, rates of stroke fluctuated for both males and females. Males reported the lowest rate of stroke at 2.2% in 2015 and the highest rate of stroke of 3.4% in 2016. Females reported the lowest rate of stroke at 2.4% in 2015, 2018, and 2021 and the highest rate of stroke of 3.5% in 2022 (Figure 23) [8].

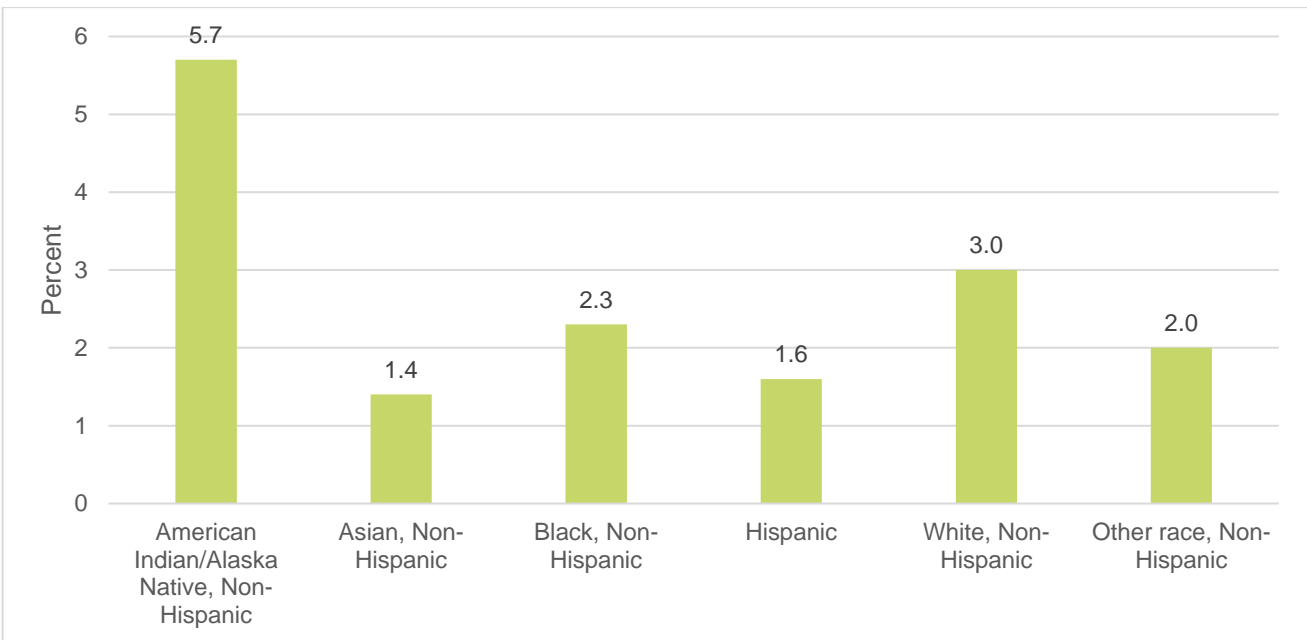
Figure 23: Prevalence of Stroke among Adults in Iowa by Sex, 2014-2023



Source: BRFSS

In Iowa, American Indian or Alaska Native, non-Hispanic adults reported the highest prevalence of stroke (5.7%), followed by White, non-Hispanic adults (3.0%), and Black, non-Hispanic adults (2.3%) (Figure 24) [10]. Asian, non-Hispanic adults had the lowest percentage of stroke at 1.4%.

Figure 24: Prevalence of Stroke among Adults in Iowa, by Race and Ethnicity, 2019-2023



Source: BRFSS

Hospitalizations

This section examines the inpatient hospitalization rates caused by heart disease and stroke complications in Iowa in 2023. Iowa Hospital Discharge Data are collected by the Iowa Hospital Association (IHA) under Iowa HHS authority. The database is maintained pursuant to Iowa Code 135.166 and a memorandum of understanding between Iowa HHS and IHA. Iowa HHS is authorized to release Iowa Hospital Discharge Data information for the purpose of public health surveillance activities.

