THE BURDEN
OF DIABETES IN ARKANSAS

The Burden of Diabetes in Arkansas

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Executive Summary

The Arkansas Diabetes Prevention and Control Program (DPCP) is funded by the Centers for Disease Control and Prevention (CDC) to reduce and prevent the burden of diabetes in Arkansas. Information on the burden of diabetes in Arkansas is compiled every other year. This report is intended to describe the impact of diabetes in Arkansas for program managers, Diabetes Advisory Council (DAC) members, policy makers, researchers and other interested parties. It is hoped that this information will provide assistance in determining where interventions are needed.

Key Findings

- The prevalence of diabetes has reached epidemic proportions in Arkansas. The prevalence has been at or above the national average for the past 15 years. There was a 44% increase in the diabetes prevalence from 1999 to 2008 in Arkansas.
- An estimated 372,000 adult Arkansans had diabetes in 2008. Of those, 124,000 remained undiagnosed and untreated.
- The prevalence of diabetes increased with age, with the prevalence among persons over the age of 45 being more than four times greater than the prevalence found among younger persons.
- The diabetes prevalence among blacks (11.5%) was significantly higher than among whites (9.4%) in 2008.
- Diabetes was the 6th leading cause of death among all Arkansans and the 4th leading cause of death among blacks in 2006.
- In 2007, 5,866 hospitalizations were reported for diabetes in Arkansas. An estimated $100 million was accrued in hospitalization charges for diabetes.
- In 2007, there were 738 lower extremity amputations, 1,724 hospitalizations for ketoacidosis and 419 hospitalizations for chronic end-stage renal disease among those with diabetes.
- There were racial/ethnic differences in preventive care practices among people with diabetes.
    - Hispanics were approximately 60% more likely to not have an annual dilated eye exam as any other racial/ethnic group.
    - Blacks had the greatest prevalence of diabetic retinopathy.
    - Blacks were less likely to have either an influenza or pneumonia shot than any other racial/ethnic group.

Diabetes Mellitus

Diabetes is a group of diseases marked by high levels of blood glucose resulting from defects in insulin production, insulin action, or both.[1] Insulin is needed to convert sugar, starches and other food into energy the body needs for daily life.[2] Diabetes can lead to many serious complications including heart disease, blindness, kidney failure, lower extremity amputations, and death.

Although the exact cause of diabetes is unknown, genetics and behavioral factors such as lack of exercise and proper diet appear to play a role.

Types of Diabetes

Type 1 Diabetes - Previously called insulin-dependent or juvenile-onset diabetes, develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose. Type 1 diabetes accounts for 5 to 10% of all diagnosed cases of diabetes.[1]

Type 2 Diabetes - Previously called non-insulin dependent or adult-onset diabetes mellitus, begins as insulin resistance when the cells do not use insulin properly. The pancreas gradually loses the ability to produce insulin as the need for insulin rises. Type 2 diabetes accounts for 90 to 95% of all diagnosed cases of diabetes.[1]

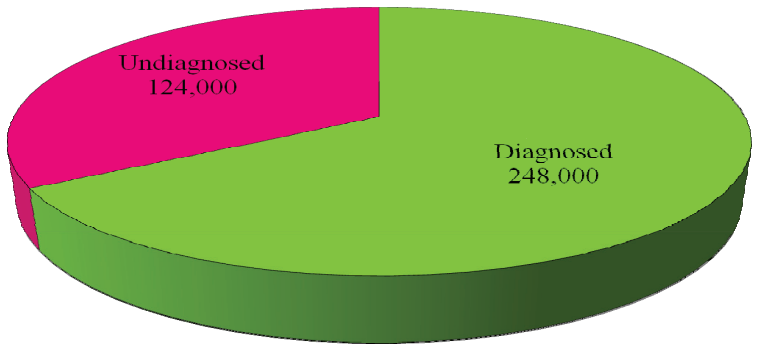
Gestational Diabetes - A form of glucose intolerance that occurs during pregnancy.[3] Women who have never been diagnosed with diabetes, but exhibit high levels of blood glucose during pregnancy are considered to have gestational diabetes. Gestational diabetes affects about 4% of all pregnant women.

Pre-diabetes - A condition that occurs when a person's blood glucose levels are high, but not high enough for a diagnosis of diabetes.[1] Those with pre-diabetes are at increased risk of developing type 2 diabetes as well as heart disease and stroke. It is estimated that 57 million Americans have pre-diabetes.

Prevalence of Diabetes

In 2008, an estimated 248,000 Arkansas adults were diagnosed with diabetes. It is projected that another 124,000 adults living with diabetes were undiagnosed. Diagnosed and undiagnosed diabetes directly affects an estimated 372,000 adults in the state.

Figure 1. Estimated Prevalence of Diabetes Among Adults (18 & Over) Arkansas, 2008



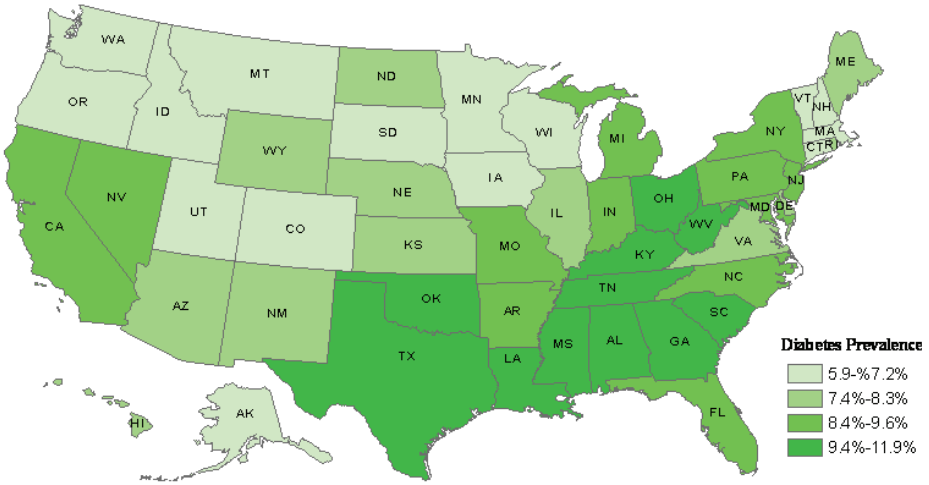
Source: CDC Behavioral Risk Factor Surveillance System.

An estimated 23.6 million Americans, or 7.8% of the U.S. population, have diabetes.[1] Approximately 75% of these individuals, or 17.9 million Americans, have been diagnosed with diabetes while the remaining 5.7 million are unaware that they have diabetes.

Diabetes prevalence both in Arkansas and nationwide has increased over the past decade. According to figures obtained from the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System, Arkansas tied with Florida and Indiana for the 12th highest prevalence of diagnosed diabetes at 9.5% in 2008. The prevalence rate in Arkansas has been at or above the national average for the past 15 years.

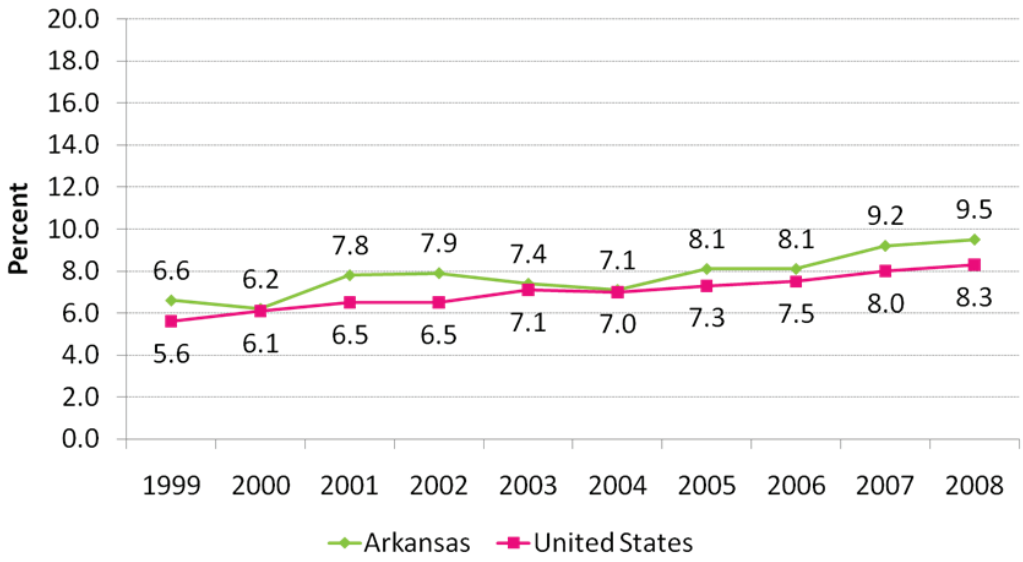
The diabetes prevalence in Arkansas rose from 6.6% in 1999 to 9.5% in 2008, a 44% increase over the 10-year period, while the U.S. rate increased by 48% during the same time period, from 5.6% in 1999 to 8.3% in 2008.

Figure 2. Estimated Prevalence of Adults Diagnosed with Diabetes* United States, 2008



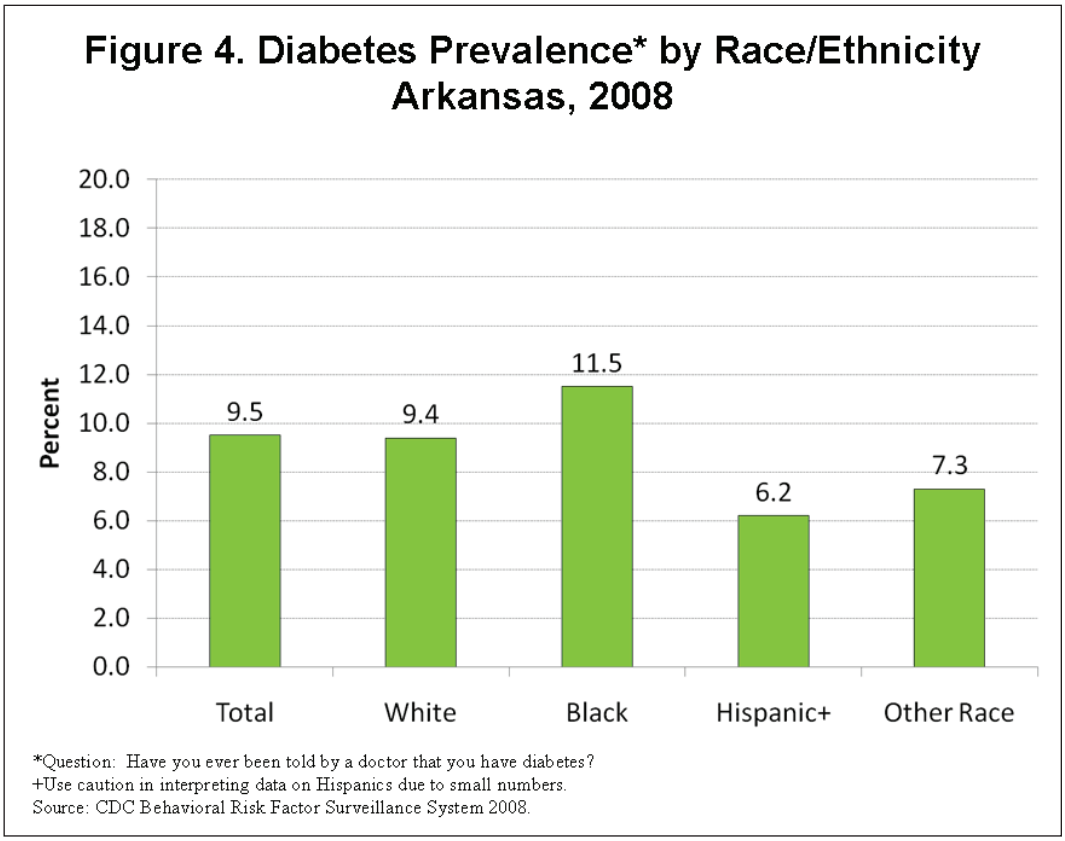
*Question: Have you ever been told by a doctor that you have diabetes?
Source: CDC Behavioral Risk Factor Surveillance System, 2008.

Figure 3. Diabetes Prevalence* in Arkansas and United States, 1999-2008

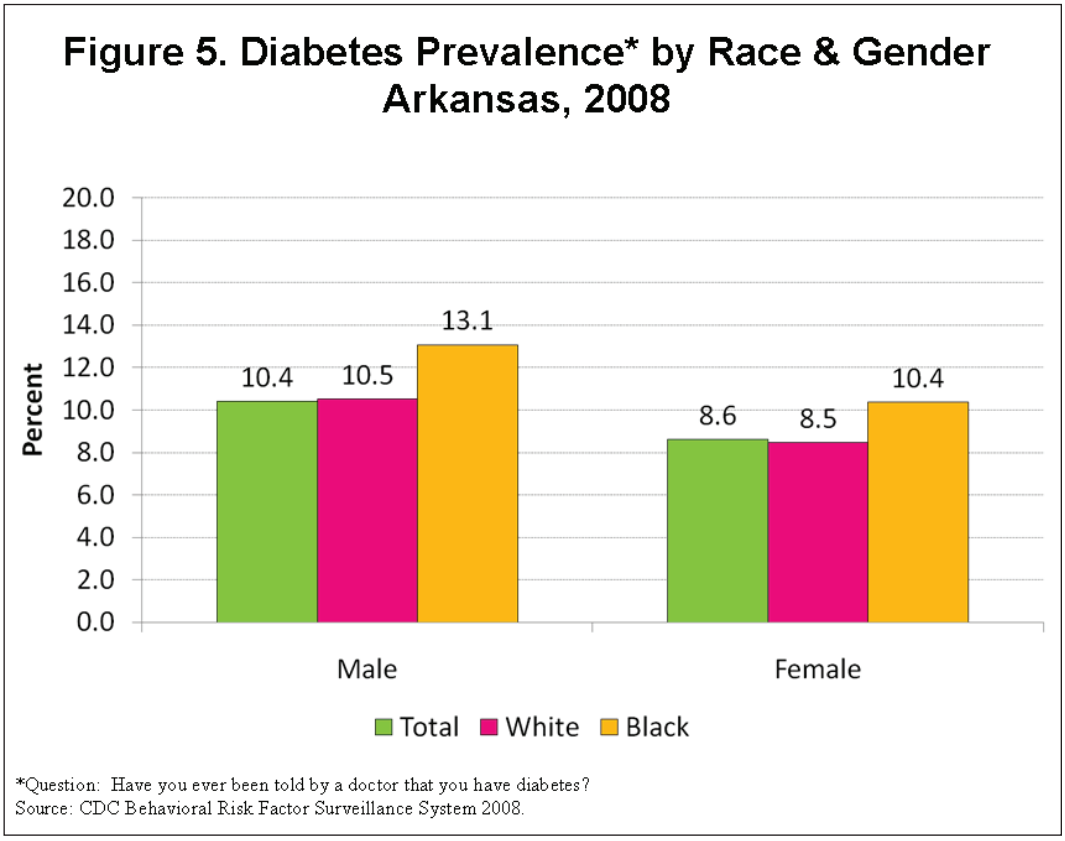


*Question: Have you ever been told by a doctor that you have diabetes?
Source: CDC Behavioral Risk Factor Surveillance System 1999-2008.

Diabetes disproportionately affects blacks. The diabetes prevalence among blacks was 22% higher than the prevalence among whites. This difference was statistically significant.



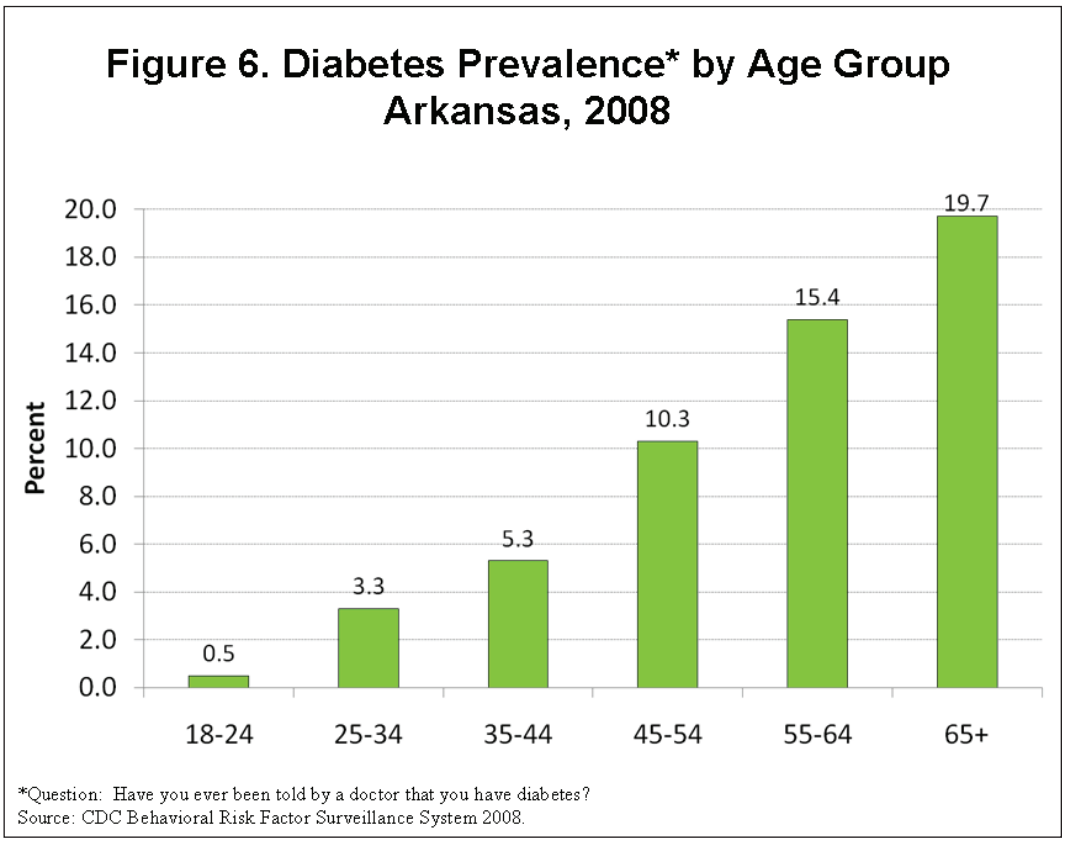
Diabetes prevalence was higher among males. The prevalence rate was 21% higher among males than females in Arkansas. This difference was statistically significant.



Diabetes prevalence increases with age. The prevalence increases by approximately 5 percentage points for each age group after the 35-44 year old age group.

