

2024 STROKE REGISTRY DATA SUMMARY



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EXECUTIVE SUMMARY

The 2024 Nevada Stroke Registry Data Summary, prepared by the Division of Public and Behavioral Health (DPBH) Cardiovascular Health Program (CVH), provides a comprehensive analysis of stroke incidence, prevalence, and care in Nevada, leveraging data from the Get With The Guidelines-Stroke (GWTG-S) data registry, the Behavioral Risk Factor Surveillance System (BRFSS), Nevada Hospital Billing Data (HBD), and other sources. This report fulfills the mandates of Nevada Revised Statutes (NRS) 439.5291 to 439.5297, inclusive, and aims to reduce the occurrence of stroke in Nevada, enhance stroke care, and improve outcomes through data-driven insights. Below are key findings:

Stroke Overview

- Stroke is a leading cause of disability and death in Nevada and nationally.
- In 2023, stroke ranked as Nevada's 5th leading cause of death (1,500 estimated deaths) and the U.S.'s 4th, with approximately 80% of strokes deemed preventable.
- The DPBH utilizes the GWTG-S platform to align with achievement measures from the Centers for Disease Control and Prevention (CDC) Paul Coverdell National Acute Stroke Program, focusing on improving care across the continuum: pre-hospital, in hospital, and post-hospital stages.

Stroke Prevalence Trends

- From 2019 to 2023, stroke prevalence in Nevada adults remained stable (approximately 3.9% in 2023) compared to the U.S. (3.4%), with a notable increase in 2022–2023, possibly due to an aging population or known risk factors such as obesity and smoking.
- In 2023, Nevada's American Indian/Alaskan Native population saw a sharp rise in stroke prevalence, from 1.1% in 2021 to 15% in 2023, signaling potential shifts in risk factors health care access, or data collection requiring further study.

Hospital Billing Data Insights

- In 2023, 8,115 Nevadans had a stroke diagnosis, with Clark County (5,842 cases) and Washoe County (1,189 cases) reporting the highest frequencies, reflecting population density.
- Stroke incidence peaks in the 66–85 age group, with a five-year trend (2019–2023) showing declines across most age groups, particularly 18–45, 46–65, and >85, and a slight drop in the 66–85 group.
- Native American/Alaskan Native cases nearly tripled (2019–2023), while White, Black, Hispanic, and Asian/Pacific Islander groups saw decreases; Black and Native American populations are overrepresented in stroke cases relative to their population size.

This summary underscores the need for focused interventions, particularly for underserved groups such as Native Americans and African Americans, and continued efforts to address

disparities in access to care and prevention gaps across Nevada's diverse regions and populations.

Data Sourced from:

Behavioral Risk Factor Surveillance System (BRFSS),
Electronic Death Registry System (EDRS),
Get With The Guidelines – Stroke (GWTG-S) Data Registry,
Hospital Billing Data (HBD),
Department of Health and Human Services, Office of Analytics - [Office of Analytics - Heart Related Illness in Nevada](#)
Maternal Mortality Review Committee Report and Severe Maternal Morbidity Data Report
Nevada, 2022-2023

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BACKGROUND AND PURPOSE

A stroke occurs when the blood supply to the brain is blocked by a blood clot (ischemic stroke) or when a blood vessel in the brain ruptures (hemorrhagic stroke), causing brain cell death and leading to functional impairment. Stroke is a leading cause of disability and death nationally and Nevada.¹

In 2015, the 78th Nevada Legislature enacted [Nevada Revised Statutes \(NRS\) 439.5291 through NRS 439.5297](#), inclusive, requiring the Nevada Division of Public and Behavioral Health (DPBH) to develop an annual report on the operation and use of the Stroke Registry and the data collected. The resulting report is titled, "Nevada Stroke Registry Data Summary Report." [NRS 439.5295](#) mandates the establishment and maintenance of the Stroke Registry to compile information and statistics to align with the consensus measures prescribed by the Paul Coverdell National Acute Stroke Program of the Centers for Disease Control and Prevention (CDC), Department of Health and Human Services, Joint Commission, American Heart Association (AHA), and American Stroke Association (ASA). In compliance, DPBH adopted the Get With The Guidelines-Stroke (GWTG-S) data management platform established by the AHA/ASA as the Nevada Stroke Registry database. The Cardiovascular Health (CVH) Program maintains superuser access to the GWTG-S database to facilitate annual stroke data compilation, analysis, and reporting.

NRS 439.5295 through 439.5297 further describe the duty of DPBH to establish and maintain a Stroke Registry, encourage and facilitate information, conduct data analysis and sharing, and adopt and carry out procedures to utilize the data to analyze the response to and treatment of strokes in Nevada. As part of the annual report, DPBH will use the data analysis

to identify potential solutions for the treatment of stroke and to make recommendations for legislation designed to improve the quality of care provided to Nevadans.

The DPBH utilizes the Stroke Registry data to drive collaborative promotion and implementation of evidence-based best practices, standards, and continuous quality improvements along the entire stroke care continuum (figure 1),² including community

awareness, Emergency Medical Services, Emergency Department, In-patient care, discharge coordination, and home and community supports, to benefit all Nevadans.

Figure 1. Continuum of Care

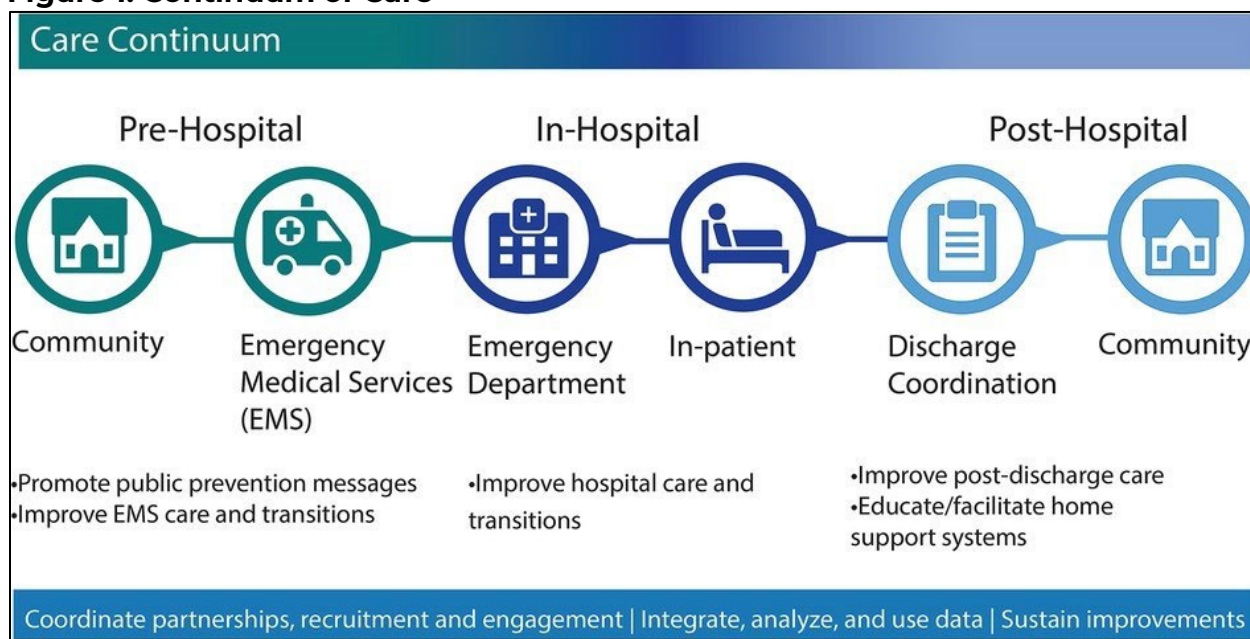


Figure 1 illustrates the continuum of care, encompassing prehospital, in-hospital, and posthospital stages.

GET WITH THE GUIDELINES-STROKE (GWTG-S) LIMITATIONS

- **Data Coverage:** GWTG-S data were collected only from Nevada's 16 Joint Commission-accredited Certified Stroke Centers (CSCs) located in Carson City, Clark, and Washoe counties, covering approximately 90% of Nevada's population.
- **Exclusion of Other Hospitals:** Data from the remaining 14 acute care hospitals and 13 critical access hospitals, which serve Nevada's rural and frontier populations, is not included.³
- **Hospital Participation:** Some hospitals opt out of the program because adult stroke care is not a primary focus or because of economic, workforce, or competitive challenges.
- **Sampling Limitations:** High-volume stroke centers may report a sample of cases rather than all stroke cases. For instance, a hospital treating 225 or more patients per quarter might only report data from a sample of 45 patients.⁵
- **Data Generalization:** The limitations prevent drawing comparisons between CSCs and make it difficult to generalize the data to represent the entire state of Nevada.

