Nevada Stroke Registry: 2015 Data Summary

May 2016 | Edition 0.3

Office of Public Health Informatics and Epidemiology

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Recommended Citation
Office of Public Health Informatics and Epidemiology. Division of Public and Behavioral Health. *Nevada Stroke Registry: 2015 Data Summary*. Carson City, Nevada e0.3. May 2016.

Background and Purpose

The Nevada Division of Public and Behavioral Health (DPBH) and the American Heart Association/American Stroke Association (AHA/ASA) entered into collaboration on the nationally recognized Get With The Guidelines℠ (GWTG) Registry program as the state's standardized data registry. The Nevada Stroke Registry collaboration intends to provide Nevada acute care hospitals with necessary tools to view statewide, aggregated data and implement change in their health care systems to improve patient outcomes and quality of care.

Legislation passed in the 78th Session of the Nevada Legislature, Senate Bill 196 (SB 196), requires DPBH to establish a stroke registry, provides for the inclusion of comprehensive and primary stroke centers on a list maintained by DPBH, and specifies required reporting of certain data by those centers. Support for SB 196 was provided by partners such as the AHA/ASA, Nevada Hospital Association, and Nevada Rural Hospital Partnership.

GWTG ensures that hospitals treat patients according to the most current nationally accepted recommendations and guidelines. Hospitals that implement GWTG can review real-time performance and identify interventions to benchmark and maximize patient care. However, the Nevada Stroke Registry aims to compile and analyze the data in an aggregate manner (rather than at an individual hospital level) so as to enhance the ways the current data can be used to improve stroke survivorship and parity of care statewide, while decreasing disability burden. The DPBH Chief Biostatistician was given super-user access to GWTG to provide aggregate data for the 15 comprehensive stroke centers reporting. Currently, the DPBH Chief Biostatistician has permission from nine hospitals to view their individual data; however, in the aggregate, all 15 hospitals' data is reflected.

The Chronic Disease Prevention and Health Promotion (CDPHP) section's Heart Disease and Stroke Prevention program fostered the development of the Nevada Heart and Stroke Taskforce, which is actively engaged in promoting quality improvements in relation to stroke care in Nevada. The Nevada Stroke Registry aligns with the goals of the Nevada Heart and Stroke Taskforce as it promotes the use of clinical best practices in pre-hospital and hospital settings. In the Heart and Stroke Taskforce Strategic Plan, Goal 1 aligns with the quality-improvement aims of the Nevada Stroke Registry.

Goal 1: Improve access to effective care

> *Strategy 1.3* Promote clinical and public health systems that coordinate efforts to collect baseline data and share across the state.[1]

A draft version of this report was shared with the Heart and Stroke Taskforce at the May 4, 2016, annual meeting. Taskforce members were asked to provide feedback, but no requests to add or revise content were provided to DPBH from the group. The AHA/ASA provided valuable and detailed feedback in relation to draft versions of this report.

Lastly, per statutory guidance in SB 196 [Sec. 6(1)d and Sec. 7(1)], outreach to encourage reporting and promote awareness of the stroke registry was conducted toward all Nevada hospitals certified as acute stroke-ready hospitals, as well as to the Heart and Stroke Taskforce, Heart and Stroke Coordinators statewide, Emergency Medical Services (EMS) partners within and outside of the DPBH, and to the Nevada Rural Hospital Partnership. The Nevada Rural Hospital Partnership recently completed an assessment to identify opportunities to align current critical access hospital reporting with possible routes to reporting stroke information in a way that parallels some of the data collected in the stroke registry.

Nevada Stroke Burden

Heart disease and stroke are both leading causes of death in Nevada and the United States. Heart disease is the leading cause of death while stroke is the fourth-leading cause nationwide and fifth in Nevada.

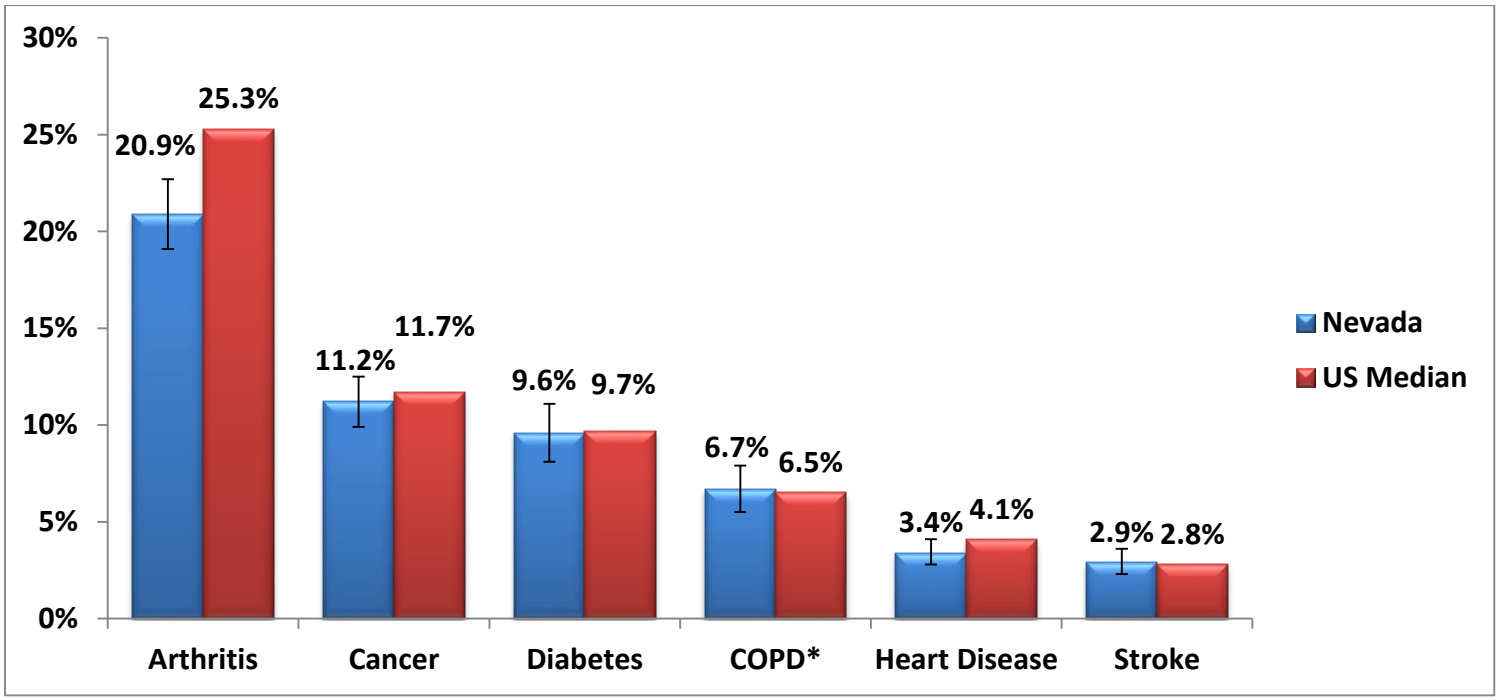
[1] Note: Clinical systems include use of electronic health care records, information sharing, and use of health information exchange; and public health systems including state, local health departments, and other community health organizations (identify data sources, compile and clean data, creating reports).

Approximately 1 out of every 3 deaths in the United States is caused by heart disease or stroke. Twenty-two hundred people die from cardiovascular disease each day, and each year 700,000 US citizens experience a stroke with 150,000 deaths caused by stroke. In the next two decades, it is estimated that the prevalence and cost of heart disease and stroke will significantly increase as the "baby boomer" generation ages.

There are many factors that increase the risk of heart disease: tobacco use, physical inactivity, obesity/being overweight, high blood pressure, and high cholesterol. Of these risk factors, smoking is also the leading cause of preventable death in the United States. One-third of American adults also have high blood pressure and more than half do not have it under control. Although most adults are treated with medication and see a doctor at least twice a year, their condition is still not controlled (Nevada Heart and Stroke Taskforce Strategic Plan, Nevada Division of Public and Behavioral Health, CDPHP, 2015).

Chronic disease prevalence in Nevada is addressed below using sampled self-reported data from the 2013 Behavioral Risk Factor Surveillance Survey (BRFSS). Nevada's stroke prevalence is slightly above the U.S. median.