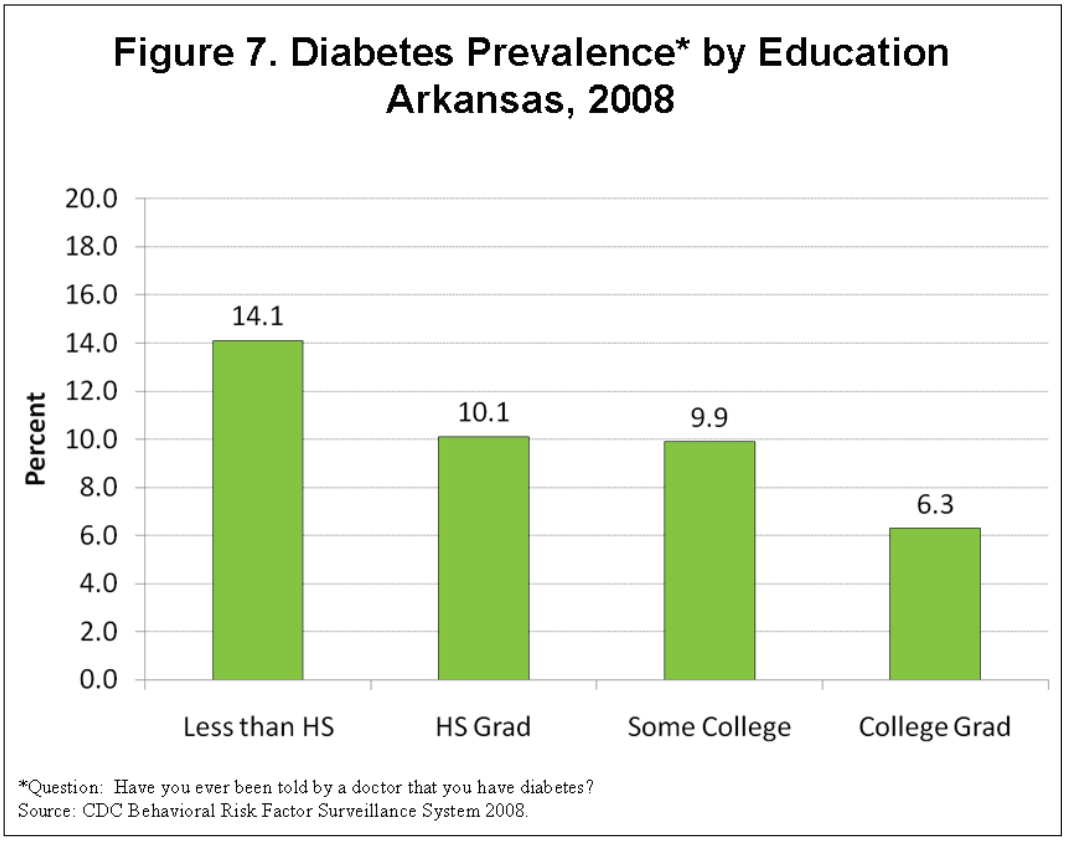
The highest prevalence of diabetes was found among adults 65 years of age or older.

Like many other chronic diseases, diabetes can remain undetected for a long time before it is clinically diagnosed.



The prevalence of diabetes decreases as the level of education increases.

The prevalence among college graduates is less than half of those with no high school diploma.



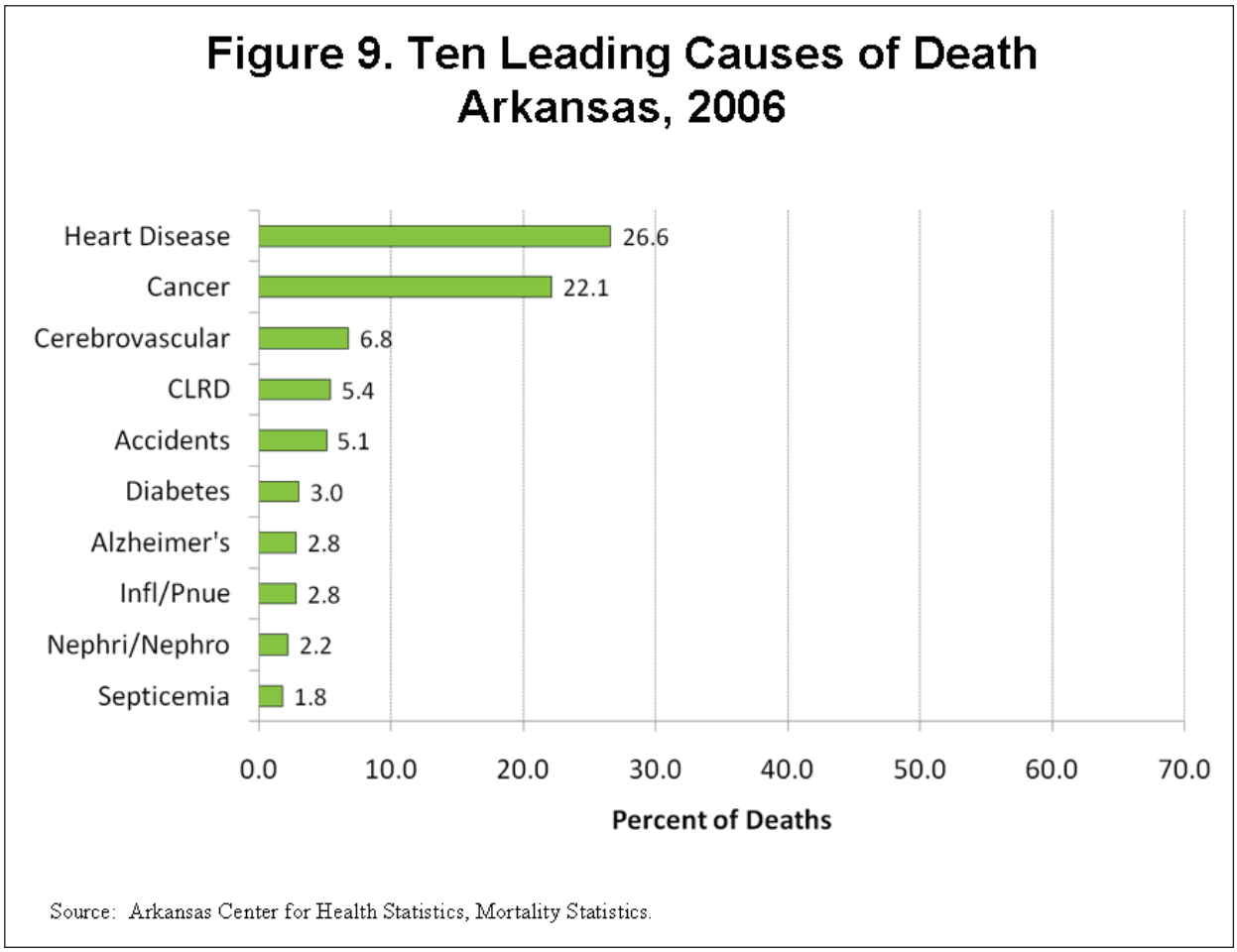
Diabetes prevalence was higher among those with lower income levels. Prevalence among those with income less than $15,000 annually was almost three times that of those with income above $50,000 annually.

*Question: Have you ever been told by a doctor that you have diabetes?
**Question: Is your annual household income from all sources…?
Source: CDC Behavioral Risk Factor Surveillance System 2008.

Mortality

Nationally, diabetes was the sixth leading cause of death in 2006, accounting for 72,507 deaths with diabetes as the underlying cause of death.[1] However, based on information provided in the 2007 CDC National Diabetes Fact Sheet, diabetes contributed to 233,619 deaths in the United States in 2005, the latest year in which data on contributing causes of death are available.[1] Despite this, diabetes contribution to mortality may be underreported. Studies have found that only about 35-40% of decedents with diabetes had it listed anywhere on the death certificate. Overall, the risk of death among people with diabetes is twice as likely as for those without diabetes of similar age.[1]

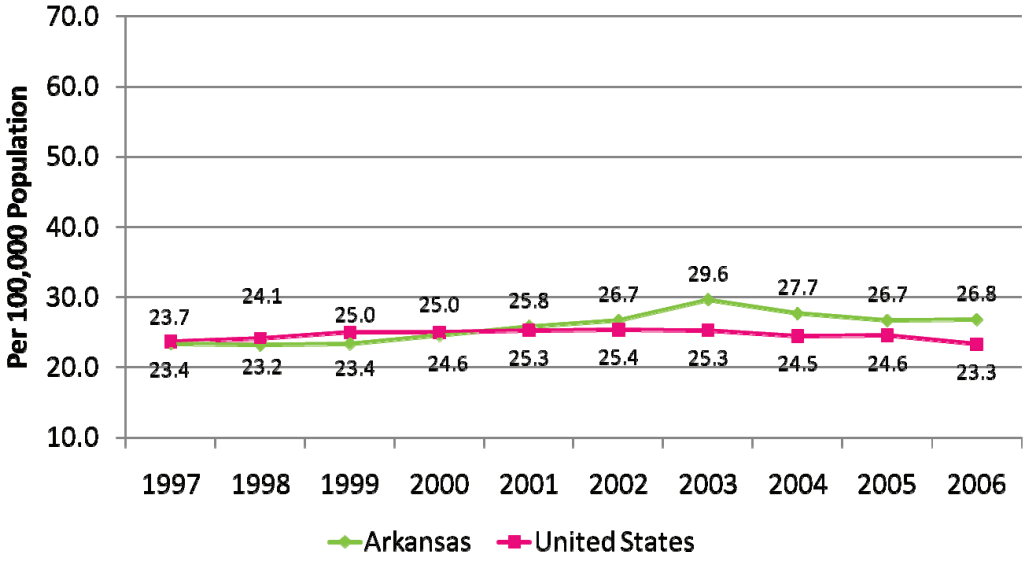
In Arkansas, diabetes was the sixth leading cause of death in 2006, accounting for 837 deaths.



The age-adjusted diabetes mortality rate has remained fairly stable nationwide over the past decade.

The diabetes mortality rate in Arkansas has increased over the past decade from 23.4 per 100,000 in 1997 to 26.8 per 100,000 in 2006, a 14.5% increase.

Figure 10. Age-Adjusted Diabetes Mortality Arkansas and United States, 1997-2006

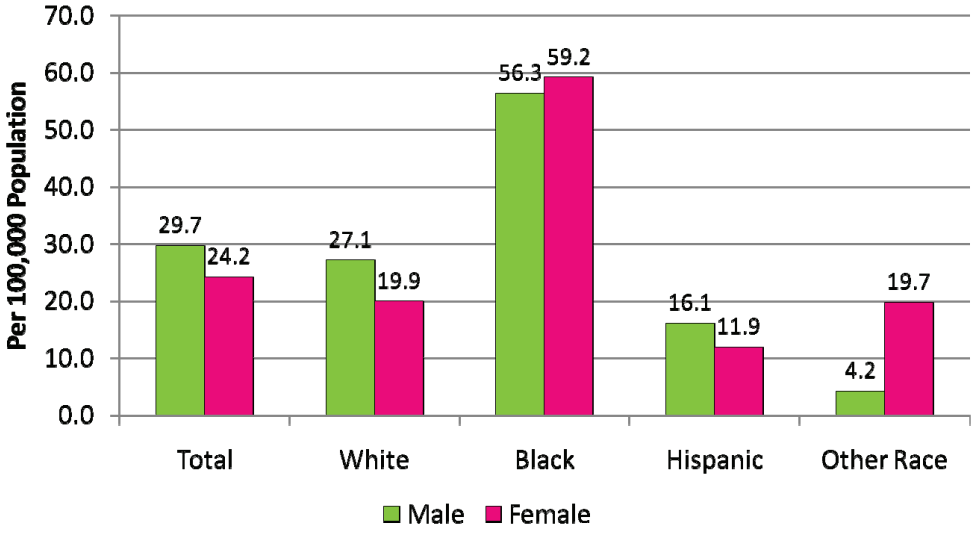


Sources: Arkansas Center for Health Statistics Query System & CDC Wonder.

The age-adjusted diabetes mortality rate for black males and females was more than two times higher than that for white males and females. This difference was statistically significant.

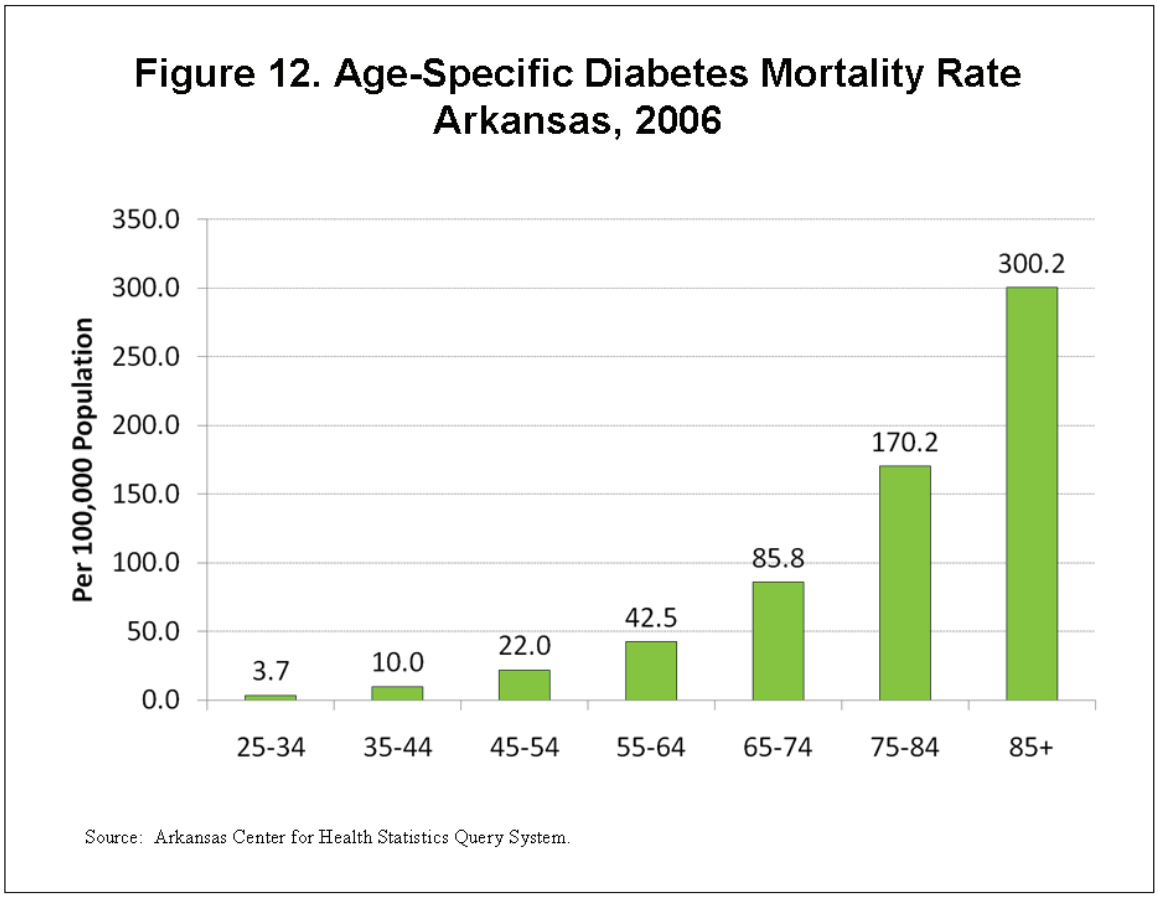
Most of the deaths among blacks occurred prematurely (before 65 years of age).[1]

Figure 11. Age-Adjusted Diabetes Mortality Rate by Race/Ethnicity & Gender Arkansas, 2006



Source: Arkansas Center for Health Statistics Query System.

As with other chronic diseases, diabetes mortality increases with age. It nearly doubles at every age interval.



Hospitalizations

The Arkansas Hospital Discharge data system collects in-patient discharge information from all Arkansas hospitals.

More than 5,800 discharges of people with a primary diagnosis of diabetes were reported in 2007.

The majority of the discharges (29.4%) were diagnosed with diabetes with ketoacidosis. Another 12.4% presented with neurological manifestations.

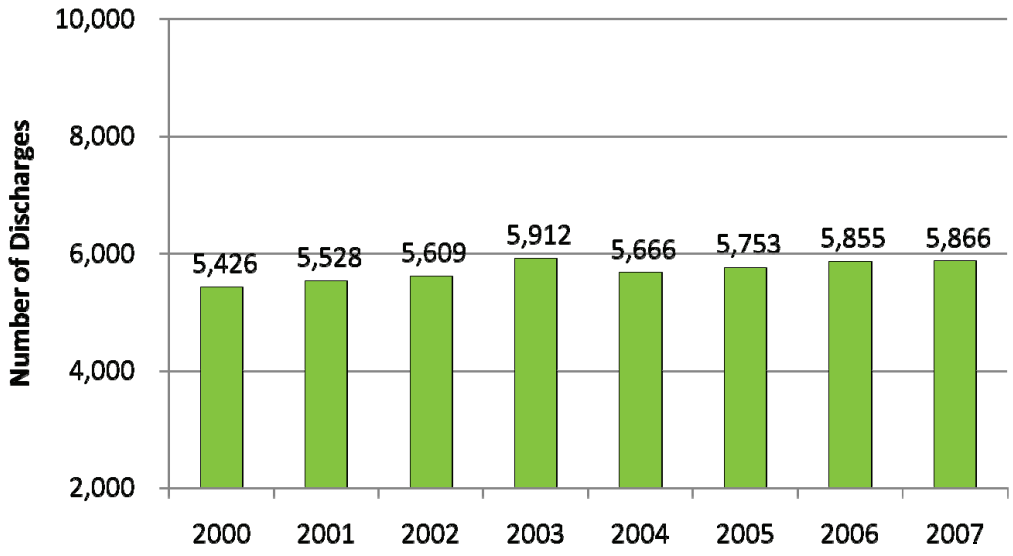
Table 1. Hospital Discharges with Primary Diagnosis of Diabetes Arkansas, 2007

ICD-9 CM	Diagnosis	Number	Percent
250.0	Diabetes without mention of Complications	1,127	19.2
250.1	Diabetes with Ketoacidosis	1,724	29.4
250.2	Diabetes with Hyperosmolar Coma	119	2.0
250.3	Diabetes with other Coma	49	0.8
250.4	Diabetes with Renal Manifestations	263	4.5
250.5	Diabetes with Ophthalmic Manifestations	10	0.2
250.6	Diabetes with Neurologic Manifestations	725	12.4
250.7	Diabetes with Peripheral Circulatory Disease	453	7.7
250.8	Diabetes with Other Specified Manifestations	1,322	22.5
250.9	Diabetes with Unspecified Complications	74	1.3
	Total	**5,866**	**100.0**

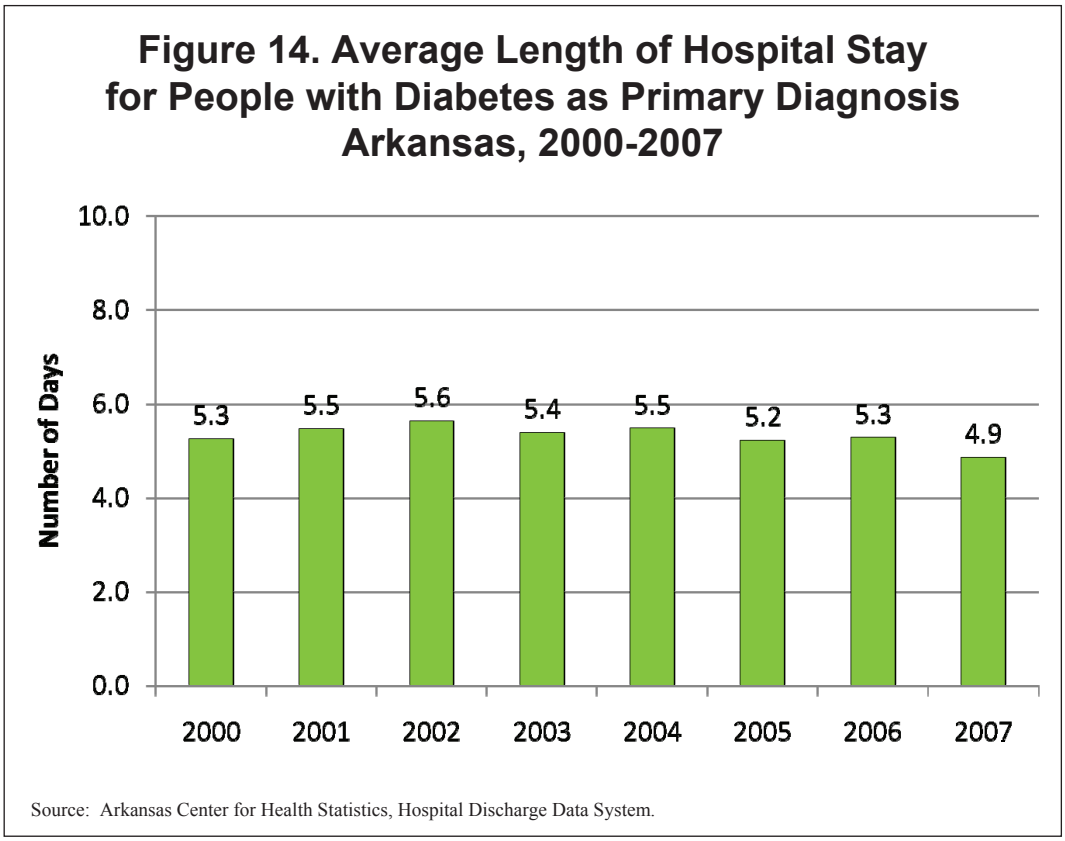
Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.