Proposed Remedies

The Cardiovascular Health Program supplemented the GWTG-S data by analyzing other reliable data sources, including

- Behavioral Risk Factor Surveillance System (BRFSS)
- Nevada Hospital Billing Data (HBD)
- Nevada Electronic Death Registry System (EDRS)

Table 1. Nevada Hospitals Participating in the GWTG-S Database

Hospital Name	
Carson Tahoe Health	Southern Hills Hospital Medical Center
Henderson Hospital	St. Rose Dominican Hospital – Siena Campus
Mountain View Hospital	Summerlin Hospital Medical Center
Northern Nevada Medical Center	Sunrise Hospital Medical Center
Renown Regional Medical Center	University Medical Center of Southern Nevada
St. Mary's Regional Medical Center	Valley Hospital Medical Center
Centennial Hills Hospital Medical Center	Spring Valley Hospital Medical Center
Desert Springs Hospital Medical Center	St. Rose Dominican Hospital – San Martin Campus

STROKE IMPACT

Stroke or “brain attack” is a medical emergency that requires immediate responsiveness. Similar to heart attacks, every minute between the onset of symptoms and medical intervention impacts the outcomes. Delays in care can be devastating.¹

In 2023, stroke was the 5th leading cause of death in Nevada and the 4th leading cause of death in the United States (U.S.). Stroke is the leading cause of severe long-term disability in the U.S. and Nevada.¹ Stroke takes an overwhelming toll on survivors, caregivers, families, communities, and health care systems. In the U.S., based upon historical medical expenditures surveyed, adjusted annual direct costs for a stroke participant was \$4,317 greater than for a non-stroke participant, resulting in a net yearly expenditure of \$38 billion nationwide. An additional \$65.5 billion of indirect costs for un/underemployment and premature mortality can be added for a total aggregate expenditure of \$103.5 billion annually in 2016 U.S.-dollar values.⁶

After decades of decline, progress in preventing stroke-related deaths has slowed. Almost 800,000 people have a stroke each year, of which 200,000 have had a previous stroke, and more than 140,000 die. In Nevada, an estimated 1,500 deaths will occur. This is disturbing as approximately 80 % of strokes are preventable.^{7,8}

A compelling consideration evident in the research literature is that the current emphasis on the prevention and early treatment of stroke overshadow the importance of stroke aftercare, reoccurrence prevention, and caregiver/family support.⁹ Improved stroke survival results in greater caregiver, family, and community burdens, often in the form of uncompensated care,

as survivors navigate a difficult and complex journey of rehabilitation and finding a new normal.

RISK FACTORS FOR STROKE

Stroke is one of the most preventable life-threatening health issues. Risk factors for stroke are either non-modifiable or modifiable through awareness, lifestyle change, or medical treatment.⁹

Non-modifiable Risk Factors

Some risk factors, such as age, sex, and family, personal, and past medical history, are beyond an individual's control. The prevalence of stroke in the U.S. increases with age in all identifiable populations. There are several unique stroke risk factors in women. As women increasingly outlive and outnumber men, a disproportionate increase in the burden of stroke in women is expected.¹⁰ Black and Hispanic populations have higher stroke risks compared to the White population. Genetics are also a significant risk factor, if a grandparent, father, mother, or sibling had a stroke before age 65, individual risk is elevated. A history of a previous stroke will also increase the risk of a stroke recurrence.¹¹

Modifiable Risk Factors

There are several factors people can control to modify their stroke risk effectively. Uncontrolled high blood pressure is the leading cause of stroke, heart attack, heart failure, dementia, and kidney disease and the most important controllable risk modifier.^{11,14} Other factors include:

- High cholesterol, directly and indirectly, increases the risk of a stroke through the process of atherosclerosis (hardening of the arteries) – also a risk factor in coronary artery disease.^{8,11}
- Atrial fibrillation/flutter (AF) increases stroke risk fivefold. AF risk can be reduced by up to 70 % with anticoagulants.⁹
- The nicotine and carbon monoxide that enters the bloodstream when smoking and vaping damages blood vessels and speed atherosclerosis increasing blood pressure and the heart's workload.¹⁴
- Diabetes mellitus (DM) plays a significant role in ischemic stroke – 67 % of all strokes are associated with DM.¹
- Diet is a leading predictor and modifier of long-term cardiovascular, brain, and metabolic health. Too much saturated and trans-fats raise blood cholesterol levels. Excess salt can increase blood pressure, and high caloric intake can lead to obesity.^{14,15}
- Excess weight, poor diet, and a sedentary lifestyle (frequently co-occurring) put undue strain on the entire circulatory system, thus increasing stroke risks.^{7,14,15}
- Finally, recognizing and treating transient ischemic attacks (a stroke that lasts only a few minutes) can reduce the risk of a major stroke.^{8,16}

SOCIAL DETERMINANTS OF STROKE

Stroke risk is also predicted and modified by social determinants of health, defined as the conditions and environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality of life outcomes and risks.¹³ In a meta-analysis of 51 studies, lower socioeconomic status measured by income, occupation, or education was linked to an increased stroke risk. Findings were particularly pronounced for education, with two-fold higher odds of hypertension (95 % CI, 1.55– 2.63) observed in lower- compared with higher-educated individuals. Associations were stronger among females and in higher-income countries.¹³ Adverse working conditions, including job loss and underemployment, are related to increased stroke risk, as are long work hours (>40hr/wk.). A smaller social network (i.e., contact with fewer family members, friends, and neighbors) was linked to a 44 % higher risk of stroke over an 18.6-year follow-up, even after controlling for demographics and other relevant risk factors.¹

RISK REDUCTION

There are several evidence-based lifestyle-change programs aimed at cardiovascular and stroke risk reduction from which to choose. Among them, the [American Heart Association's Life's Simple 7](#) is a prescription for health using the seven most important predictors of heart health and a pathway to achieve ideal cardiovascular health and the [American Heart Association's Life's Essential 8™](#) Your Checklist for Lifelong Good Health.^{18,19} These programs, and all competent healthy lifestyle content, address two major areas: purposeful healthy behaviors and managed biometric factors. All Americans are called upon to quit smoking, be physically active, develop healthy eating patterns, get restorative sleep, and manage (medically, if necessary) body weight, blood glucose, cholesterol, and blood pressure.^{8,9,11,15,16}

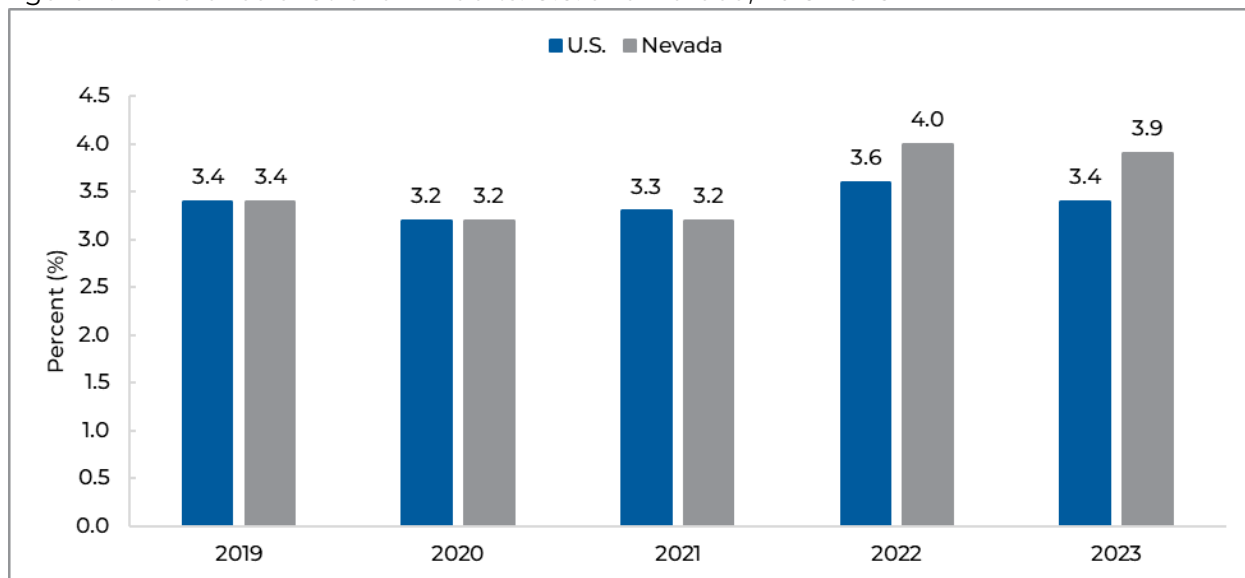
American Heart Association's Life's Essential 8™	
EAT BETTER	
Aim for an overall healthy eating pattern that includes whole foods, lots of fruits and vegetables, lean protein, nuts, seeds, and cooking in non-tropical oils such as olive and canola.	
MANAGE WEIGHT	
Achieving and maintaining a healthy weight has many benefits. Body mass index (BMI), a numerical value of your weight in relation to your height, is a useful gauge. Optimal BMI for most adult's ranges from 18.5 to less than 25. You can calculate it online or consult a health care professional.	
BE MORE ACTIVE	
Adults should participate in 150 minutes of moderate or 75 minutes of vigorous physical activity per week. Walking is great for moderate levels of activity. Kids should have 60 minutes every day, including play and structured activities.	
CONTROL CHOLESTEROL	
High levels of non-HDL, or "bad," cholesterol can lead to heart disease. Your health care professional can consider non-HDL cholesterol as the preferred number to monitor, rather than total cholesterol, because it can be measured without fasting beforehand and is reliably calculated among all people.	