Heart Disease

Heart disease is the leading cause of inpatient hospitalization among Iowa residents [11]. In 2023, heart disease accounted for 26,746 hospitalizations, about 9.6% of all inpatient hospitalizations [11]. These hospitalizations were associated with days spent in the hospital and substantial hospital charges. In 2023, patients with heart disease listed as the first diagnosis spent an average of five days in the hospital (Table 1) and a combined total of 122,189 days in the hospital. The total charges for heart disease hospitalizations in 2023 was approximately \$1.8 billion with an average charge of approximately \$67,424.

Additionally, there were 7,411 CHD hospitalizations which accounted for 2.7% of all inpatient hospitalizations [11]. The average length of stay for CHD inpatient hospitalization was an average hospital stay of four days for adults in Iowa (Table 1) and a total of 31,047 days in the hospital in 2023. In 2023, the total hospitalization charges for CHD as the primary diagnosis was approximately \$677 million with an average charge of approximately \$91,400.

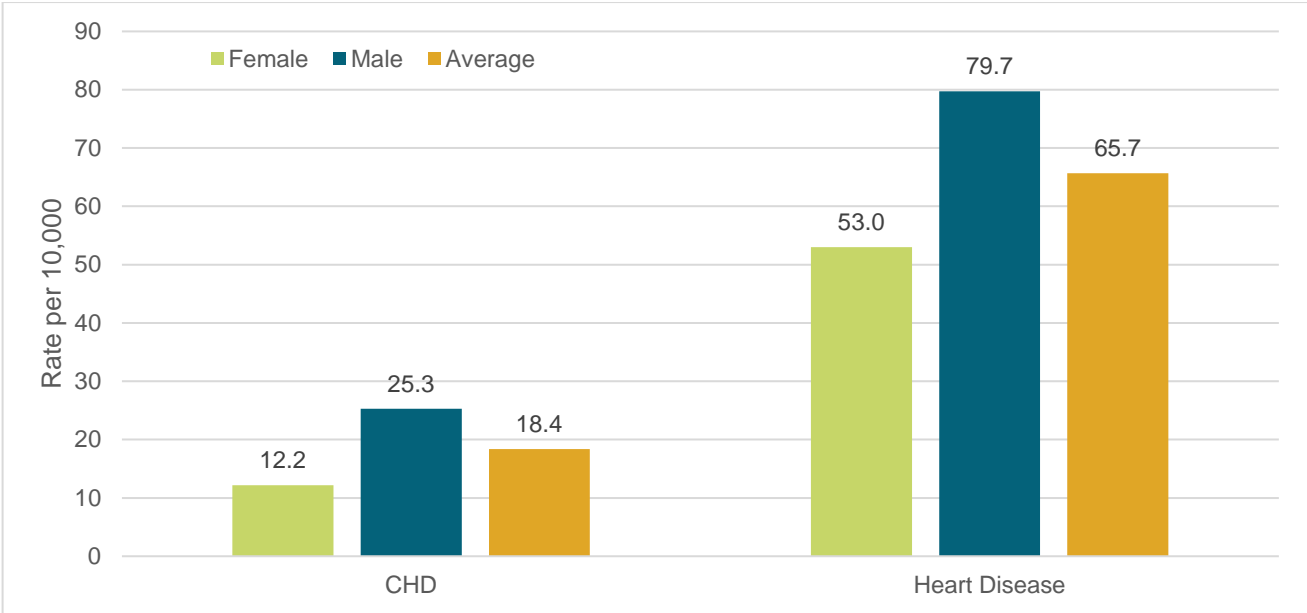
Table 1: Average Hospital Inpatient Charge for Heart Disease and CAD in Iowa, 2023

	Average Length of Stay	Median Length of Stay	Average Charges	Total Charges
Heart Disease	5 days	3 days	\$67,424	\$1,803,331,514
CHD	4 days	3 days	\$91,400	\$677,369,792

Source: Iowa Hospital Discharge Database

The average rate of heart disease hospitalizations for female and male adults in Iowa was 65.7 per 10,000 in 2023. Males had a higher hospital inpatient rate for heart disease of 79.7 per 10,000 compared to 53.0 per 10,000 for females [11]. The overall rate of hospitalization for CHD for adults in Iowa was 18.4 per 10,000 in 2023, and males also had a higher hospital inpatient rate for CHD of 25.3 per 10,000 compared to 12.2 per 10,000 for females (Figure 25) [11].