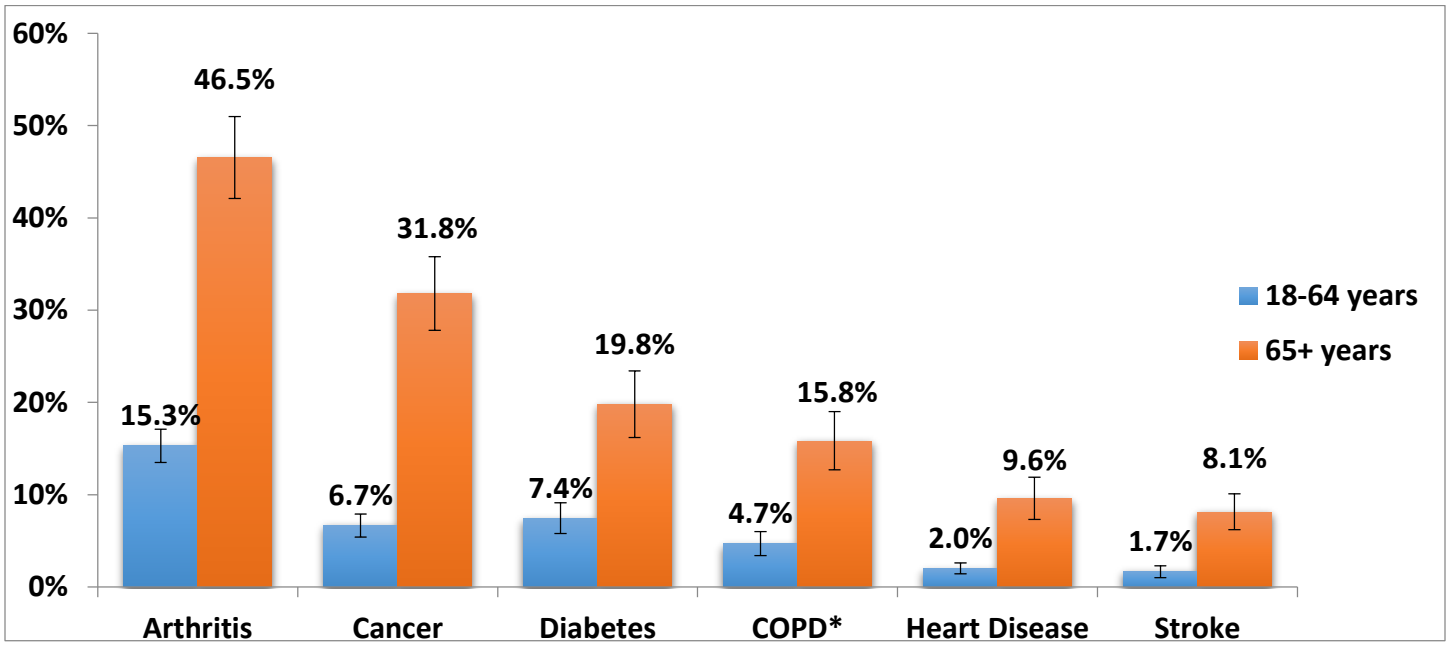
Prevalence of Chronic Diseases, Nevada vs. U.S., 2013 BRFSS Data



Source: Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013.

The differential burden of stroke prevalence by age group can also be seen in the 2013 BRFSS data, with the over 65 years of age group at higher risk for chronic diseases.

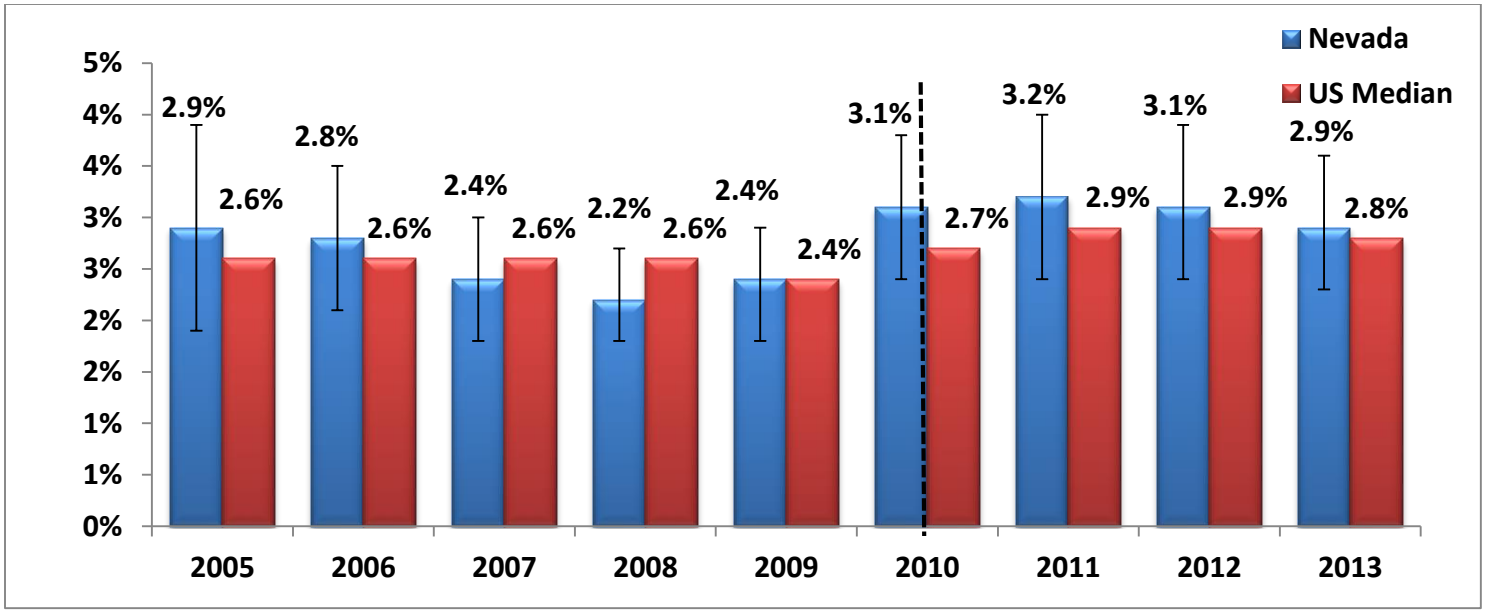
Prevalence of Chronic Diseases by Age Groups, Nevada, 2013 BRFSS Data



Source: Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013.

Stroke prevalence in Nevada compared to the United States overall using 2005-2013 BRFSS data indicates some variability as seen in the table below, but exceeds the U.S. median for the 2010-2013 period.

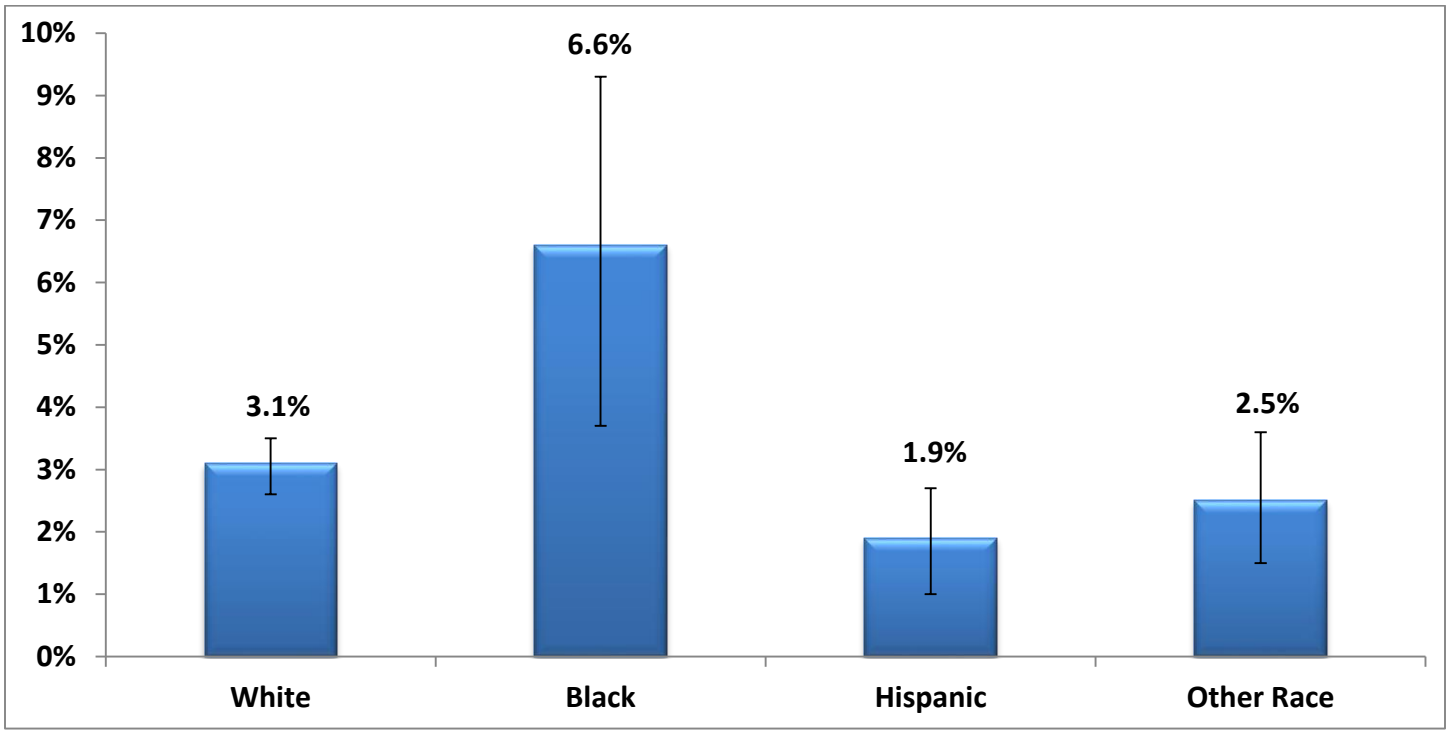
Adults who have had a stroke by year, Nevada vs. U.S., 2005-2013 BRFSS Data



Note: BRFSS methodology changed in 2011, therefore it may be misleading to compare statistics before and after the methodology change. Source: Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005-2013.