QUIT TOBACCO
Use of inhaled nicotine delivery products, which includes traditional cigarettes, e-cigarettes, and vaping, is the leading cause of preventable death in the U.S., including about a third of all deaths from heart disease. And about a third of U.S. children ages 3-11 are exposed to secondhand smoke or vaping.
MANAGE BLOOD SUGAR
Most of the food we eat is turned into glucose (or blood sugar) that our bodies use as energy. Over time, high levels of blood sugar can damage your heart, kidneys, eyes, and nerves. As part of testing, monitoring hemoglobin A1c can better reflect long-term control in people with diabetes or prediabetes.
MANAGE BLOOD PRESSURE
Keeping your blood pressure within acceptable ranges can keep you healthier longer. Levels less than 120/80 mm Hg are optimal. High blood pressure is defined as 130-139 mm Hg systolic pressure (the top number in a reading) or 80-89 mm Hg diastolic pressure (bottom number).
GET HEALTHY SLEEP
Getting a good night's sleep every night is vital to cardiovascular health. Adults should aim for a nightly average of 7-9 hours, and babies and kids need more depending on their age. Too little or too much sleep is associated with heart disease, studies show.

STROKE PREVALENCE

The Behavioral Risk Factor Surveillance System (BRFSS) is a large-scale continuous health survey conducted by the CDC to collect data from U.S. residents about health-related risk behaviors, chronic health conditions, and the use of preventative services. BRFSS data is collected monthly and aggregated annually, with prevalence estimates weighted to reflect the state's population. The data represents adults 18 and older living in private residences or college housing and excludes those living in group homes or institutions. BRFSS methodology prioritizes data quality and confidentiality.²⁰ By collecting health risk data at the state and local level, BRFSS is a valuable tool to identify priority populations and implement disease prevention and health promotion activities. Because age, race/ethnicity, and co-morbidities (multiple simultaneous medical conditions) are known stroke risk factors, it is instructive to view the prevalence of strokes and chronic diseases in relation to each other.

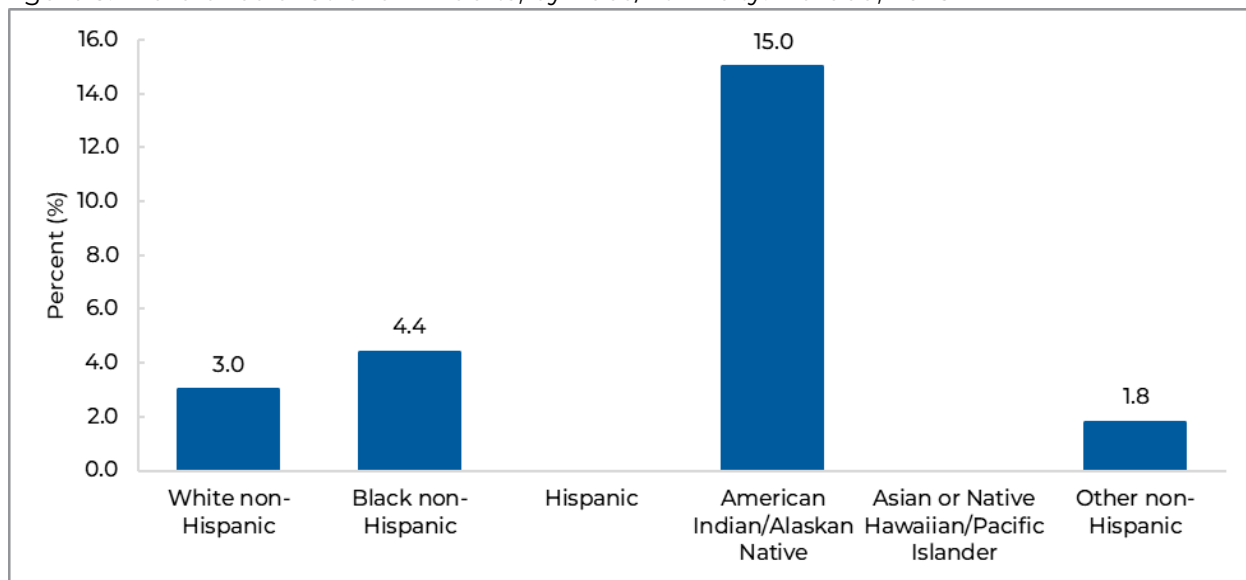
Figure 2. Prevalence of Stroke in Adults: U.S. and Nevada, 2019-2023



Source: BRFSS

Figure 2 compares the prevalence of stroke in adults in Nevada and the U.S. from 2019 to 2023. The prevalence of stroke in adults for both the U.S. and Nevada remained relatively stable over the period with a notable deviation for Nevada in 2022 and 2023.

Figure 3. Prevalence of Stroke in Adults, by Race/Ethnicity: Nevada, 2023



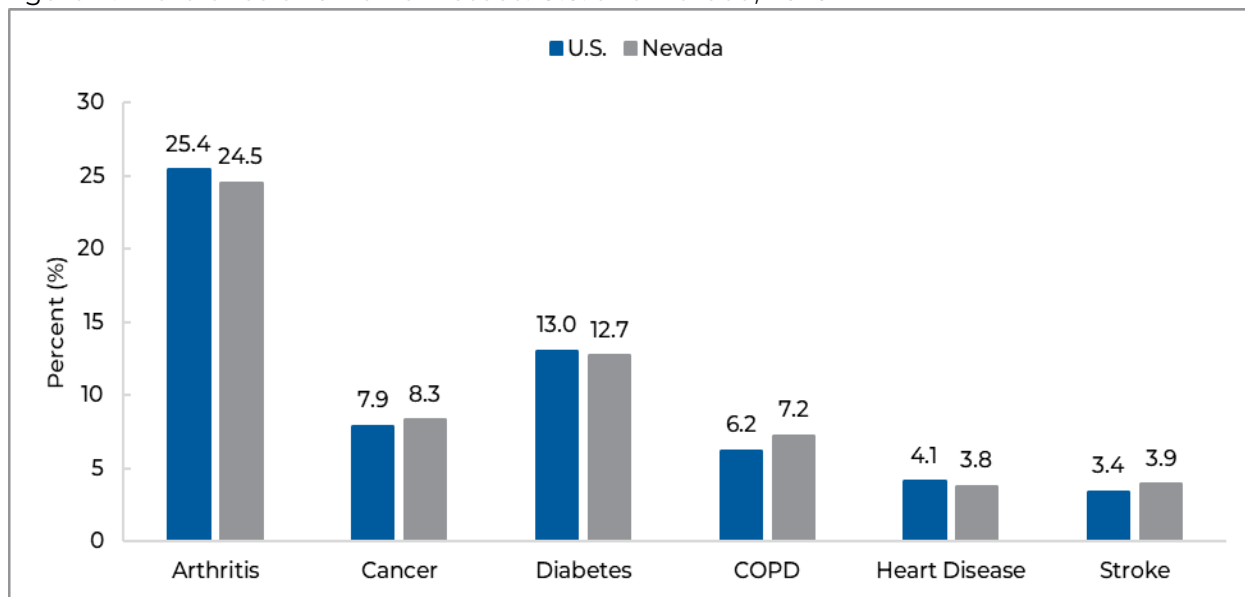
Source: BRFSS

Note: Missing bars indicate suppressed values.

Figure 3 represents the prevalence of stroke in Nevada adults by race/ethnicity in 2023. The data for Hispanic and Asian or Pacific Islander categories is suppressed. Suppression occurs when the sample size is too small to produce reliable results. Prevalence of stroke for American Indians or Native Alaskan community increased sharply from 1.1% in 2021 to 10% in 2022 to 15% in 2023. This escalation suggests possible shifts in risk factors, health care access or demographic trends and warrants further investigation.

PREVALENCE AND MORTALITY OF CHRONIC DISEASE

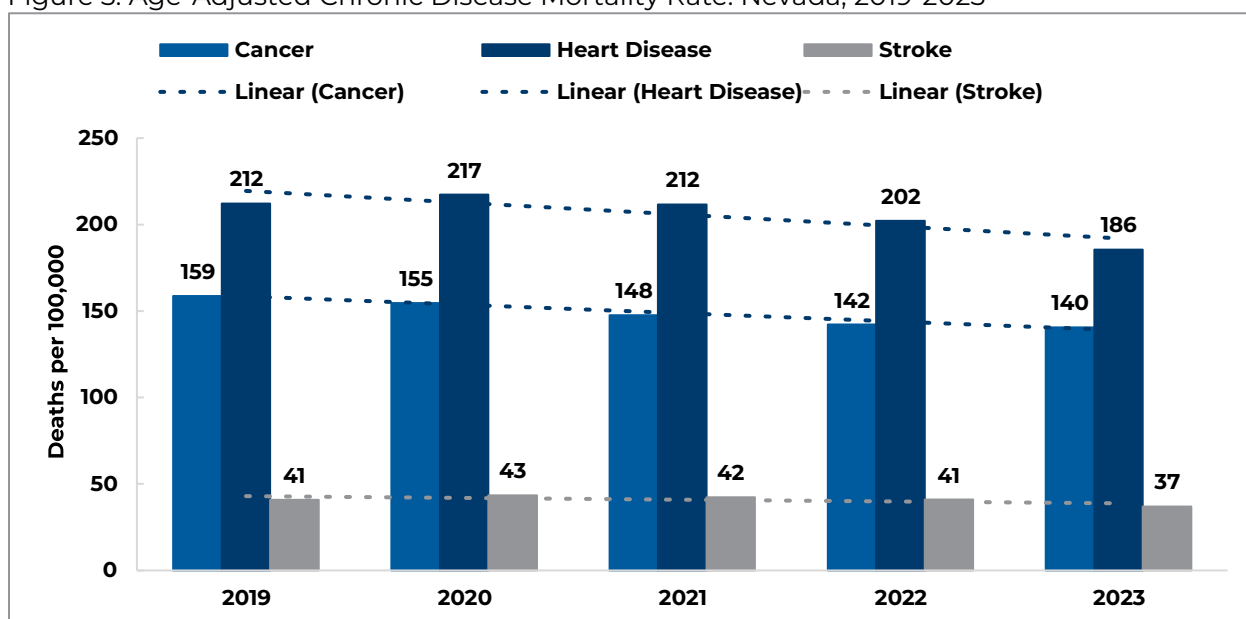
Figure 4. Prevalence of Chronic Disease: U.S. and Nevada, 2023