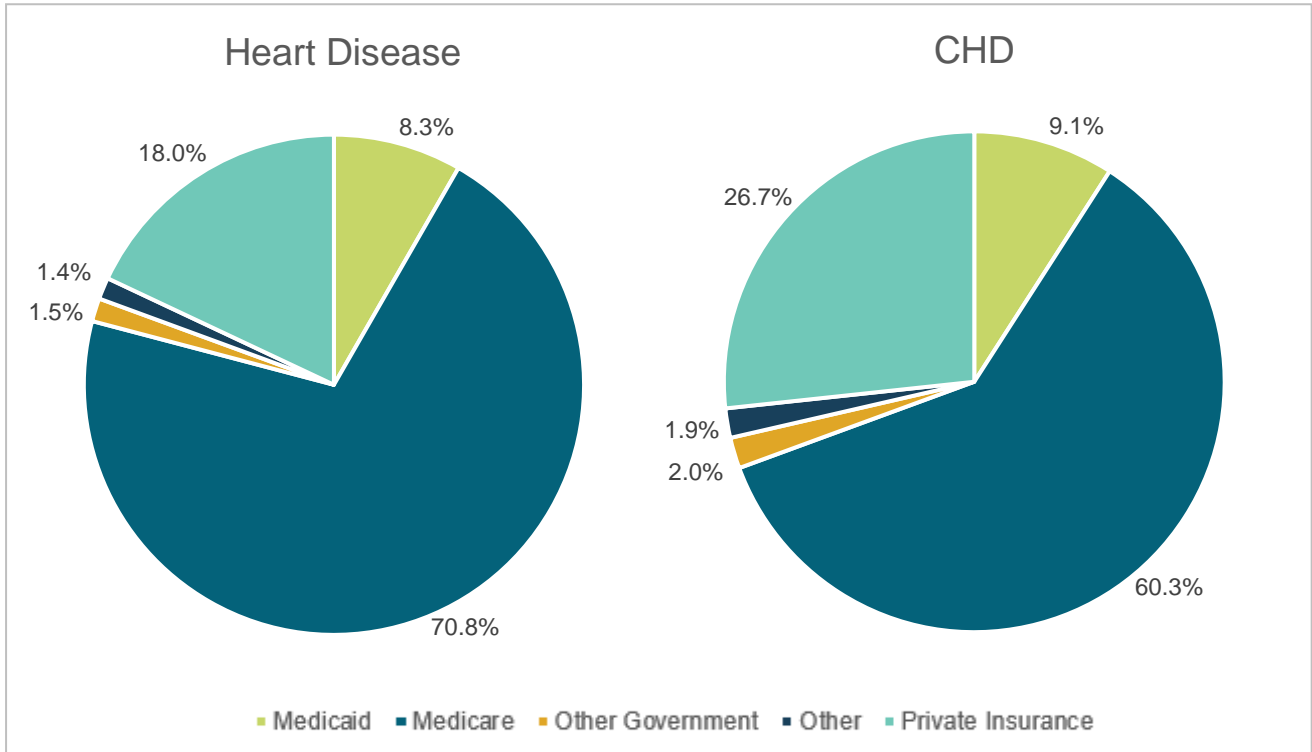
Figure 25. Age-adjusted CHD and Heart Disease Hospital Inpatient Rate in Iowa by Sex, 2023



Source: Iowa Hospital Discharge Data

Eighty percent of the heart disease hospitalizations in 2023 were covered by government funds as the first source of payment [11]. In 2023, approximately 70% of CHD hospitalizations were covered by governmental funds as the first source of payment (Figure 26) [11].