Since 2000, there has been an 8% increase in the number of hospital discharges with primary diagnosis of diabetes.

Figure 13. Hospital Discharges with Primary Diagnosis of Diabetes Arkansas, 2000-2007



Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.



Since 2000, the average length of diabetes-related hospital stays reduced from 5.3 days in 2000 to 4.9 days in 2007, after reaching a high of 5.6 days in 2002.

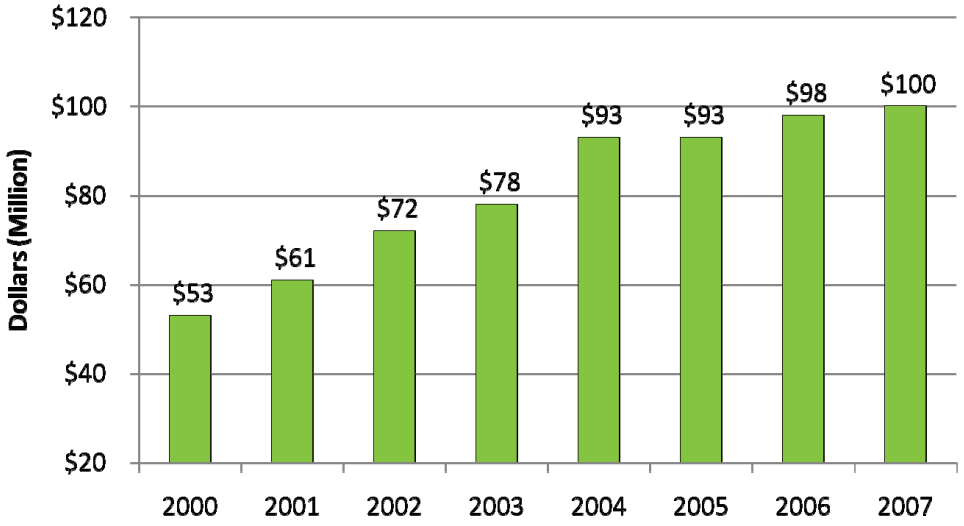
Economic Impact

- The costs due to diabetes include direct medical costs such as physician visits, hospitalizations and pharmacy charges, as well as indirect costs such as lost days of work, disability and premature deaths.
- The American Diabetes Association (ADA) estimated that the national costs of diabetes exceeds $174 billion.[4]
- The cost of diabetes in Arkansas for 2007 was estimated at $1.4 billion.[5] Included in this estimate was $956 million in medical costs and $471.7 million in indirect costs.
- Detailed explanations of the estimation methods used for this analysis are available in the ADA report "Economic Costs of Diabetes in the U.S. in 2007".[6]

The direct medical charges due to hospitalizations are estimated from the Arkansas Hospital Discharge Data System, although these estimates do not include outpatient charges.

There has been a significant increase in total hospitalization charges due to diabetes in Arkansas, despite reductions in average length of stays for the same time period. (See Figure 14). These charges increased from $53 million in 2000 to $100 million in 2007, an 89% increase.

Figure 15. Total Hospital Charges for People with Diabetes as Primary Diagnosis Arkansas, 2000-2007

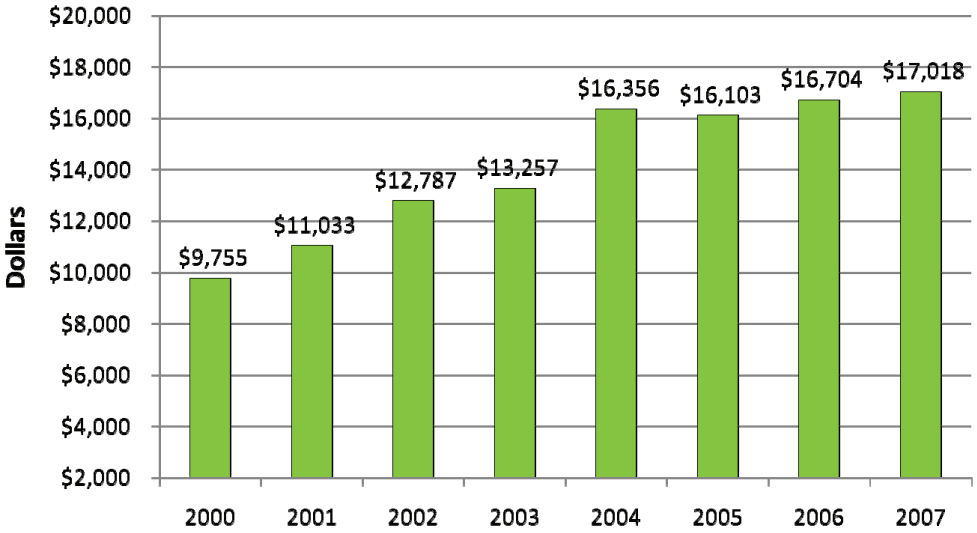


Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.

During the same time period, average hospitalization charges have increased as well.

There was a 74% increase from 2000 to 2007, increasing from $9,755 in 2000 to $17,018 in 2007.

Figure 16. Average Hospital Charges for People with Diabetes as Primary Diagnosis Arkansas, 2000-2007



Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.

Morbidity/ Complications

Diabetes can cause serious complications like heart disease, kidney disease, eye disease, foot problems, dental disease, pregnancy related complications and diabetic ketoacidosis.[7]

According to the Arkansas Hospital Discharge Data System, there were 738 lower extremity amputations among people with diabetes in 2007.

Toe amputations were the most common at 37.5%, followed by below knee amputations at 29.3% and above knee amputations at 19.4%.

Table 2. Lower Extremity Amputations Among People with Diabetes by Procedure Arkansas, 2007

Code	Procedure	Number	Percent
84.10	Lower Limb Amputation NOS	0	0.0
84.11	Toe Amputation	277	37.5
84.12	Amputation Through Foot	82	11.1
84.13	Disarticulation of Ankle	1	0.1
84.14	Amputation Through Malleoli	10	1.4
84.15	Below Knee Amputation NEC	216	29.3
84.16	Disarticulation of Knee	7	0.9
84.17	Above Knee Amputation	143	19.4
84.18	Disarticulation of Hip	2	0.3
	Total	**738**	**100.0**

Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.

Hypertension is the most common co-morbidity in hospitalizations for people with diabetes with over 2,500 discharges each year since 2003.

Coronary artery disease is the second most common co-morbidity, with approximately 800 hospital discharges per year.

Table 3. Hospital Discharges with Co-Morbidity Among People with Diabetes as Primary Diagnosis Arkansas, 2003-2007

Secondary Diagnosis	2003	2004	2005	2006	2007
Diabetic Retinopathy	194	160	199	122	121
Blindness	45	40	35	41	41
Hypertension	2,597	2,619	2,607	2,829	2,852
Coronary Artery Disease	880	906	788	885	826
Acute Renal Failure	150	216	240	256	321
End-Stage Renal Disease	0	0	88	364	419
Lower Extremity Amputation	781	756	715	760	738

Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.

Diabetes was listed as a co-morbid condition with many other primary conditions.

Coronary artery disease is the most common diagnosis with diabetes mellitus as a co-morbid condition with over 6,000 discharges each year since 2003.

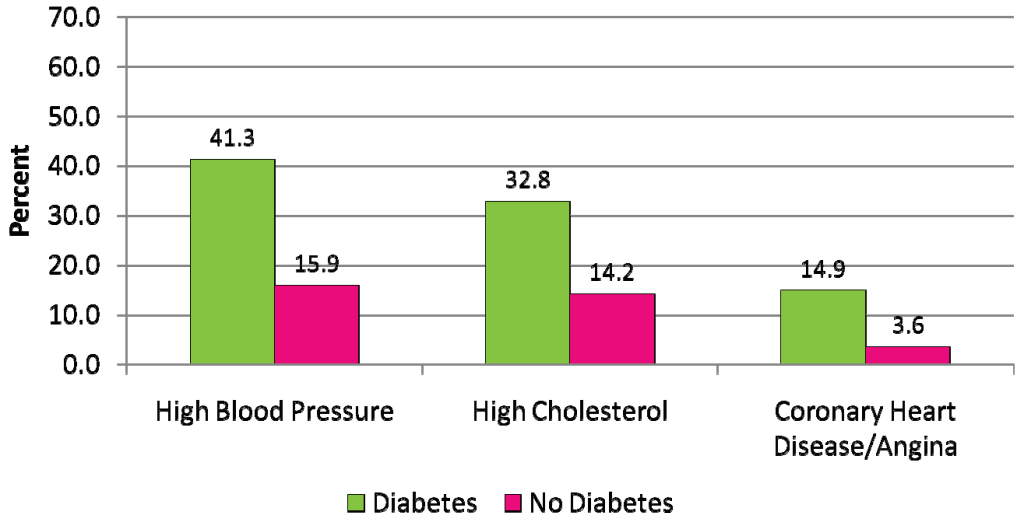
High blood pressure, high cholesterol and coronary heart disease are more common among people with diabetes than among those who do not have diabetes. The prevalence of high blood pressure as well as high cholesterol is more than twice among those with diabetes than among those without diabetes. For coronary heart disease/ angina the prevalence is over four times greater. These differences were statistically significant.

Table 4. Hospital Discharges where Diabetes was Listed as Other Diagnosis Arkansas, 2003-2007

Primary Diagnosis	2003	2004	2005	2006	2007
Hypertension	947	951	997	1,047	992
Coronary Artery Disease	6,500	6,739	6,544	6,487	6,290
Acute Renal Failure	406	571	642	670	841
End-Stage Renal Disease	0	0	13	32	49

Source: Arkansas Center for Health Statistics, Hospital Discharge Data System.

Figure 17. Prevalence of Co-Morbidity* Among Adults by Diabetes Status Arkansas, 2003-2007



*Questions: Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?
Have you ever been told by a doctor, nurse, or other health professional that your blood cholesterol is high?
Has a doctor, nurse, or other health professional ever told you had angina or coronary heart disease?

Source: Arkansas Behavioral Risk Factor Surveillance System, 2003-2007.

There are several risks associated with diabetes during pregnancy including preeclampsia, delivery complications and macrosomia.[3]

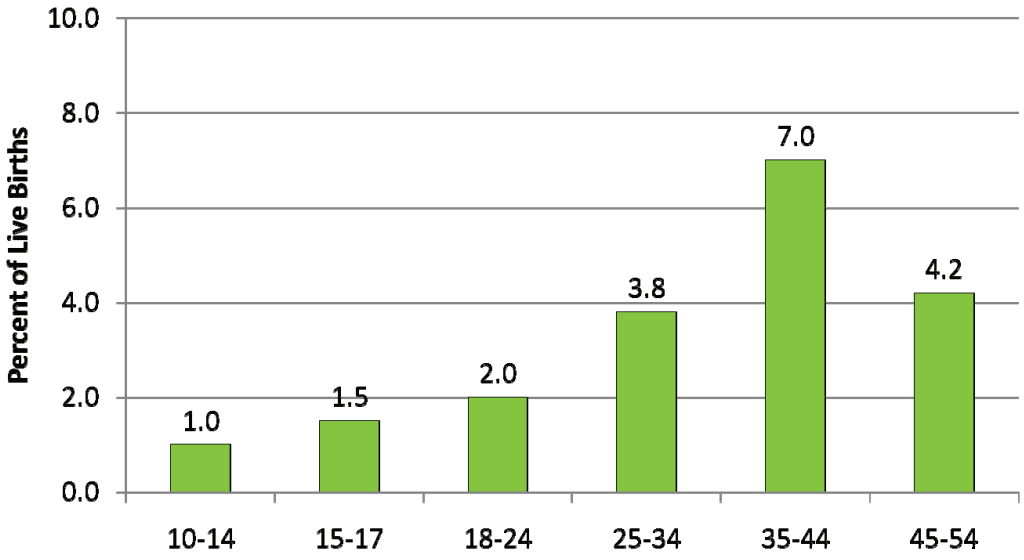
In 2006, there were 1,281 live births in which diabetes was listed as a medical risk, representing over 3% of all live births.

Diabetes as a medical risk occurred most often among mothers 35-44 years of age.

Diabetes as a medical risk was more common among Hispanic mothers than for white or black mothers.

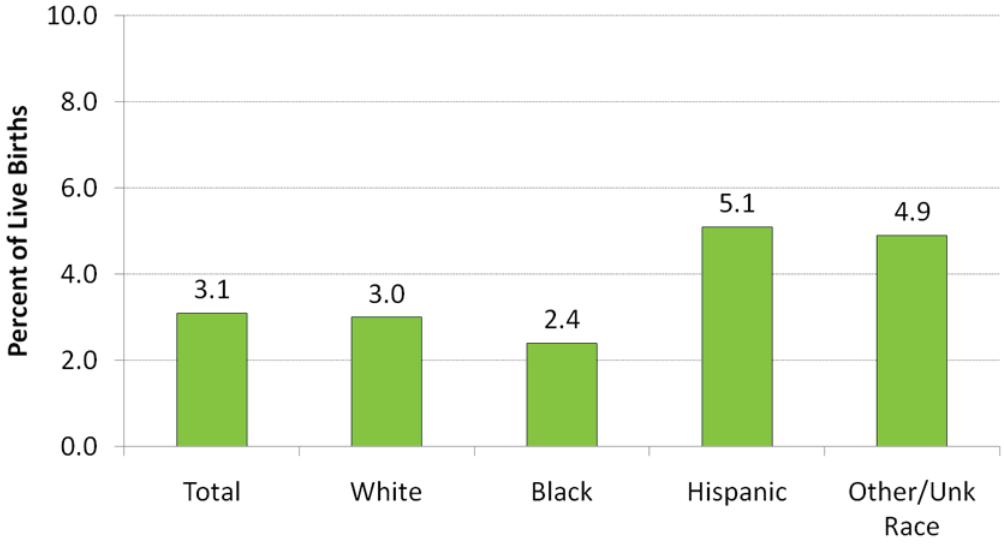
Good glucose control, blood pressure control and control of blood lipids have been shown to prevent many of the complications listed in this report.[7]

Figure 18. Percent of Live Births in Arkansas where Diabetes was Listed as Risk Factor Among Mothers by Age Group, 2006



Source: Arkansas Center for Health Statistics, Birth Certificate data.

Figure 19. Percent of Live Births in Arkansas where Diabetes was Listed as Risk Factor Among Mothers by Race/Ethnicity, 2006



Source: Arkansas Center for Health Statistics, Birth Certificate data.

Risk Factors

Prevention is the key to halting the diabetes epidemic. Identification of the risk factors among the population and promotion of primary prevention measures are the first steps. The risk factors associated with a person developing diabetes can be classified as either modifiable risk factors such as obesity and physical inactivity, or non-modifiable risk factors such as age, race and family history of diabetes.[8]

Tobacco use increases cardiovascular complications for people with diabetes.[9] Prevalence of smoking among adults with diabetes is higher among blacks. This was statistically significant compared to whites. However, the difference between Hispanics to whites was not significant due to small sample size.

Obesity prevalence was significantly higher among those with diabetes (55.3%) compared to those without diabetes (26.8%).

Physical activity among those with diabetes (54.3%) was lower than those without diabetes (73.7%). This difference was statistically significant.

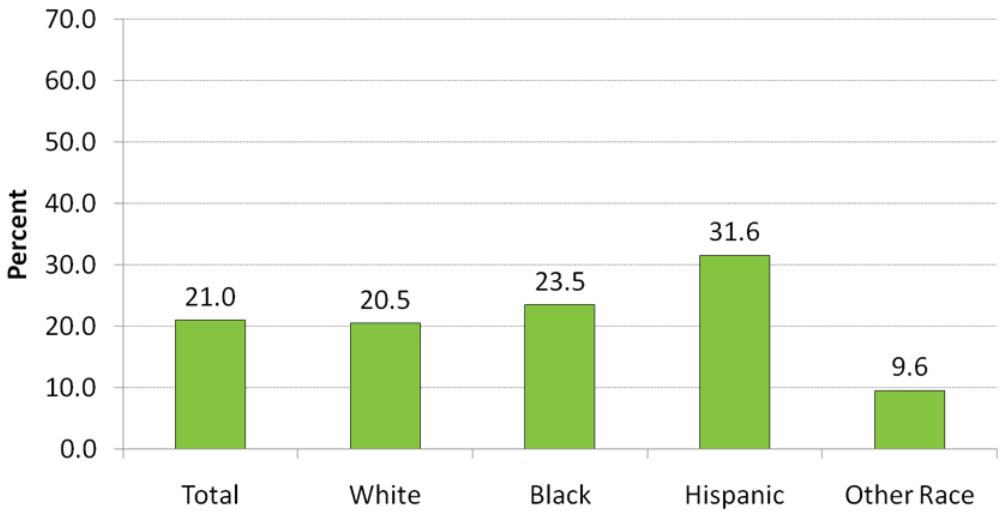


Figure 20. Prevalence of Current Smoker* Among People with Diabetes by Race/Ethnicity Arkansas, 2007

*Questions: Have you smoked at least 100 cigarettes in your entire life?
Do you now smoke cigarettes everyday, some days, or not at all?
Source: CDC Behavioral Risk Factor Surveillance System 2007.