Source: BRFSS

Figure 4 represents a comparison of the prevalence of selected chronic diseases in Nevada and the U.S. in 2023. The prevalence of chronic diseases in Nevada is generally similar to the U.S. averages. Nevada has higher prevalence rates for Cancer, Diabetes, Chronic Obstructive Pulmonary Disorder (COPD), and Stroke. These elevations may be influenced by a combination of obesity, lifestyle factors, long-term exposure to irritants or carcinogens, or lack of access to preventative care, all known chronic disease risk factors with implications for public health policy and resource allocation.

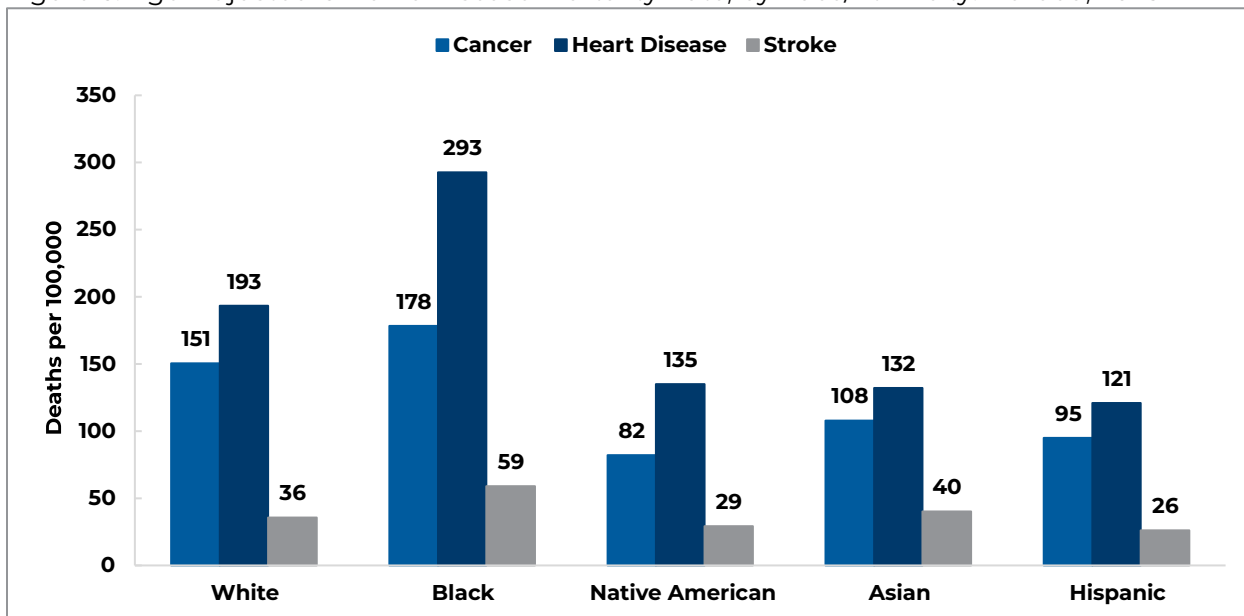
Figure 5. Age-Adjusted Chronic Disease Mortality Rate: Nevada, 2019-2023



Source: EDRS

Figure 5 represents the age-adjusted mortality rate for cancer, heart disease, and stroke in Nevada from 2019 to 2023 using data from the Nevada Electronic Death Registry System (EDRS). The chart shows a positive trend of declining age-adjusted mortality rates for cancer and heart disease in Nevada. .

Figure 6. Age-Adjusted Chronic Disease Mortality Rate, by Race/Ethnicity: Nevada, 2023



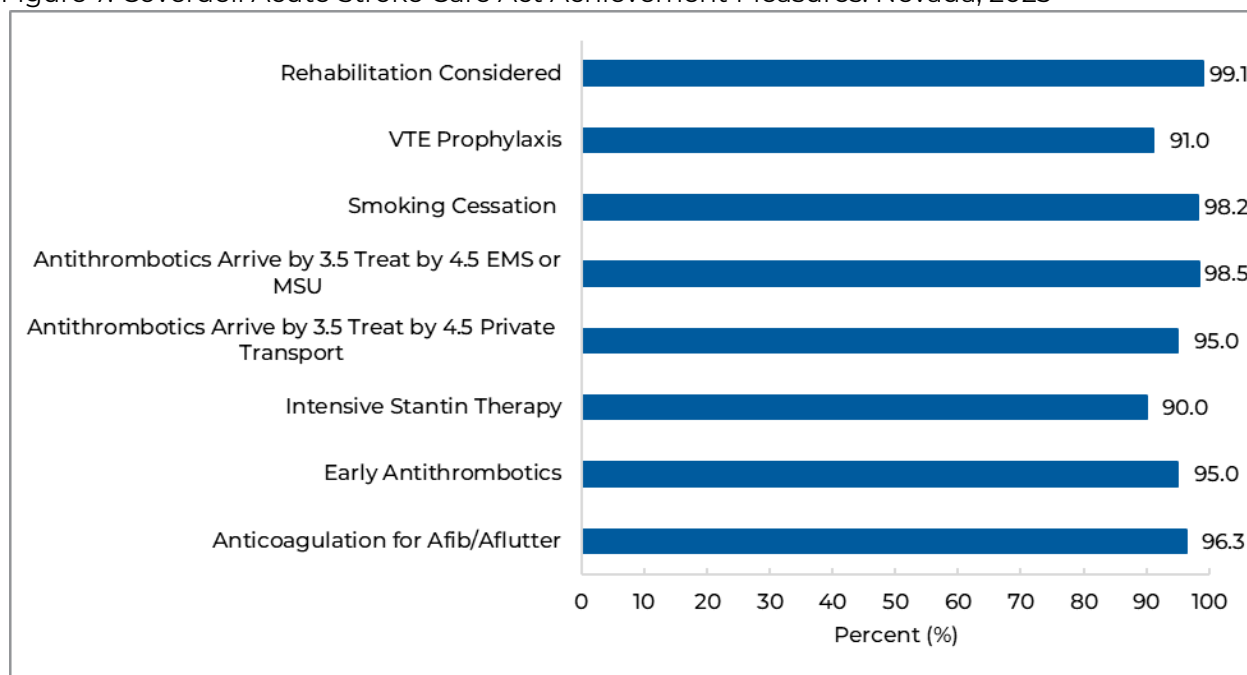
Source: EDRS

Figure 6 represents age adjusted mortality rates by race/ethnicity in Nevada for 2023. The Black non-Hispanic population had the highest mortality rates for heart disease, cancer, and stroke.

PAUL COVERDELL NATIONAL ACUTE STROKE PROGRAM

The Coverdell program, in partnership with the Joint Commission, the American Heart Association, and American Stroke Association, developed achievement measures to track and analyze the quality of stroke care from the onset of symptoms through acute care and rehabilitation to preventing repeat strokes and known complications.²

Figure 7. Coverdell Acute Stroke Care Act Achievement Measures: Nevada, 2023



Source: GWTG-S

Figure 7 represents the aggregate achievement measures of Nevada's 16 Get With The Guidelines-Stroke (GWTG-S) participating hospitals in 2023.

