Strategic Plan to Reduce the Burden of Diabetes in Nevada

2011-2015

Nevada State Health Division
Bureau of Child, Family and Community Wellness
Nevada Diabetes Prevention & Control Program
In partnership with
Nevada Diabetes Council

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January 21, 2011

Dear Colleague:

The Nevada State Health Division, Bureau of Child, Family and Community Wellness, is pleased to share with you a copy of the Strategic Plan to Reduce the Burden of Diabetes in Nevada 2010-2015. The Nevada Diabetes Prevention and Control Program, in collaboration with Nevada Diabetes Council, developed the report.

Research indicates that diabetes is one of the most controllable and often rising preventable chronic diseases. Despite this promising research, diabetes prevalence is high, increasing in Nevada from 4.2% in 1996 to 7.9% in 2009. In comparison, national diabetes prevalence increased from 4.5% in 1996 to 8.3 % in 2009. By 2050, as many as 1 in 3 U.S. adults could have diabetes if current trends continue, according to a new analysis from the Centers for Disease Control and Prevention. Diabetes prevalence is expected to rise sharply over the next 40 years due to the aging of the U.S. population, the increase of obesity and physical inactivity, increases in minority groups that are at high risk for type 2 diabetes, and people with diabetes living longer.

In addition:

- Diabetes is the leading cause of adult blindness, kidney failure, and nontraumatic lower-limb amputations.
- Persons with diabetes are 2 to 4 times more likely to have heart disease and stroke than persons without the disease.

Current scientific evidence demonstrates that much of the morbidity and mortality of diabetes can be prevented or delayed by aggressive treatment with diet, physical activity, and new pharmacology approaches to normalize blood sugar levels, blood pressure, and lipids. The good news is that research also shows that type 2 diabetes can be prevented or delayed by losing a modest amount of weight by getting 30 minutes of physical activity 5 days a week, and making healthy food choices.

Unfortunately, a wide gap still exists between current and desired diabetes care and practices. Public awareness about the seriousness of diabetes and its treatment is low, despite the fact that the disease is one of the leading causes of death and disability in the United States. Using the Healthy

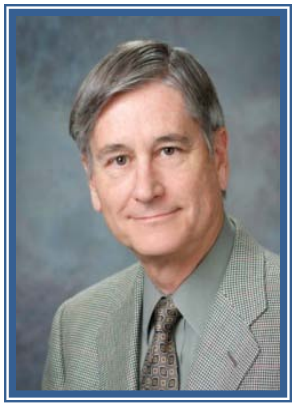
People Initiative 2020 as a guide, Nevada's Strategic Plan to Reduce the Burden of Diabetes represents a call to action to improve the quality of life for people with diabetes in Nevada. It encourages changes in public awareness, health policies and systems.

The Nevada State Health Division's Bureau of Child, Family and Community Wellness extends its appreciation to the many individuals who helped prepare this report. The information presented serves as a starting point in the effort to define and reduce the burden of diabetes in Nevada.

Sincerely

Richard Whitley, MS
Administrator

A Message from the Chair



The growing number of Nevadans with complications of diabetes is a rallying cry for our public health professionals, healthcare systems, health insurance sponsors, patient advocates, public servants, and community collaboratives to coordinate and intensify our commitment to fighting the ravages of diabetes.

Diabetes creates an unbelievable burden of illness and premature death among the approximately 156,167 adult Nevadans who have diabetes. This represents about 7.9% of adults in Nevada in 2009 that have this serious, common and costly disease.

In 2008, there were 4284 hospital stays for a primary diagnosis of diabetes. The average cost per diabetes discharge was $37,689 and Nevada's diabetes related hospitalization costs totaled $161,460,917 in 2008. Medicaid reimbursed $19,638,664 of this amount. These costs impact us all. Many patients with diabetes have inadequate insurance coverage and delay their care due to the high costs.

Recent reports show that the proportion of Nevadans with high number of diabetes complications and co-morbid conditions such as high blood pressure, heart failure, and coronary artery disease is steadily increasing. The prevalence of serious complications and late diagnosis is higher in Hispanic, American Indians and Alaska Natives, Black Americans and economically disadvantaged populations living in Nevada. National data suggests that for every two people with a diagnosis of diabetes, a third person is living with undiagnosed diabetes. New tests that can identify patients who will develop diabetes within the next five years, shows an even higher burden is coming among patients with pre-diabetes.

Uncontrolled diabetes can cause serious complications including heart disease, stroke, kidney disease, blindness, and amputations. The percentage of Nevada adults who had hypertension and also had diabetes (64.6%) was almost triple that of those who do not have diabetes (22.5%) in 2008. Among Nevadans requiring lower extremity amputations in 2008, 39.1% were performed on individuals with a primary diagnosis of diabetes. Diabetes is also the leading cause of new cases of end stage renal disease in Nevada. Nevadans with diabetes often experience a very poor quality of life with many spending their last years needing frequent dialysis treatments for kidney failure.

Much can be done to reduce and delay the severe manifestations of diabetes. Unhealthy eating, physical inactivity, and obesity are contributing to earlier and higher burden of illness in patients with diabetes. Recent reports from Centers for Disease Control and Prevention indicate 63% of Nevada adults were overweight or obese. In 2009, Nevada had the 11th highest rate of childhood obesity in the United States, with 34.2% of youth who were overweight or obese[1].

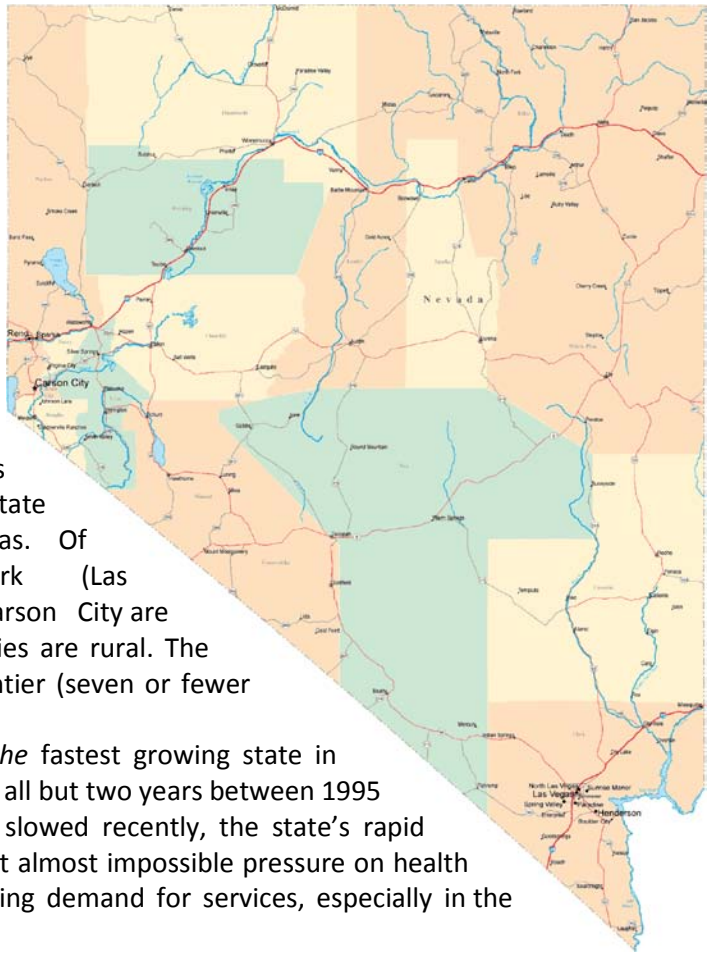
In 2010, the Nevada Diabetes State Plan was developed to inform Nevadans of the current status of diabetes in Nevada and actions that must be taken to improve the health and vitality of Nevadans at risk for diabetes and its complications. This report displays information on health behaviors among persons with diabetes obtained primarily from the Behavioral Risk Factor Surveillance System (BRFSS). This report includes data on diabetes related complications and highlights opportunities for improving preventive care services.

All Nevadans play a role in improving the control of diabetes and reducing the diabetes related burden of illness for Nevadans. Together we can make a difference.

Jerry Reeves

Jerry Reeves, MD
Chair -Nevada Diabetes Council

Nevada Demographic Profile



Nevada is the nation's seventh largest state geographically with an area of 110,540 square miles. This area is equivalent to the combined area of Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, and the District of Columbia. Nevada is a semi-arid, high desert, largely mountainous state. The Sierra Nevada Mountains form a natural barrier between Nevada and California. Las Vegas and Henderson, Nevada's two most populated cities and are located in the southern end of the state while Reno, Nevada's third most populated cities, is located in the northern part of the state separated by about 430 miles from Las Vegas. Of Nevada's seventeen counties, only Clark (Las Vegas/Henderson), Washoe (Reno) and Carson City are urban, while Douglas, Lyon and Storey counties are rural. The other eleven counties are all regarded as frontier (seven or fewer persons per square mile).

According to the U.S. Census, Nevada was *the* fastest growing state in terms of percentage increase in population for all but two years between 1995 and 2007[2]. Although population growth has slowed recently, the state's rapid population growth in the past 20 years has put almost impossible pressure on health and human services to keep pace with spiraling demand for services, especially in the older age groups and racial/ethnic groups.

- From 2000 to 2008, Nevada led the nation in population growth, increasing by 30%. Nevada's 2008 population was estimated to be 2,600,167 residents[3].
- 72% of Nevadans now live in Clark County (Las Vegas area.) From 2000-2007, the population of Clark County increased by 32%, adding almost 443,000 people. During the same time period, Washoe County (Reno area) grew by 19%[4].
- Nevada's birthrate increased 44% from 1998 to 2007. Nevada's senior population (65 years and older) increased by 30% between 2000 and 2007, much faster than the national average of 8%.
- The number of persons of Hispanic origin more than doubled from 1990 to 2008.
- In 2008, White non-Hispanics made up 57.1% of Nevada's population; Hispanic was the second largest ethnic group, making up 25.7% of Nevada's population; Black non-Hispanics made up 8.1% of Nevada's population; and Other Race non-Hispanics made up 9.1% of Nevada's population. Other Race non-Hispanics include: American Indian, Alaskan Native, Asian, Native Hawaiian, and Pacific Islander.

What Is Diabetes?

Diabetes is a disease in which the body does not produce enough insulin or properly use the insulin it produces[5]. Insulin is a hormone that converts sugar, starches and other food into energy needed by the body for everyday life. It unlocks the body cells to allow blood sugar to enter and fuel them. The cause of diabetes remains unknown, although both genetics and environmental factors such as obesity and a lack of physical activity appear to play a role in determining whether a person develops diabetes.

In the United States (U.S.) it is estimated that there are 23.5 million adults with diabetes[6]. This estimate includes 17.9 million adults diagnosed with the disease, and 5.7 million adults who are unaware that they have diabetes. The rate of diabetes has been increasing steadily across the U.S. Between 2000 and 2007, the number of persons diagnosed with diabetes rose by 9.5 million, an increase of 68%. As with other chronic illnesses, this increase is due to multiple factors including, the aging of the U.S. population, the rising rate of obesity and physical inactivity. In addition, a greater incidence of diabetes is found among minority groups. In Nevada, it is estimated from BRFSS data that about 156,167 adults were diagnosed with diabetes in 2009.