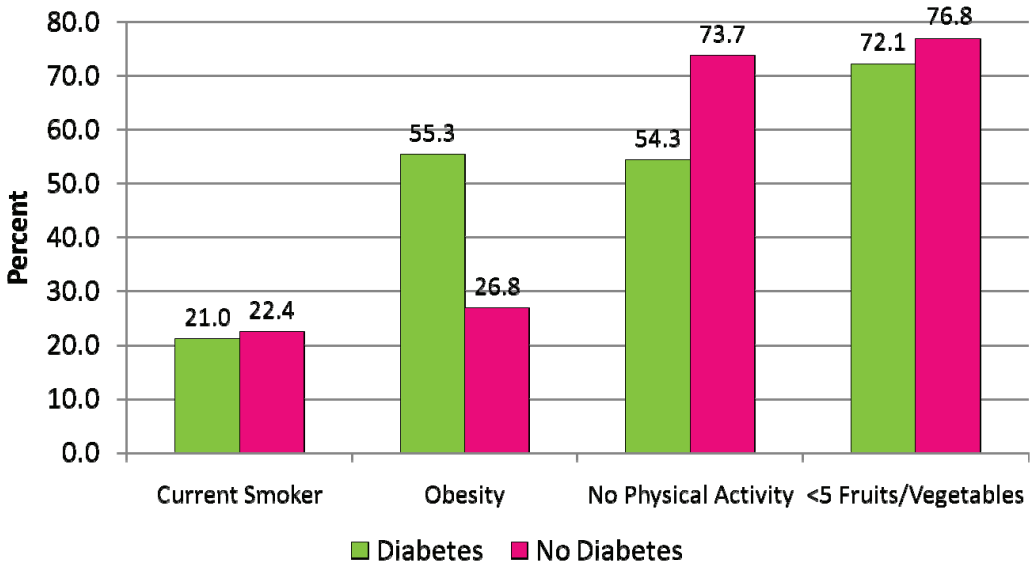
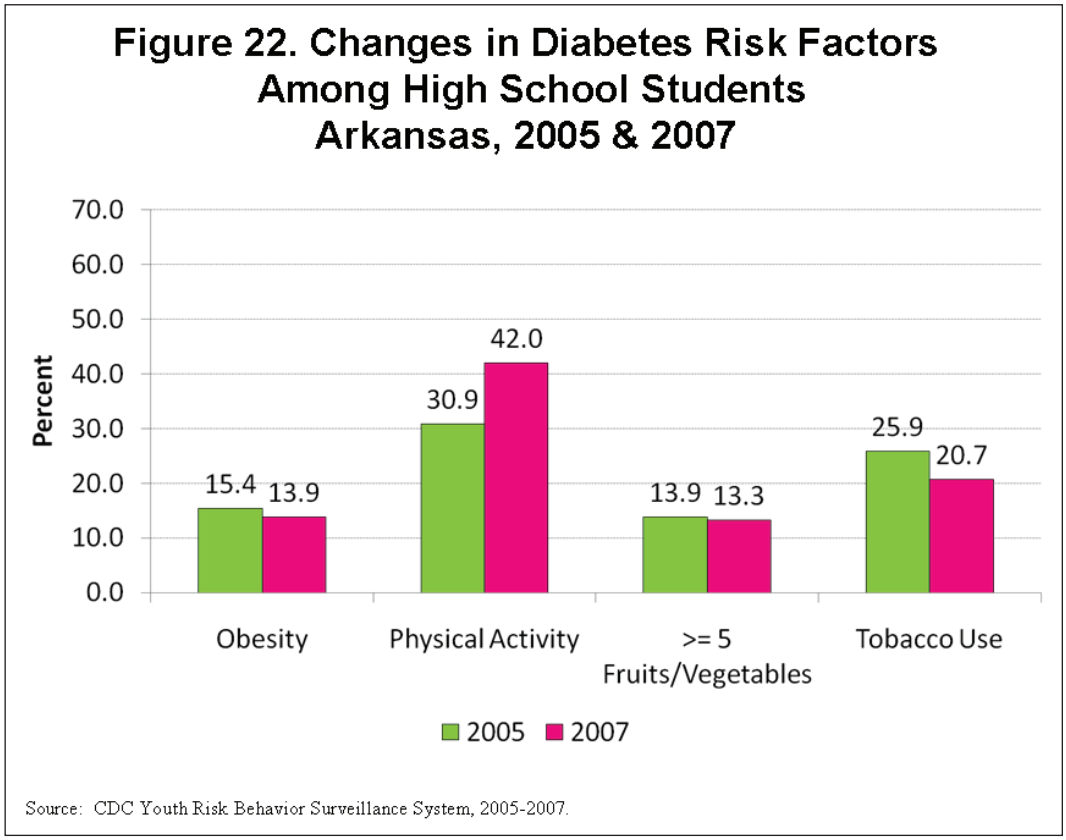


Figure 21. Prevalence of Risk Factor Among Adults by Diabetes* Status Arkansas, 2007

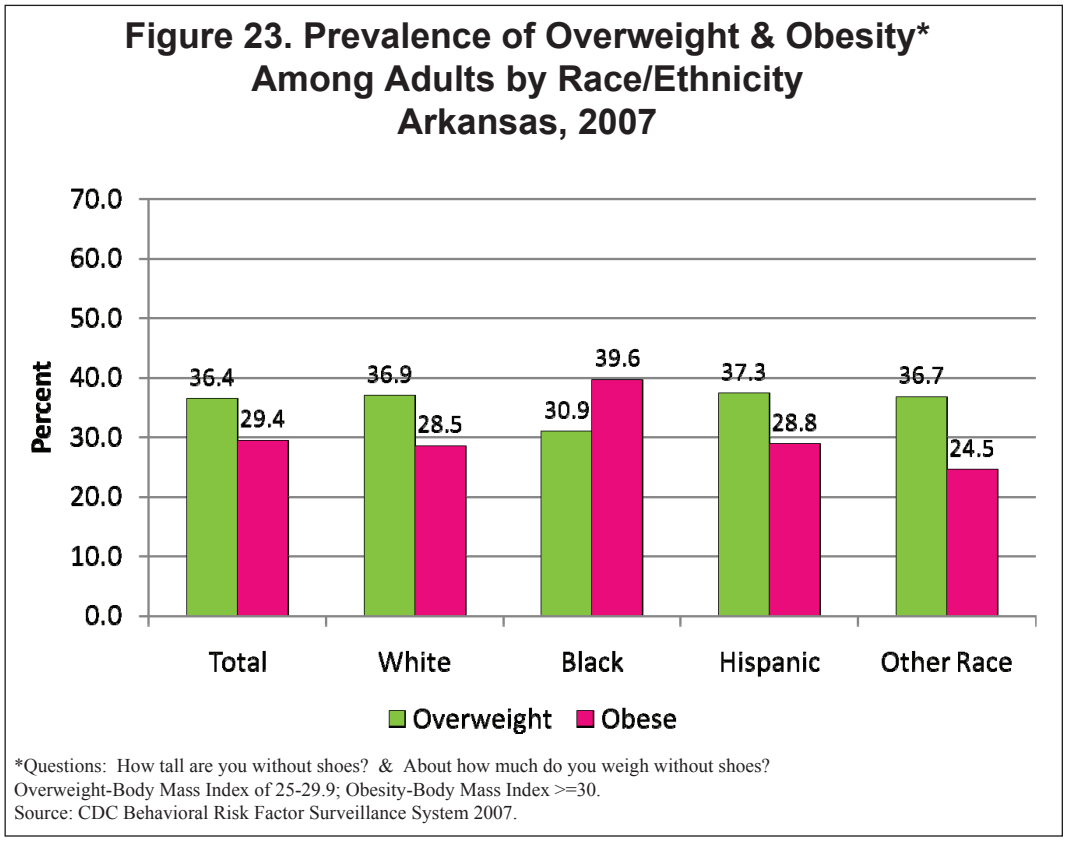
*Question: Have you ever been told by a doctor that you have diabetes?
Source: Arkansas Behavioral Risk Factor Surveillance System, 2003-2007.

The prevalence of risk factors of diabetes among youth shows some improvement. The prevalence of physical activity among high school students increased 36% from 30.9% in 2005 to 42.0% in 2007.

The prevalence of tobacco use among Arkansas high school students showed a decline of 20% from 25.9% in 2005 to 20.7% in 2007.



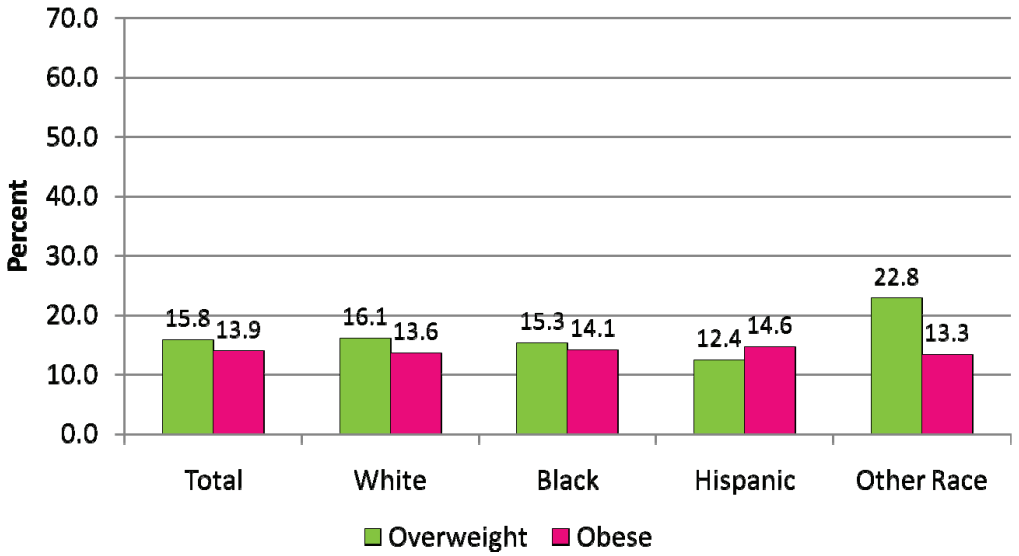
There was a marked difference in the prevalence of overweight and obesity by race/ethnicity. The prevalence of obesity was highest among blacks. This difference was statistically significant.



Among Arkansas high school students, the prevalence of obesity was similar by race/ethnicity.

The prevalence of overweight was significantly higher among the race category of Other Race relative to the specified other racial/ethnic groups.

Figure 24. Prevalence of Overweight* & Obesity Among High School Students by Race/Ethnicity Arkansas, 2007**



*>=85th percentile but < 95th percentile for body mass index
**>= 95th percentile for body mass index
Source: CDC Youth Risk Behavior Surveillance System, 2007.

Research has shown that lifestyle changes can prevent or delay the onset of Type 2 diabetes among high-risk adults.[10]

The Centers for Disease Control and Prevention recommend following a healthy diet (5 or more servings of fruits and vegetables a day, reduced fat and sugar intake) and moderate physical activity (30 minutes a day, 5 days a week) for all adults.

The Diabetes Prevention Program, a large prevention study of people at high risk for diabetes, showed that the risk of developing diabetes could be reduced by 58% over 3 years by following the recommended lifestyle modifications such as losing weight and increasing physical activity.[1]

Access to Health Care

Lack of health care access is a problem faced not only by people with diabetes but also by many Arkansans generally. Poor health consequences among people with diabetes can be secondary to limited availability of preventive services such as professional eye exams and foot exams.

Barriers to health care access may include:

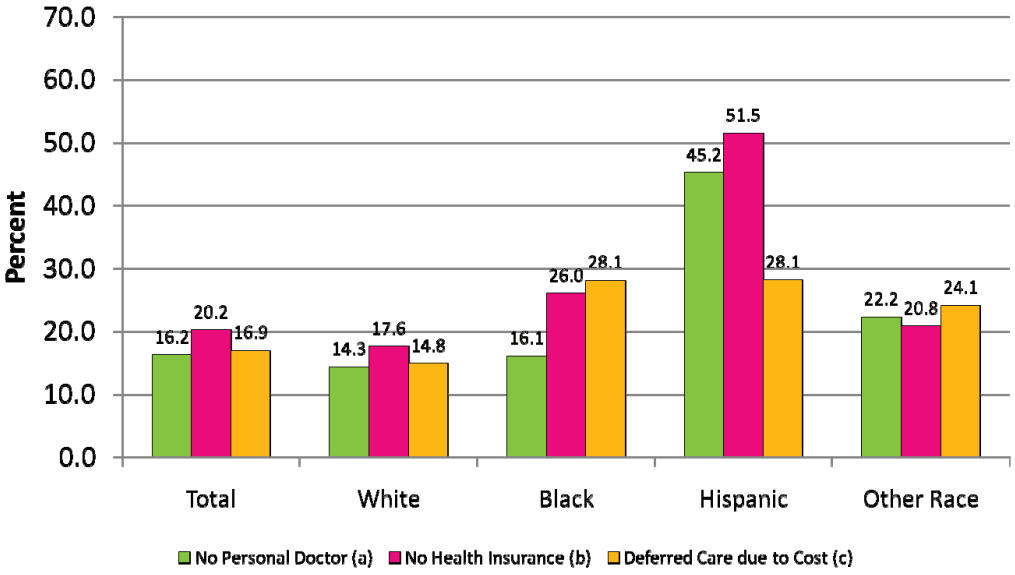
- Financial Barriers
- Structural Barriers
- Personal Barriers

Financial Barriers

Lack of health insurance may contribute to the lack of periodic visits with their own personal doctor. The cost of care without health insurance can contribute to the individual delaying treatment until a problem becomes serious or life threatening. These barriers differ among racial/ethnic groups in Arkansas.

A higher proportion of minorities lack health insurance as well as a personal doctor compared to whites. Minority populations are also more likely to defer care due to cost. Hispanics have a significantly higher percentage of persons who do not have health insurance. Delay in treatment or deferred care percentage among Hispanics, blacks and Other Race are all significantly higher than whites.

Figure 25. Access to Health Care by Race/Ethnicity Arkansas, 2007



*Questions: (a) Do you have one person you think of as your personal doctor or health care provider?
(b) Do you have any kind of health care coverage including health insurance, prepaid plans such as HMOs, …?
(c) Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?

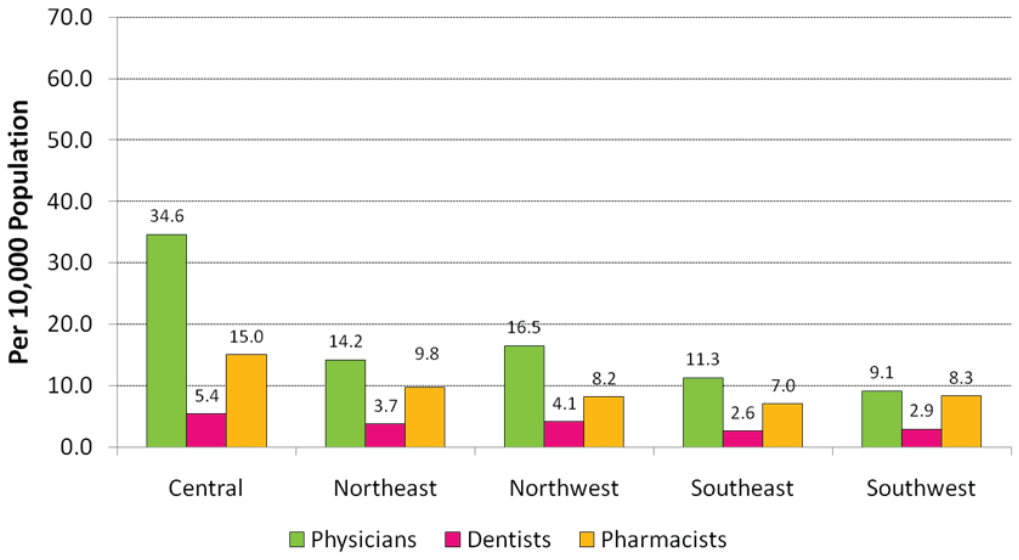
Source: CDC Behavioral Risk Factor Surveillance System 2007.

Structural Barriers

Approximately 22% of the population in Arkansas lives in areas designated as Health Professional Shortage Areas (HPSAs) by the federal government. More than half of the population in Arkansas lives in areas designated as Medically Underserved Areas (MUAs).

In Arkansas, there are a higher proportion of healthcare professionals in the Central Region. The proportions are lower within the Northeast, Southeast and Southwest Public Health Regions.

Figure 26. Arkansas Healthcare Professionals by Public Health Region, 2007

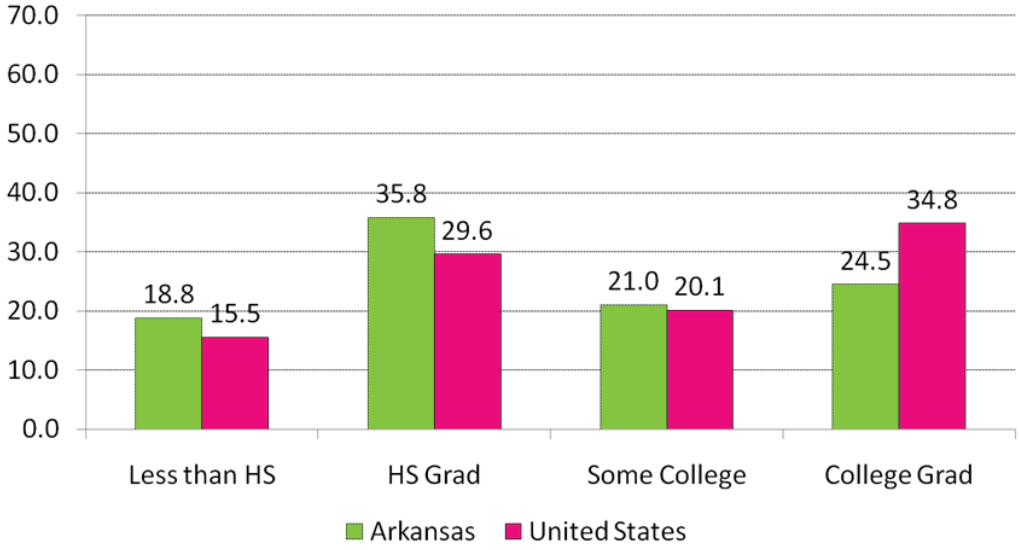


Source: Arkansas Center for Health Statistics, Health Professions Manpower Assessment.

Personal Barriers

Even in the presence of health care infrastructure, personal barriers such as lack of knowledge or trust in the system, could pose barriers to health care access. Promoting awareness and education among the general public regarding access to health care services is the key to eliminating this barrier.

Figure 27. Educational Attainment for Adults (25+) Arkansas & United States, 2006-2008



Source: U.S. Census Bureau, American Community Survey.