Additionally, 2011-2013 BRFSS stroke prevalence data reflects self-reported stroke experience by race and ethnicity. The health disparity in Nevada's African American population as compared to other ethnicities is striking — more than double the stroke prevalence — and indicates a clear need to focus efforts on reducing this disparity.

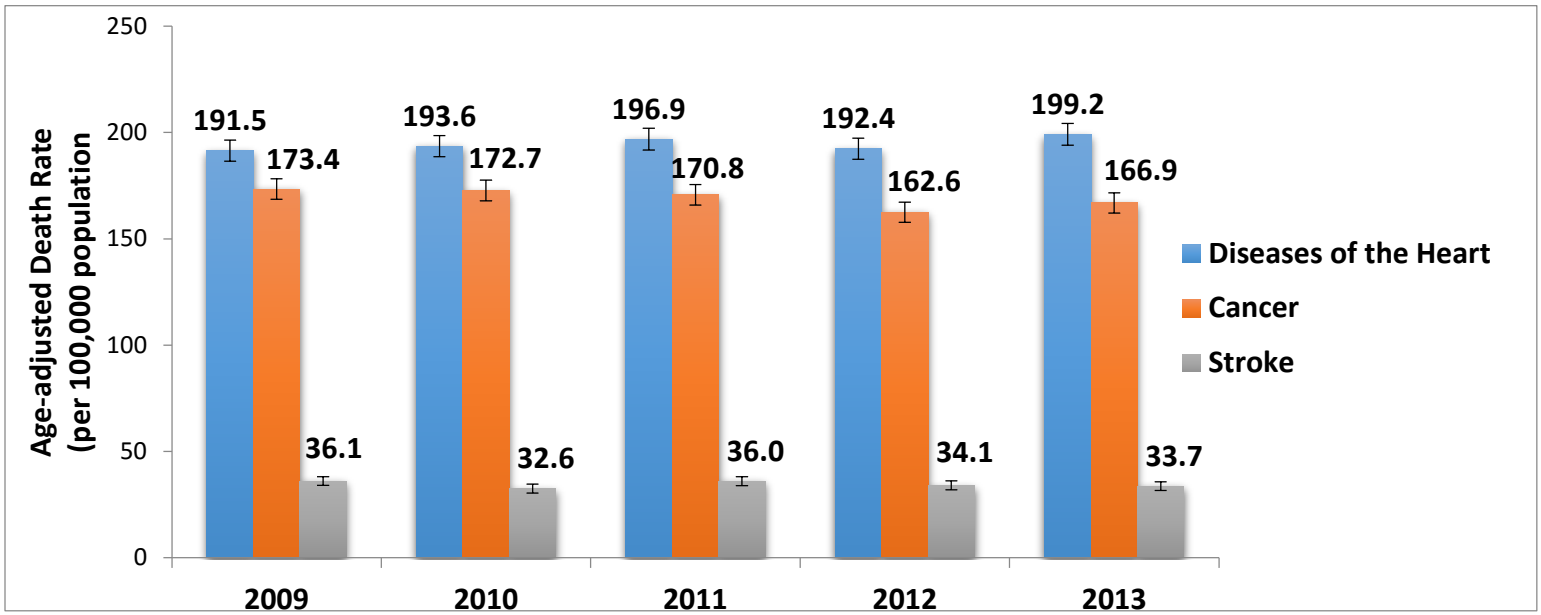
Adults who have had a stroke by race/ethnicity, Nevada, 2011-2013: Pooled BRFSS data



Source: Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data.* Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011-2013.

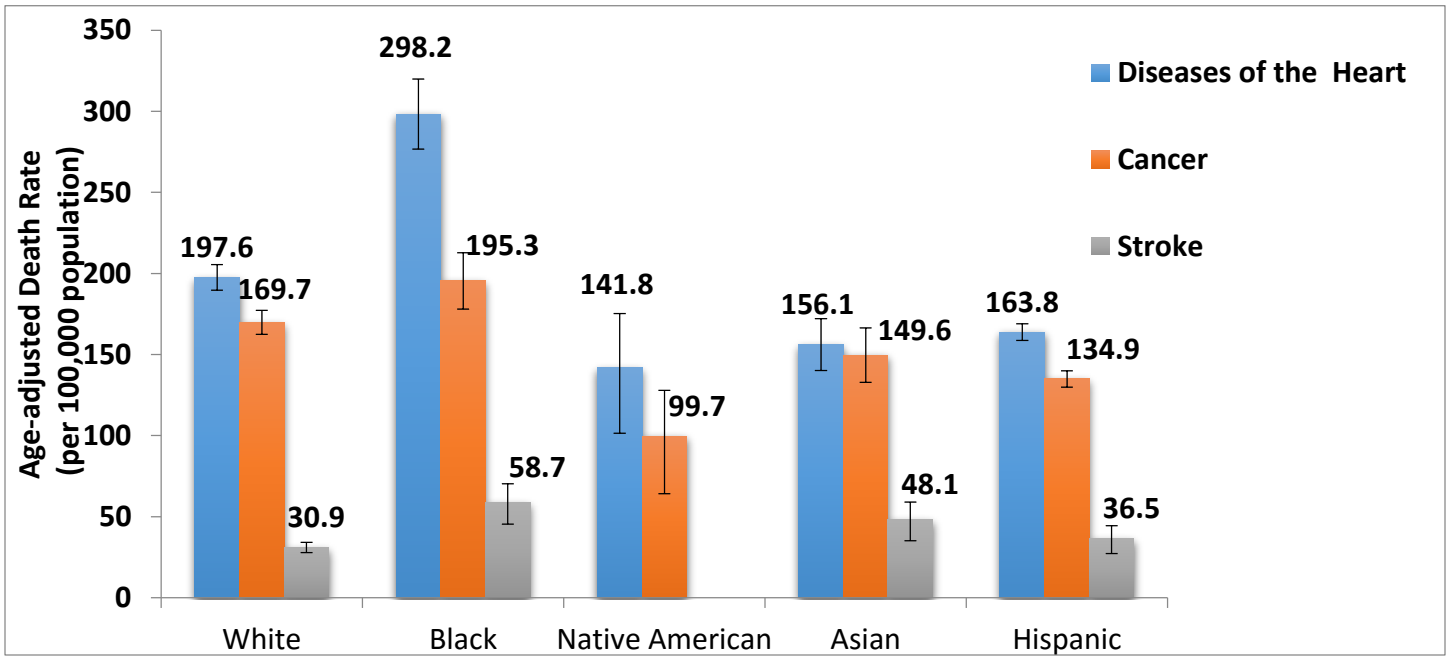
Mortality due to stroke in Nevada from 2009-2013 can be seen in the table below. In 2013, stroke contributed to 4% of Nevada mortality. Male mortality (35.2) exceeded female mortality (32.4) in the age-adjusted death rate per 100,000 population (Nevada Division of Public and Behavioral Health. Office of Public Health Informatics and Epidemiology, 2014).

Chronic Disease Mortality by Year, Nevada Residents, 2009-2013



Source: Nevada Division of Public and Behavioral Health. Office of Public Health Informatics and Epidemiology, 2014. Note: 2013 Mortality data is preliminary and is subject to change.

Chronic Disease Mortality by Race/Ethnicity, Nevada Residents, 2013



Source: Nevada Division of Public and Behavioral Health. Office of Public Health Informatics and Epidemiology, 2014. Note: 2013 Mortality data is preliminary and is subject to change.