The overall goal of diabetes management is to prevent or delay diabetes related complications. People with diabetes are more likely to experience serious complications if blood sugar is not controlled. Diabetes is recognized as the leading cause of blindness in adults, non-traumatic lower extremity amputations, and kidney failure. Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes. The risk for stroke is also two to four times higher among people with diabetes. People with diabetes can also experience acute complications under certain circumstances such as low blood sugar (hypoglycemia) or high blood sugar (hyperglycemia).

What Are The Different Types Of Diabetes?

Type 1 diabetes usually occurs among children and young adults, and was formerly called juvenile-onset diabetes. Type 1 diabetes results from the body's failure to make insulin. People with type 1 diabetes control their disease by taking insulin, monitoring their blood sugars, meal planning and engaging in a physical activity program. Nationally, 5-10% of those who are diagnosed with diabetes have type 1 diabetes[5].

Type 2 diabetes is the most common form of diabetes and used to be referred to as adult onset diabetes**.** Type 2 diabetes occurs when the body fails to make enough insulin or the body cells and muscles do not use insulin properly. The estimates indicate that 90-95% of Americans diagnosed with diabetes have type 2 diabetes[5]. Although the average age at onset is 51 years, an increasing number of younger people are being diagnosed with type 2 diabetes. People with type 2 diabetes control their disease by monitoring their blood sugars, eating healthy foods, and engaging in regular physical activity. In addition, medications may be needed to help keep blood sugar levels in control.

About 4% of all pregnant women develop **Gestational diabetes**. Nationally there are about 135,000 cases in the U.S. each year[5]. Gestational diabetes starts when the pregnant body is not able to make and use all the insulin it needs for the pregnancy. In general, gestational diabetes requires treatment only during pregnancy. However, women with gestational diabetes and their children are at higher risk for developing type 2 diabetes later in life.

What Is Pre-Diabetes?

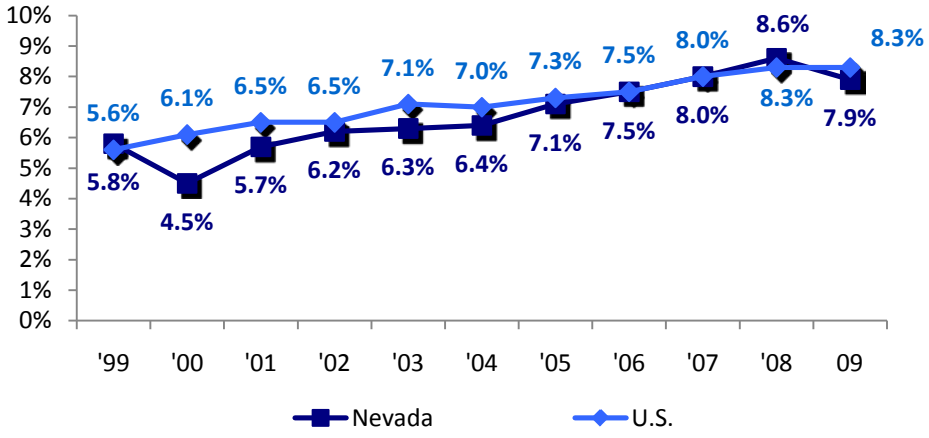
Pre-diabetes is a condition that occurs when a person's blood sugar levels are higher than normal but not high enough for a diagnosis of type 2 diabetes. A normal fasting blood sugar level is below 100 mg/dl. A person with pre-diabetes has a fasting blood sugar level between 100 and 125 mg/dl. If the blood glucose level rises to 126 mg/dl or above, a person has diabetes. It is estimated that 57 million Americans have pre-diabetes. The American Diabetes Association states that recent research has shown that some long-term damage to the body, especially the heart and blood vessels, may already be occurring during pre-diabetes[5].

The good news is that many people with pre-diabetes can prevent or delay the onset of diabetes. The Diabetes Prevention Program (DPP), a landmark study sponsored by the National Institutes of Health, found a 58% reduction in the development of diabetes over three years in people at high risk for diabetes who implemented small lifestyle interventions[5]. The study found that people with pre-diabetes can prevent or delay the onset of diabetes by losing 5 to 7 percent of their body weight (10-15 pounds for a 200 pound person), getting 30 minutes of physical activity 5 days a week and making healthy food choices.

The Burden of Diabetes in Nevada

According to the 2009 Nevada BRFSS, the estimated diabetes prevalence among Nevadan ≥ 18 years is currently 7.9 which is slightly lower than the United States prevalence of 8.3%. Figure 1 shows the estimated diabetes prevalence in Nevada and U.S. adults from 1999 through 2009. The Nevada diabetes prevalence trend is similar to that of the U.S.

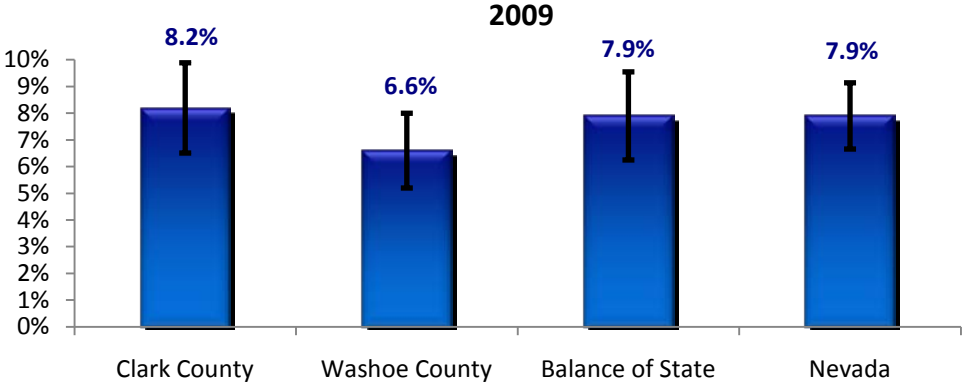
Figure 1
The Prevalence of Nevada Adults with Diabetes, 1999-2009



Sources: BRFSS 1999-2009

Figure 2 shows diabetes prevalence by region:

Figure 2
The Prevalence of Nevada Adults with Diabetes by Region, 2009

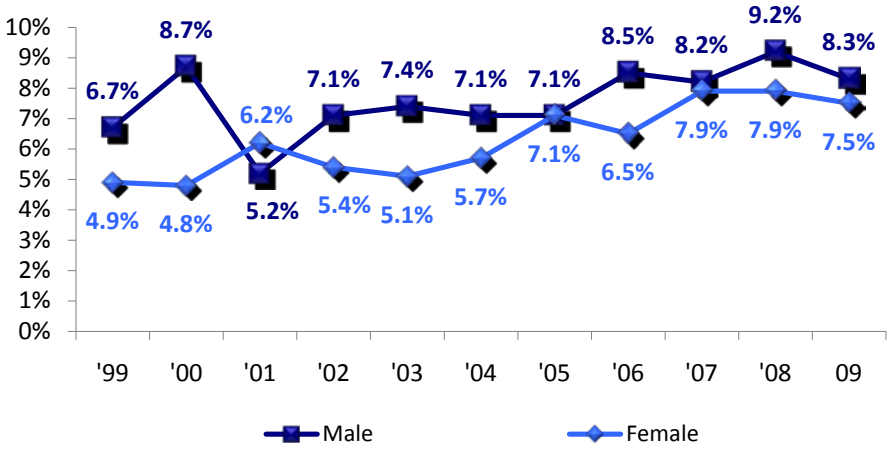


Source: BRFSS 2009

Note: Balance of State includes Carson, Churchill, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lincoln, Lyon, Mineral, Nye, Pershing, Storey, and White Pine Counties.

In Nevada, BRFSS data shows higher estimated prevalence trends for males as compared to females (Figure 3). For males, the estimated diabetes prevalence increased from 6.7% in 1999 to 8.3% in 2009. The estimated diabetes prevalence for females in Nevada shows an upward trend from 4.9% in 1999 to 7.5% in 2009.

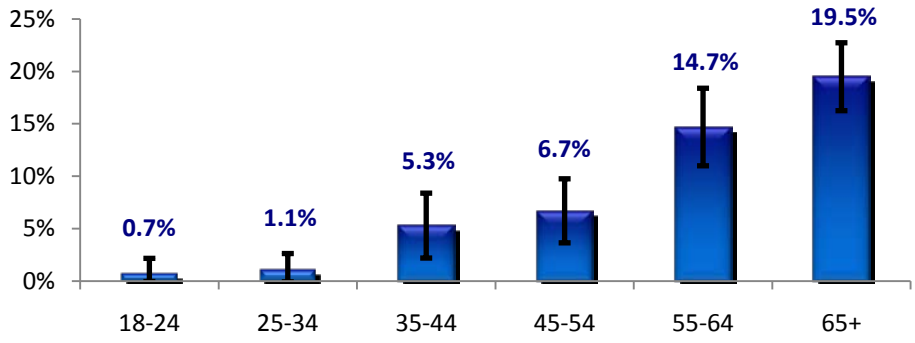
Figure 3
The Prevalence of Nevada Adults with Diabetes by Gender, 1999-2009



Sources: BRFSS 1999-2009

Estimated diabetes prevalence differs among age groups. Less than 1.5% of adults age 18-24 in both Nevada and the United States have been diagnosed with diabetes, while 19.5% of Nevada adults and 19.0% of U.S. adults age 65 and older have been told they have diabetes. According to 2009 BRFSS data, Nevada adults 55 and older have slightly higher estimated diabetes prevalence than those aged 55 and older nationwide.

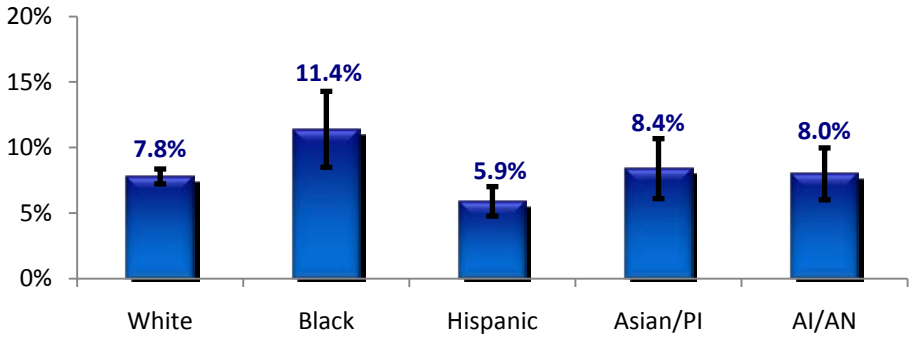
Figure 4
The Prevalence of Nevada Adults with Diabetes by Age Group, 2009



Source: BRFSS 2009

Estimated diabetes prevalence varies among racial and ethnic groups in Nevada. Figure 5 presents aggregated 2004-2009 BRFSS data by racial/ethnic group. Black non-Hispanics had the highest estimated diabetes prevalence of any racial/ethnic group in Nevada at 11.4%. Asians/Pacific Islanders had the second highest estimated prevalence (8.4%), followed by American Indians/Alaskan Natives (8.0%), White non-Hispanics (7.8%), and Hispanics at 5.9%.