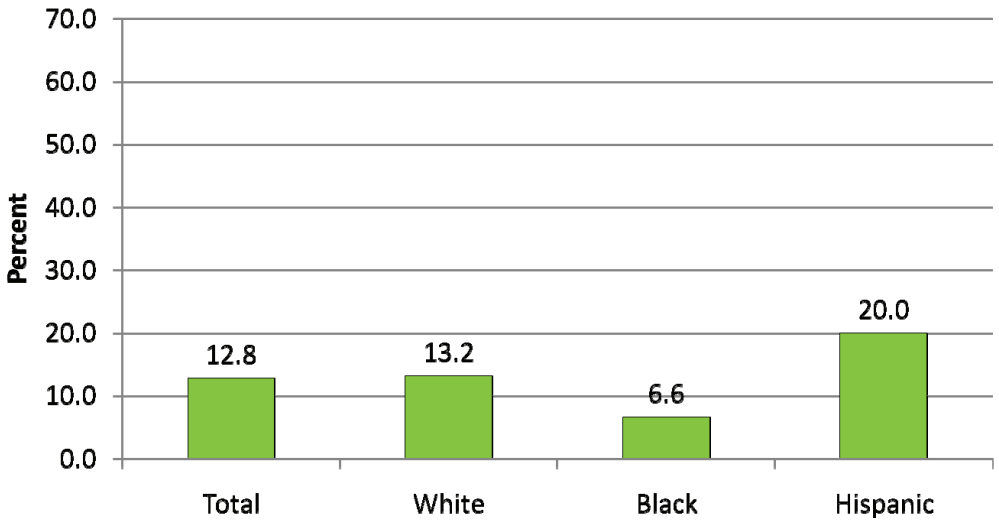
Preventive Care Practices

The Centers for Disease Control and Prevention and the American Diabetes Association (ADA) have set national objectives for preventive care practices among people with diabetes. Following the recommended guidelines, which address receiving annual eye exams, foot exams, HbA1c checks and flu and pneumonia vaccinations, has been shown to reduce the costs associated with complications of diabetes and improves the quality of life among people with diabetes.[1]

There were racial differences in preventive care practices among people with diabetes, according to the Behavioral Risk Factor Surveillance System (BRFSS).

Blacks were more likely to have had an annual doctor visit with only 6.6% reporting not having an annual doctor visit. The percentage of Not Having an Annual Doctor Visit for blacks is much lower than other ethnic groups. The difference was statistically significant when comparing blacks to whites.

Figure 28. Percent of People with Diabetes Without an Annual Doctor Visit* by Race/Ethnicity Arkansas, 2003-2007

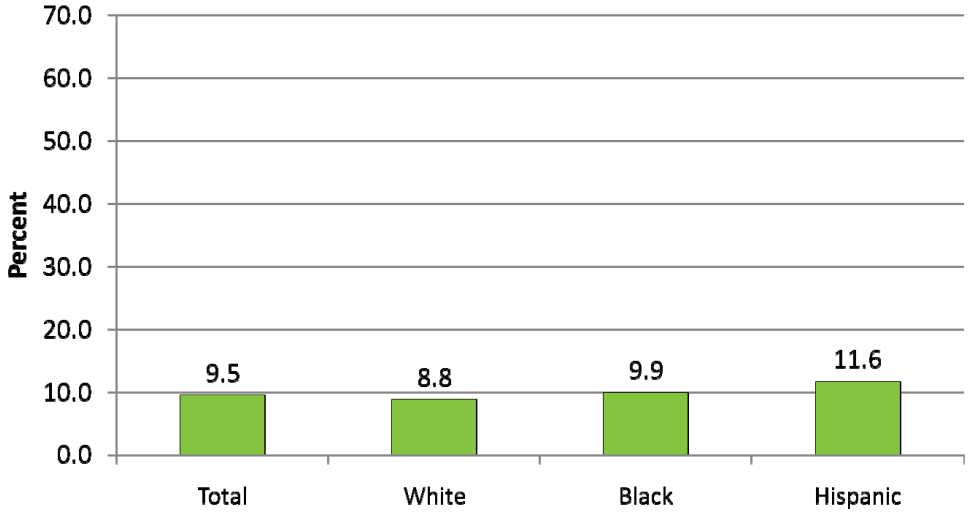


*Question: About how many times in the past 12 months have you seen a doctor, nurse, or other health professional …?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007.

ADA guidelines also recommend daily blood glucose checks for people with diabetes.

During the 2003-2007 time period, Hispanic and Other Races were the least likely to perform daily blood glucose checks. Hispanics were higher but not statistically different from whites and blacks due to small sample size.

Figure 29. Percent of People with Diabetes Not Performing Daily Blood Glucose Checks by Race/Ethnicity Arkansas, 2003-2007

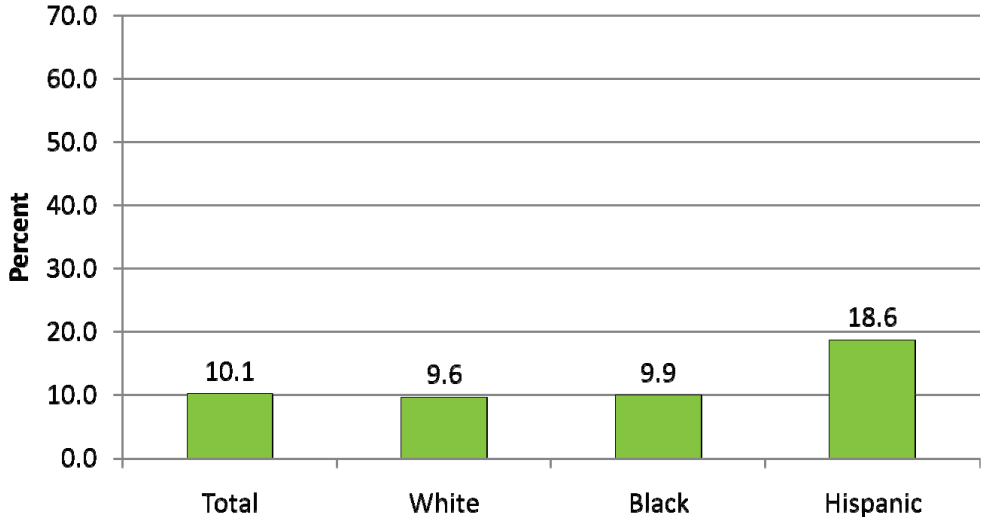


*Question: About how often do you check your blood for glucose or sugar?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007.

The ADA also recommends that people with diabetes have a Hemoglobin A1c check at least twice a year.

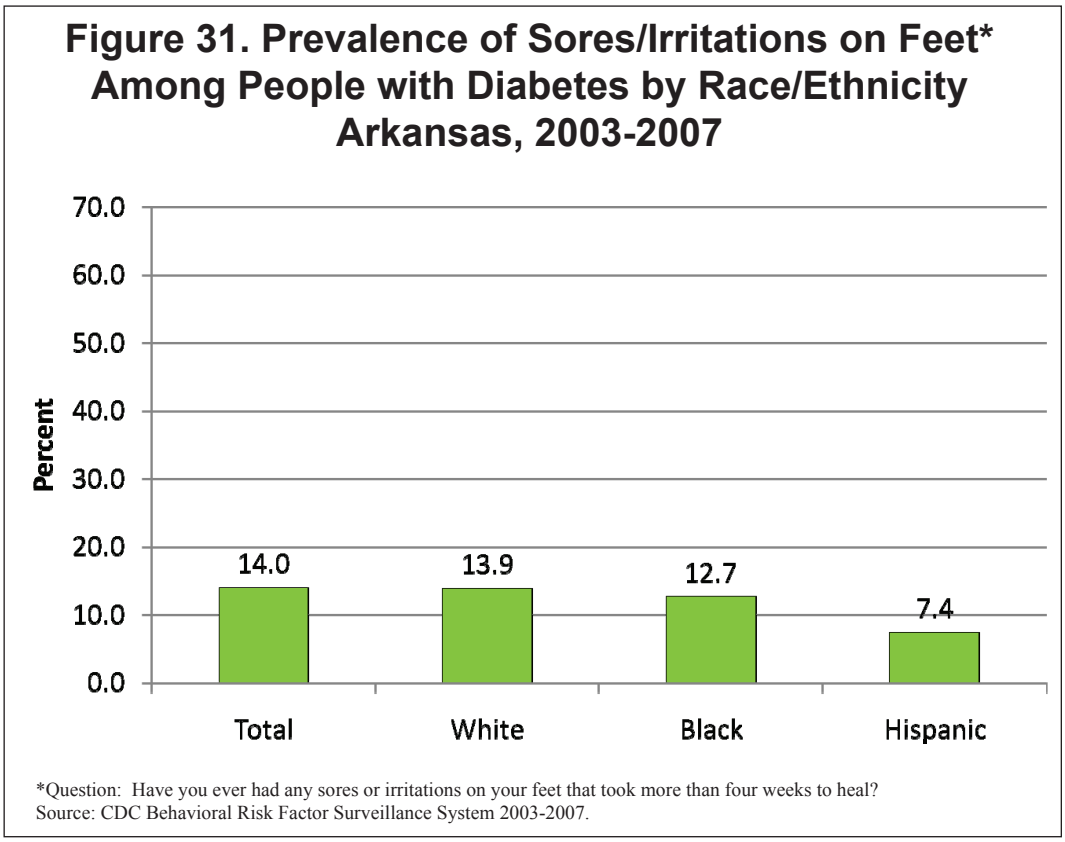
Hispanics (18.6%) were nearly twice as likely to not have received an HbA1c test in the past year as whites (9.6%) and blacks (9.9%). However, this difference was not statistically significant due to small sample size.

Figure 30. Percent of People with Diabetes Not Having Hemoglobin A1C Checks* by Race/Ethnicity Arkansas, 2003-2007



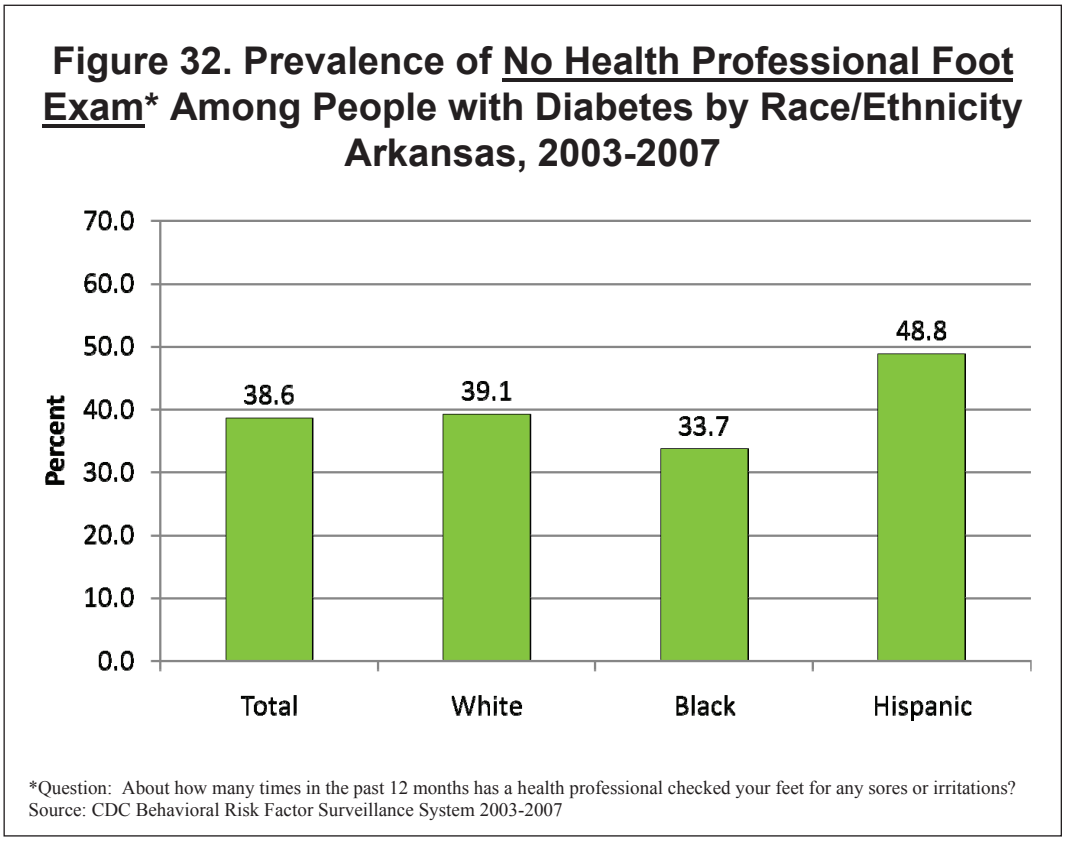
*Question: About how many times in the past 12 months has a doctor, nurse, or other health professional checked you for "A one C"?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007

The proportion of whites and blacks reporting ever having sores or irritations on their feet was statistically equivalent. For Hispanics this proportion was lowest. However, this difference was not statistically significant due to small sample size.



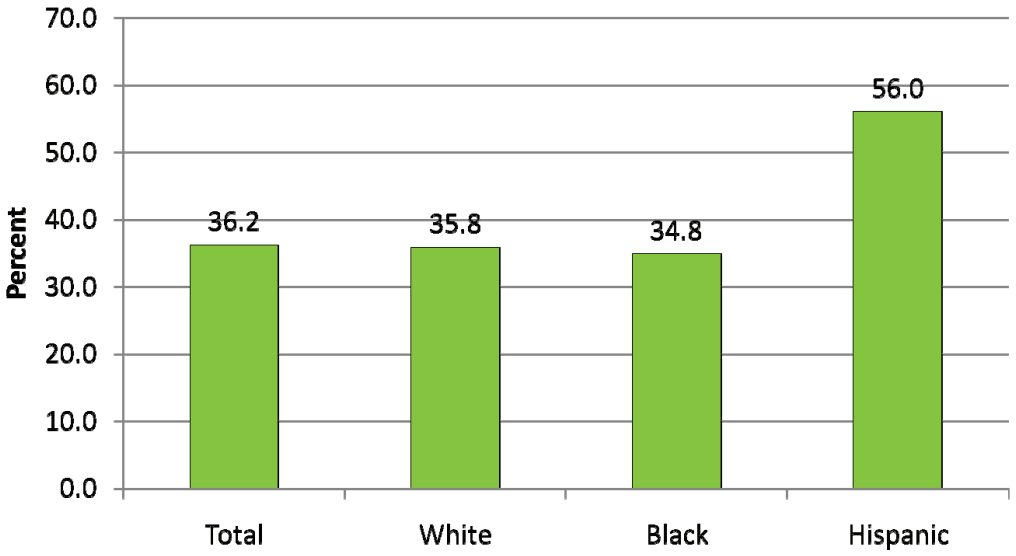
Problems with the feet among those with diabetes can lead to lower extremity amputations. Professional foot exams are vital to the detection of sores and irritations on the feet.

Hispanics (48.8%) were more likely to not have received a professional foot exam than any other race/ethnicity. This difference was not statistically significant due to small sample size.



A larger proportion of Hispanics (56%) did not receive a dilated eye exam in the past year, more than 60% higher than other race/ethnic populations. This difference was statistically significant when compared to whites.

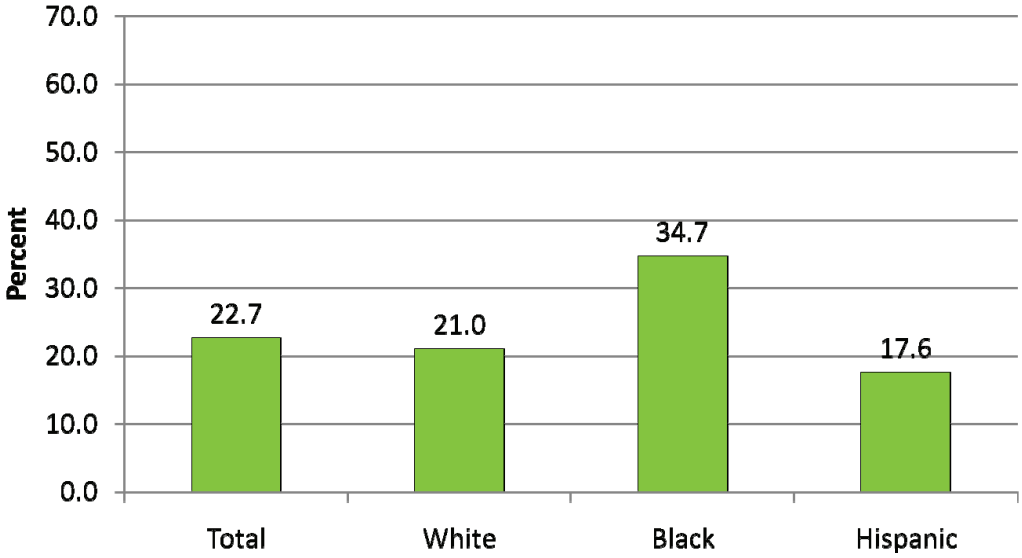
Figure 33. Percent of People with Diabetes Not Having Annual Dilated Eye Exam* by Race/Ethnicity Arkansas, 2003-2007



*Question: When was the last time you had a eye exam in which the pupils were dilated?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007

The detection of eye problems such as retinopathy is determined through dilated eye exams. The prevalence of diabetic retinopathy was highest among blacks (34.7%). This was statistically different than the 21.0% for whites.

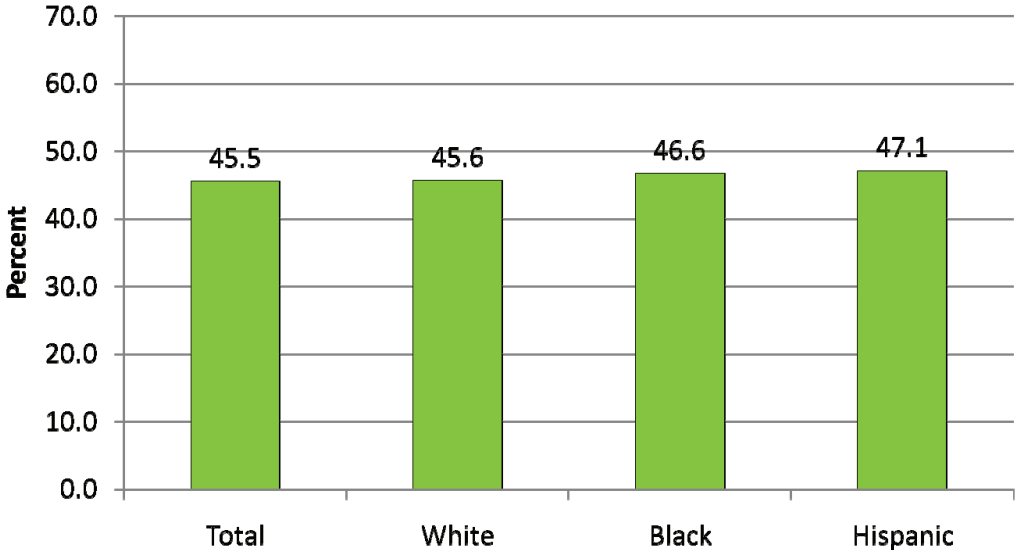
Figure 34. Prevalence of Diabetic Retinopathy* Among People with Diabetes by Race/Ethnicity Arkansas 2003-2007



*Question: Has a doctor ever told you that diabetes has affected your eyes or that you had retinopathy?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007.