Coverdell Stroke Care Act Consensus Measures

Venous Thromboembolism (VTE) Prophylaxis – Treatment for VTE prophylaxis, also known as deep vein thrombosis or pulmonary embolism, is highly effective in preventing complications and reducing early post-stroke mortality.²¹

Stroke Education - Stroke education provided to stroke survivors, caregivers, and families modifies outcomes. Instruction provided by stroke centers can improve post-stroke quality of life, assist with navigating the health care system, improve access to medication and therapy options and decrease readmission and recurrence rates.²²

Smoking Cessation – The importance of smoking cessation after a stroke is widely recognized. Continued smoking after a stroke is associated with elevated recurrent stroke risk. Recurrent strokes are generally more disabling than initial strokes. Therefore, smoking/vaping cessation is an essential focus for secondary prevention.¹⁴

High-Intensity Statin Therapy - Reducing cholesterol levels is a well-established primary prevention strategy to reduce long-term cardiovascular and stroke risk. High-intensity statin therapy after ischemic stroke is an established secondary prevention strategy to reduce recurrent stroke risk, especially in large vessel atherosclerosis.²³

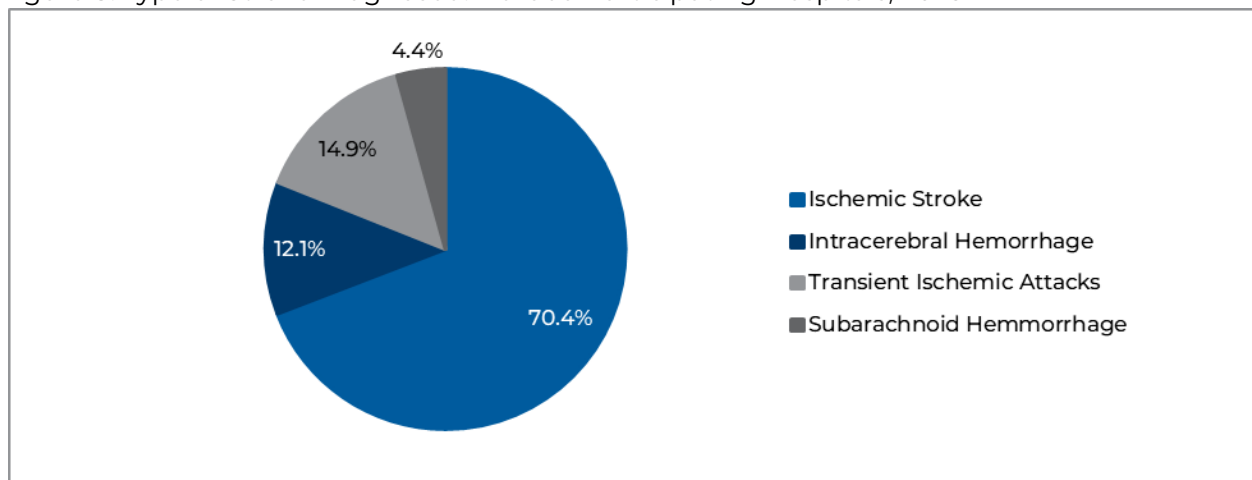
Intravenous Tissue Plasminogen Activator (tPA) Therapy, Arrive by Hour 3.5, Treat by Hour 4.5 – The clot-dissolving medicine tPA, when administered within four hours from the onset of symptoms helps to restore blood flow to the brain regions affected by stroke, thereby limiting the risk of damage and functional impairment.²⁴

Early Antithrombotic Therapy – Stroke survivors carry a high risk of recurrence. “Early” is defined as the end of day two of the hospital stay. Large, randomized control trials provide evidence-based support for the use of anticoagulant and antiplatelet agents for secondary prevention and overall stroke burden reduction.²⁵

Anticoagulation for Atrial Fibrillation – The risk of recurrent ischemic stroke is high among patients with a recent stroke and atrial fibrillation. Early initiation of anticoagulation is thought to protect these patients from further damage due to recurrent stroke.²⁷

Rehabilitation Consideration – For many stroke survivors, rehabilitation involves physical therapy to relearn motor activities, occupational therapy to relearn activities of daily living, or speech therapy to relearn language and speaking skills. Rehabilitation can start as soon as the patient is medically stable and occurs in various settings, including subacute inpatient facilities, at home, and as an outpatient. The rehabilitation care team might include a case manager/care coordinator, dietitians, neurologists, nurses, psychiatrists, peer groups, and recreation therapists.^{9,28}

Figure 8. Type of Stroke Diagnosed: Nevada Participating Hospitals, 2023



Source: GWTG-S Data Registry System

Figure 8 shows the types of strokes diagnosed by Nevada's Get With The Guidelines-Stroke (GWTG-S) participating hospitals in 2023. Ischemic strokes were the dominant type (70.4%), followed by Transient Ischemic Attacks (TIAs) (14.9%), Intracerebral Hemorrhage (12.1%), and Sub-arachnoid Hemorrhage (4.4%).

NEVADA HOSPITAL BILLING DATA

Nevada hospital billing data (HBD) from the Nevada Department of Health and Human Services, Office of Analytics for Nevada's thirty (30) Acute Care Hospitals were analyzed to discern the scope of stroke in Nevada and which Nevadans are most affected.³ Data inclusion criteria used the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) stroke diagnosis codes I60 – I69. The data reflect the number of patients with at least one (1) hospital billing record where a stroke ICD-10-CM code was present as the primary reason for the visit. To avoid double counting of patients admitted to both the emergency department and as an inpatient on the same day, only one visit per day was counted.

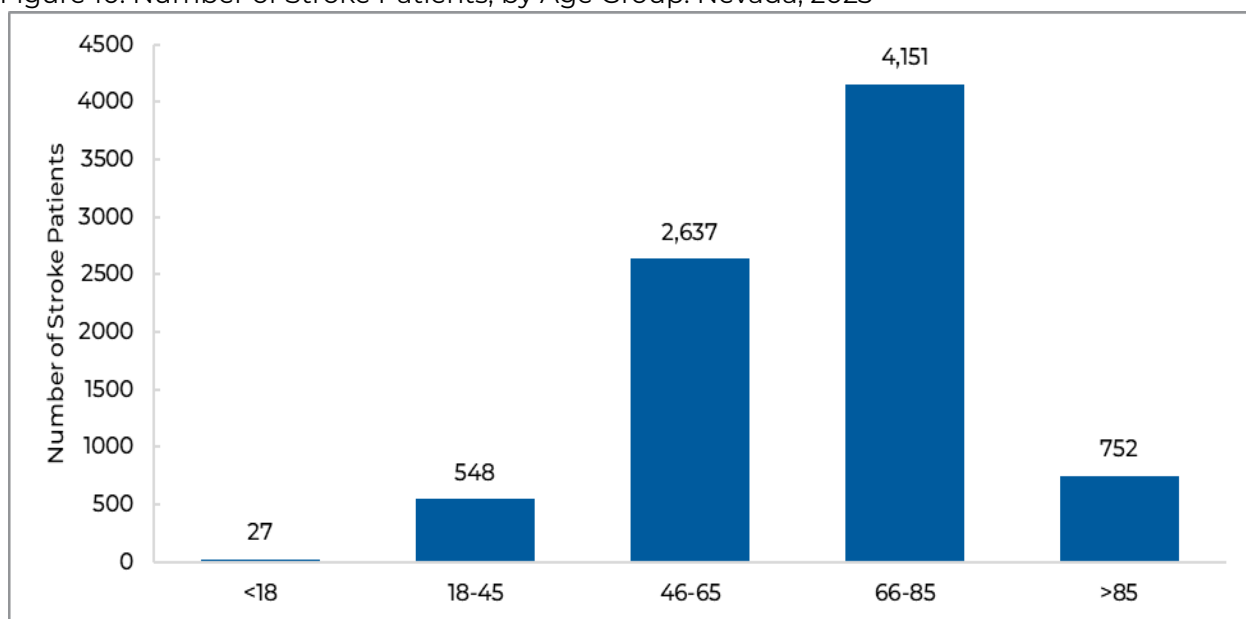
Table 2. Frequency of Stroke Diagnosis, by Resident County: Nevada, 2023

Resident County	Emergency	In-patient	Total
Carson City	18	190	208
Churchill	15	47	62
Clark	642	5,200	5,842
Douglas	33	140	173
Elko	53	35	88
Esmeralda	0	3	3
Eureka	0	2	2
Humboldt	7	30	37
Lander	1	11	12
Lincoln	8	8	16
Lyon	26	164	190
Mineral	4	10	14
Nye	59	185	244
Pershing	4	11	15
Storey	0	2	2
Washoe	154	1,035	1,189
White Pine	10	5	15
Unknown	0	3	3
Total	1,034	7,081	8,115

Source: HBD

Table 2 shows the frequency of patients with a stroke diagnosis by resident county for Nevada in 2023.

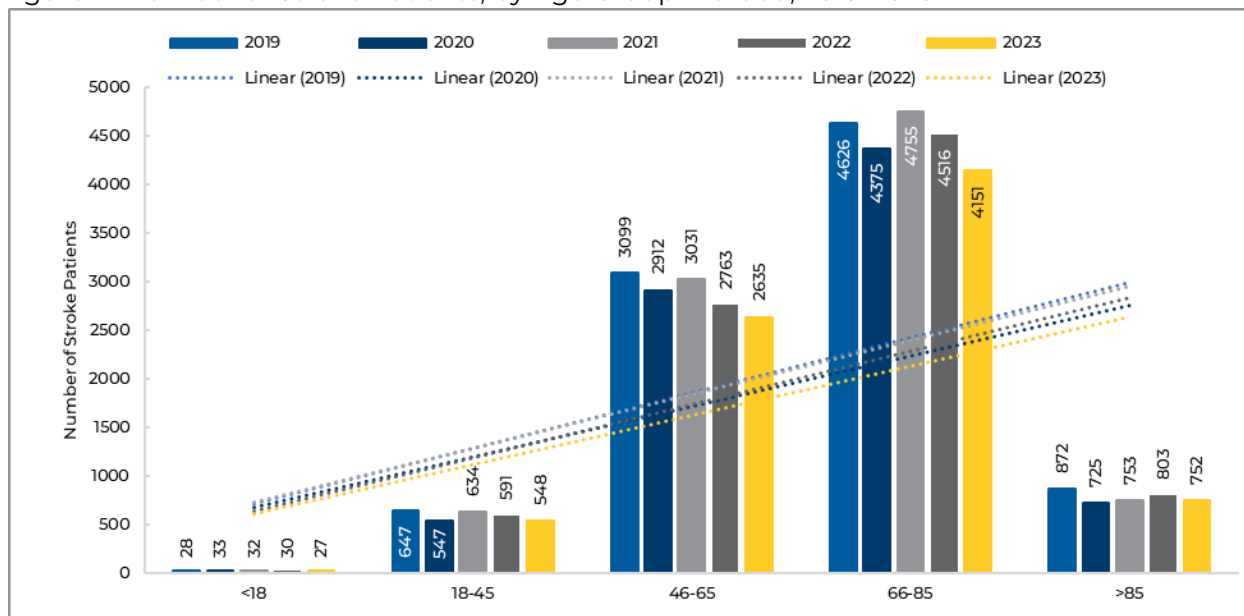
Figure 10. Number of Stroke Patients, by Age Group: Nevada, 2023



Source: HBD

Figure 10 shows the number of stroke patients in Nevada by age group. The distribution indicates that the risk of stroke increases with age. The >85 age group is the smallest group in the dataset due to increased all-cause mortality in older adults.