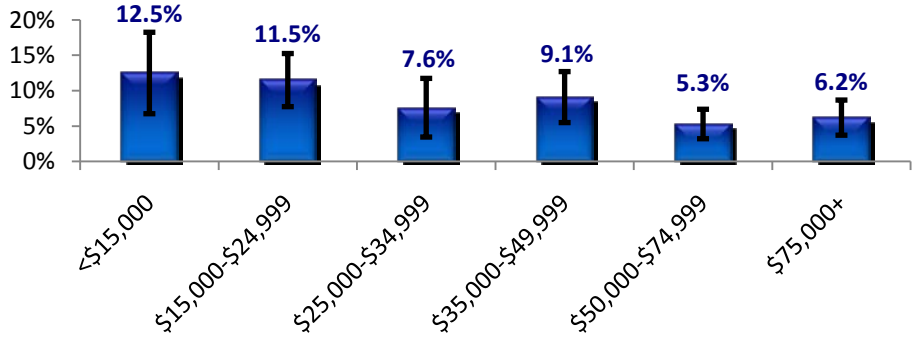
Figure 5
The Prevalence of Nevada Adults with Diabetes by Race/Ethnicity, Aggregate Data (2004-2009)



Source: BRFSS 2004-2009

Figure 6 shows estimated diabetes prevalence by household income level; highest estimated prevalence among those earning $15,000 or less.

Figure 6
The Prevalence of Nevada Adults with Diabetes by Income Level, 2009



Source: BRFSS 2009

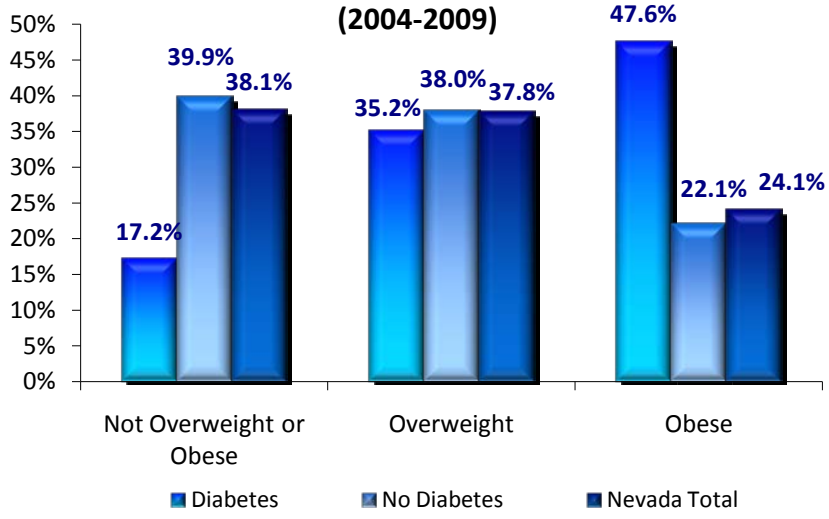
Risk Factors for Diabetes

Although the causes of type 2 diabetes are unknown, there are a number of factors that may contribute. There are a number of non-modifiable risk factors that can contribute to a person's overall likelihood of developing type 2 diabetes and heart disease. The non-modifiable risk factors include: age, race and ethnicity, gender and family history. The American Diabetes Association states that accumulating research shows that there are a number of modifiable factors that contribute to a person's overall likelihood of developing type 2 diabetes and heart disease as well. These include: overweight/obesity; high blood glucose; hypertension; abnormal inflammation; physical inactivity and smoking. Furthermore, the chances of getting type 2 diabetes increase the more health risk factors that are present.

Overweight/Obesity

The type 2 diabetes epidemic is believed to be largely due to the increase in obesity levels in the U.S. Research at the Harvard School of Public Health showed that the single best predictor of type 2 diabetes is being overweight or obese. Figure 7, shows the estimated percentage of adults with diabetes, living in Nevada, who are obese is more than double those who do not have diabetes.

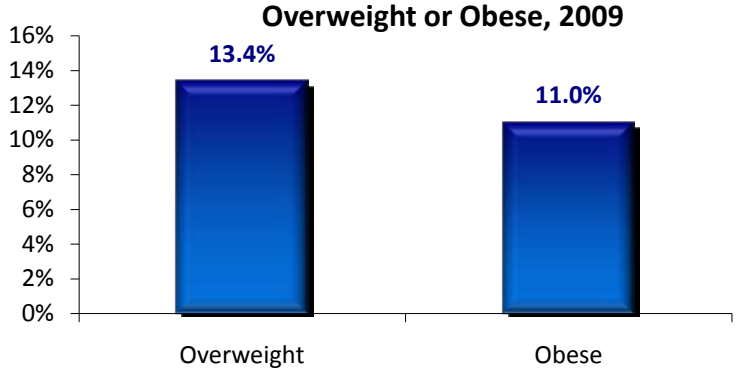
Figure 7
The Prevalence of Nevada Adults who are Overweight, Obese, and Not Overweight or Obese, Aggregate Data (2004-2009)



Source: BRFSS 2004-2009

Unfortunately, because of the current epidemic of obesity among U.S. children, there is an increased risk of prediabetes and type 2 diabetes in youth. According to the 2009 Youth Risk Behavior Surveillance Survey (YRBSS), 13.4% of high school students (grades 9-12) in Nevada were overweight, and 11.0% were obese in 2009, (Figure 8).

Figure 8
The Prevalence of Nevada High School Students who are Overweight or Obese, 2009

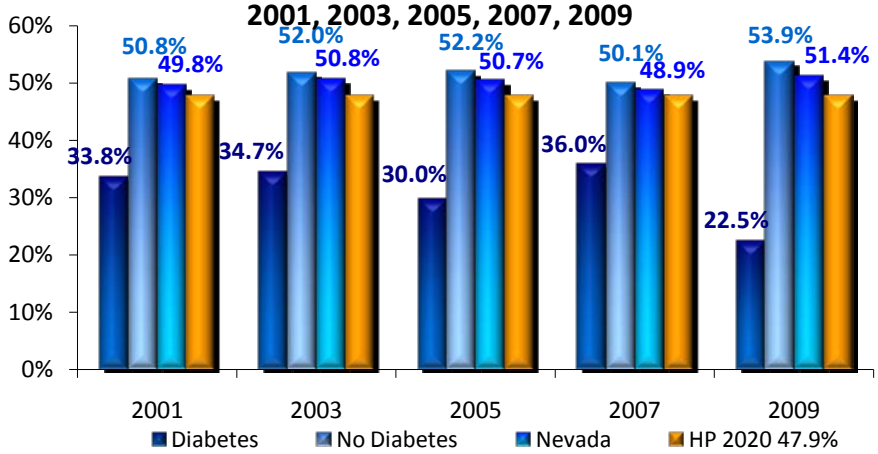


Source: YRBS 2009

Additionally, 15.6% of high school students in Nevada had reported not eating fruit and 40.3% had not eaten green salad in the 7 days prior to the survey. During the 7 days before the survey, 22.1% drank a can, bottle, or glass of soda pop at least one time per day. Only 55.9% had participated in any kind of physical activity that increased heart rate or made them breath hard sometime within the past 7 days[7].

Physical Inactivity

Figure 9
The Prevalence of Nevada Adults who Regularly Engage in Moderate or Vigorous Physical Activity, 2001, 2003, 2005, 2007, 2009



Source: BRFSS 2001, 2003, 2005, 2007, 2009 & Healthy People Objective

**Defined in BRFSS as at least 30 minutes of moderate physical activity on 5 or more days per week, or at least 20 minutes of vigorous physical activity on 3 or more days per week, or an equivalent combination.*

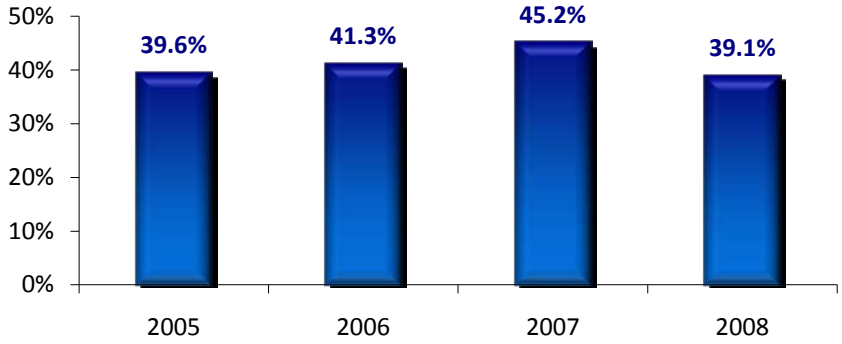
Diabetes Complications

People with diabetes are at high risk for diabetes related complication. These include neuropathy, lower extremity amputations, end-stage renal disease, retinopathy, cardiovascular disease, dental disease, and complications of pregnancy.

Neuropathy - Lower Extremity Amputations

Diabetic neuropathy increases risk for foot problems. Neuropathy often causes pain, tingling, and numbness. Peripheral Arterial Disease (PAD) also occurs in individuals with diabetes when blood vessels in the feet and legs are narrowed or blocked by fatty deposits[5]. Figure 10 shows the percentage of lower extremity amputations performed in Nevada from 2005 to 2008 where diabetes was the primary diagnosis.

Figure 10
Percent of Lower Extremity Amputations with a Primary Diagnosis of Diabetes, Nevada 2005-2008



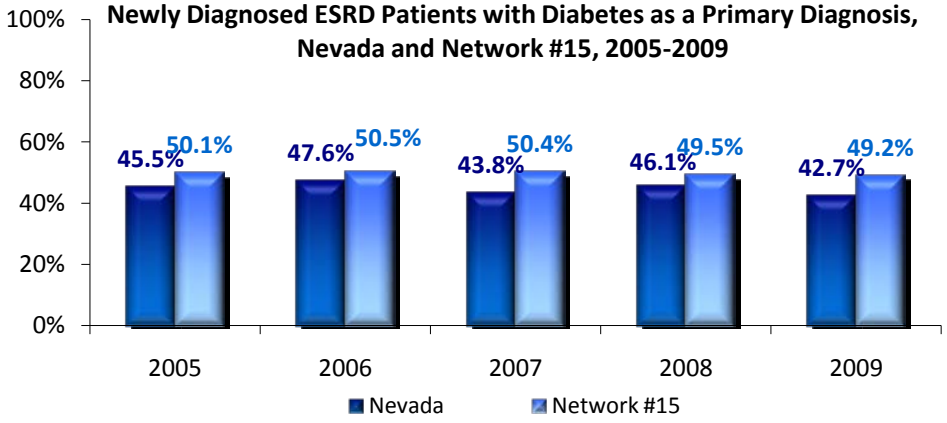
Source: Nevada Inpatient Hospital Discharge Database

Diabetic Nephropathy/End-Stage Renal Disease

Diabetic nephropathy (diabetic kidney disease) occurs when cells and blood vessels in the kidneys are damaged, affecting the kidney's ability to filter out waste. Waste builds up in the blood and can lead to kidney failure or end-stage renal disease (ESRD). Diabetes is a leading cause of new cases of ESRD. Controlling blood glucose can prevent or delay the onset of kidney disease. Keeping blood pressure under control is also important for kidney health[9].

Figure 11 shows the percentage of new ESRD patients with diabetes as the primary diagnosis. In Nevada, the number of new cases of ESRD decreased from 45.5% new cases in 2005 to 42.7% in 2009. The state of Nevada compares favorably to the other states in ESRD Network #15 (Arizona, Colorado, Nevada, New Mexico, Utah, Wyoming) who had diabetes as the primary diagnosis in 49.2% of new ESRD cases in 2009.