Figure 26: CHD and Heart Disease Inpatient Charges by Principal Source of Payment, 2023

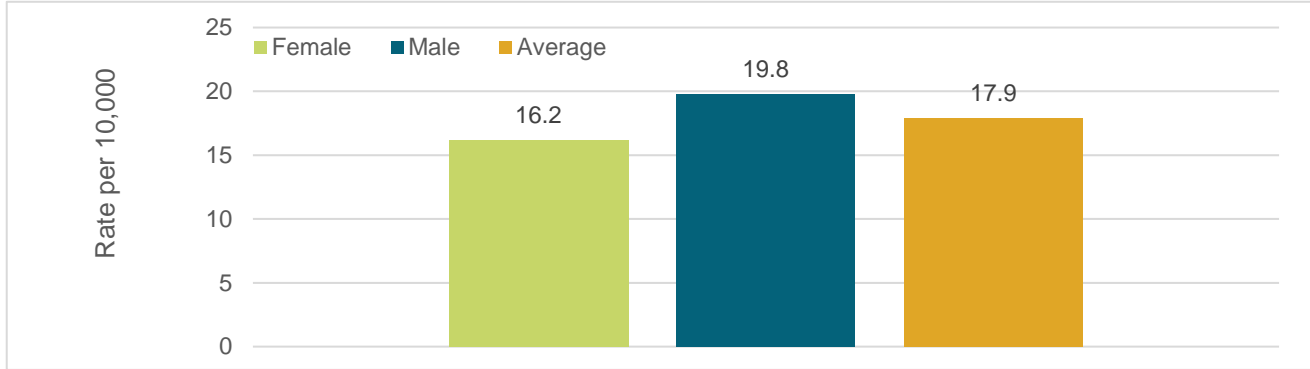


Source: Iowa Hospital Discharge Data

Stroke

In 2023, there were 7,326 stroke hospitalizations (primary diagnosis), which was approximately 2.6% of all hospitalizations across the state [11]. The overall age-adjusted rate of hospitalization was 17.9 per 10,000 people and males had a higher rate of 19.8 per 10,000 people compared to females, 16.2 per 10,000 people (Figure 27).

Figure 27: Age-adjusted Hospital Inpatient Rate for Stroke by Sex in Iowa, 2023



Source: Iowa Hospital Discharge Data

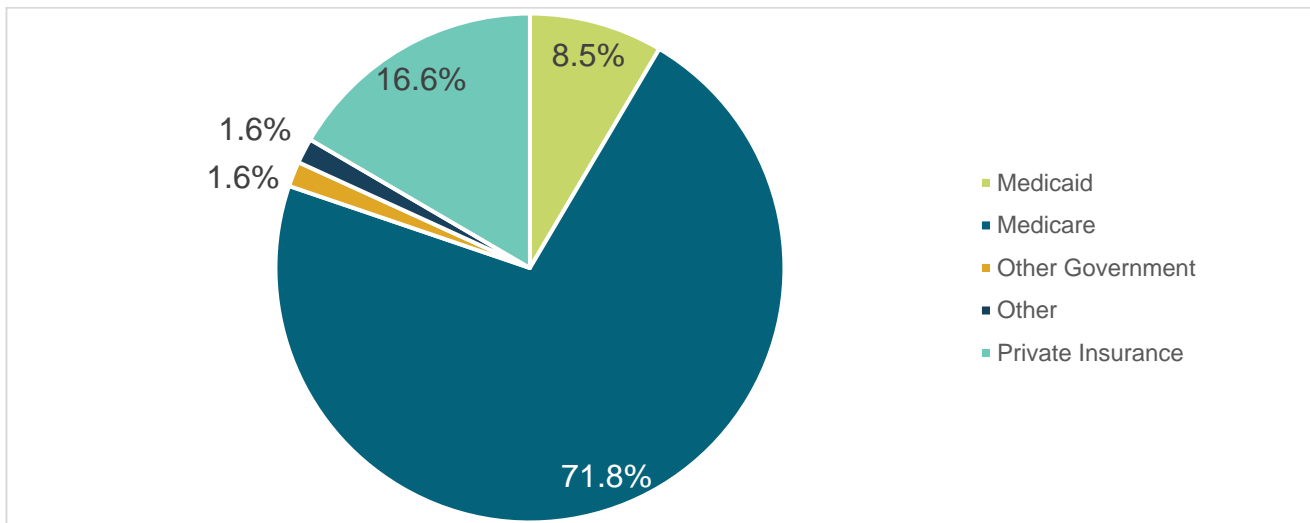
Stroke hospitalizations were associated with many days spent in the hospital and substantial hospital charges. In 2023 the average length of stay was seven days (Table 2) and a combined total of 47,837 days [11]. The total hospital charges were approximately \$443 million (Table 2). More than 80 percent of stroke hospitalization charges were covered by government funds as the first source of payment (Figure 28).