Prevalence of attending diabetes education classes was equivalent among racial/ethnic groups. The prevalence was less than 50% for all racial/ethnic groups. These estimates are lower than the Healthy People 2010 goal of 60% for persons with diabetes who receive formal diabetes education.

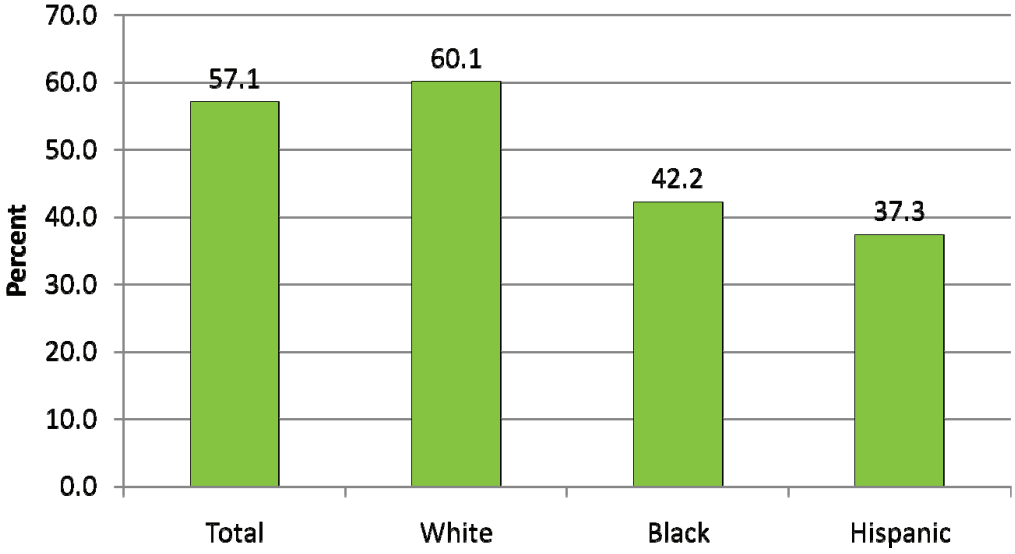
Figure 35. Diabetes Education Class Attendance* Among People with Diabetes by Race/Ethnicity Arkansas, 2003-2007



*Question: Have you ever taken a course or class in how to manage your diabetes yourself?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007.

Fewer Hispanics (37.3%) and blacks (42.2%) received an influenza shot in the past year than whites (60.1%). The difference between blacks and whites was statistically significant. The difference in Hispanics was not significant due to small sample size.

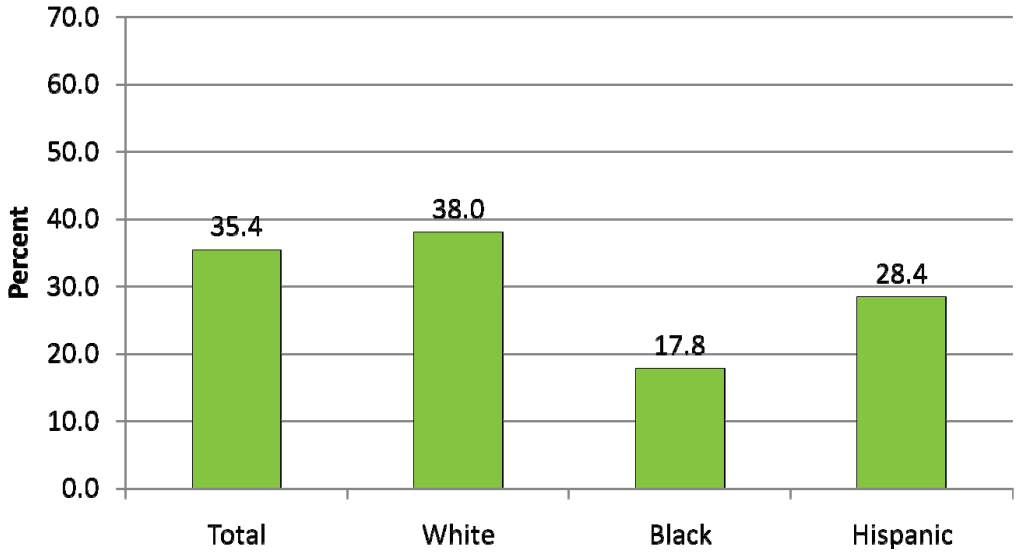
Figure 36. Prevalence of Influenza Immunization* Among People with Diabetes by Race/Ethnicity Arkansas, 2003-2007



*Question: During the past 12 months, have you had a flu shot?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007.

Prevalence of ever receiving a pneumonia shot was lowest among blacks (17.8%) compared to other race/ethnicity groups. This difference was statistically significant when compared to whites.

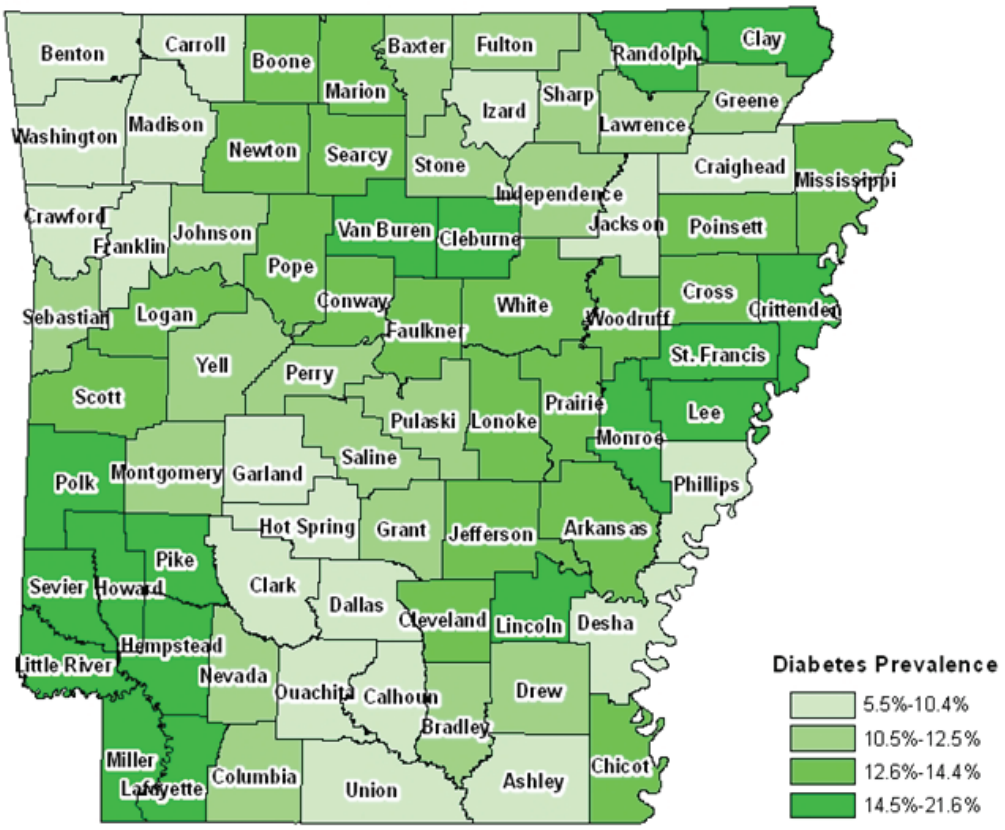
Figure 37. Prevalence of Pneumonia Immunization* Among People with Diabetes by Race/Ethnicity Arkansas, 2003-2007



*Question: Have you ever had a pneumonia shot?
Source: CDC Behavioral Risk Factor Surveillance System 2003-2007.

County Data

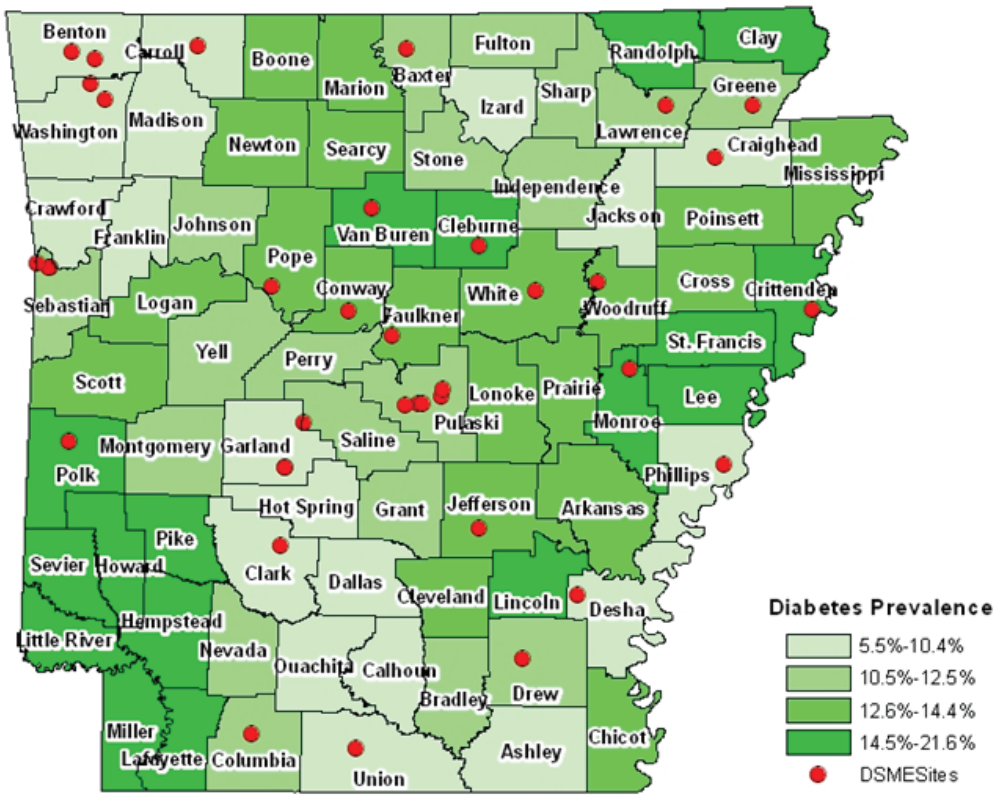
Map 1. Estimated Prevalence of Adults Diagnosed with Diabetes Arkansas, 2008



Source: CDC Behavioral Risk Factor Surveillance System, 2008

- The prevalence of diabetes is disproportionately high in certain parts of the state.
- Counties in the Southwestern, Eastern and North Central part of the state (darker shades) have the highest estimated diabetes prevalence among adults.
- Polk County had the highest prevalence of adults diagnosed with diabetes in the state at 21.6%.
- Washington County had the lowest prevalence of adults diagnosed with diabetes in the state at 5.5%.

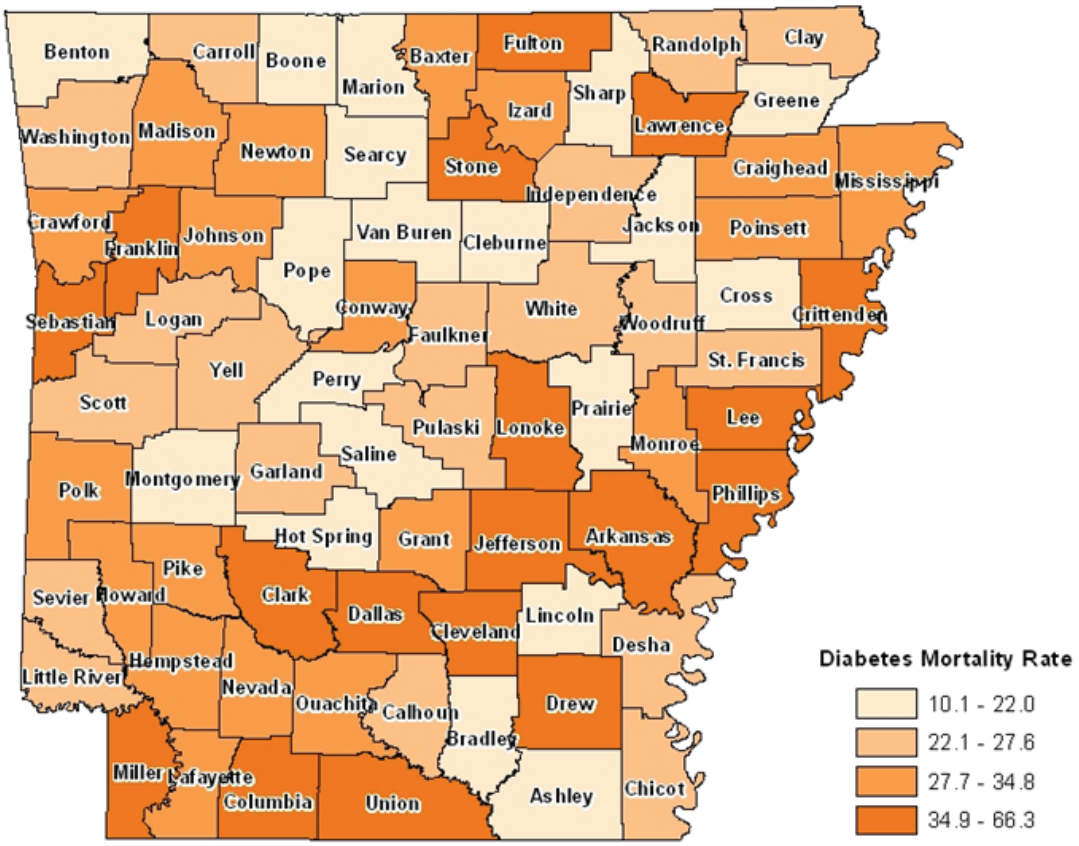
Map 2. Estimated Prevalence of Adults Diagnosed with Diabetes and Diabetes Self Management Education (DSME) Sites Arkansas, 2008



Source: CDC Behavioral Risk Factor Surveillance System, 2008

- More than half of Arkansas counties do not have an American Diabetes Association (ADA) recognized diabetes self-management education (DSME) program.
- Arkansas Diabetes Prevention and Control Program, along with its advisory council members, is working to establish ADA-recognized programs in all Arkansas counties. Currently, there are 37 recognized DSME programs across 27 counties of the state.
- In 2008, there were 17 Arkansas counties with a diabetes prevalence of 14.5% or higher. Of those, only 5 had a DSME site.
- The ADA's Diabetes Education Recognition Program certifies diabetes self-management education (DSME) programs that meet National Standards.[11] The National Standards for DSME identifies the essential elements in diabetes education to facilitate improvement in health care outcomes among people with diabetes. For a list of ADA certified locations in Arkansas see pages 47-48 of this document.

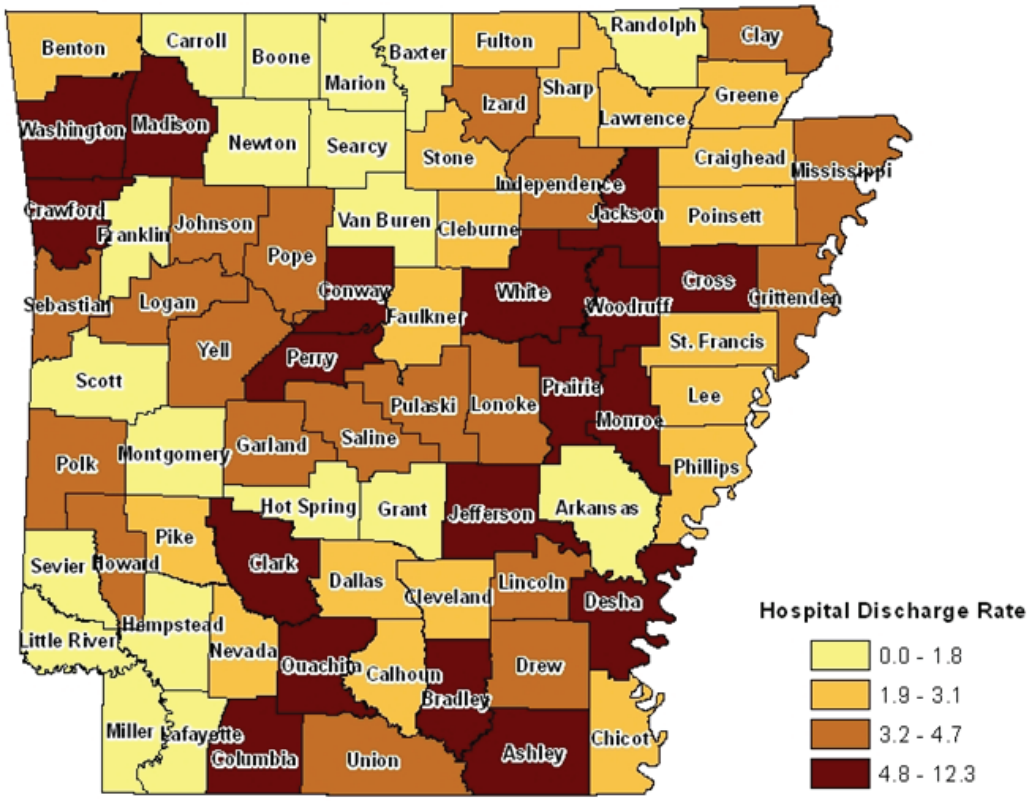
Map 3. Age-adjusted Diabetes Mortality per 100,000 Population Arkansas, 2002-2006



Source: Arkansas Center for Health Statisitcs Query System

- Diabetes accounted for 3.0% of all deaths to Arkansas residents in 2006. During the five-year period of 2002-2006, the age-adjusted mortality rate for diabetes was 27.5 per 100,000 population.
- Phillips County had the highest five-year age-adjusted diabetes mortality rate at 66.3 per 100,000 population for Arkansas residents.
- Marion County had the lowest five-year age-adjusted diabetes mortality rate at 10.1 per 100,000 population for Arkansas residents.