Again, the need to address disparities in stroke mortality outcome by race and ethnicity is highlighted by the table above, with the mortality of African American Nevadans being almost double that of white Nevadans, and the increased mortality experienced by Asian and Hispanic Nevadans in stark contrast to that of whites. In the *Minority Health Report: 2011-2014* published by OPHIE, Figure 9:

Adults Who Have Been Told They Had a Stroke (p. 19 at http://dpbh.nv.gov/Programs/OPHIE/Docs/minority_rpt/) proportions by race and ethnicity indicate a disparate stroke burden on Pacific Islanders/Native Hawai'ians and African Americans that bear further exploration to identify ways to decrease stroke burden and increase services to these populations.

Population and Limitations

This report utilizes aggregate data from 15 stroke centers in Nevada. The participating stroke centers are listed below. In 2015, the participating stroke centers treated 93.7% of all the strokes in Nevada (2015 discharge data includes the first two quarters of data only; in 2014, 92.9% of strokes treated were at the participating centers). In the hospital discharge data, all of the stroke-relevant ICD codes that hospitals can enter are reflected; however, hospitals have the option to sample their data, as well as to enter only the 10 stroke ICD codes that the Centers for Medicare and Medicaid Services and the Joint Commission review.

The data in this report is reflective only of the hospitals that are currently participating in the GWTG program, and therefore may not be generalizable to the entire state of Nevada. Currently, the Nevada Stroke Registry is receiving individual hospital data from nine of the 15 primary care stroke centers reporting into GWTG and aggregate view data from all 15. Additional limitations included data from a percentage of total stroke cases in Nevada and incomplete data fields for the reported stroke cases. The provisions require only the primary care stroke centers within Nevada report data into the stroke registry. Nevada currently houses 32 hospitals, of which 15 are primary stroke centers per the AHA guideline designations. Furthermore, the data accessed through GWTG is de-identified by nature and was not compiled in a fashion to allow comparison across different hospitals for this report. This data will be addressed for the purpose of developing quality improvements relative to the state of Nevada in its entirety.

Participating Nevada Hospitals (as of May 2016)

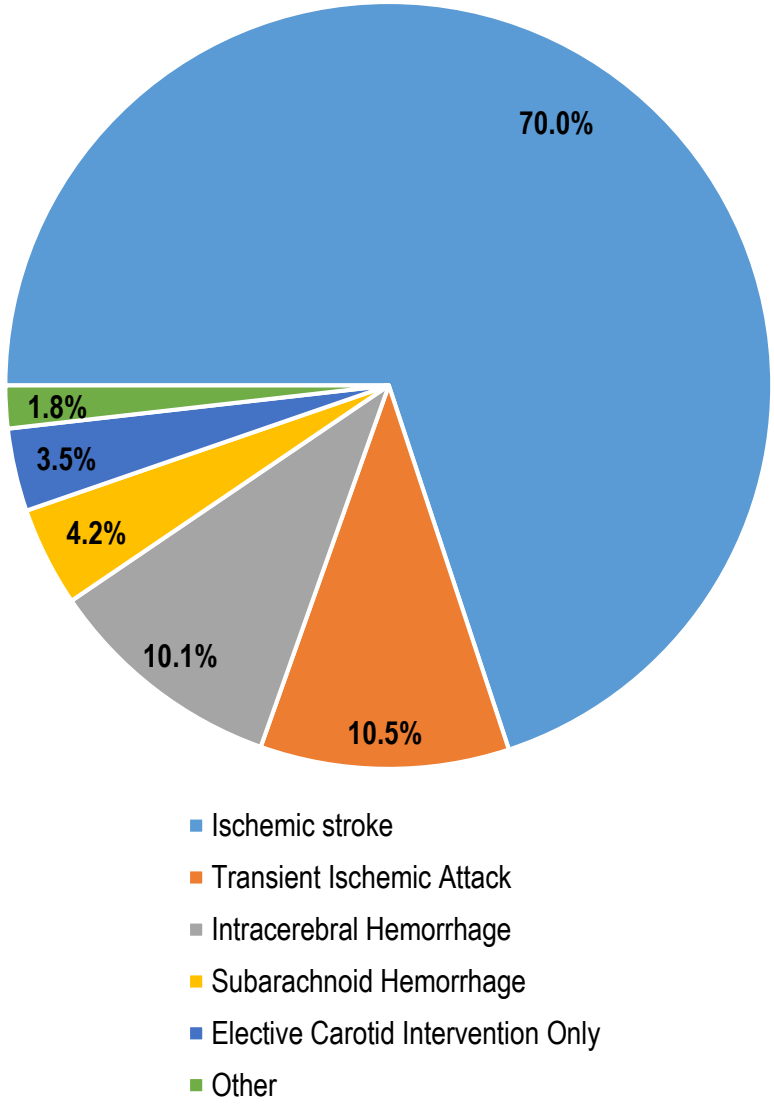
Centennial Hills Hospital *
Desert Springs Hospital *
Mountain View Hospital *
Northern Nevada Medical Center *
Renown Regional Medical Center *
St. Mary's Regional Medical Center
St. Rose Dominican Hospital- Rosa de Lima
St. Rose Dominican Hospital-San Martin
St. Rose Dominican Hospital- Siena
Southern Hills Hospital and Medical Center *
Spring Valley Hospital Medical Center *
Summerlin Hospital Medical Center *
Sunrise Hospital and Medical Center *
University Medical Center
Valley Hospital Medical Center

* *Denotes those centers that currently can be viewed individually in GWTG due to permission status.*

Demographics

This report was compiled using de-identified patient data from GWTG-participating hospitals in Nevada for calendar year 2015. The figure below displays the percentage of cerebrovascular events in reporting Nevada hospitals. The most common type of stroke for 2015 was ischemic (70.0%), followed by transient ischemic attack (TIA) (10.5%), intracerebral hemorrhage (10.1%), subarachnoid hemorrhage (4.2%), and elective carotid intervention only (3.5%).

Type of Stroke, Nevada Hospitals, 2015



Stroke is the fifth-leading cause of death in Nevada, but the fourth-leading cause of death in the United States, killing nearly 130,000 Americans each year.

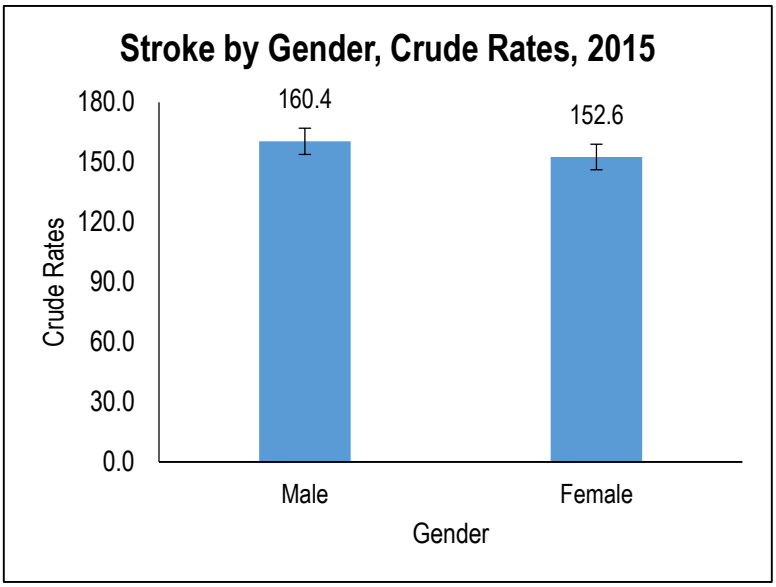
Definitions

- **Cerebrovascular event**: a clinical syndrome caused by disruption of blood supply to the brain, characterized by rapidly developing signs of focal or global disturbance of cerebral functions, lasting for more than 24 hours or leading to death. A transient ischemic attack (TIA) refers to a similar presentation that resolves within 24 hours.
- **Ischemic Stroke (IS)**: occurs when an artery to the brain is blocked resulting in inadequate blood supply and oxygen.
- **Transient Ischemic Attack (TIA)**: occurs when a clot (typically blood) temporarily blocks an artery and part of the brain does not get the blood flow it needs. The symptoms occur rapidly and usually last for a short time (less than 24 hours) before resolving completely and leaving no permanent damage.
- **Intracerebral Hemorrhage (ICH)**: occurs when a blood vessel within the brain ruptures, allowing blood to leak inside the brain.
- **Subarachnoid Hemorrhage (SAH)**: occurs when a blood vessel just outside the brain ruptures. The area of the skull surrounding the brain (the subarachnoid space) rapidly fills with blood.
- **Elective Carotid Intervention Only**: elective definitive interventions include elective carotid endarterectomy, angioplasty, and carotid stenting.
- **Other**: includes stroke not otherwise specified, no stroke-related diagnosis, and missing diagnosis.