Table 2: Average Hospital Inpatient Charge for Stroke

	Average Length of Stay	Median Length of Stay	Average Charges	Total Charges
Stroke	7 days	3 days	\$60,436	\$442,755,871

Source: Iowa Hospital Discharge Data

Figure 28: Stroke Inpatient Charges by Principal Source of Payment in Iowa, 2023



Source: Iowa Hospital Discharge Data

Risk Factors

Several factors influence the risk of developing heart disease, stroke, or having a heart attack. While some risk factors cannot be controlled, such as age, family history, and genetic predisposition, others can be managed through lifestyle changes. Key controllable risk factors for heart disease and stroke include high blood pressure, high cholesterol, and tobacco use. These factors can be addressed through behavior changes and disease management, but they are also influenced by social determinants of health. Other risk factors, such as diabetes, weight status, physical inactivity, poor diet, and excessive alcohol consumption, may also increase the likelihood of developing heart disease.

High Blood Pressure

According to the CDC, blood pressure readings exceeding 130/80 mmHg are considered high, or hypertension, which may damage the heart, arteries, and other major organs [12]. Uncontrolled blood pressure is a leading cause of heart attack, stroke, and heart failure [13]. In 2023, 34.5% of adults in Iowa reported being told by a healthcare professional that they had high blood pressure, slightly higher than the national rate of 34.0%. Adults aged 65 and older had the highest rate of high blood pressure at 60.2% [8].

High Cholesterol

Cholesterol is a waxy, fat-like substance produced by the liver to aid in various bodily functions, including hormone production and fat digestion [14]. High levels of LDL (low-density lipoprotein) cholesterol can build up in the artery walls limiting blood flow to the heart, brain, and other parts of the body. In 2023, 83.9% of adults in Iowa, compared to the national rate of 87.0%, reported having had their cholesterol checked within the last five years. Of those who were checked, 36.9% were told they had high cholesterol [8]. About half of adults in Iowa 55 years and older reported having high cholesterol with 49.8% among those 55-64, 53.1% among those 65 and older [8].

Tobacco Use

Tobacco users are at an increased risk for heart disease and stroke [15]. Tobacco use contributes to heart disease and stroke by raising triglycerides, lowering good cholesterol (HDL), promoting plaque buildup in blood vessels, and increasing the risk of blood clots [16]. In 2023, 13.7% of adults in Iowa were current cigarette smokers, which is a decrease from 18.5% in 2014 [8].

Diabetes

Diabetes is a chronic condition that impairs the body's ability to convert food into energy, causing blood sugar levels to rise and affecting blood flow [17]. In 2023, 11.3% of adults in Iowa reported being diagnosed with diabetes, which is similar to the national median of 11.5% [8].

Weight Status

According to the CDC, individuals with a weight higher than what is considered healthy for their height are classified as overweight or obese. Unhealthy weight status is often associated with conditions like diabetes, high cholesterol, and high blood pressure [18]. In BRFSS data, weight status is classified according to body mass index or BMI. The classification of overweight includes a BMI range of 25.0 to 29.9, while the classification of

obese includes a BMI range of 30.0 to 99.8. In 2023, 34.3% of adults in Iowa were classified as overweight, and 37.8% were classified as obese, based on self-reported data. Trends in Iowa show more adults are becoming classified as obese compared to overweight with 36.0% of adults classified as overweight and 30.9% classified as obese in 2014. In 2023, Iowa was one of 23 states with an obesity rate exceeding 35% [8].