Map 4. Hospital Discharge Rate for Lower Extremity Amputations per 1,000 People with Diabetes Arkansas, 2007

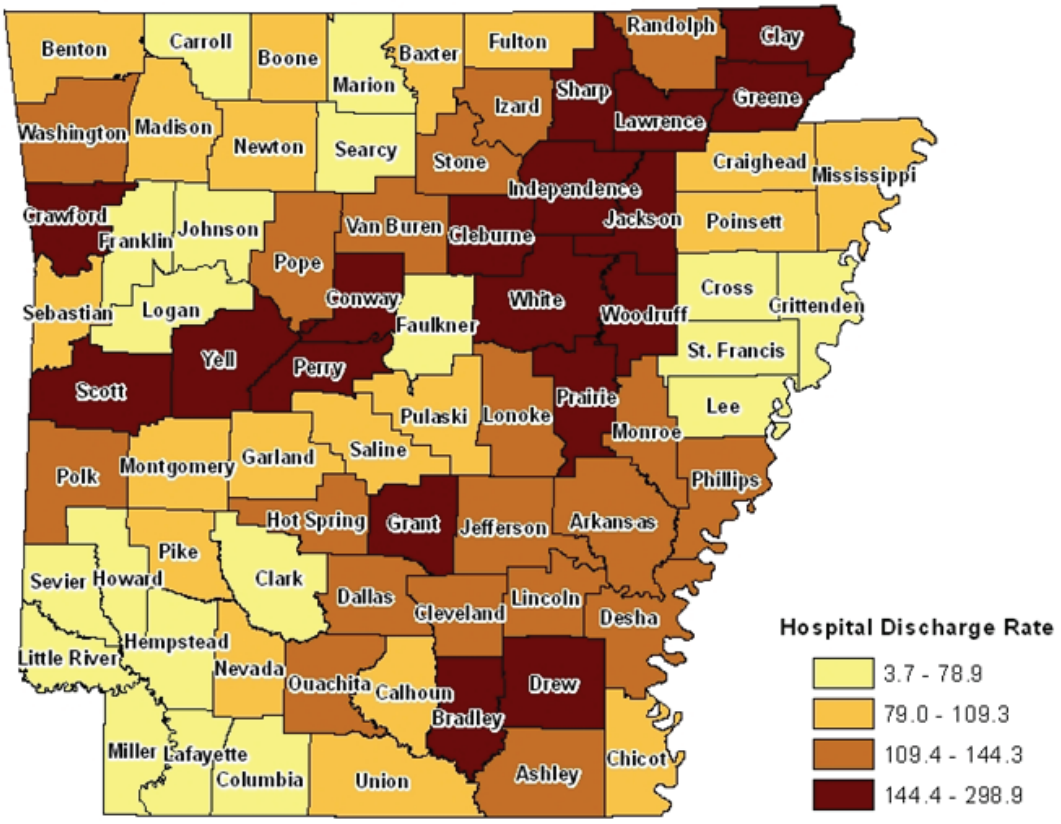


Source: Arkansas Center for Health Statistics, Hospital Discharge System

- Diabetes can damage both the nerves and the blood vessels to the feet, leading to numbness, burning sensation, poor circulation and lower extremity amputation (LEA).
- Counties shaded dark brown have the highest hospital discharge rates for lower extremity amputations per 1,000 people with diabetes.
- In 2007, there were a total of 738 Arkansas hospital discharges among people with diabetes as a primary diagnosis that had LEA procedure(s). This translates to a crude rate of 3.6 per 1,000 people with diabetes.
- Woodruff County had the highest hospital discharge rate for lower extremity amputations with diabetes in the state at 12.3 per 1,000 people with diabetes.

Note: Hospital discharge data are only available for hospitals within the state of Arkansas. Information is not available for those residents admitted to out-of-state hospitals (i.e., Texas receiving Miller County residents or Tennessee receiving Crittenden County residents).

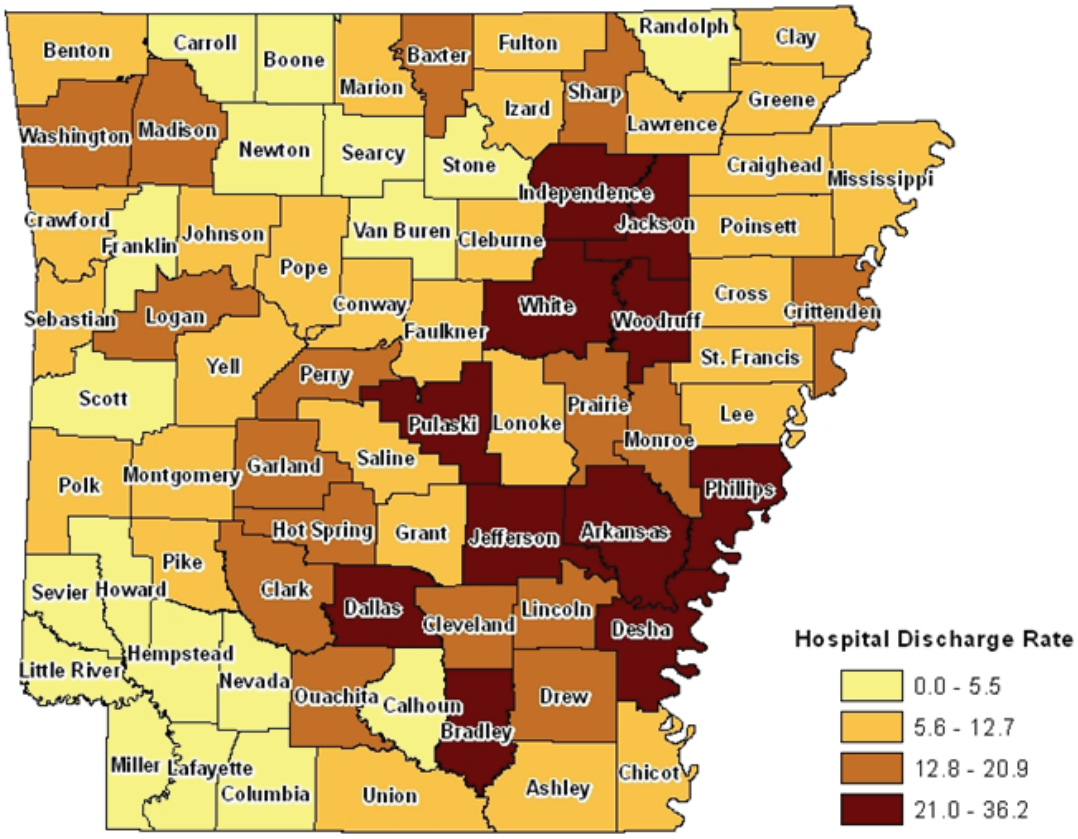
Map 5. Hospital Discharge Rate for Coronary Artery Disease per 1,000 People with Diabetes Arkansas, 2007



Source: Arkansas Center for Health Statistics, Hospital Discharge System

- Diabetes causes heart disease, especially in people with high blood pressure and high cholesterol. Heart disease is the leading cause of death among people with diabetes.
- Counties shaded dark brown have the highest hospital discharge rates for heart disease per 1,000 people with diabetes.
- Yell County had the highest number of hospital discharges among people with heart disease who also had diabetes at 298.9 per 1,000 people with diabetes.
- Miller County had the lowest rate at 3.7 per 1,000 people with diabetes. However, as noted earlier, out-of-state hospital discharges for Miller County are not available for analysis.

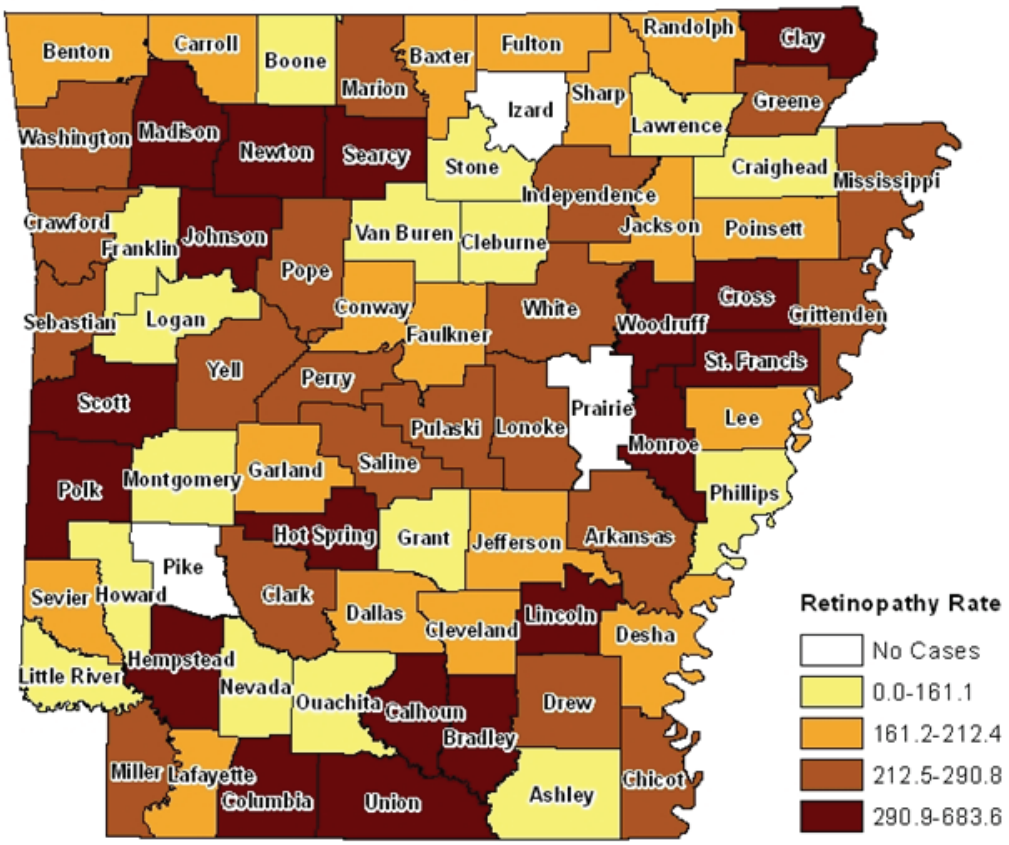
Map 6. Hospital Discharge Rate for End-Stage Renal Disease per 1,000 People with Diabetes Arkansas, 2007



Source: Arkansas Center for Health Statistics, Hospital Discharge System

- End-Stage Renal Disease (ESRD) results when chronic kidney failure has progressed to the point where kidney function is less than 10% of normal.[12]
- Diabetes is the most common cause of ESRD in the U.S.[12] In most cases, ESRD follows chronic kidney failure.
- Desha County had the highest rate of hospital discharges for ESRD at 36.2 per 1,000 people with diabetes.
- Lafayette, Miller, Hempstead and Sevier counties had the lowest rates (under 1.0) per 1,000 people with diabetes. However, as noted earlier, out-of-state hospital discharges for these county residents are not available for analysis.

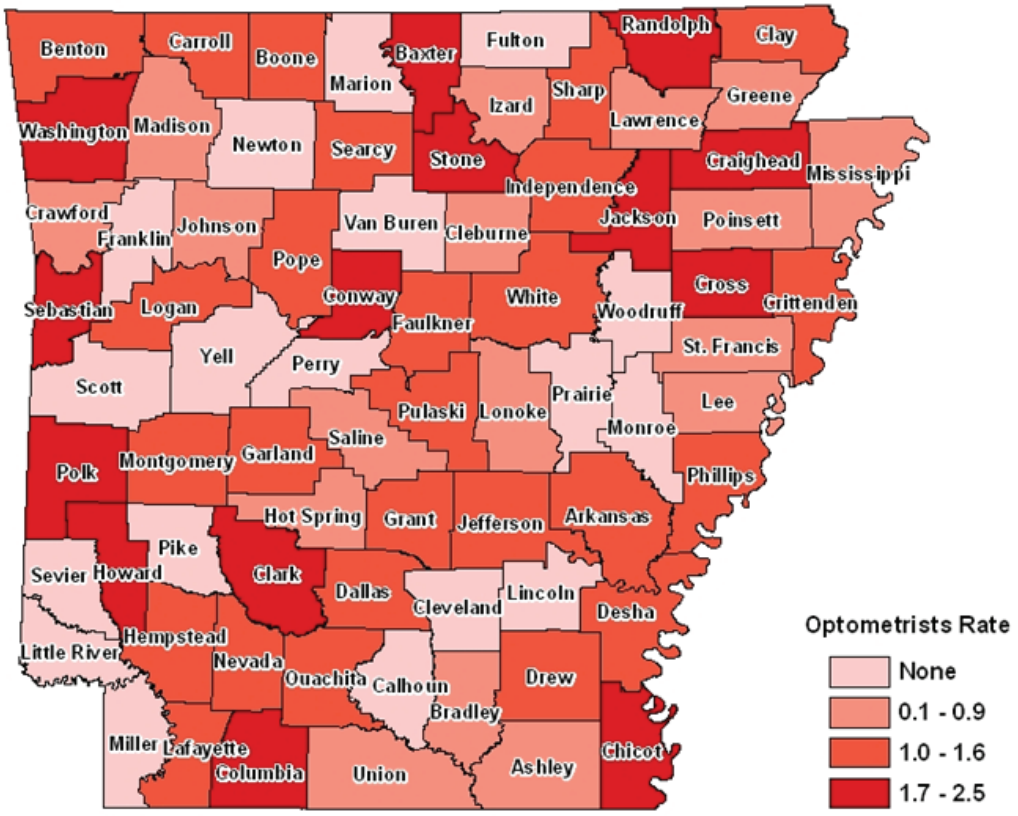
Map 7. Estimated Prevalence Rate for Diabetic Retinopathy per 1,000 People with Diabetes Arkansas, 2003-2007



Source: CDC Behavioral Risk Factor Surveillance System, 2003-2007

- Poorly controlled diabetes can result in diabetic retinopathy and subsequent blindness. Diabetic retinopathy is a degenerative disease of the retina.[13]
- During the five-year period of 2003-2007, the prevalence rate for diabetic retinopathy was 226.7 per 1,000 people with diabetes.
- Calhoun County had the highest prevalence of diabetic retinopathy among people with diabetes at 683.6 per 1,000 people.
- There were no reported occurrences of diabetic retinopathy in Izard, Pike and Prairie counties for the five-year period.

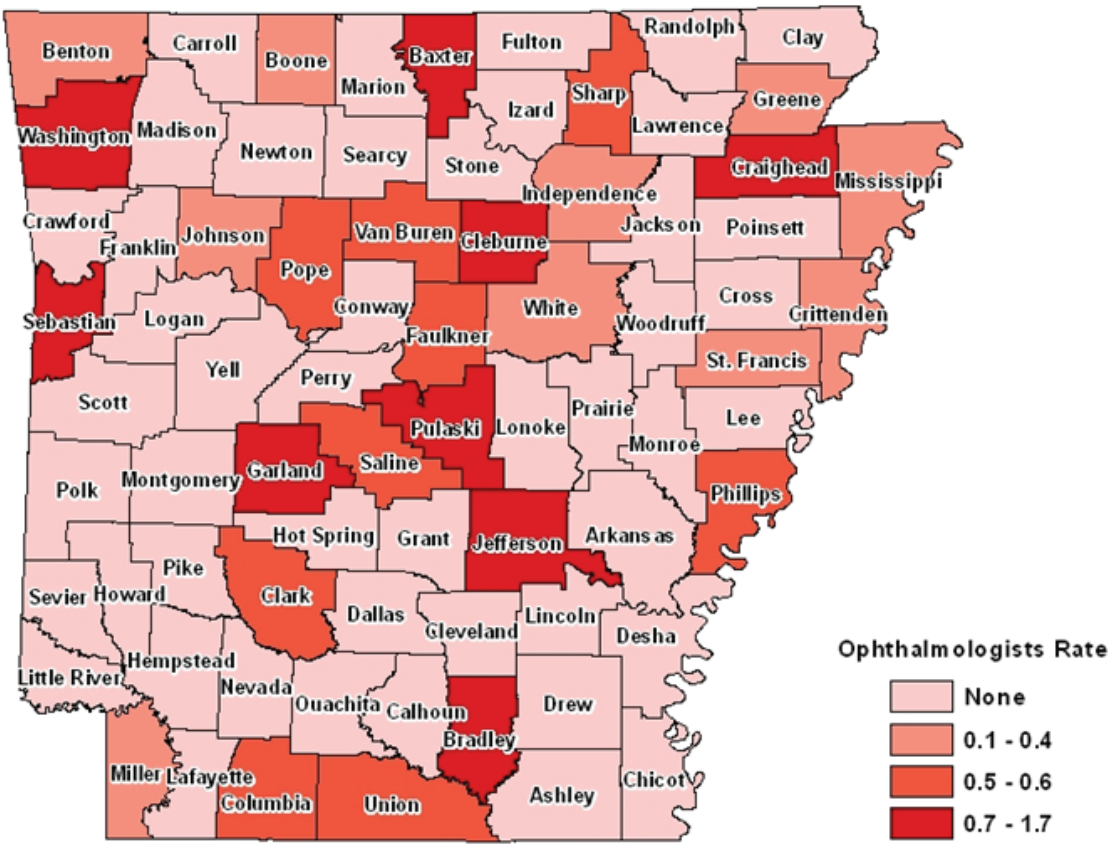
Map 8. Distribution of Optometrists per 10,000 Population Arkansas, 2007



Source: Arkansas Center for Health Statistics, Health Professions Manpower Assessment

- Optometrists are licensed health care professionals who provide primary eye care services. These services include diagnosis and treatment of eye diseases and visual conditions as well as prescribing contact lenses and glasses.[14]
- Optometrists tend to be more common in counties with higher populations and less common in rural areas of the state.
- In 2007, Arkansas had a reported 333 optometrists across 57 counties.

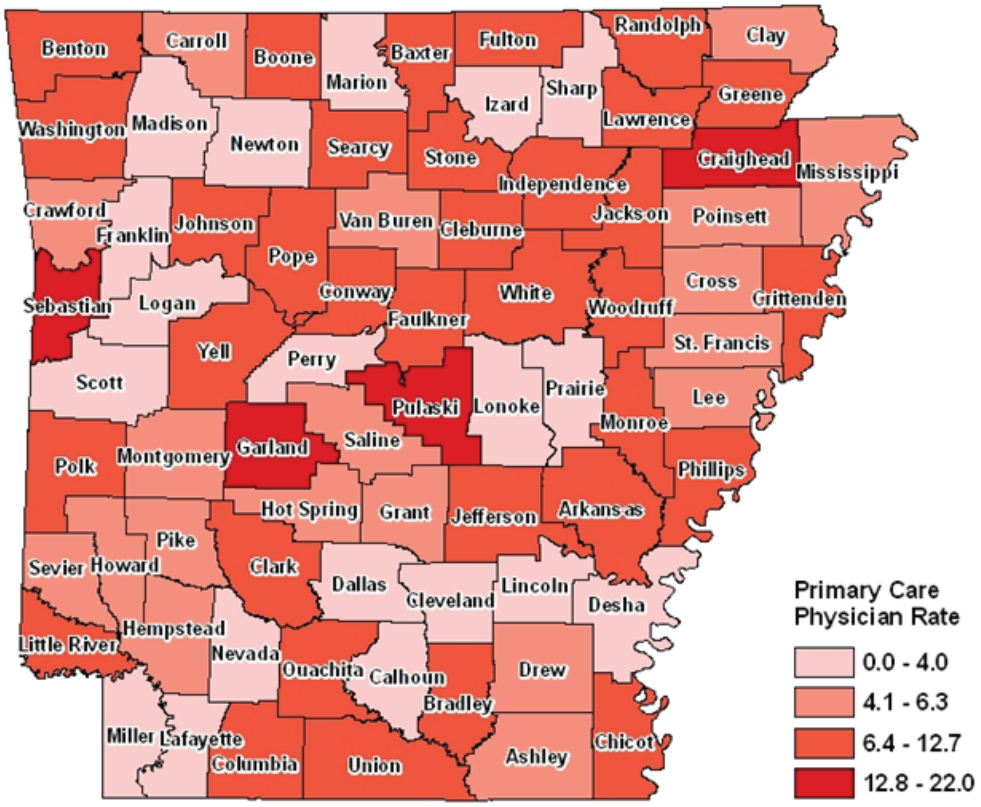
Map 9. Distribution of Ophthalmologists per 10,000 Population Arkansas, 2007



Source: Arkansas Center for Health Statistics, Health Professions Manpower Assessment

- Ophthalmologists are medical doctors who provide specialized eye and vision care, including prescribing glasses and contacts as well as eye surgery.[14]
- The disproportionate burden of diabetic retinopathy in some counties may be associated in part with the differential distribution of ophthalmologists.
- Ophthalmologists tend to be clustered in the more populous counties within the state with rural areas not having an ophthalmologist.
- In 2007, Arkansas had a reported 148 ophthalmologists across 28 counties.
- The American Diabetes Association recommends that people with diabetes see an ophthalmologist at least once a year for a dilated eye exam.[15]

Map 10. Distribution of Primary Care Physicians Per 10,000 Population Arkansas, 2007



Source: Arkansas Center for Health Statistics, Health Professions Manpower Assessment

- Primary Care Physicians are generalist physicians whose practice is devoted to providing primary care services to a defined population of patients, serving as the entry point for all medical and health care needs.[16]
- The majority of primary care physicians within the state are in those counties that have large metropolitan areas.
- Pulaski County has more primary care physicians than all other counties combined. Thus, the smaller counties in Arkansas are disproportionately affected in the provision of primary health care.