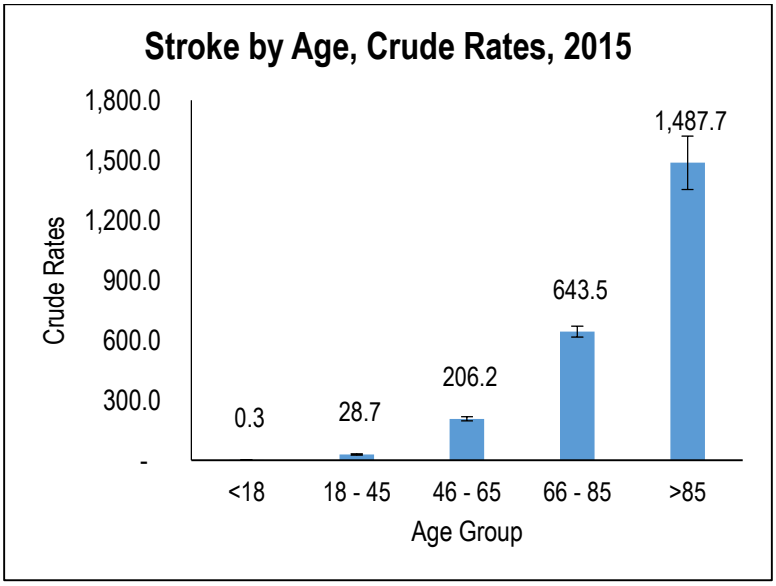
Who is Affected?

The Nevada Stroke Registry provides information on stroke as it relates to gender and age group. The percent of strokes in males exceeded that of females, and the older age groups experienced much higher stroke burdens (N.B.; crude rate is generated by dividing the total number of cases in a specific time period by the total number of people in the population).

When examining by gender, males (2,321 cases, 160.4 per 100,000 population) did not have significantly higher rates of strokes when compared to females (2,178 cases, 152.6 per 100,000 population).



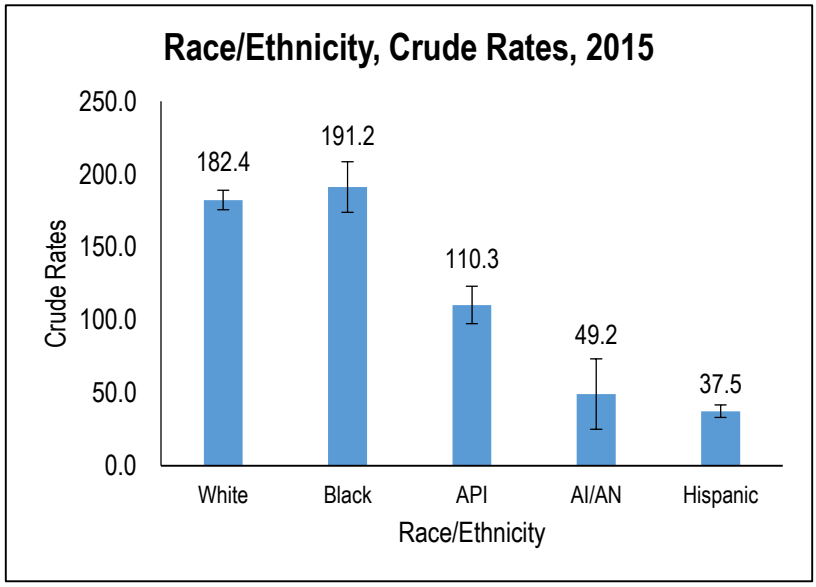
When examining the distribution of stroke by age group, individuals age 85 and older (471 cases, 1,488.7 per 100,000 population) had significantly higher rates of strokes when compared to all other age groups.



Who is Affected?

The Nevada Stroke Registry provides information on stroke as it relates to race and ethnicity (Hispanic and non-Hispanic). The percent of stroke by race is presented here.

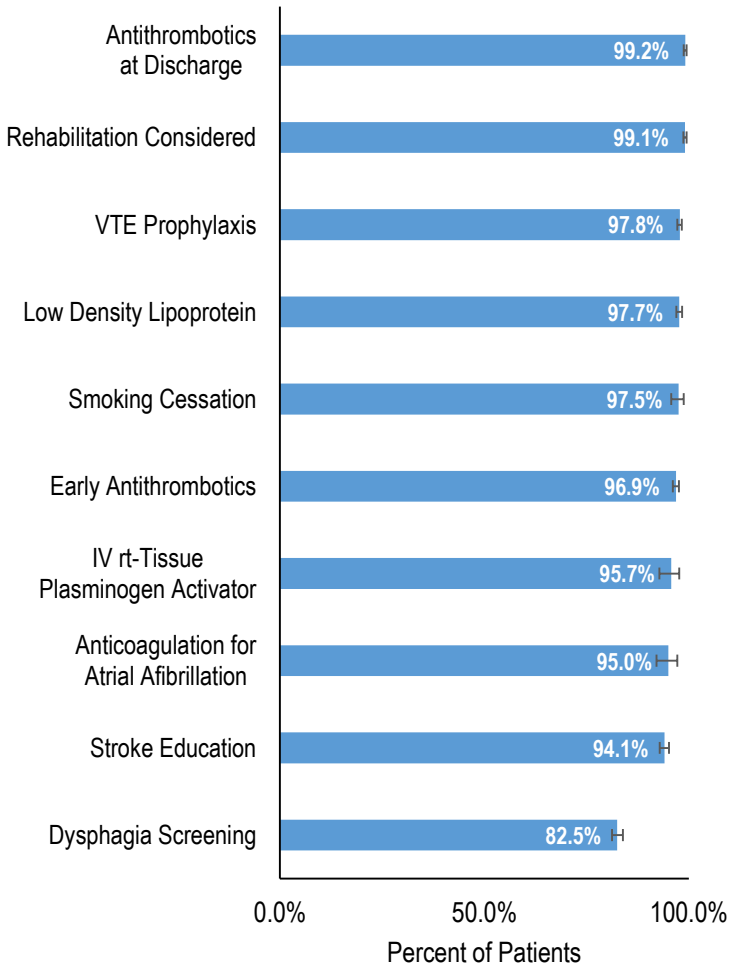
When examining the distribution of strokes by race/ethnicity, whites (2,791 cases, 182.4 per 100,000 population) and blacks (465 cases, 191.2 cases per 100,000 population) had significantly higher rates of stroke when compared with all other racial and ethnic categories.



Performance Measures

The performance measures listed below coincide with the Paul Coverdale core consensus measures and are based on GWTG data reported by Nevada stroke centers between January and December 2015. The performance measures were developed by the Joint Commission, AHA, and the CDC for optimal treatment of ischemic strokes. Some of the lower-scoring performance measures are discussed in more detail in the following sections of this report, as well as a few additional performance measures beyond the core consensus measures that indicate opportunities for statewide improvement. The core performance measures were examined by geographic location for the nine currently individually identifiable hospitals (northern region and southern region). Specific core measures had notable differences between regions over 2011-2015: stroke education (north at 99.1%, south at 94.1%), IV rt-PA administration (north 92.3% and south 96.8%), and early antithrombotics (north 99.7% and south 96.4%).

Performance Measures, 2015



Performance Measures

Antithrombotics at discharge: percentage of ischemic stroke or TIA patients prescribed antithrombic medications (prophylactics that prevent clot formation) at discharge.

Rehabilitation: percentage of patients with stroke, evaluated for rehabilitation services including modalities within the hospital, subacute care, long-term care facility, home and outpatient therapies.

VTE Prophylaxis: percentage of patients with ischemic stroke, hemorrhagic stroke, or like conditions who receive venous thromboembolism prophylaxis the day of or the day after hospital admission.

Low Density Lipoprotein (LDL): percentage of patients with LDL levels ≥ 100, or not measured, or on cholesterol-reducer prior to admission, who are discharged on statin medication (cholesterol-reducing drugs).

Smoking Cessation: percentage of patients with history of tobacco product use who receive, or their caregivers receive, smoking cessation advice or counseling during hospital stay.

Early Antithrombotics: percentage of stroke or TIA patients who have received antithrombotic therapy by the end of admission day two.

IV rt-Tissue Plasminogen Activator (t-PA): percentage of ischemic stroke patients who arrived at the hospital within two hours of their last known well time and received tissue plasminogen activator to dissolve clots and improve blood flow within three hours of last well known well time.

Anticoagulation for Atrial Fibrillation/Atrial Flutter: percentage of patients with an ischemic stroke or TIA also presenting with atrial fibrillation and/or atrial flutter who are discharged on anticoagulation therapy (medication that thins blood and prevents clotting).