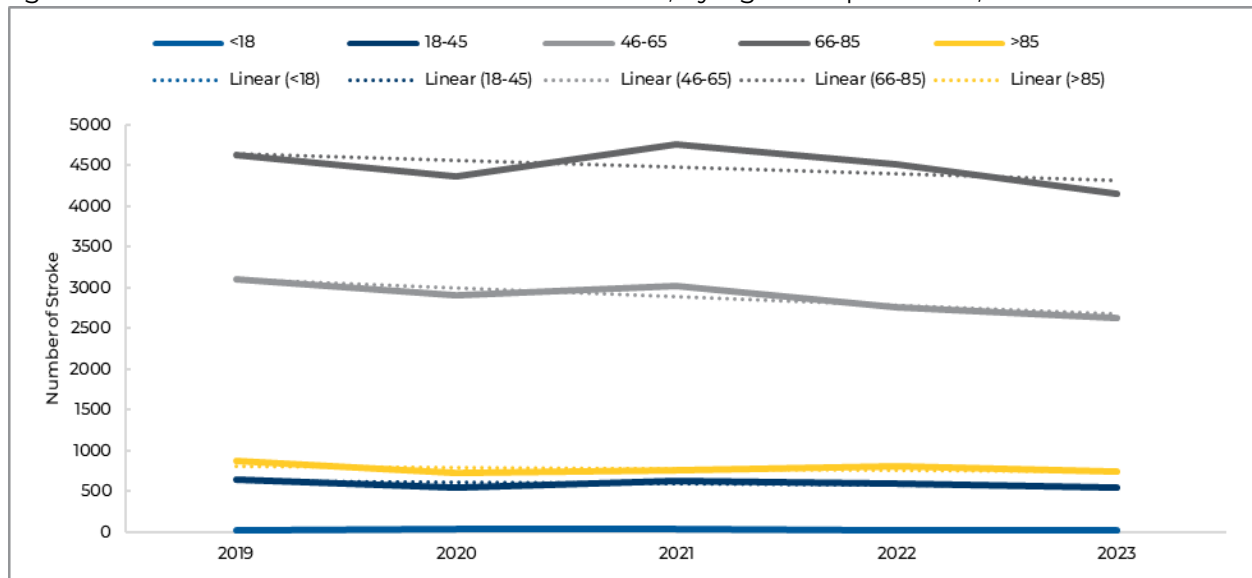
Figure 11. Number of Stroke Patients, by Age Group: Nevada, 2019-2023



Source: HBD

Figure 11 shows the number of stroke patients in Nevada by age group from 2019 to 2023. Stroke incidence is strongly age-related. The <18 group had a low incidence with little deviation. The 18-45 age group, while higher than the <18 group, had a small proportion of stroke cases. The 46-65 group shows a significant increase in stroke incidence compared to the younger groups. Strokes are most common in the 66-85 age group, highlighting the increased stroke burden in older populations in Nevada. The >85 group was the smallest group owing to age-related increases in all-cause mortality in older adults.

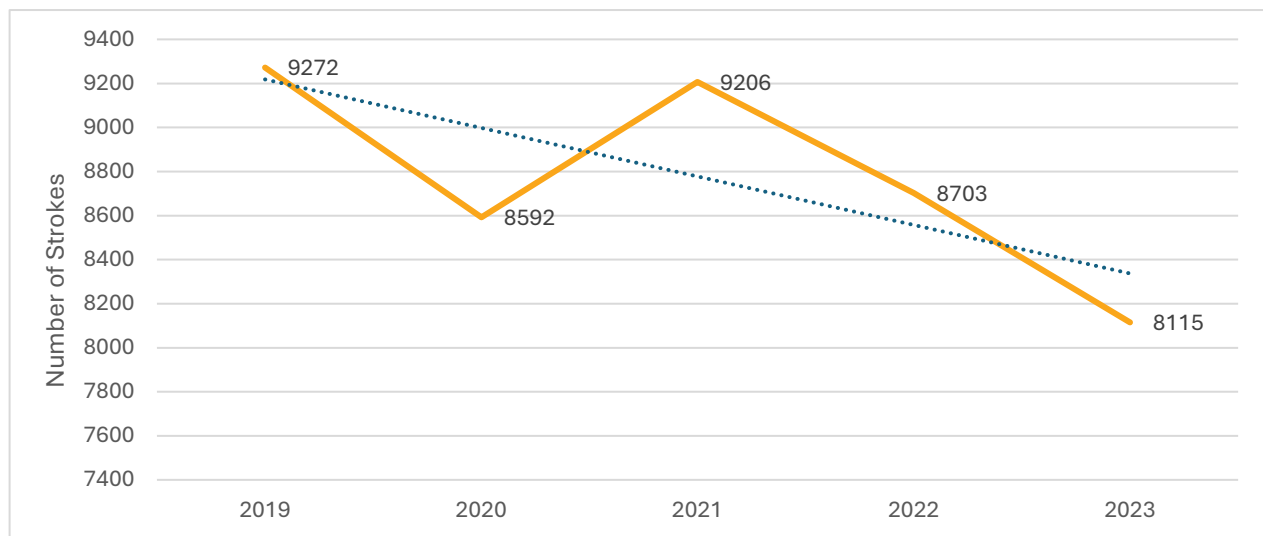
Figure 12. Trends in the Number of Stroke Patients, by Age Group: Nevada, 2019-2023



Source: HBD

Figure 12 represents the five-year trend for the number of stroke patients by age group in Nevada from 2019 to 2023. The age groups 18-45, 46-65, and >85 years showed a consistent decrease in the number of strokes over the period. The <18 age group remains low and slightly declines, while the 66-85 age group also shows a slight decline.

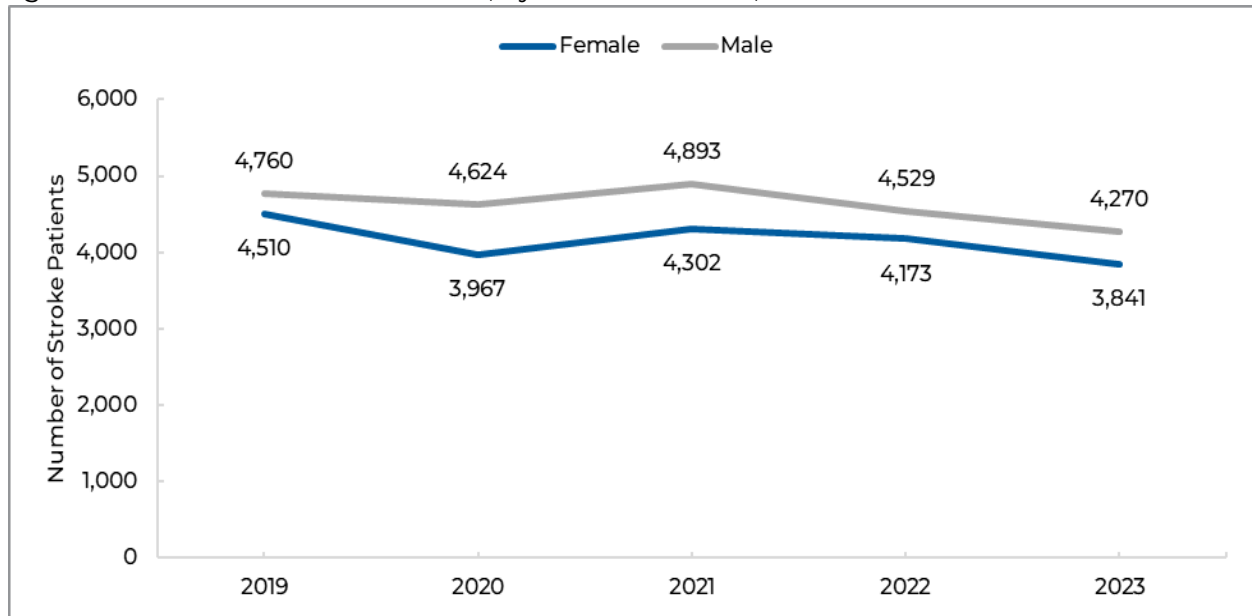
Figure 13. Number of Strokes: Nevada, 2019-2023



Source: HBD

Figure 13 shows the number of stroke patients in Nevada from 2019 to 2023. The overall trend during this period shows fluctuations, with a peak in 2019 and 2021 and a general decline in 2022 and 2023. The number of strokes in 2023 (8115) was the lowest recorded during this period. The data suggest that the number of strokes in adults in Nevada may be declining, particularly in recent years.