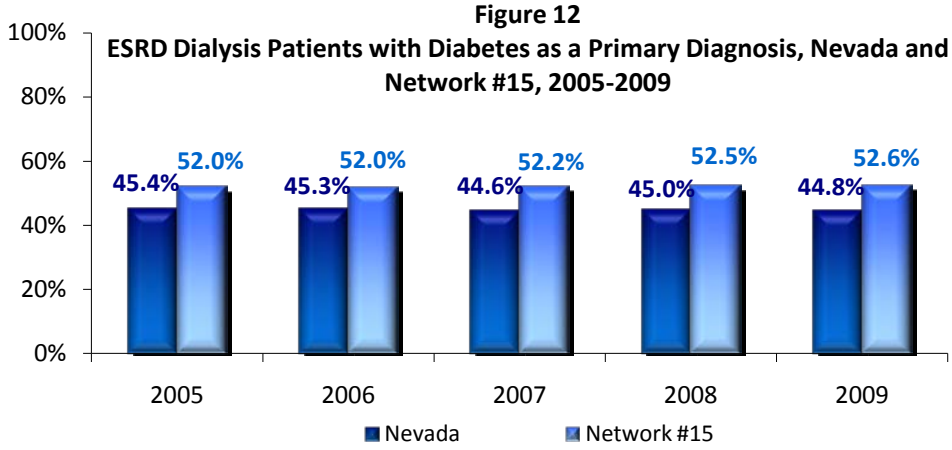
Figure 11
Newly Diagnosed ESRD Patients with Diabetes as a Primary Diagnosis, Nevada and Network #15, 2005-2009



Source: ESRD Network #15

The percentage of ESRD Dialysis patients with diabetes as the primary diagnosis was similar in 2005, at 45.4%, and in 2009, at 44.8%, Figure 12. The 2009 ESRD Network #15 percentage of 52.6% was higher than Nevada's.

Figure 12
ESRD Dialysis Patients with Diabetes as a Primary Diagnosis, Nevada and Network #15, 2005-2009



Source: ESRD Network #15

Diabetes Care and Management

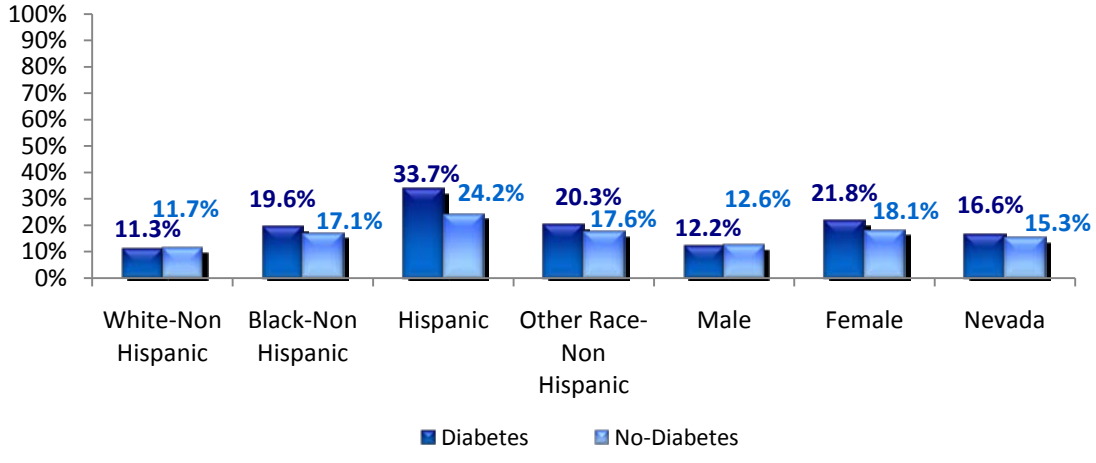
Reducing risk for diabetes complications requires active and effective disease management by the person diagnosed with diabetes and a team of health care professionals including primary care physicians, endocrinologists, diabetes educators, and dietitians. By following recommended preventive care practices and health behaviors, such as, physical activity, health eating, and no smoking, a person with diabetes can maintain good health and quality of life as they age. Such practices relate directly to the patients access to health care; attendance of diabetes self-management education class; monitoring blood glucose levels as dictated by the particular needs and goals of the patient, at least twice a year A1C blood test, with a recommendation of quarterly A1C blood test for patients whose therapy has changed or who are not meeting glycemic goals; annual eye exams; annual foot exams; and vaccinations for both influenza and pneumonia.

Access to Care

Access to health care is critical for people with diabetes. Progress has been made in the area of insurance coverage for persons with diabetes in Nevada and nationally. The history of legislative action in Nevada include: required coverage of diabetes medications, supplies, equipment and education under certain health plans, and defined health care professionals who can be reimbursed for diabetes self-management training.

More Nevada adults with diabetes report that they cannot see a doctor due to cost than those who do not have diabetes. In Figure 13, Hispanics have the highest percentage of individuals with diabetes who are not able to see a doctor due to cost, at an estimated 33.7%.

Figure 13
Percentage of Nevada Adults who Could Not See a Doctor Due to Cost within the Past 30 days by Race/Ethnicity and Gender, Aggregate Data (2004-2009)



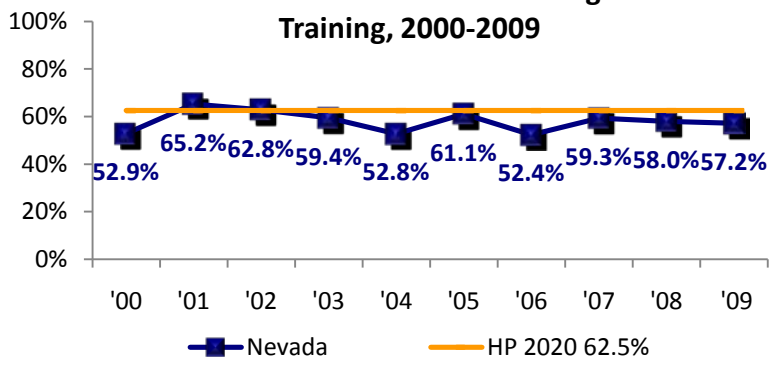
Source: BRFSS 2004-2009

Diabetes Self-Management Education

A thorough understanding of diabetes is critical to knowing how to properly manage the disease. It is important for people diagnosed with diabetes to be consistent with care and up to date on the best practices for management. Hence, it is recommended that individuals with diabetes and their families learn how to best manage their diabetes and how to work with their health care providers as a team.

Figure 14 shows the estimated percentage of Nevada adults with diabetes who reported taking a self-management course. This percentage has ranged from 52.9% in 2000, to 57.2% in 2009. The Healthy People 2010 objective is 60.0%. Nevada most recently exceeded the objective in 2005.

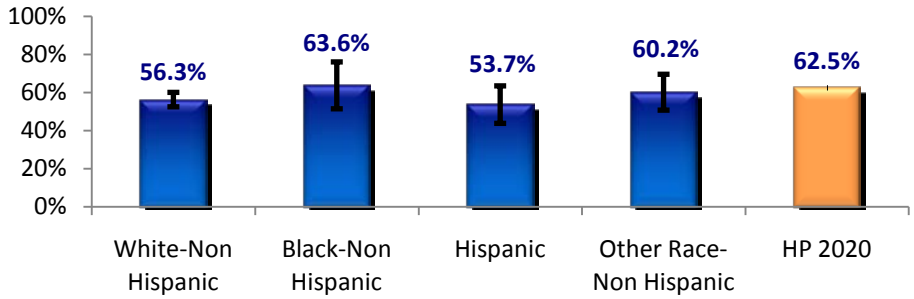
Figure 14
The Prevalence of Nevada Adults with Diabetes who have had Diabetes Self-Management Training, 2000-2009



Sources: BRFSS 2000-2009 & Healthy People Objective

Figure 15 shows aggregated data (2004-2009) for the percentage of Nevada adults who have had diabetes self-management education/training by racial/ethnic group. The "Other Race-Non Hispanic" category includes Asian/Pacific Islanders and American Indians/Alaska Natives. Hispanic people with diabetes reported the lowest rate of diabetes self-management training, at an estimated 53.7%.

Figure 15
The Prevalence of Nevada Adults with Diabetes who have had Self-Management Training by Race/Ethnicity, Aggregate Data (2004-2009)



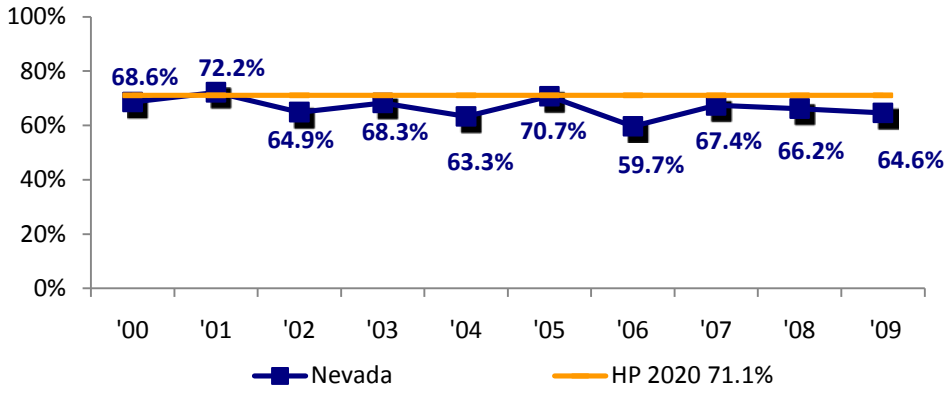
Source: BRFSS 2004-2009 & Healthy People Objective

A1C Tests

Blood sugar control is an important part of diabetes management. The A1C test measures average blood sugar levels over a period of the last two to three months. Current clinical practice recommendations indicate that persons with diabetes have a quarterly A1C test if treatment changes or treatment goals are not being met or twice a year if blood sugar levels are stable.

Figure 16 shows the estimated percentage of persons with diabetes who report receiving an A1C test at least twice within the past year.

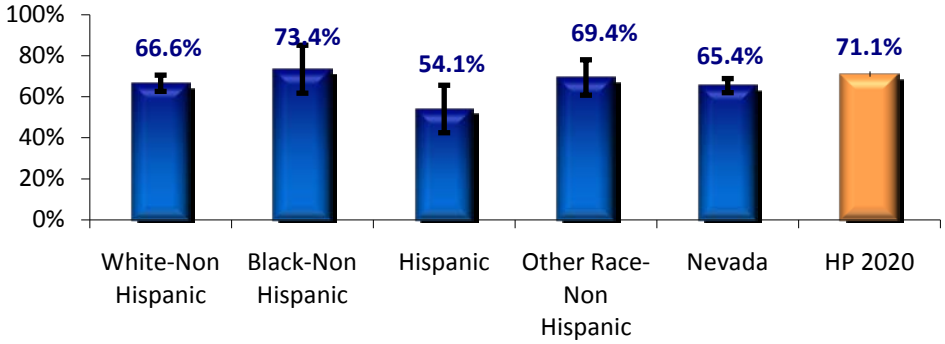
Figure 16
The Prevalence of Nevada Adults with Diabetes Receiving an A1C Test Twice within the Past Year, 1999-2009



Sources: BRFSS 1999-2009 & Healthy People Objective

Figure 17 shows aggregated data (2004-2009) for the percentage of Nevada adults with diabetes who receive A1C tests at least twice per year by racial/ethnic groups. The Other category includes Asian/Pacific Islanders and American Indians/Alaska Natives. Only the Black non-Hispanic racial/ethnic group exceeded the Healthy People 2010 objective of 72%, at an estimated 73.4%.