Physical Activity

Physical activity can lower the risk of high blood pressure, stroke, and obesity [19]. In 2023, 24.1% of adults in Iowa reported no leisure-time physical activity in the past month, which was similar to the national rate of 24.2% [8].

Nutrition

A balanced diet rich in fruits and vegetables can significantly reduce the risk of heart disease and other chronic conditions [1]. The 2020-2025 Dietary Guidelines for Americans recommend that adults consume 1½ to 2½ cups of fruits and 2 to 4 cups of vegetables daily [20]. In 2021, 58.5% of adults in Iowa reported eating at least one fruit per day, and 77% reported eating at least one vegetable per day [8].⁴

Food insecurity - when people don't have enough to eat and don't know where their next meal will come from [21] - in Iowa was 9.8% in 2021-2023, compared to the national average of 12.2% [22] and 8.2% of individuals in Iowa received SNAP benefits in 2023 [22].

Alcohol Consumption

Excessive alcohol consumption can raise blood pressure and increase the risk of heart disease [1]. In 2023, 57.4% of adults in Iowa reported consuming at least one alcoholic drink in the past 30 days. Additionally, one in five adults (20.5%) reported binge drinking in the past month, and 7.2% reported heavy drinking. Binge drinking is defined as males having five or more drinks on one occasion, females having four or more drinks on one occasion, while heavy drinking is defined as adult men having more than 14 drinks per week and adult women having more than seven drinks per week. Iowa ranked second highest for adult binge drinking and ninth highest for heavy drinking in the nation in 2023 [8].

⁴ Fruit and vegetable consumption was not included in the 2023 BRFSS questionnaire.

Conclusion

Heart disease, stroke, and their risk factors impose a great burden on Iowa. There were over 9,000 deaths from heart disease and stroke combined in 2023, and tens of thousands of people living at high risk for developing cardiovascular diseases in the state. While there are many opportunities to intervene for improved heart health, structural systems and social determinants of health have created larger challenges to overcome disease burden.

Evidence-based prevention and control strategies are being implemented and refined across Iowa to prevent heart disease, manage chronic conditions, and control risk factors. Reducing the burden of cardiovascular diseases and improving heart health requires collaboration across multiple sectors. Iowa HHS works closely with national organizations, local health departments, healthcare systems, community-based organizations, and individuals to implement evidence-based strategies to prevent, manage, and delay cardiovascular diseases and their risk factors.

Implications

The data presented in this report highlight the significant burden that heart disease, stroke, and their risk factors place on Iowans. Heart disease remains the leading cause of death in Iowa, accounting for nearly a quarter of all deaths, and has recently surpassed the national average. Stroke is also a major concern, ranking as the fifth leading cause of death in the state. However, there are substantial opportunities to improve heart health across Iowa.

A large portion of Iowa's adult population is at risk of developing heart disease or having a stroke due to controllable risk factors. Over one third of adults in Iowa report having high blood pressure, with nearly two-thirds of adults aged 65 and older being affected by hypertension. More than one-third of adults have high cholesterol, and over half of those aged 65 and older report high cholesterol levels. Additionally, nearly 14% of adults in Iowa currently smoke. Addressing these risk factors through targeted interventions can help reduce the incidence of cardiovascular diseases and improve overall heart health in the state.

The report shows that disease and death disproportionately affect communities facing significant social and structural challenges. Disparities based on age, sex, race/ethnicity, and geography are evident throughout the data, emphasizing the need for focused efforts to address these inequalities and improve health outcomes for all Iowans.

Black or African American adults in Iowa experience some of the highest mortality rates from CAD (137.4 per 100,000), heart disease (252.4 per 100,000), and stroke (55.3 per 100,000), despite making up only 5.5% of the state's population [7, 23, 23]. American Indian/Alaska Native adults in Iowa report the highest prevalence rates for CHD (6.3%), heart attack (5.7%), and stroke (5.7%), though that population represents just 1.9% of Iowa's total population [10, 23]. Cardiovascular diseases disproportionately impact minority racial and ethnic communities, which often face higher levels of discrimination and stress, compounded by social determinants of health.