Stroke Education: patients and/or caregivers provided with education and/or educational materials during the hospital stay addressing personal risk factors and warning signs of stroke, activation of emergency medical system, need for follow-up after discharge, and medications prescribed.

Dysphagia Screening: percentage of patients screened for dysphagia (difficulty swallowing), using evidenced-based protocol, before allowing any foods, fluids, and/or medications orally.

Dysphagia Screening

Causes of Nutritional Impairment after Stroke

Primary Factor

- Dysphagia

Secondary Factor

- Upper limb paralysis
- Disturbance of sensory function
- Depression
- Cognitive changes affecting eating (e.g.; attention-concentration deficit, forgetting to eat, eating too fast or too slowly)

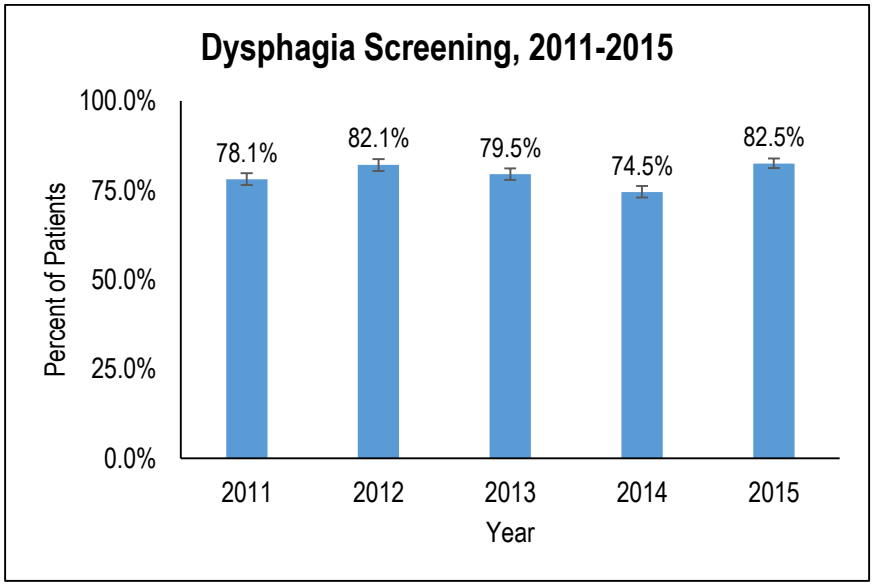
Dysphagia screening was the lowest-performing core measure. Promotion of the use of a dysphagia screening action plan by stroke stakeholders would be a route to improve performance on this measure.

Dysphagia Screening Action Plan

Hospitals identify and recruit professionals to develop a stroke care team (e.g., speech therapist, occupational therapist, physical therapist, social worker, registered dietician, and nursing navigator) that develop policies to integrate evidenced-based dysphagia screenings into the stroke patient's care plan. In addition, the stroke care team participates in quarterly sessions addressing stroke education and training. The risk management and quality improvement teams closely monitor activities and deliver recommendations for quality improvement.

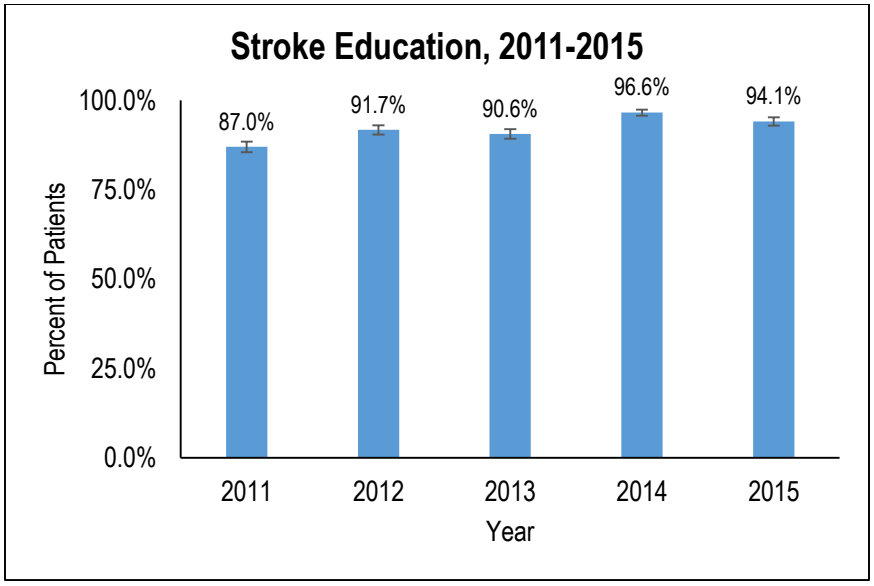
Dysphagia, or difficulty swallowing, is a common occurrence resulting from acute stroke. Early screening helps to identify stroke patients who could be vulnerable to weight loss, fluid depletion, malnutrition, and aspiration of food or liquid causing pneumonia. Patients who are unable to consume food or fluid by mouth often demonstrate poor outcomes and experience prolonged hospital stays including post-discharge long-term care facility admissions.

Although dysphagia screening in 2015 (82.5%) has significantly increased when compared to 2014 (74.5%), dysphagia screening in 2014 was significantly lower in comparison to other years.



Stroke Education

The percent of patients or their caregivers who were provided education addressing personal risk factors for stroke, warning signs for stroke, activation of emergency medical system, need for follow-up after discharge, and medications prescribed has increased from 87.0% in 2011 to 94.1% in 2015. However, a decrease in the percentage from 2014 to 2015 was observed. Increasing efforts by all stroke stakeholders on stroke education across the stroke continuum of care (prevention, treatment, rehabilitation, decreasing readmissions, and re-occurrence) is key to raising this performance measure. Nevadans would benefit from a coordinated effort to increase recognition of the signs of stroke and preventive behavior and lifestyle factors.



Stroke Education

Risk Factors for Stroke: risk factors for stroke include, but are not limited to, using tobacco products, obesity, high blood pressure, high cholesterol (HDL), heart disease, diabetes, and sickle cell disease.

High Blood Pressure: increased pressure exerted within the blood vessels; systolic measurements

Warning Signs of Stroke:

- Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body
- Sudden confusion, trouble speaking, or understanding
- Sudden trouble waking, dizziness, loss of balance, and/or coordination
- Sudden severe headache with no known cause

Activation of Emergency Medical Systems: If a patient experiences one or more signs and symptoms of a stroke, they should immediately call 9-1-1 and activate the emergency response system. Early access to advanced care and early definitive interventions are imperative for the best possible patient outcomes. Patients should arrive at the nearest appropriate acute care facility within one hour of the onset of signs and symptoms.

Follow-up Care: Patients who have suffered a stroke are at high risk of suffering additional strokes. Stroke care teams develop a plan of care for patients post discharge, including follow-up primary care visits, medication regimens, physical therapy, occupational therapy, and other services including support groups.

Medication Adherence: Patients are discharged on specific medication regimens after suffering a stroke to help prevent additional strokes. These medications may include antihypertensives, antithrombics, anticoagulation therapies, and antilipidemics.

Anticoagulants for Treatment of Atrial Fibrillation and Atrial Flutter

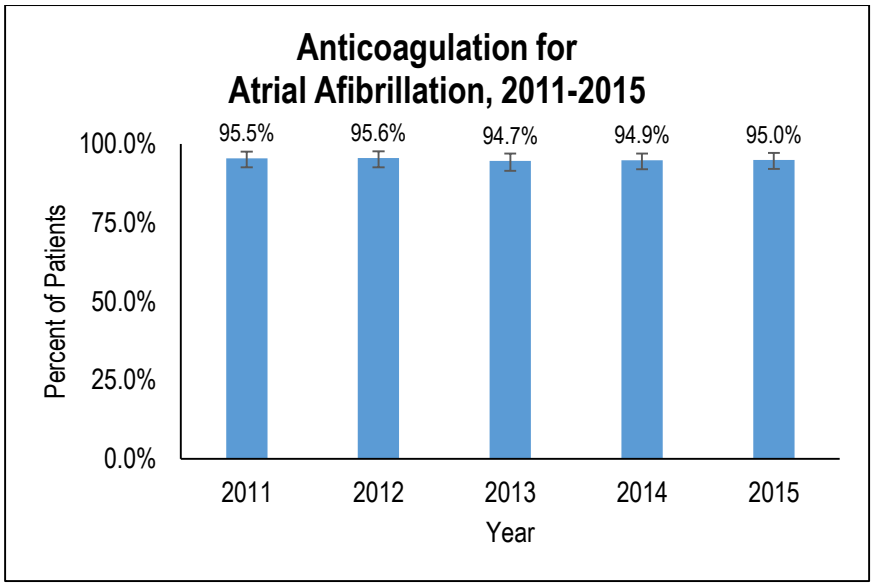
Atrial Fibrillation: an irregular heartbeat (or arrhythmia) that may result in blood clots, stroke, heart failure and other heart-related complications.