Figure 17
The Prevalence of Nevada Adults with Diabetes Receiving an A1C Test Twice within the Past Year, Aggregate Data (2004-2009)



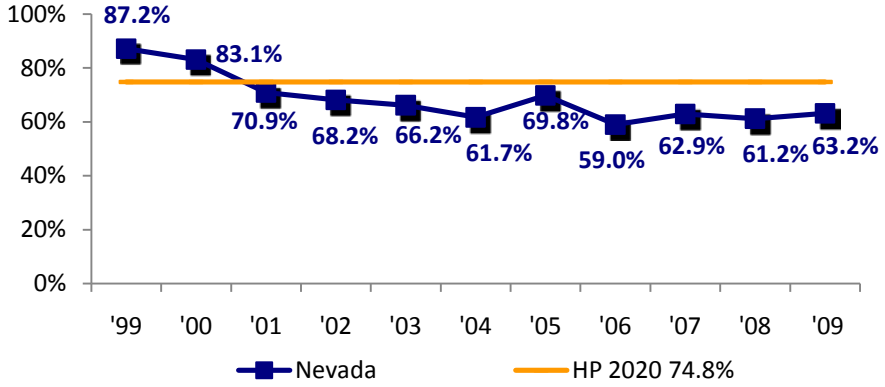
Source: BRFSS 2004-2009 & Healthy People Objective

Foot Exams

People with diabetes are asked to check their own feet regularly for sores, cuts or other problems and to have an annual foot exam by a health care professional to reduce the rate of lower extremity amputations. More than 60% of non-traumatic lower extremity amputations in the U.S. occur among people with diabetes[5].

Figure 18 shows the estimated percentage of Nevada adults with diabetes in reporting at least one foot exam by their health care provider in the previous year. The percentage has decreased from 87.2% in 1999 to 63.2% in 2009. The Healthy People 2020 objective is 74.8%.

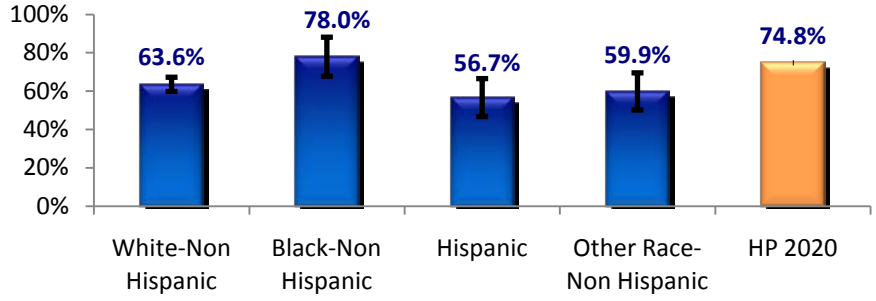
Figure 18
The Prevalence of Nevada Adults with Diabetes Receiving an Annual Foot Exam, 1999-2009



Sources: BRFSS 1999-2009 and Healthy People Objective

Figure 19 shows aggregated data (2004-2009) for the estimated percentage of Nevada adults with diabetes who receive annual foot exams by racial/ethnic group. The Other category includes Asian/Pacific Islanders and American Indians/Alaska Natives. The racial/ethnic group with the highest estimated percentage of individuals with diabetes who receive an annual foot exam in Nevada was Black non-Hispanics (78.0%). Hispanics had the lowest estimated percentage receiving an annual foot exam (56.7%). All racial/ethnic groups were lower than the Healthy People 2020 objective of 74.8%

Figure 19
The Prevalence of Nevada Adults with Diabetes Receiving an Annual Foot Exam by Race/Ethnicity, Aggregate Data (2004-2009)



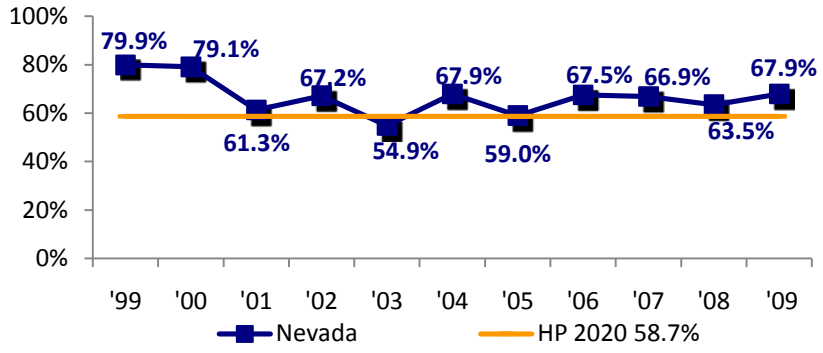
Source: BRFSS 2004-2009 & Healthy People Objective

Eye Exams

Diabetes is the leading cause of new cases of blindness among adults 20-74 year olds[5]. Yearly dilated eye examination can be used to detect and prevent vision loss.

Figure 20 shows the estimated percentage of Nevadans with diabetes reporting an annual dilated eye exam from 1999 to 2009. The percentage decreased from 79.9% in 1999 to 67.9% in 2009. The Healthy People 2020 objective is 5%.

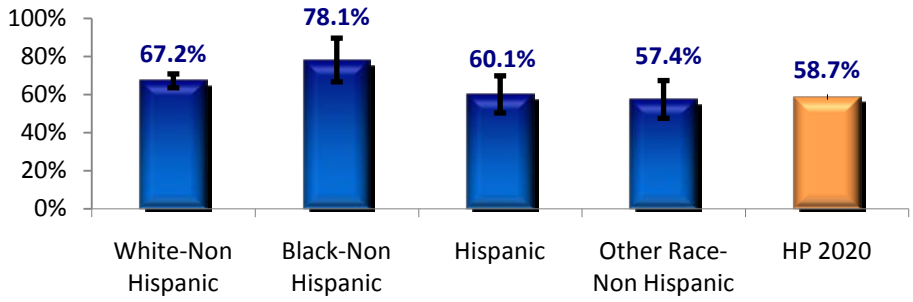
Figure 20
The Prevalence of Nevada Adults with Diabetes Receiving an Annual Dilated Eye Exam, 1999-2009



Sources: BRFSS 1999-2009 & Healthy People Objective

Figure 21 shows aggregated data (2004-2009) for the percentage of Nevada adults with diabetes who received an annual dilated eye exam by racial/ethnic group. The Other category includes Asian/Pacific Islanders and American Indians/Alaska Natives. Black non-Hispanics had the highest percentage receiving an annual dilated eye exam (78.1%), while Other Race non-Hispanics had the lowest percentage (57.4%).

Figure 21
The Prevalence of Nevada Adults with Diabetes Receiving an Annual Dilated Eye Exam by Race/Ethnicity, Aggregate Data (2004-2009)



Source: BRFSS 2004-2009 & Healthy People Objective

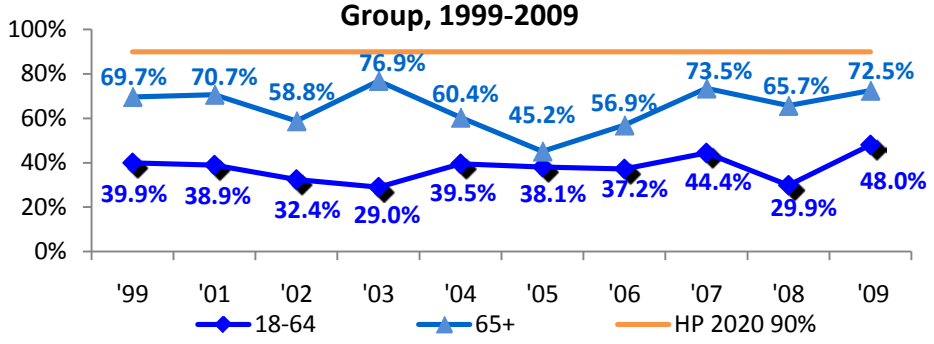
Immunizations

Individuals with diabetes are more likely than people without diabetes to suffer from complications caused by influenza (flu) and pneumonia. Flu and pneumonia immunizations are an effective strategy to reduce illness and deaths. For this reason, individuals with diabetes are encouraged to receive an annual influenza vaccination.

Influenza Vaccination

Figure 22 shows the estimated percentage of Nevada adults with diabetes who report receiving an annual influenza vaccination. In 2009, the estimated percentage of Nevada adults with diabetes who received an annual influenza vaccination as 72.5% for those aged 65 years and older and 48.0% for those aged 18-64. Note: These Healthy People targets are for the proportion of all adults recieveing annual influence vaccination and are not specifically for those adults with diabetes.

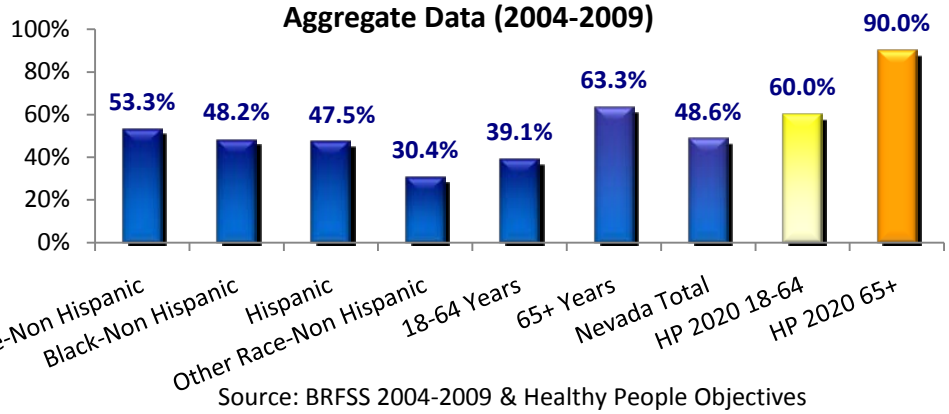
Figure 22
The Prevalence of Nevada Adults with Diabetes Receiving an Annual Influezna Vaccination by Age Group, 1999-2009



Sources: BRFSS 1999-2009 & Healthy People Objective

Figure 23 shows aggregated data (2004-2009) for the percentage of Nevada adults with diabetes who received an annual influenza vaccination by racial/ethnic group and age. The "Other Race Non-Hispanic" category includes Asian/Pacific Islanders and American Indians/Alaska Natives who reported the lowest percentage of Nevada adults with diabetes who had received an annual influenza vaccination.