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Methods

BRFSS

The Arkansas Behavioral Risk Factor Surveillance System (BRFSS) data were analyzed to assess diabetes prevalence, health behavior and self-management patterns among Arkansas adults. Arkansas BRFSS contracts with an outside agency to conduct the survey, using a Computer-Aided Telephone Interviewing System. Respondents are selected using a "Disproportionate Stratified Random Sampling" design using a two-stage process. First, a telephone number is randomly selected from listed and unlisted telephone numbers. Second, according to BRFSS protocol, when a residence is selected, a random household member (age 18 or older) is chosen for interview.

The BRFSS covers a wide range of health behaviors including health care access, hypertension and cholesterol awareness, physical activity and dietary consumption, which provides estimates of the prevalence of these risk factors for health status and disease. The Arkansas Center for Health Statistics obtains county-specific estimates by including responses from participants in adjacent counties. Using both the sample and actual population, the responses are adjusted so that age, race and gender characteristics match those of the population for the county. The county specific prevalence estimates for health risk factors are weighted accordingly using the SAS system.

Mortality

Age-adjusted mortality rates from 1997 through 2006 were obtained from CDC WONDER for U.S. rates and Arkansas Center for Health Statistics Query System for Arkansas rates. International Classification of Diseases (ICD) 9th and 10th Revision Codes (ICD-9 codes of 250.0 - 250.9 and ICD-10 codes of E10.0 - E14.9) were used. The U.S. 2000 projected population was used as the standard population. Age-specific mortality rates for Arkansas in 2006 were also obtained from the Arkansas Center for Health Statistics Query System. Leading cause of death for Arkansas was obtained from the Arkansas Center for Health Statistics 2006 Mortality Statistics Report.

Hospitalizations

Hospitalization data were obtained from the Arkansas Center for Health Statistics Hospital Discharge Data System. These data contain discharge information for Arkansas hospitals only. Information from out-of-state hospitals is not collected. The ICD-9 Clinical Modification was used for determining primary and secondary diagnosis of diabetes as well as for determining other co-morbidity and complications of diabetes. These data were analyzed using the SAS system.

Other Sources

Arkansas Center for Health Statistics, Vital Statistics Section provided data on live births for purposes of determining diabetes as a medical risk during pregnancy. Information on youth risk factors was obtained from the Centers for Disease Control & Prevention Youth Risk Behavior Survey. These risk factors included tobacco use, overweight and obesity, fruit and vegetable consumption and physical activity. Data on Arkansas health professionals were obtained from the Arkansas Center for Health Statistics, Health Professions Manpower Assessment. Aggregate counts by county were provided for doctors, primary care physicians, dentists, dieticians, pharmacists, optometrists and ophthalmologists. The U.S. Census Bureau was used to obtain demographics for the state of Arkansas.

Limitations of the data presented in the report

It must be noted that in 1999, a new cause-of-death tabulation was developed in the form of ICD-10 codes. Before 1999, the ICD-9 classification was used. There are differences in mortality rates between the two codes. In this document, however, no adjustments have been made in mortality rates with respect to ICD-9 and ICD-10 codes.

Healthy People 2010 Objectives
1. Increase the proportion of persons with diabetes who receive formal diabetes education from 45% to 60%.
2. Decrease new cases of diabetes from 3.5 cases per 1,000 population to 2.5 cases per 1,000 population.
3. Reduce the overall rate of diabetes that is clinically diagnosed from 40 cases per 1,000 population to 25 cases per 1,000 population.
4. Increase the proportion of adults with diabetes whose condition has been diagnosed from 68% to 80%.
5. Reduce the diabetes death rate from 75 deaths per 100,000 population to 45 deaths per 100,000 population.
6. Reduce diabetes-related deaths among persons with diabetes from 8.8 deaths per 1,000 persons with diabetes to 7.8 deaths per 1,000 persons with diabetes.
7. Reduce deaths from cardiovascular disease in persons with diabetes from 343 deaths from cardiovascular disease per 100,000 persons with diabetes to 309 deaths per 100,000 persons with diabetes.
8. (Developmental) Decrease the proportion of pregnant women with gestational diabetes.
9. (Developmental) Reduce the frequency of foot ulcers in persons with diabetes.
10. Reduce the rate of lower extremity amputations in persons with diabetes from 4.1 lower extremity amputations per 1,000 persons with diabetes to 1.8 lower extremity amputations per 1,000 persons with diabetes per year.
11. (Developmental) Increase the proportion of persons with diabetes who obtain an annual urinary microalbumin measurement.
12. Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least once a year from 24% to 50%.
13. Increase the proportion of adults with diabetes who have an annual dilated eye examination from 47% to 75%.
14. Increase the proportion of adults with diabetes who have an annual foot examination from 55% to 75%.
15. Increase the proportion of adults with diabetes who have at least an annual dental examination from 58% to 75%.
16. Increase the proportion of adults with diabetes who take aspirin at least 15 times per month from 20% to 30%.
17. Increase the proportion of adults with diabetes who perform self-blood-glucose-monitoring at least once daily from 42% to 60%.

Source: U.S. Department of Health & Human Services, Healthy People 2010.

Diabetes Management Schedule

Adults with diabetes should receive medical care from a physician-coordinated team of health care professionals. Referrals to these team members should be made as appropriate.

At each regular diabetes visit:

- Measure weight and blood pressure.
- Inspect feet if one or more high-risk foot conditions are present.
- Review self-monitoring glucose record.
- Review/adjust medications to control glucose, lipids and blood pressure. Include regular use of low-dose aspirin for cardiovascular disease (CVD) prevention as appropriate.
- Review self-management skills, dietary needs and physical activity.
- Assess for depression or other mood disorders.
- Counsel on smoking cessation and alcohol use.

Quarterly:

- Obtain A1C in patients whose therapy has changed or who are not meeting glycemic goals (twice a year if at goal with stable glycemia).

Annually:

- Calculate body mass index.
- Obtain fasting lipid profile (every 2 years if patient has low-risk lipid values).
- Obtain serum creatinine to estimate glomerular filtration rate and stage the level of chronic kidney disease.
- Perform urine test for albumin-to-creatinine ratio in patients with type 1 diabetes ≥ 5 years and in all patients with type 2 diabetes.
- Refer for dilated eye exam (if normal, an eye care specialist may advise an exam every 2–3 years).
- Perform comprehensive foot exam.
- Refer for dental/oral exam at least once a year.
- Administer influenza vaccination.
- Review need for other preventive care or treatment.

Lifetime:

- Administer pneumococcal vaccination (repeat if over 64 or immunocompromised and last vaccination was more than 5 years ago).

Source: National Diabetes Education Program. http://ndep.nih.gov/media/NumAtGlance_Eng.pdf

Arkansas Demographics, 2008

TOTAL POPULATION	**2,855,390**
Gender	
Male	49.0%
Female	51.0%
Median Age	**37.3**
Age Distribution	
Under 18	24.6%
18-24	9.8%
25-44	26.0%
45-64	25.4%
65 & Over	14.1%
Race/Ethnicity	
White	80.8%
Black/African American	15.8%
Hispanic American*	5.6%
Asian American	1.1%
Native American/Alaskan Native	0.9%
Native Hawaiian/Pacific Islander	0.1%
Educational Attainment (25 years & Over)	
Less than High school	18.0%
High School Graduate	35.4%
Some College/Associate Degree	27.8%
Bachelor's Degree	12.5%
Graduate/Professional Degree	6.3%
Median Household Income	**$38,815.00**
Percent Below Poverty	
People Age 65 & over	13%
Related Children Under 18	25%
All Families	13%
Female Household Families	38%

*Hispanics may be of any race and are included in applicable race categories.

Source: U.S. Census Bureau

Recognized Diabetes Education Program Sites in Arkansas, 2009

County & Program Name	Address	City	Phone
Baxter			
Reppell Diabetes Learning Center	624 Hospital Drive	Mountain Home	870-508-1765
Benton			
Northwest Medical Center of Benton County	2900 Medical Center Parkway	Bentonville	479-553-2000
Diabetes Self-Management Program	2708 Rife Medical Lane, Suite T20	Rogers	479-338-2850
Carroll			
St. John's Health System - Berryville	214 Carter Street	Berryville	870-423-5185
Clark			
Diabetes Self-Management Education Program	3002 West Pine Street	Arkadelphia	870-246-3044
Cleburne			
Diabetes Self-Management Education Program	1800 Bypass Rd.	Heber Springs	501-887-3256
Columbia			
Diabetes Self-Management Education Program	101 Hospital Drive	Magnolia	870-235-3473
Conway			
St. Anthony's Diabetes Self-management Education Program	#4 Hospital Drive	Morrilton	501-354-4637, x18
Craighead			
St. Bernard's Outpatient Diabetes Management Center	505 E. Washington	Jonesboro	870-972-4341
Crittenden			
Diabetes Self-Management Education Program	200 Tyler Ave.	West Memphis	870-735-1500
Desha			
Delta Well Care Program*	161 S. Main Street, PO Box 158	Dumas	870-263-4878, x234
Drew			
Diabetes Self-Management Education Program	778 Scogin Drive	Monticello	870-460-3509, x109
Faulkner			
Diabetes Self-Management Education Program	2302 College Avenue	Conway	501-513-5248
Garland			
Hot Springs Diabetes Education Program	101 McGowan Court	Hot Springs	501-623-2781
Diabetes Self-Management Education Program	300 Werner Street	Hot Springs	501-622-4665
Village Internal Medicine	702 DeSoto Boulevard	Hot Springs Village	501-922-2217
Jefferson			
Life Check	1600 West 40th Avenue	Pine Bluff	870-541-7310
Lawrence			
Diabetes Self-Management Education Program	1309 West Main	Walnut Ridge	870-886-4105
Monroe			
White River Rural Health Center (WRRHC) Diabetes Self-Management Center-Brinkley Health Center	615 North Main	Brinkley	870-734-1150
Phillips			
Delta AHEC Diabetes Education Clinic	1393 Hwy 242 South	Helena-West Helena	870-572-2727, x101

County & Program Name	Address	City	Phone
Polk			
Diabetes Self-Management Education Program	1201 S. Mena Street	Mena	479-437-3449, x218
Pope			
Diabetes Self-Management Education Program	809 West Main Street	Russellville	479-968-3733
Pulaski			
Diabetes Self-Management Program	9601 Interstate 630, Exit 7	Little Rock	501-202-1877
The Arkansas Diabetes Self-Management Education Program	4301 W. Markham, # 547-04	Little Rock	501-296-1220
St. Vincent Diabetes Self-Management Education Program	Two Shackleford West Boulevard	Little Rock	501-552-4763
Diabetes Health Management Center	3333 Springhill Drive	North Little Rock	501-202-3701
St. Vincent Diabetes Self-Management Education Program	2215 Wildwood, Suite 200	Sherwood	501-552-7570
Saline			
Saline Memorial Hospital DSMT Program	3 Medical Park Dr. Suite 200	Benton	501-574-7060
Sebastian			
Sparks Diabetes Self-Management Program	1001 Towson Avenue	Fort Smith	479-441-4076
Cooper Clinic Diabetes Education Program	6801 Rogers Avenue	Fort Smith	479-452-2077, x407
Diabetes Education Program	7301 Rogers Avenue	Fort Smith	479-314-6722
Union			
Let's Put the Puzzle Together!	600 South Timberlane	El Dorado	870-862-2400
Van Buren			
Diabetes Self-Management Education Program	2500 Highway 65 S.	Clinton	501-745-7004, x120
Washington			
Diabetes Self-Management Education Program	3017 N. Bob Younkin Drive, Suite 102	Fayetteville	479-463-4333
Northwest Medical Center of Washington County	601 West Maple Avenue, Suite 603	Springdale	479-757-3600, x479
White			
Diabetes Self-Management Education Program	3214 East Race Avenue	Searcy	501-380-1349
Woodruff			
WRRHC Diabetes Self-Management Center-Augusta Med Clinic	623 North 9th	Augusta	870-347-2508

**DSME Expansion Program is maintained in Lincoln County by Daughters of Charity Services of AR of Dumas.*
An expansion program is an extension of the Accredited Program that is maintained by the sponsoring program.

Glossary

Acute Renal Failure (ARF) - Also known as acute kidney failure or acute kidney injury, is a rapid loss of renal function due to damage to the kidneys.

Age-adjusted Mortality Rate - A statistical technique for calculating mortality rates that allows for the direct comparison of mortality rates between populations with different age distributions.

Age-specific Mortality Rate - A mortality rate limited to a particular age group, in which the numerator is the number of deaths in that age group, and the denominator is the number of persons in that age group in the population.

Blindness - Condition of lacking visual perception due to physiological or neurological factors.

Blood Glucose - The main sugar that the body makes from the food in the diet. Glucose is carried through the bloodstream to provide energy to all cells in the body.

Body Mass Index (BMI) - Surrogate measure of body fatness expressed as weight (measured in kilograms) divided by height (measured in meters) squared.

Co-morbidity - Refers to the existence of two or more diseases or conditions in the same individual at the same time.

Coronary Artery Disease (CAD) - Also known as coronary heart disease (CHD) or coronary atherosclerosis, involves the progressive narrowing of the arteries that nourish the heart muscle.

Current Smoker - Adults who reported that they had smoked at least 100 cigarettes in their life and smoked everyday or some days.

Dentist - Medical professional who provides care, treatment and repair of teeth.

Diabetes Education - Class or course designed to help people with diabetes to learn to manage their diabetes.

Diabetic Retinopathy - Complication of diabetes that results from damage to the blood vessels of the light-sensitive tissue at the back of the eye (retina).

Diagnosed Diabetes - Person with diabetes that has been determined by medical examination to have diabetes.

Dilated Eye Exam - Painless procedure in which an eye care professional examines your eyes to look for common vision problems and eye diseases, many of which have no early warning signs.

End-Stage Renal Disease (ESRD) - Condition in which the kidneys no longer function normally. (Renal describes anything having to do with the kidneys.) Usually, in end-stage renal disease, the kidneys are functioning at less than 10% of their normal capacity.

Hemoglobin A1C - Also called HbA1C, is a simple lab test that shows the average amount of sugar (also called glucose) that has been in a person's blood over the last 3 months.

High Cholesterol - Diagnosed when you have too much cholesterol circulating in your blood.

Hyperosmolar Coma - Diabetic hyperglycemic hyperosmolar coma is a condition of decreased consciousness, extreme dehydration (lack of water) and extremely high blood glucose (sugar) levels, which is not accompanied by ketoacidosis.

Hypertension - Disorder in which blood pressure remains abnormally high (a reading of 140/90 mm Hg or greater).

Influenza Shot - An inactivated vaccine (containing killed virus) that is given with a needle, usually in the arm. The flu shot is approved for use in people older than 6 months, including healthy people and people with chronic medical conditions.

Live Birth - Occurs when a fetus, regardless of gestational age, exits the maternal body and subsequently shows any sign of life. This includes voluntary movement, heartbeat, or pulsation of the umbilical cord for however brief a time and regardless of whether the umbilical cord or placenta are intact.

Lower Extremity Amputation - Surgical removal of a lower limb (toe, foot, leg).

Ketoacidosis - A dangerous complication of diabetes mellitus in which the chemical balance of the body becomes far too acidic, most commonly seen in individuals with Type I diabetes.

Macrosomia - Macrosomia describes an unusually large body size. It is often used to describe an oversized fetus.

Malleoli - The rounded bony protuberances on each side of the ankle joint.

Modifiable Risk Factor - Risk factors that can be changed and include things like diet, exercise and smoking.

No Physical Activity - People who reported not being involved in any kind of physical activity or exercise in the past 30 days besides their regular job.

Non-modifiable Risk Factor - Risk factors that cannot be controlled, such as age, gender, race and ethnicity and family history.

Obese (Adult) - Body Mass Index greater than or equal to 30.0.

Obese (Youth) - Percentage of students who were obese (i.e., >= 95th percentile for body mass index, by age and sex, based on reference data).

Ophthalmologist - Medical doctor who is specialized in eye and vision care.

Optometrist - Health care professional who is licensed to provide primary eye care services.

Overweight (Adult) - Body Mass Index greater than or equal to 25.0 but less than 30.0.

Overweight (Youth) - Percentage of students who were overweight (i.e., >= 85th percentile but < 95th percentile for body mass index, by age and sex, based on reference data).

Pharmacist - Health professionals who practice the science of pharmacy. A person qualified to prepare and dispense medicinal drugs.

Physical Activity - Percentage of students who were physically active doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time for a total of at least 60 minutes per day on five or more of the 7 days before the survey.

Physician - Medical practitioner, doctor of medicine or medical doctor who practices medicine, and is concerned with maintaining or restoring human health through the study, diagnosis, and treatment of disease and injury.

Pneumonia Shot - Given to prevent one specific type of pneumonia, the pneumonia caused by the Pneumococcus (Streptococcus pneumoniae) bacterium.

Prevalence - The percent (proportion) of a population that has a disease or a risk factor at a given point in time.

Primary Care Physician (PCP) - Physician, such as a general practitioner or internist, chosen by an individual to serve as his or her health-care professional. The physician is capable of handling a variety of health-related problems, keeping a medical history and medical records on the individual and referring the person to specialists as needed.

Risk Factor - Characteristic or behavior that is consistently associated with increased probability of disease or event.

Tobacco Use - Percentage of students who smoked cigarettes on at least 1 day during the 30 days before the survey.

Underlying Cause of Death - Disease or injury that initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence that produced the fatal injury.

Undiagnosed Diabetes - Person who unknowingly has an elevated glucose level that meets the definition of diabetes.

A message from Arkansas's Chronic Disease Programs

Stay Informed. Stay Healthy.

Arkansas Department of Health
Keeping Your Hometown Healthy

Requests for additional copies should be directed to:

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