Atrial Flutter: arrhythmia due to problems with the electrical system of the heart originating in the atria

Anticoagulants: drugs that slow the clotting process in the blood preventing blood clots from forming

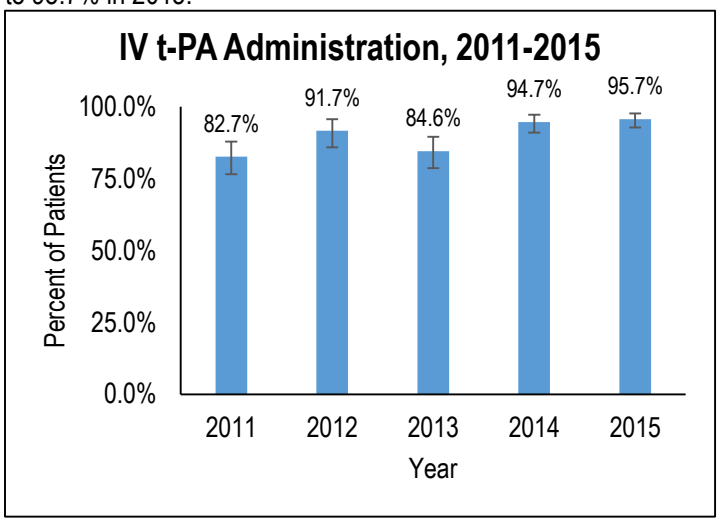
Anticoagulants for treatment of atrial fibrillation and atrial flutter remained stable over the 2011-2015 time period.

The percent of patients with an ischemic stroke or TIA with atrial fibrillation/flutter discharged on anticoagulation therapy has not significantly changed in the past five years.



IV t-PA Administration

IV t-PA administration for eligible patients has increased from 82.7% in 2011 to 95.7% in 2015.



The IV t-PA administration performance measure reflects the percentage of ischemic stroke patients who arrived at the hospital within two hours of their last known well time and received tissue plasminogen activator to dissolve clots and improve blood flow within three hours of last known well time. Focused efforts aiming to increase awareness of the key time periods for administration, the benefits of use, and the importance of administration in a continuum of care may be productive routes to improving this performance measure, keeping in mind the contraindications listed in the sidebar.

Contraindications for Administering IV t-PA

Acute Intracranial Hemorrhage (ICH): examples of ICH include subarachnoid hemorrhage, intraventricular hemorrhage, epidural hemorrhage, and subdural conversion of infarctions.

History of ICH

Severe Uncontrolled Hypertension

Serious Head Trauma or Stroke in the Three Months Preceding the Stroke

Myocardial Infarctions (MI) Within Three Months

Thrombocytopenia and Coagulopathy

Severe Hypoglycemia or Hyperglycemia

Mild or Improving Stroke Symptoms

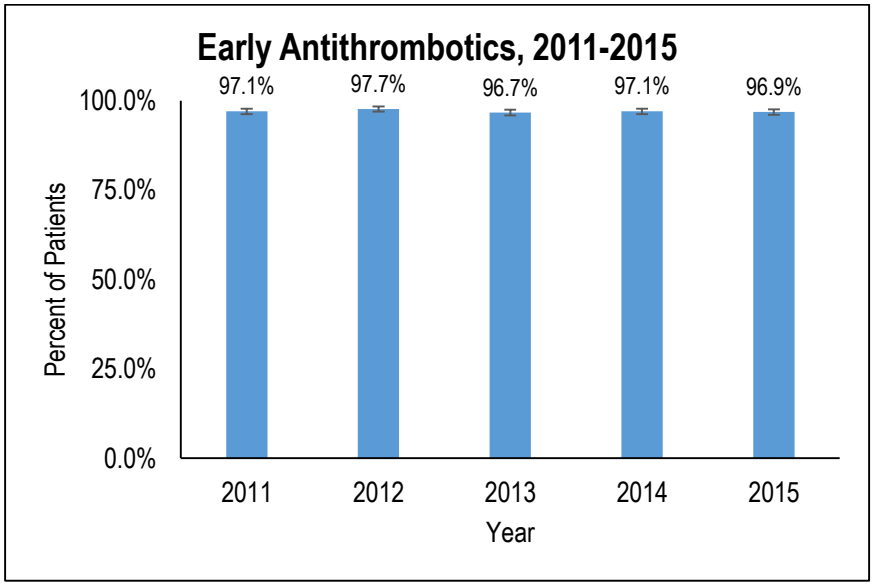
More Than Four Hours since the Last Known Well Time: time of onset of symptoms or time the patient was last known to be well or symptom free.

Early Antithrombotics

Early antithrombotic therapy (before the end of the second hospital day) has remained fairly constant from 2011-2015 as reflected by the Nevada Stroke Registry. Early antithrombotic therapy is considered most effective after the first 24 hours for those experiencing acute ischemic stroke.

Focusing stroke stakeholder efforts on identification of barriers to use in appropriate conditions may be a path to increasing the outcome statewide on this performance measure.

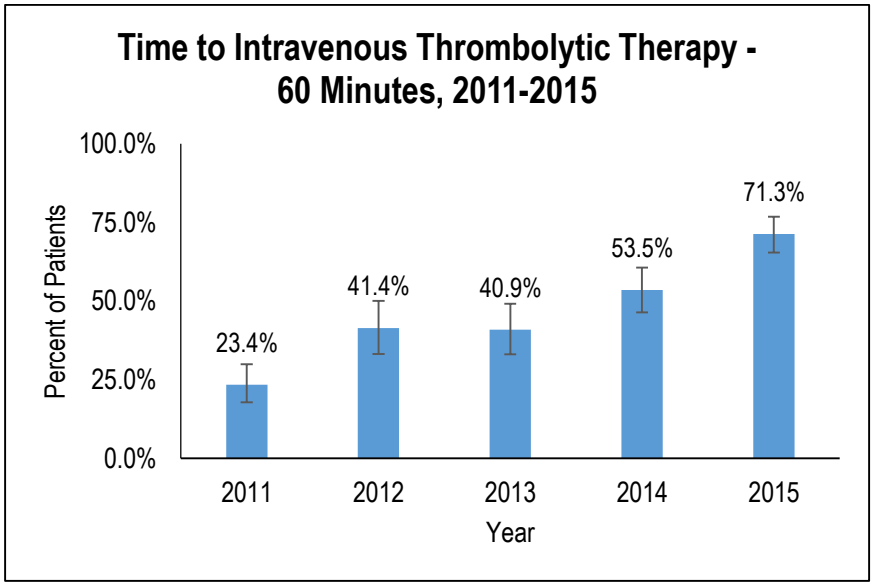
The percent of patients with an ischemic stroke or TIA who received antithrombotic therapy by the end of the second hospital day has not significantly changed in the past five years.



Time to Intravenous Thrombolytic Therapy

The table below indicates the need to continue to increase statewide performance on time to intravenous thrombolytic therapy within 60 minutes as an opportunity to improve stroke outcomes. Although this measure is not part of the core consensus measures, it highlights improving statewide performance over the past five years as well as an opportunity for statewide quality improvement.

The percent of patients with an ischemic stroke or TIA who received antithrombotic therapy within 60 minutes has significantly improved in the past five years.