Figure 23
The Prevalence of Nevada Adults with Diabetes Receiving an Annual Influenza Vaccination by Race/Ethnicity and Age, Aggregate Data (2004-2009)

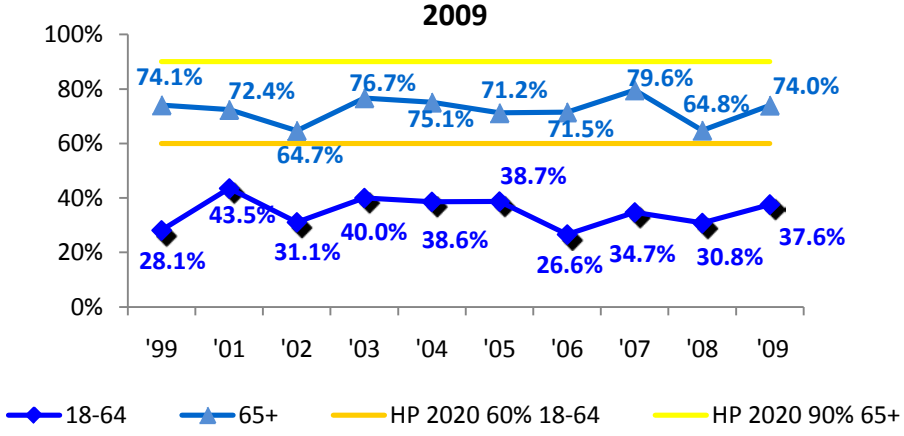


Source: BRFSS 2004-2009 & Healthy People Objectives

Pneumococcal Vaccination

Figure 24 shows the estimated percentage of Nevada adults with diabetes who report ever receiving a pneumococcal vaccination. Among adults 18-64 years of age, the estimated percentage was 37.6% in 2009. For adults 65 years and older, the estimated percent was 74.0% in 2009. Note: These Healthy People targets are for the proportion of all adults ever receiving a pneumococcal vaccination and are not specifically for those adults with diabetes.

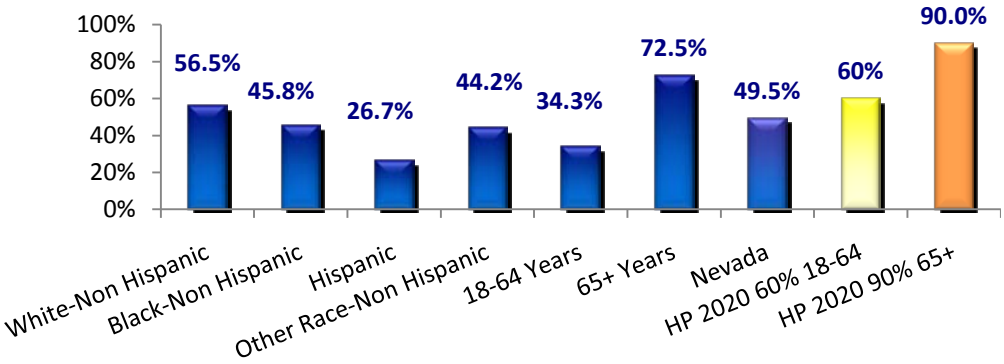
Figure 24
The Prevalence of Nevada Adults with Diabetes Ever Receiving a Pneumococcal Vaccination by Age Group, 1999-2009



Sources: BRFSS 1999-2009 & Healthy People Objectives

Figure 25 shows aggregated data (2004-2009) for the percentage of Nevada adults with diabetes who had ever received a pneumococcal vaccination by racial/ethnic group and age group. The Other category includes Asian/Pacific Islanders and American Indians/Alaska Natives. Hispanic individuals with diabetes had the lowest estimated percentage of people with diabetes who had ever received a pneumococcal vaccination.

Figure 25
The Prevalence of Nevada Adults with Diabetes Ever Receiving a Pneumococcal Vaccination by Race/Ethnicity and Age Group, Aggregate Data (2004-2009)

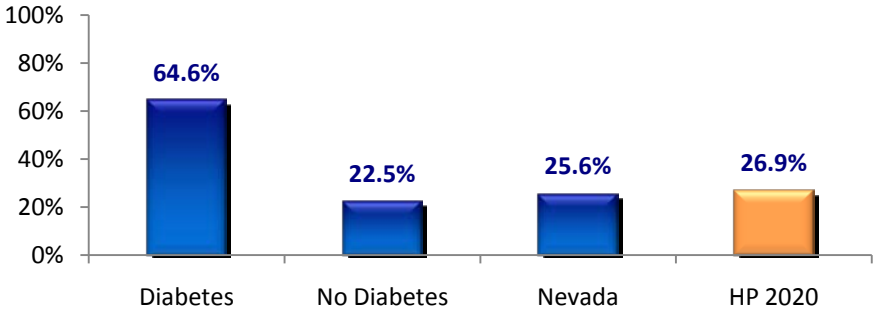


Source: BRFSS 2004-2009 & Healthy People Objectives

Hypertension

Hypertension, or high blood pressure, can be a serious problem for those who have diabetes or pre-diabetes leading to cardiovascular disease and kidney disease. As shown in Figure 26, the percentage of Nevada adults with diabetes and with hypertension (64.6%) was almost three times that of those who do not have diabetes (22.5%).

Figure 26
The Prevalence of Nevada Adults with Hypertension, Aggregate Data (2003, 2005, 2007, 2009)

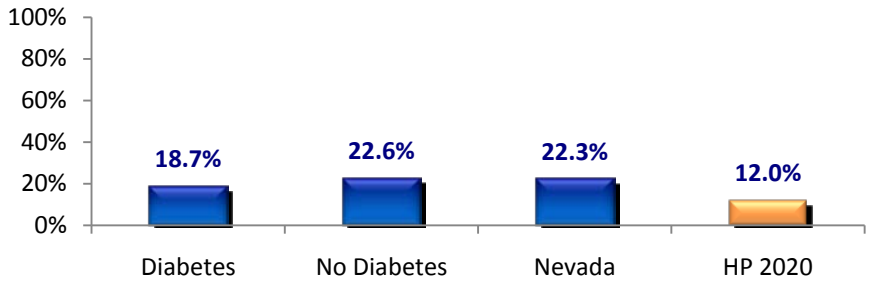


Source: BRFSS 2003, 2005, 2007, 2009 & Healthy People Objective

Cigarette Use

Cigarette smoking causes significant health problems. People with diabetes who also smoke face higher risk of cardiovascular disease and neuropathy. Quitting smoking, in spite of how long an individual has smoked, will improve their health. In Nevada, persons who have diabetes are less likely to be current smokers (18.7%) than those who do not have diabetes (22.6%). Nevada exceeds the Healthy People 2020 objective of 12.0% for this indicator.

Figure 27
The Prevalence of Nevada Adults who Currently Smoke, Aggregate Data (2004-2009)



Source: BRFSS 2004-2009 & Healty People Objective

Cost of Diabetes

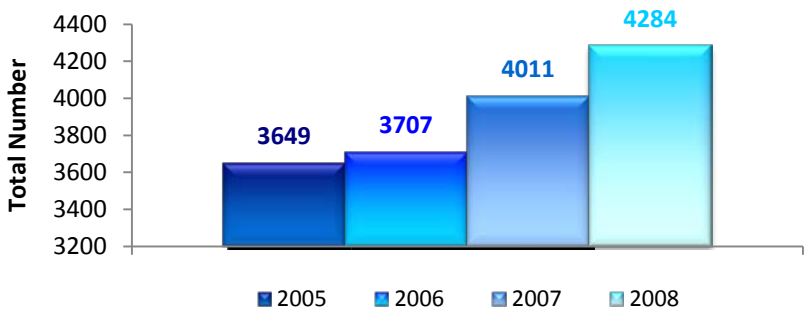
Diabetes is a costly disease; not only related to health care costs, but also to the indirect cost caused by loss of productivity due to disability and higher rates of absenteeism from work than the general population, as well as premature mortality. (*http://www.paho.org/english/ad/dpc/nc/dia-alad-background.pdf*)

Hospitalization

In 2010, the Agency for Healthcare Research and Quality (AHRQ) reported that nearly one of every five hospitalizations nationally involved a person with diabetes. U.S. hospitals spent $83 billion in caring for people with diabetes. This amount is 23 percent of what hospitals spent overall to treat all conditions in 2008[10].

The following figures show the cost of hospitalization and the amounts spent on pharmaceuticals to treat diabetes related disease in Nevada, according to the Nevada Inpatient Hospital Discharge Database. Figure 28 shows the total number of diabetes-related hospitalizations in Nevada from 2005 to 2008. The data presented is for cases in which diabetes was the primary diagnosis. The average number of inpatient hospital visits per year for a type 2 diabetes patient was 2.04 in 2007 and 1.89 in 2008[11].

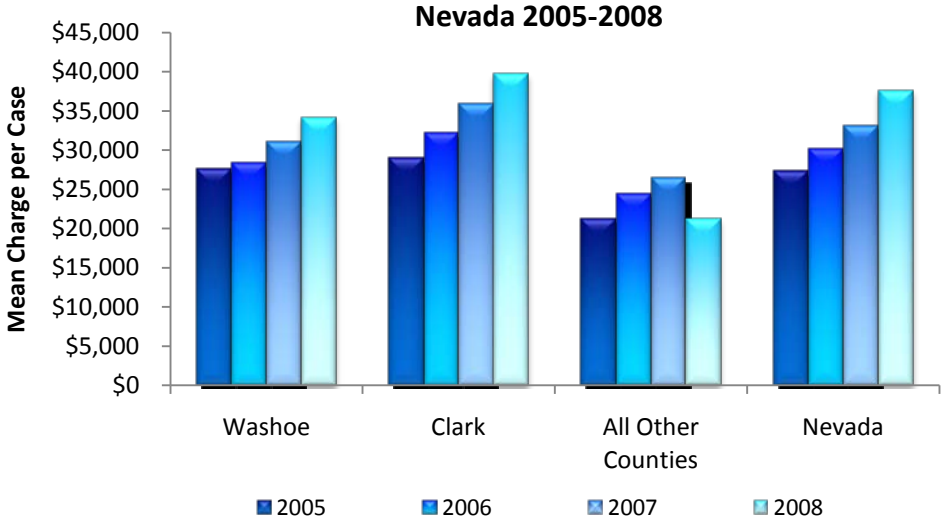
Figure 28
Total Number of (Primary Diagnosis) Diabetes-Related Hospitalizations, Nevada 2005-2008



Source: Nevada Inpatient Hospital Discharge Database

The mean charge per diabetes case varies among Nevada's regions. Figure 29 (next page) shows the mean charge per case for a diabetes hospitalization from 2005 to 2008 in Nevada, according to the Nevada Inpatient Hospital Discharge Database. Mean charges increased from 2005 to 2008 in Washoe County, Clark County, and in all of Nevada. The mean costs per hospitalization were greatest in Clark County[11].

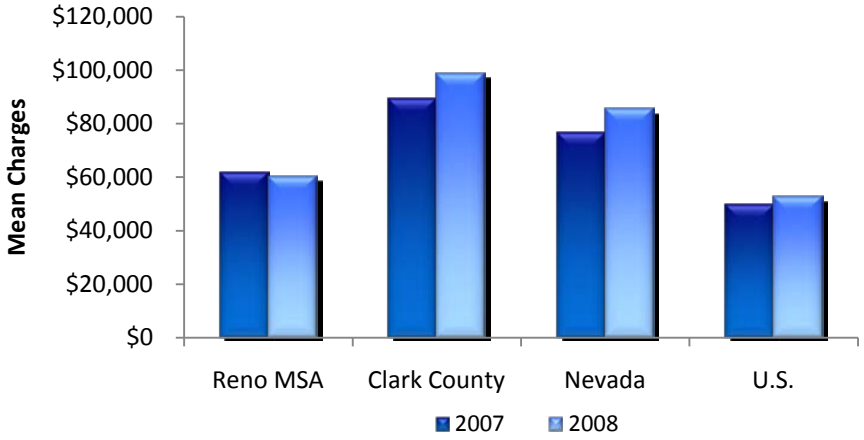
Figure 29
Mean Charge per Diabetes-Related Hospitalization, Nevada 2005-2008



Source: Nevada Inpatient Hospital Discharge Database

According to the *2009* Nevada *Type 2 Diabetes and Stroke Report*, mean hospital inpatient charges per year for type 2 diabetes patients were greater in Nevada than across the nation in 2007 and 2008, as shown in Figure 30. Within Nevada, mean charges were higher in Clark County compared to the Reno metropolitan statistical area (MSA), with a $38,632 difference between the two regions in 2008[11].