Rural counties in Iowa have higher mortality rates from cardiovascular diseases compared to urban counties. Smaller populations in rural areas typically face limited access to healthcare providers and services, often requiring residents to travel long distances to receive care. These areas may also have fewer community-based resources, limited access to broadband internet, and unreliable cellular service. Additionally, grocery stores and fresh produce may

be scarce, and local convenience stores may not offer healthy food options. These challenges hinder residents' ability to access healthy foods, engage in physical activity, and seek healthcare. These regional disparities are influenced by factors such as limited healthcare access, socioeconomic status, and lifestyle behaviors, all of which vary across different communities.

Approximately 80% of hospital costs related to heart disease, 71% of coronary artery disease (CAD) hospitalization charges, and over 81% of inpatient stroke charges are covered by government-funded programs. These programs primarily serve low-income individuals, people with disabilities, older adults, and other vulnerable populations. Recipients of these programs often face numerous barriers not only in accessing healthcare but also in navigating broader societal challenges.

To improve heart health, reduce health care costs, and narrow health disparities, a multifaceted approach is needed. Focusing on controlling hypertension, managing cholesterol, and promoting tobacco cessation are all key factors that align with goals from national strategies. Addressing these risk factors is critical to reduce heart disease and stroke in the state. Given the disproportionate impact of cardiovascular diseases on certain populations, particularly racial/ethnic minorities and those in rural areas, targeted interventions are essential to reduce health disparities. Expanding access to healthcare, improving lifestyle choices, and addressing social determinants of health, can help to make progress toward reducing the incidence of cardiovascular disease and improving heart health in Iowa. Through collaborative efforts and continued focus on these high-priority risk factors, we have the opportunity to improve health outcomes and reduce the financial burden of cardiovascular disease for vulnerable populations.

Prevention and Control Strategies

Million Hearts® Iowa Initiative

Million Hearts® is a national initiative to prevent one million heart attacks and strokes every five years. Its focus is on implementing a small set of evidence-based priorities and targets that can improve cardiovascular health. Iowa, like the other states, addresses the priorities through activities best suited for the population and capacity of its partners. Iowa HHS helps to facilitate the coordination of the initiative and priorities to improve heart health. Currently, Million Hearts® has the following 2027 priorities:

- ▶ Build healthy communities
 - Decrease tobacco use
 - Decrease physical inactivity
 - Decrease in particle pollution exposure
- ▶ Optimize care
 - Improve appropriate aspirin/anticoagulant use
 - Improve blood pressure control
 - Improve cholesterol management
 - Improve smoking cessation
 - Increase use of cardiac rehabilitation
- ▶ Focus on health equity in priority populations

- Pregnant and postpartum women with hypertension
- People from racial/ethnic minority groups
- People with behavioral health issues who use tobacco
- People with lower incomes
- People who live in rural areas or other ‘access deserts’

Healthy People Goals

Healthy People is a national health promotion program with disease-prevention goals set by the United States Department of Health and Human Services. The program identifies public health priorities to help individuals, organizations, and communities across the United States improve health and well-being and provides a framework built on the knowledge to promote, strengthen and evaluate the nation's efforts to improve the health and well-being of all people. The CDC cooperative agreement, outlined in the following section, aligns with the following Healthy People 2030 objectives that are specifically related to heart disease:

- ▶ HDS-01: Improve cardiovascular health in adults
- ▶ HDS-02: Reduce coronary heart disease deaths
- ▶ HDS-03: Reduce stroke deaths
- ▶ HDS-04: Reduce the proportion of adults with high blood pressure
- ▶ HDS-05: Increase control of high blood pressure in adults
- ▶ HDS-06: Reduce cholesterol in adults
- ▶ HDS-07: Increase cholesterol treatment in adults

Cardiovascular Health Program

The Cardiovascular Health Program at Iowa HHS first received funding related to heart disease and stroke prevention and management more than two decades ago from the CDC. Today, Iowa HHS continues this program through current CDC funding, “The National Cardiovascular Health Program,” which will continue through 2028. This funding supports state investments in evidence-based strategies for preventing and manage CVD in high-burden populations, contributing to improved health outcomes. Strategies implemented through contracted healthcare systems, Federally Qualified Health Centers, and community organizations to make policy and system changes to:

- ▶ 1. Track and monitor clinical and social services and support needs measures shown to improve health and wellness, health care quality, and identify individuals at the highest risk of CVD with a focus on hypertension and high cholesterol.
 - 1A. Advance the adoption and use of electronic health records or health information technology.
 - 1B. Promote the use of standardized processes or tools to identify social services and support needs.
- ▶ 2. Implement team-based care to prevent and reduce CVD risk with a focus on hypertension and high cholesterol prevention, detection, control, and management through the mitigation of social support barriers to improve outcomes
 - 2A. Advance use of health information systems supporting team-based care.
 - 2B. Assemble multidisciplinary teams to identify patients’ social and support needs and improve management of hypertension and high cholesterol.

- 2C. Build and manage a coordinated network of multidisciplinary partnerships that address identified barriers to social services and support needs.
- ▶ 3. Link community resources and clinical services that support bidirectional referrals, self-management, and lifestyle change to address social determinants that put the priority populations at increased risk for cardiovascular disease with a focus on hypertension and high cholesterol.
 - 3A. Create and enhance community-clinical links to identify and address SDOH.
 - 3B. Identify and deploy CHWs to provide a continuum of care and services.
 - 3C. Promote the use of self-measured blood pressure monitoring (SMBP) with clinical support among populations at the highest risk of hypertension.

Additional partnerships and activities built and completed through the Cardiovascular Health Program, include:

- ▶ Sponsorship and exhibition of conferences and events for local organizations.
- ▶ Formation of the Iowa Cardiovascular Collaborative, a diverse group of statewide partners focused on improving cardiovascular health in the state.
- ▶ Development and distribution of educational materials for patients and providers.

Heart Disease Prevention and Control Partners

The Iowa HHS Cardiovascular Health Program partners with a variety of organizations to implement effective cardiovascular disease prevention and control strategies. Key national partners, including the CDC and the National Association of Chronic Disease Directors, provide essential technical assistance and resources, along with funding to support evidence-based practices in hypertension control and cholesterol management. Additionally, Iowa HHS has worked with local and regional organizations to implement prevention and control strategies.

Data Sources

The following data sources were used and analyzed to compile the 2023 Heart Disease and Stroke Report. These data sources have varying rules for data suppression, and any suppressed data in this report is marked as “NA” (not available). Several limitations exist regarding the data. The data sources are not standardized, and they use different classifications, naming conventions, and methods for aggregating data. For example, the CDC BRFSS combines race and ethnicity data, while CDC WONDER treats these as separate data points.

- ▶ **CDC WONDER:** Mortality rates by race and ethnicity, and by county were generated from CDC Wonder using aggregated data from 2020-2023. This source can be accessed at <https://wonder.cdc.gov/>. The following International Classification of Diseases (ICD)-10 codes were used for mortality data:
 - Heart disease: I09, I11, I13, I20-I51
 - Coronary Heart Disease: I20-I25
 - Stroke: I60-I69
- ▶ **Behavior Risk Factor Surveillance System (BRFSS) Survey Data:** Prevalence data for CAD, heart attack, and risk factors were from the BRFSS web enabled analysis tool from CDC. The data were weighted to produce estimates representative of all adults in Iowa (18 years or older). Aggregated data from 2019-2023 were used for race and ethnicity prevalence data.
- ▶ **Iowa Hospital Discharge Database:** Hospitalization data were generated from the Iowa Hospital Discharge Database. These data include number of inpatient hospitalizations and the age-adjusted hospitalization rates for heart disease and CHD as the primary diagnosis. The following ICD-10 codes were used for hospitalization data:
 - Heart disease: I09, I11, I13, I20-I51
 - Coronary Heart Disease: I20-I25
 - Stroke: I60-I69
- ▶ **2000 U.S. Standard Population:** The year “2000 U.S. Standard Population” was used for the calculation of age-adjusted hospitalization rates in this report. The age-adjusted rates are presented in this report as rates per 10,000 population.

Funding Source

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