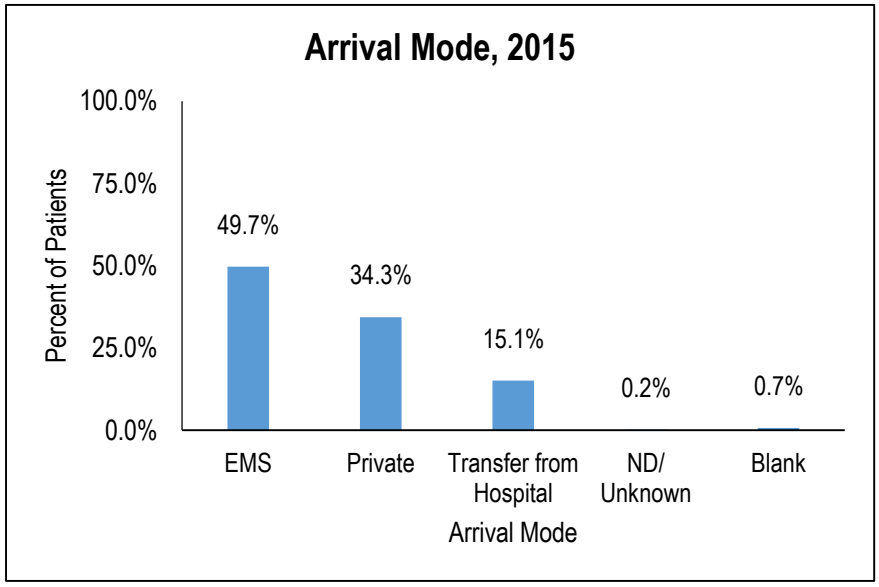


Pre-Hospital Mode of Transport

Notification and Response of EMS for Stroke

The notification and response of EMS to a stroke involves a complex interaction between the public, the applicable EMS program, and the relevant hospital emergency departments. The CDC recommends hospitals develop partnerships with local EMS providers and educate communities about the symptoms of stroke and the importance of dialing 9-1-1 when someone is experiencing symptoms of a stroke for timely treatment. It is also important for EMS and emergency dispatch operators to be trained in stroke symptom recognition and be able to assist these patients in quickly getting to the nearest hospital that can provide the drug IV t-PA within the three-hour window from symptom onset. Additional measure relating to arrival mode of transport is displayed below. Also, a measure relating to pre-notification of hospital by EMS indicates that, in 2015, 54.2% of stroke patient encounters involved hospital pre-notification by EMS, offering room for improvement to increase pre-notification rates statewide to maximize transitions along the stroke continuum of care.

In addition to mode of transport, a measure relating to last known well to arrival time offers opportunities for improvement to maximize survivorship and decrease disability burden. In 2015 GWTG data, last known well to arrival time was 138.5 minutes, offering opportunities to work on statewide reduction of the time period for this measure.



Stroke Symptoms (With Acute Onset)

Altered Mental Status: patients suddenly become confused, disoriented, agitated, or unresponsive.

Facial Droop: patients develop a sudden onset of facial numbness or droop. This often happens to only one side of the face and can be accompanied by slurred speech or difficulty speaking.

Dysphagia: (difficulty swallowing) patients may suddenly lose the ability to swallow, feel like they are choking, and/or feel as if something is lodged in their throat.

Hemiparesis or hemiplegia: sudden onset of one-sided weakness and/or movement, usually beginning in the face and associated side of the body.

Difficulty ambulating: acute onset of stroke often leaves patients unable to walk due to hemiparesis, loss of coordination, and leaves them with an unsteady gait, increasing the risk of falls.

Cephalgia: sudden onset of severe headache or pain. Often times described as the worst "headache" of their life.

Anyone experiencing these symptoms or noticing these symptoms in another person should immediately **dial 9-1-1**. It is also important to note the time of symptom onset.

Recommendations and Aggregated Data

Below is a series of recommendations based on the 2015 aggregate Nevada Stroke Registry data:

- Currently only nine of the 15 facilities have completed and returned their Memorandum of Agreements (MOU) for data sharing/super-user agreement to Quintiles (vendor of GWTG). Two of the facilities' MOUs are pending processing at Quintiles.
    - QI recommendation: Increase MOU agreements returned to DPBH to all 15 primary stroke facilities in Nevada to enable viewing all 15 hospitals individually.
    - QI recommendation: Explore use of the Health Information Exchange to collect data aligning with the 10 GWTG performance measures to include critical access hospitals and cross walking with GWTG data to get a comprehensive geographic representation of stroke in Nevada.
- Stroke case data is being reported for patients without all data being contributed (fields left empty or blank), likely unintentionally or due to the lack of data collection/documentation at time of service.
    - QI recommendation: Improve quality of reporting for individual stroke cases and ensure complete data is collected and reported. Consider increased training across the health care team as to what data elements are collected, why the reporting is important, how it benefits patient outcome, and the value of a complete stroke registry for Nevada.
- Use aggregate data to address health disparities by ethnicity and race, gender, insurance status, and geographic location.
    - QI recommendation: Health disparities are evident in Nevada in relation to stroke prevalence and mortality rate by race and ethnicity. Health disparities for stroke are most marked among African American and Pacific Islanders/Native Hawai'ian Nevadans, and an emphasis on addressing racial and ethnic disparities relating to stroke must be prioritized and contributing factors identified.
- The core performance measures were examined by geographic location for the nine currently individually identifiable hospitals (northern region and southern region). Specific core measures had notable differences between regions over 2011-2015: stroke education (north at 99.1%, south at 94.1%), IV t-PA administration (north 92.3% and south 96.8%), and early antithrombotics (north 99.7% and south 96.4%).
    - QI recommendation: Examining the data by geographic locations can identify opportunities for targeted technical assistance and can reveal important differences between regions. Additional measures could be identified to analyze by geographic location.
- Reporting fatigue and numerous reporting requirements/demands are presenting barriers to effective and beneficial reporting of all stroke cases versus the current submission of limited stroke cases.
    - QI recommendation: Determine a quality improvement that will reduce reporting fatigue and requirements/demands to facilitate increased reporting to encompass all stroke cases encountered by each facility.
    - QI recommendation: Explore feasibility of the use a template for entering data from Electronic Health Records (EHRs) and develop data-sharing capability or importing-exporting functionality between GWTG database platform and EHRs.
- Include stroke pre-notification of hospital by EMS statewide to maximize transitions along the continuum of care.
- Continue to increase statewide performance on time to intravenous thrombolytic therapy within 60 minutes.
- Decrease last known well to arrival time to maximize survivorship and decrease disability burden.
- Explore interest on the part of the Nevada Heart and Stroke Taskforce in reviewing stroke registry data and making recommendations on quality improvement for possible incorporation into the Nevada Stroke Registry Report.

Legislative Recommendations

In SB 196 of the 78th Nevada Legislative Session, section 9, subsection 2, subsubsection b, the DPBH is required to provide "any recommendations for legislation to improve the quality of care provided to patients who suffer from strokes in the State." Due to the delayed provision of super-user access to the DPBH Chief Biostatistician, data was received for analysis as of May 2, 2016. The DPBH does not recommend additional stroke quality improvement legislation at this time due to the need to address the limitations mentioned in this report, and the fact that access to the data was so recently attained. A better sense of the possible need to recommend additional legislation will be available over time and with additional utilization of the Nevada Stroke Registry. An updated Legislative Recommendation section will be available in the 2016 Nevada Stroke Registry report, which will be submitted to legislatively mandated entities by June 1, 2017.

Summary

Aggregate data collected in the Nevada Stroke Registry provides a much-needed opportunity to enhance stroke survivorship and reduce disability burden in Nevada through the identification of priority areas upon which to focus quality-improvement efforts. It also allows participating hospitals the opportunity to identify and celebrate areas of success and optimal implementation of quality-improvement measures with excellent performance measure outcomes. The results of the performance measures reported here, along with the recommendations above, are offered to address quality improvements on a statewide scale, as opposed to the level of the individual hospital. Efforts of the CDPHP section's Heart Disease and Stroke Prevention program, in concert with the efforts of the Nevada Heart and Stroke Taskforce and the Nevada AHA/ASA, will need to align in addressing quality-improvement opportunities for promoting and implementing enhanced stroke prevention and care along the continuum of stroke prevention education, optimal stroke treatment, and post-stroke care, particularly in regard to readmissions. Stroke-prevention education needs to address the importance of widespread stroke signs awareness, hypertension and hypercholesterolemia control (including medication adherence), smoking cessation, importance of physical activity and exercise, and diabetes control. Expansion of data collection to include EMS and rural Critical Access Hospitals to capture stroke data, hand in hand with efforts to promote the values of complete reporting and of all 15 hospitals opting into the Nevada Stroke Registry by sharing permission for the DPBH to view their GWTG data, will allow for more complete regional representation independent of facility size and location. Increased stroke-education efforts, particularly in relation to stroke burden and mortality health disparities and for the lowest-scoring performance measure (dysphagia screening), are needed with all stroke stakeholders working in concert to leverage resources and scope of impact. Closing the circle for seamless information flow from stroke education to stroke transit and hospital care to post-discharge care will be key to implementing quality improvements at the health systems level statewide to ensure each Nevadan has the optimal experience to enhance survival and decrease disability burden in case of stroke.

Citations

- Nevada Division of Public and Behavioral Health, Office of Public Health Informatics and Epidemiology, Quintiles. Data as of May 2016, 2016.
- Nevada Division of Public and Behavioral Health, Office of Public Health Informatics and Epidemiology, Hospital Inpatient Billing (HIB), 2016.

Acknowledgements

Thank you to Mick Smith, Ron Loomis, and Ben Schmauss of the American Heart Association/American Stroke Association for their generous technical assistance and time.