Figure 30
Mean Hospital Charge per Year for Type 2 Diabetes Patients, Nevada 2007 & 2008

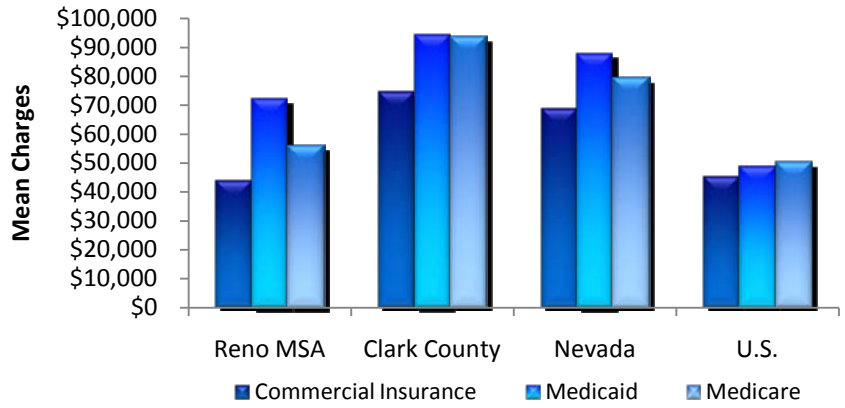


Source: Nevada Type 2 Diabetes and Stroke Report 2009

According to the *2009 Nevada Type 2 Diabetes and Stroke Report*, the total 2007 hospitalization cost with diabetes as the primary diagnosis in Nevada was $221,813,165. Of this amount, $88,725,266 was reimbursed by Nevada Medicaid (Nevada Interactive Databases, 2007).

Figure 31 depicts the mean hospital inpatient charges by region by payer type. The highest charges across the state were for Medicaid patients. With the exception of commercial insurance in the Reno MSA, mean charges in Nevada were greater than across the U.S. The charges in Clark County were higher than in Reno for all payer types[11].

Figure 31
Mean Hospital Inpatients Charges per Year for Type 2 Diabetes Patients by Payer Type, Nevada 2008

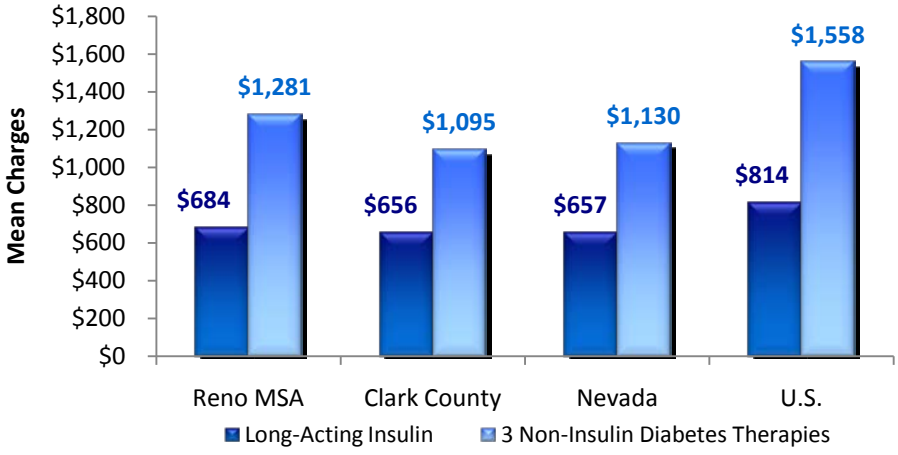


Source: Nevada Type 2 Diabetes and Stroke Report 2009

Treatment Cost

Figure 32 shows the mean payments for medications per Type 2 diabetes patient per year for 2008. Nevada costs were lower than the national average for both long-acting insulin and three other non-insulin diabetes therapies, i.e., Biguanides; Insulin Sensitizing Agents; Sulfonylureas. Costs were similar in Clark County and the Reno MSA, although slightly higher in Reno[11].

Figure 32
Mean Payments per Type 2 Diabetes Patient per Year by Type of Therapy, Nevada 2008

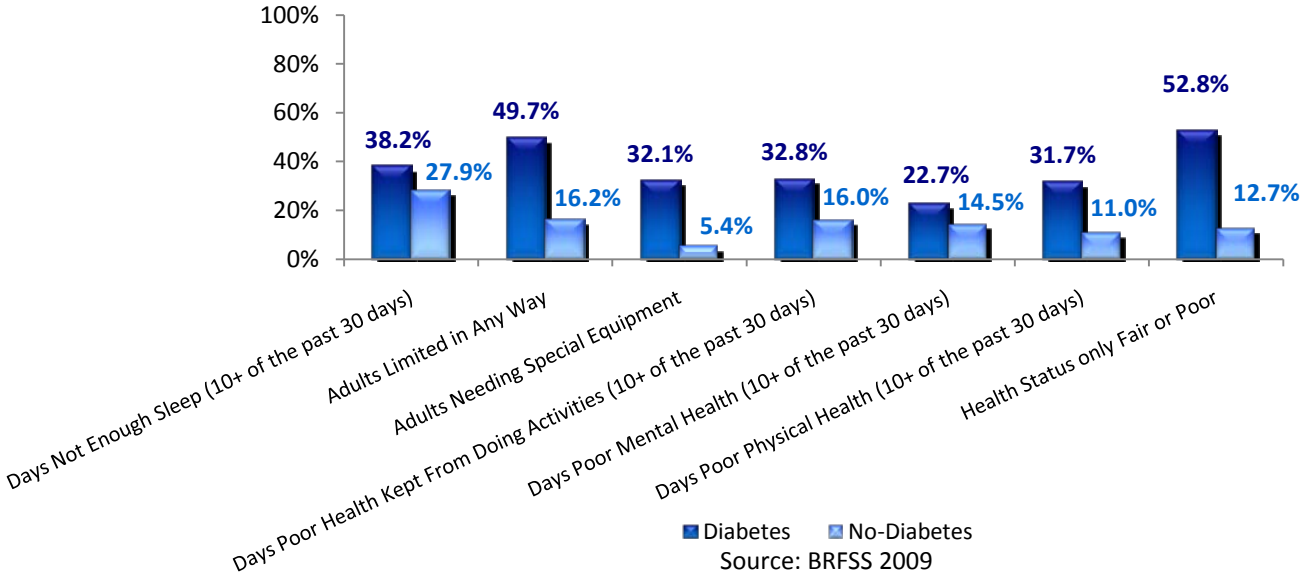


Source: Nevada Type 2 Diabetes and Stroke Report 2009

Quality of Life Indicators

Self-reported quality of life remains significantly reduced for Nevada adults with diabetes compared to those without the disease.

Figure 33
Health-Related Quality of Life Indicators by Diabetes Status, 2009

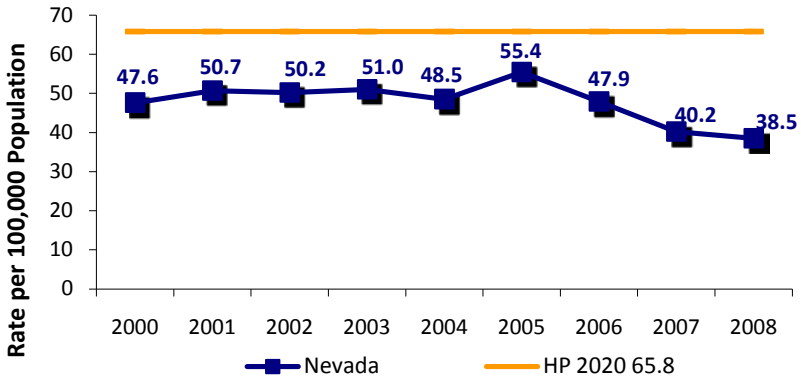


Source: BRFSS 2009

Diabetes-Related Death Rate

The diabetes-related death rate in Nevada has been decreasing since 2005, when it was at a high of 55.4 per 100,000 people. In 2008 the diabetes death rate was 38.5 per 100,000 people, below the Healthy People 2020 goal.

Figure 34
Diabetes-Related Death Rate, 2000-2008



Source: Nevada Vital Statistics Records & Healthy People Objective
Note: These rates are age-adjusted to the 2000 U.S. Standard population.
Note: 2007 and 2008 Nevada data are not final and are subject to change.

Statewide Goals and Objectives 2011 -2015

The statewide goals and objectives are based on the four National Diabetes Program Framework goals developed by Centers for Disease Control and Prevention, Division of Diabetes Translation. These goals include: 1) prevent diabetes; 2) prevent the complications, disabilities, and burden associated with diabetes; 3) eliminate diabetes-related health disparities; and 4) maximize organizational capacity to achieve the National Diabetes Program goals. In addition, the Nevada specific diabetes surveillance data and Nevada Diabetes Council member input provide the guide for developing goals and objectives for the state of Nevada which focus on the prevention of diabetes and the reduction of complications. The following are the six statewide goals and objectives for the state of Nevada (2011-2015).

Goal 1: Prevent or delay the onset of type 2 diabetes in Nevada.

Objectives:

1.a. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans $\geq$ 18 years who will report themselves to be "neither overweight nor obese" as defined by BMI, will increase from 38.1% (BRFSS pooled 2004- 2009) to 39.5% by 2015.

1.b. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to maintain the percentage of Nevadans $\geq$ 18 years who regularly engage in moderate or vigorous physical activity* at 51.4% (BRFSS 2009) (HP2020 target 47.9%) by 2015. (*defined in BRFSS as 30+ minutes moderate physical activity 5 or more days per week or vigorous activity for 20+ minutes 3 or more days per week).

1.c. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to decrease the percentage of Nevadans $\geq$ 18 years who currently smoke from 22.3% (BRFSS 2004-2009) to 20.0% by 2015. (HP 2020 target 12.0%)

1.d. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, and the Nevada Fitness and Wellness Advisory Council will develop methodologies to maintain the percentage of youth (9-12 grades) in Nevada who are overweight at 13.4% by 2015. (YRBS 2009)

1.e. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, and the Nevada Fitness and Wellness Advisory Council will develop methodologies to decrease percentage of youth (9-12 grades) in Nevada who are obese 11.0% (YRBS 2009) to 9.0% by 2015.

Goal 2: Reduce the complications, disabilities and burden associated with diabetes.

Objectives:

2.a. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans $\geq$ 18 years with diabetes who self report diabetes self-management education from 57.2% (Nevada BRFSS 2009) to 60.0% (HP 2020 target 62.5%) by 2015.

2.b. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who receive the appropriate A1C test from 64.6% (Nevada BRFSS 2009) to 70.0% (HP 2020 target 71.1%) by 2015.

2.c. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who report having an annual foot exam from 63.2% to 68.0% by 2015.

2.d. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who report having an annual dilated eye exam from 67.9% to 70.0% by 2015.

2.e. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who report having an annual influenza vaccination from 48.0% to 50.0% among adults ≥ 18 to 64 years old and from 72.5% to 78.0% among adults ≥ 65 by 2015.