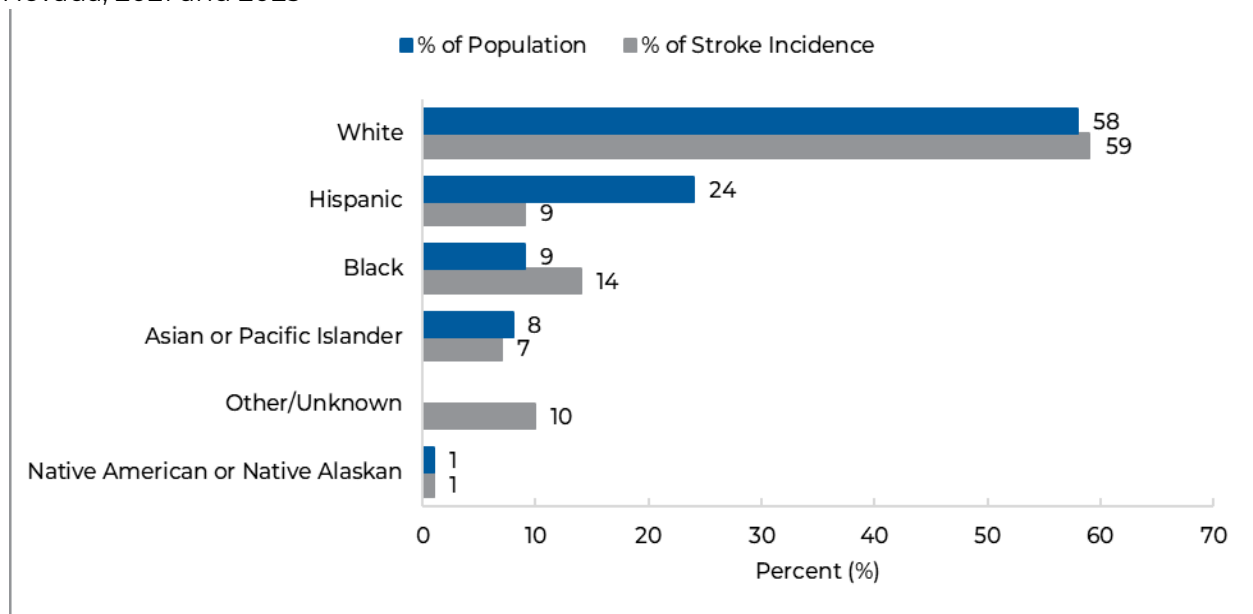
Figure 14. Number of Stroke Patients, by Gender: Nevada, 2019-2023



Source: HBD

Figure 14 shows the five-year trend for the number of stroke patients by sex (male/female) in Nevada from 2019 to 2023. The data indicate a general downward trend for both sexes over the period, with females experiencing more fluctuations.

Figure 15. Comparison of % of Population and % of Stroke Incidence, by Race/Ethnicity: Nevada, 2021 and 2023

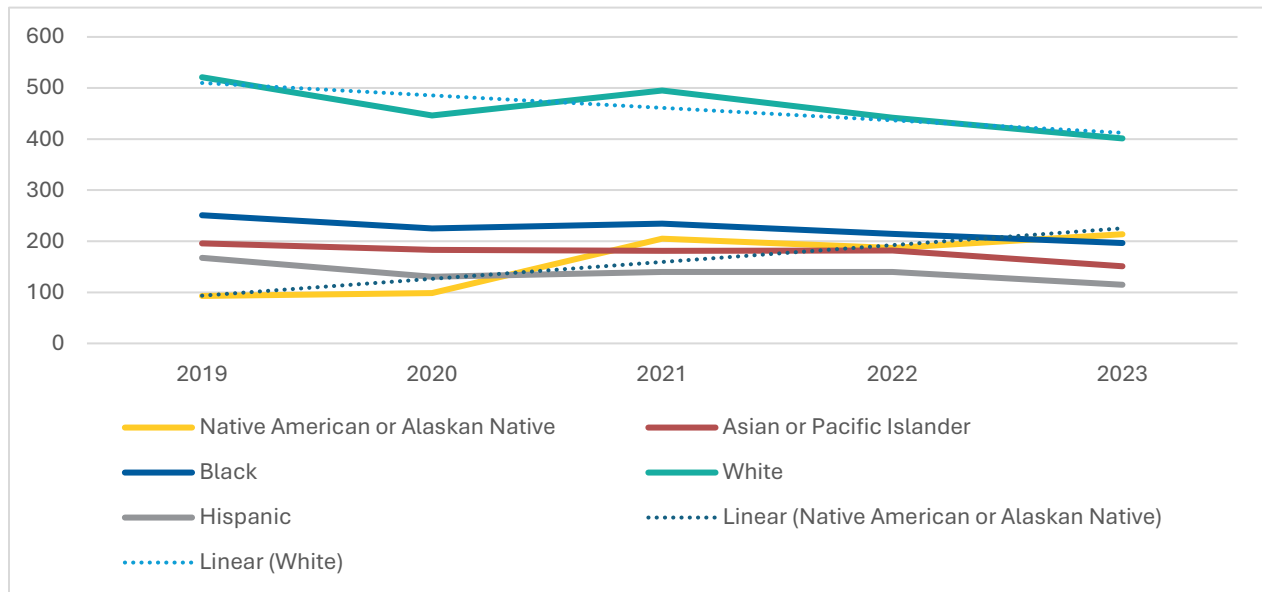


Sources: U.S. Census Bureau, HBD

Figure 15 compares the percentage of stroke patients by race/ethnicity in Nevada for 2023 with the percentage of the population by race/ethnicity in Nevada for 2021. The demographic groups were defined using [the United States Census Bureau population estimates for 2021](#) for non-Hispanic White, non-Hispanic Black, Hispanic, Asian and Pacific Islander, and Native American or Alaskan Native.

Black populations show a higher incidence of stroke than their overall population percentages. This suggests potential gaps or risk factors that need to be addressed. Asian, Pacific Islanders, and Hispanic populations are underrepresented in stroke incidence. The representation of the White population aligns with their population percentage, indicating no significant gaps.

Figure 16 Age-Adjusted Rate of Stroke, by Race/Ethnicity: Nevada, 2019-2023



Source: HBD

Figure 16 represents the five-year trend of the number of stroke patients by race/ethnicity in Nevada from 2019 to 2023. The Native American or Alaskan Native population showed an upward trend in strokes, nearly tripling over the period. This finding may require further investigation and focused interventions to identify the contributing factors. The Asian or Pacific Islander, Black, White, and Hispanic populations revealed a general decrease in stroke incidence over the period, particularly among the White population, which saw a notable decrease.

REPORT CONCLUSION

The data aggregated in this report provide an opportunity to enhance stroke survivorship and reduce the burden of disease and disability in Nevada. By identifying high-burden populations and systemic strengths and weaknesses, quality improvement strategies can be planned, implemented, tracked, and adjusted to meet the needs of Nevadans.

The Behavioral Risk Factor Surveillance System (BRFSS) data (Fig. 2 – 4) indicate that the prevalence of stroke, cancer, diabetes, chronic obstructive pulmonary disease, and heart disease in Nevada is comparable to that in the U.S. over the past few years. The data also demonstrate that Nevada's Native American or Native Alaskan population experienced a spike in stroke prevalence in 2023. Nevadan's chronic disease mortality rates (Fig. 5 and 6) show a decreasing trend for cancer and heart disease population wide and that the Black or

African American community experiences the highest mortality rates for cancer, heart disease and stroke.

The Coverdell performance measures (Fig. 7 and 8) indicate that the participating hospitals successfully adhered to evidence-based recommendations developed by the Joint Commission (JC), American Heart Association (AHA), American Stroke Association (ASA), and the Centers for Disease Control and Prevention (CDC). Just over 70 % of strokes treated in Nevada Certified Stroke Centers are ischemic strokes, which are caused by a blood clot blocking the blood flow to an area of the brain.¹ Nevada hospital billing data (Fig 9 – 16) indicate which communities and populations experience elevated risk and possible trends to watch. Figure 9 demonstrates that the most populous counties experienced the highest stroke incidence. Figures 10 and 11 reveal the 46-65 and 66-85 age groups are at the highest risk for stroke. Figures 12, 13, and 14 represent five (5) year trends that may indicate a decline in the number of strokes statewide across gender and age demographics. Figure 15 offers an opportunity to analyze the percentage of Nevadans who suffered a stroke compared to their population percentages in Nevada. The comparison revealed notable disparities in stroke incidence among groups. The African American community is overrepresented in stroke cases relative to their population size, indicating a higher stroke burden that may warrant focused public health interventions. Conversely, the Hispanic population is significantly underrepresented, which could reflect a lower risk or systemic issues such as underdiagnosis and reporting. Figure 16 shows that the number of strokes by group generally decreased from 2019 to 2023, except for the Native American community, which saw a threefold increase to the second highest prevalence rate in the State.