2.f. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who report receiving a pneumococcal vaccination from 37.6% to 40.0% among adults ≥ 18 to 64 years old and from 74.0% to 78.0% among adults ≥ 65 by 2015.

2.g. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who report themselves to be "neither overweight nor obese" as defined by BMI from 17.2% to 20.0% by 2015.

2.h. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will develop methodologies to increase the percentage of Nevadans ≥ 18 years with diabetes who report regularly engaging in moderate or vigorous physical activity* from 22.5% to 28.0% by 2015.

**Defined in BRFSS as 30+ minutes of moderate physical activity five or more days per week or vigorous activity for 20+ minutes three or more days per week.*

2.i. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, Nevada Tobacco Prevention Coalition and Nevada Tobacco Users Helpline will develop methodologies to decrease the percentage of Nevadans ≥ 18 years with diabetes who currently smoke from 18.7% to 17.0% by 2015.

Goal 3: Promote changes in public policies and plans which will have a positive impact on people with or at risk for diabetes in Nevada.

Objectives:

3.a. The Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, the Nevada Office of Minority Health and the Nevada Fitness and Wellness Advisory Council, will develop a diabetes-related policy agenda and coordinate advocacy efforts among member agencies and organizations to slow the rate of diabetes in Nevada caused by obesity and other environmental factors by 2015.

3.b. By 2015, the Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, and the Nevada Office of Minority Health, will implement strategies to decrease the burden of diabetes among disparate populations throughout Nevada, especially the Hispanic community, through advocacy of policy and environmental changes that support diabetes self-management education and skills.

Goal 4: Reduce diabetes-related health disparities in Nevada.

Objectives:

4.a. From 2011 to 2015, the Nevada State Health Division will actively partner with the Nevada Office of Minority Health and other organizations to expand the collection, analysis and dissemination of diabetes statistics regarding disparate populations (including but not limited to race/ethnicity, gender, socioeconomic status, geographic location, and access to health care) throughout the state on an annual basis.

4.b. From 2011 to 2015, the Nevada State Health Division, in partnerships with members of the Nevada Diabetes Council, will promote and support culturally and linguistically appropriate awareness campaigns related to diabetes and other chronic diseases designed to reach priority populations, i.e., African Americans, Latinos, Native Americans, rural residents, and those with limited access to health care at least twice each year.

Goal 5: Maintain and improve diabetes surveillance and quality improvement data systems in Nevada.

Objectives:

5.a. By 2011, the Nevada Diabetes Prevention and Control Program (DPCP), in partnership with the Bureau of Health Statistics, Planning, Epidemiology and Response, will expand Nevada-specific BRFSS to include pre-diabetes module.

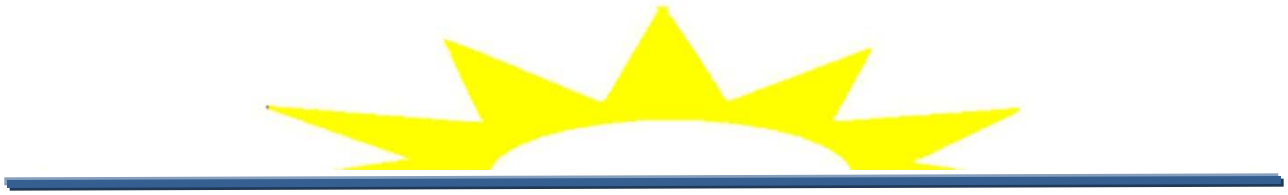
5.b. The Nevada Diabetes Prevention and Control Program (DPCP) will engage partners in Nevada to disseminate the diabetes surveillance and tracking reports to consumers, health policy and delivery systems and other stakeholders.

Goal 6: Establish and expand partnerships with agencies, organizations, and programs that promote positive health behaviors in Nevadans with or at risk for diabetes and address associated co-morbid conditions such as obesity, heart disease and stroke.

Objectives:

6.a. By 2015, the Nevada State Health Division, Nevada Diabetes Prevention and Control Program (DPCP), in partnerships with members of the Nevada Diabetes Council (NDC), will annually increase stakeholder engagement and contributions to meeting the priority goals and objectives of the NDC as evidenced by participation in council meetings and workgroups.

6.b. The Nevada Diabetes Prevention and Control Program (DPCP) will ensure that all Nevada DPCP-funded community program action plans are evidence-based and include targeted community efforts and objectives aimed at promoting diabetes self-management that includes; physical activity, healthy weight and blood pressure control, and smoking cessation programs for people with or at risk for diabetes to at least 2015.



Nevada Diabetes Prevention and Control Program

The Nevada Diabetes Prevention and Control Program (DPCP) is a program of the Nevada State Health Division, Bureau of Child, Family and Community Wellness. The mission of the Nevada DPCP is to reduce the morbidity and mortality of diabetes in Nevada.

The Nevada Diabetes Prevention and Control Program is responsible for:

- Monitoring the prevalence and incidence of diabetes and available care and education opportunities,
- Informing the public of diabetes prevalence and available resources,
- Providing technical assistance on how to use existing resources as efficiently and effectively as possible, and
- Identifying and addressing potential gaps in the diabetes care system where possible.

The Nevada DPCP is funded through a cooperative agreement with the Centers for Disease Control and Prevention (CDC), Division of Diabetes Translation (DDT).

APPENDIX I - References

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Data from the following sources were used to develop this report:

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APPENDIX II - Acknowledgments

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APPENDIX III - Nevada Diabetes Council Members

ADEMS (Adult Diabetes Education and Management Support) Group

American Diabetes Association

American Heart Association

Carson City Health and Human Services

Diabetes Treatment Center at Desert Springs Hospital Medical Center

Duck Valley Tribal Health

Health Innovations

HealthInsight

IDo (Improving Diabetes and Obesity Outcomes)

Indian Health Board of Nevada

Juvenile Diabetes Research Foundation

Las Vegas YMCA

LEAP (Lower Extremity Amputation Prevention) Alliance

Merck, Inc.

Nevada Broadcaster's Association

Nevada Diabetes Association

Nevada Health Centers

Nevada Pharmacist Association

Nevada Public Health Foundation

Nevada State Health Division

Renown Diabetes Health Center

Sanofi-Aventis

Sierra Dietetics

South Lyon Medical Center

Southern Nevada Health District

St. Rose Dominican Hospitals

Tahoe Carson Healthcare

United Health Services, Inc.

University of Nevada Cooperative Extension

Washoe County Health District

Washoe Tribal Health Centers

APPENDIX IV - Data Sources & Technical Notes

The Behavioral Risk Factor Surveillance System (BRFSS) is the primary data source used to describe the burden of diabetes in Nevada. The BRFSS is a program funded by the Centers for Disease Control and Prevention supplemented by state program funds. This is the largest telephone health survey in the world and is conducted in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. The Nevada BRFSS surveys Nevada adults aged eighteen years or older. There are limitations to the BRFSS data in terms of the representations of all regions in the state and all population groups. The frequency of responses by particular population groups (e.g. racial and ethnic minorities) may be rather small, so in several instances multiple years of data were aggregated, or counties of the state were combined (rural counties and Carson City) to achieve reliable frequencies.

The Healthy People (HP) Initiative is a national strategy for significantly improving the health of Americans and provides a framework for national, state and local health agencies, as well as non-government entities, to assess health status, health behaviors, and health services. The HP Initiative began as an offshoot from the 1979 the Surgeon General's Report, Health Promotion and Disease Prevention, which was followed in 1980 by the report, Promoting Health/Preventing Disease: Objectives For a Nation, which detailed 226 health objectives to be reached by 1990. Subsequently the HP 2000, HP 2010, and HP 2020 were developed that documented objectives to be reached by 2000, 2010, and 2020 respectively. The goals of the HP Initiative are to increase quality and years of healthy life, and eliminate health disparities. Whenever applicable and available, HP 2010 and HP 2020 objectives are included in this report along with their corresponding health indicators; in order to compare our progress towards the goals set for 2010 and show our future goals for 2020.

The Inpatient Hospital Discharge Database provides information about patients discharged from non-federal acute care hospitals in Nevada. These data are collected through the standard Uniform Billing (UB-92) Form, which is utilized by hospitals to bill for their hospital charges. They include patients who spent at least 24 hours as an inpatient, but do not include patients who were discharged from the emergency room. The data identify billed charges, not the actual payments received by the hospital. Data include demographic information, diagnoses (identified by International Classification of Disease codes—9 (ICD-9)), diagnostic and operative procedures, billed hospital charges, length of hospital stay and discharge destination. The ICD-9 system is used to code and classify morbidity (the rate at which an illness occurs) data from inpatient records. Inpatient Hospital Discharge Data include up to 33 ICD-9 diagnosis codes.

Network #15 is involved in the assurance of quality care to individuals with End-Stage Renal Disease (ESRD), and also in the collection and validation of information about and treatment of persons with ESRD. The Centers for Medicare and Medicaid Services (CMS) contracts with and funds 18 ESRD Network organizations covering all 50 states and U.S. territories. The territory of Network #15 includes six states: Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. ESRD is the only disease which entitles an individual to Medicare benefits (with some minimum requirements). The Network Council is a major advisory committee to Network #15 and includes representatives from: all Network dialysis and transplant facilities; professional disciplines involved in renal care; agencies involved in the treatment of kidney disease; and patients who want to have a Network voice. ESRD Network #15, a consortium of just under 300 dialysis and 14 transplant facilities, serves a population of approximately 15,000 dialysis patients and over 850 transplant patients each year.

The *Nevada Type 2 Diabetes and Stroke Report 2009* contains data gathered by SDI, Plymouth Meeting, Pa., a leading provider of innovative health care data products and analytic services. The data provides employers with independent, third-party information that they can use to benchmark their own data on

patient demographics, professional (provider) and facility (hospital) charges, service utilization and pharmacotherapy.

The Bureau of Health Statistics, Planning, Epidemiology and Response collects, processes, analyzes, and maintains the state of Nevada's Vital Records Statistical Database. Funeral directors, or persons acting as such, are legally responsible with filling death certificates. The vital records statistical database includes those individuals who died in Nevada (residents and non-residents) and includes Nevada residents who died outside the state of Nevada. Mortality data include demographic data of the individual, occupation, gender, age, date of birth, age at death, place of death, manner of death, state of residence, and cause of death (identified by International Classification of Disease codes—10 (ICD-10)). The ICD-10 system is used to code and classify mortality (the number of deaths) data from death certificates. Mortality data in this report include both the underlying (primary) and multiple causes of death.

The Youth Risk Behavior Surveillance System (YRBSS) is a national, biennial, school-based survey administered to samples of students in grades 9-12. The survey collects data on health risk behaviors such as injury, tobacco use, alcohol, and other drug use, sexual behavior, diet, nutrition, and physical activity.

Statistics based on samples of a population are subject to sampling error. Sampling error refers to a random variation that occurs because only a subset of the entire population is sampled and used to estimate a finding for the entire population. Confidence intervals provide a range of values that can describe the uncertainty around an estimate. In this report Statistical Analysis Software (SAS) was used to compute 95% confidence intervals, i.e. there is a 95% chance that the confidence intervals cover the true values. Confidence intervals have been included as error bars in the graphs representing diabetes prevalence among Nevada adults by the demographic breakdowns region, age, race/ethnicity, and household income levels.

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