NEXT STEPS

Near-Term Actions (6-12 months)

- 1.** Community Outreach: Maintain or implement focused awareness campaigns in underserved communities, particularly among Native American, Black, and Hispanic communities, focused on stroke prevention and symptom recognition.
- 2.** Collaboration with Local Health Providers: Partner with health care providers and community leaders to increase screening and access to prevention services, especially in counties with high stroke incidence.
- 3.** Enhance Data Collection: Improve data accuracy and reporting to better understand underrepresented groups, such as the Hispanic population, and address potential underdiagnosis.

Intermediate-Term Actions (1-3 years)

- 1.** Continue to Improve Focused Interventions: Continue evidence-based prevention programs focusing on lifestyle changes and risk factor management for at-risk age groups (46-65 and 66-85) and high-incidence communities.
- 2.** Expand Access to Health Care: Work on expanding health care access in rural and underserved areas by increasing telehealth services and mobile health clinics.

3. Monitor and Evaluate Programs: Regularly assess the effectiveness of current programs and interventions using updated data to ensure that they meet community needs and address disparities.

Long-Term Actions (3-5 years)

1. Investing in health care infrastructure, including educating Nevadans on recognizing stroke signs and symptoms and prevention strategies, to better serve diverse populations across Nevada, including those specific to the perinatal period.
2. Policy Development: Advocating for policy changes that support funding for stroke prevention and treatment programs, focusing on reducing racial and ethnic disparities.
3. Foster Collaborative Research: Encourage and support partnerships to explore innovative solutions for reducing stroke prevalence and improving outcomes in high-risk groups.

RECOMMENDATIONS

As mandated by Nevada Revised Statutes 439.5291, this annual Stroke Report includes an evaluation of stroke-related data in Nevada and recommendations for legislative action to enhance care for stroke patients across the state. The Cardiovascular Health Program has diligently sought input to inform these recommendations through extensive engagement with key stakeholders, including presentations to the Nevada Statewide Cardiovascular Health Learning Collaborative (NSCVHLC), the Advisory Council on the State Program for Wellness and the Prevention of Chronic Disease (CWCD), the Wellness Integrated Nevada Network (WINN), and programs within the Chronic Disease Prevention and Health Promotion (CDPHP) Section at the State of Nevada Division of Public and Behavioral Health (DPBH). These presentations, conducted throughout the reporting period, were designed to solicit actionable insights and recommendations for improving stroke prevention, treatment, and outcomes. Despite these efforts, no recommendations have been received from these groups or other stakeholders as of the preparation of this report. While no formal recommendations have been received from any stakeholder groups the Cardiovascular Health Program (CVH) remains committed to fostering collaboration and will continue to engage these and other partners to identify legislative opportunities that could,

- strengthen stroke care infrastructure,
- address disparities in access and outcomes,
- to enhance public health initiatives in Nevada.

The absence of recommendations does not diminish the urgency of improving stroke care in the state, particularly given the data presented in this report, which highlights persistent disparities, such as the elevated chronic disease mortality rates among African Americans, the increasing stroke prevalence among American Indians/Alaskan Natives (15.0% in 2023), and higher overall stroke rates in Nevada (3.9%) compared to the U.S. national average (3.4%). Moving forward, the Cardiovascular Health Program proposes intensifying outreach efforts, potentially through workshops or focused discussions with the NSCVHLC, CWCD, WINN, CDPHP, and other groups to elicit specific legislative proposals. These could include funding for rural stroke readiness, expanded telehealth services for stroke care, or expanding current

initiatives to address risk factors such as hypertension and diabetes, which disproportionately affect underserved populations. The Cardiovascular Health Program invites stakeholders to partner in this critical endeavor to ensure that stroke patients in Nevada receive the highest quality of care.

DPBH

- Develop a specific program to address the higher incidence of stroke in Black and Native American communities.
- Continue to use the data to identify gaps and inequities in care and drive quality improvements throughout the stroke care continuum.
- Continue to seek funding sources to help reduce deaths and disability from heart disease and stroke.
- Enhance the Well-Integrated Screening and Evaluation for Women across the Nation (WISEWOMAN) program for low-income and uninsured women to prevent heart disease and strokes.²⁹
- Promote the Million Hearts initiative to private sector partners to raise awareness about quality improvements in preventing heart disease and strokes.²⁹
- Support the Cardiovascular Health program's efforts to expand the Heart Healthy Ambassador Blood Pressure Self-Monitoring program throughout Nevada.
- Support the Nevada Statewide Cardiovascular Health Learning Collaborative.
- Support collaborations between programs within the Division, including sharing maternal warning signs education to prevent cardiovascular-related maternal mortality.
- Conduct public awareness campaigns to promote recognition of heart attack and stroke signs and symptoms and the importance of calling 911.²⁹
- Investigating the Rural Health Care Outcomes Accelerator.

Health Systems

- Use system-wide approaches to identify patients "hiding in plain sight" with undiagnosed or unmanaged heart disease and stroke risk factors.²⁹
- Participate in the Nevada Statewide Cardiovascular Health Learning Collaborative.
- Coordinate with Emergency Medical Service (EMS) care providers to implement coordinated systems of care that get patients to certified stroke centers fast and reduce delays in care transitions.²⁹
- Work with community members to raise awareness of stroke and heart attack symptoms and ensure that EMS systems are activated quickly.

Health Care Professionals

- Identify and treat high blood pressure, diabetes, obesity, high cholesterol, smoking, and other stroke risk factors.²⁹
- Refer patients to community lifestyle change programs such as blood pressure self-monitoring, smoking cessation hot-lines, obesity, and diabetes prevention.²⁹

- Educate patients to recognize the signs and symptoms of heart attack and stroke and the importance of calling 911.²⁹

Every Nevadan

- Learn B.E.F.A.S.T. to recognize the signs and symptoms of a stroke and be empowered to activate 911.²⁹
- Eat a healthy diet with plenty of fruits and vegetables, maintain a healthy weight, and be physically active.
- Manage medical conditions such as obesity, lung disease, diabetes, high cholesterol, and high blood pressure by following medical advice and taking medication as prescribed.^{18,19}
- Avoid smoking, vaping, and secondhand smoke.^{14,16}
- Share this information with a friend, coworker, neighbor, or loved one.

CALL TO ACTION

Figure 17 summarizes the key points of this report and provides a call to action. Strokes can occur wherever Nevadans are born, live, learn, work, play, worship, and age. To promote active and productive lives, it is essential to know and manage stroke risk factors. To save lives, learn the signs of a stroke (B.E.F.A.S.T.) and act fast:

- Balance: Sudden loss of balance or dizziness
- Eyes: Sudden loss of vision or blurred vision
- Face: Uneven smile, one side of the face is drooping or numb
- Arm: One arm is weak or numb
- Speech: Slurred speech or difficulty speaking
- Time: Call 911 immediately-every second counts


Figure 17. How to Spot a Stroke, B.E.F.A.S.T.

When it comes to Stroke

BE FAST. Call 911.


Any one of these sudden symptoms could mean a stroke.

HOW TO SPOT A STROKE

B	E	F	A	S	T
					
Balance	Eyes	Face	Arm	Speech	Time
Sudden loss of balance, dizziness	Sudden loss of vision or blurred vision	Uneven smile, one side of face is drooping or numb	One arm is weak or numb	Slurred speech or difficulty speaking	Time to call 911 immediately

KEYS TO PREVENTION

Know and manage your risks.

				
Manage high blood pressure, the leading cause of stroke.	Avoid tobacco use and vaping.	Get regular physical activity.	Manage cholesterol.	Eat healthy foods including vegetables, fruits, and lean protein.

Source: <https://www.startwithyourheart.com/stroke-awareness-matters/>

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APPENDIX

Stroke Reporting Terms – Acronym List

Acronym	Definition
ACH	Acute Care Hospitals
AF	Atrial Fibrillation/Flutter
AHA	American Heart Association
ASA	American Stroke Association
AI/AN	American Indian and/or Alaskan Native
API	Asian and/or Pacific Islander
ASA	American Stroke Association
BMI	Body Mass Index
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CDPHP	Chronic Disease Prevention and Health Promotion
CFCW	Child, Family, and Community Wellness
COPD	Chronic Obstructive Pulmonary Disease
Coverdell	Paul Coverdell National Acute Stroke Act
CVH	Cardiovascular Health Program
CQI	Continuous Quality Improvement
CSCs	Certified Stroke Centers
DHHS	Department of Health and Human Services
DM	Diabetes Mellitus
DPBH	Division of Public and Behavioral Health
DVT	Deep Vein Thrombosis
ED	Emergency Department
EMS	Emergency Medical Services
GWTC-S	Get With the Guidelines - Stroke
HBD	Hospital Billing Data
HDD	Hospital Discharge Data
HDL	High-Density Lipoprotein
HDSP	Heart Disease and Stroke Prevention
ICD-10-CM	International Classification of Diseases, Tenth Rev. Clinical Modification code
JC	Joint Commission
M/F	Male/Female
NH	Non-Hispanic
NRS	Nevada Revised Statutes
PE	Pulmonary embolism
SES	Socioeconomic Status
tPA	Tissue Plasminogen Activator
U.S.	United States

VTE	Venous Thromboembolism
WISEWOMAN	Well-Integrated Screening and Evaluation for Women Across the Nation