Diabetes in Alabama

a report from

ADPH

ALABAMA DEPARTMENT OF PUBLIC HEALTH

July 2010

Alabama Department of Public Health

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This report was supported by Cooperative Agreement Number DP09-901 from the Centers for Disease Control and Prevention, Division of Diabetes Translation

Perspective

According to 2009 data released from the Centers for Disease Control and Prevention (CDC), over 12% of people in Alabama have been diagnosed with diabetes, and thousands are unaware that they have the disease. Alabama ranks among the top five states in the nation for the prevalence of diabetes, surpassing the national average. Diabetes is the 7th leading cause of death in the state and directly contributes to the incidence of heart disease and stroke. It is also the primary cause of kidney failure, non-trauma related limb amputations, and adult onset blindness.

Nearly everyone has family members or friends with diabetes. Although the disease can affect anyone, some populations are more likely to develop Type 2 Diabetes, the most common form of the disease. Those at an increased risk include: African Americans, American Indians, those of Hispanic descent, Asian descent, the elderly, and those with a family history of diabetes along with the overweight/obese, the physically inactive, and those with poor dietary habits.

The Diabetes Branch of the Alabama Department of Public Health works in collaboration with many other programs within and outside of the Department to help people prevent or delay the development of diabetes and to reduce complications related to the disease. The Diabetes Branch utilizes a systems thinking approach to work towards opportunities to improve the health status of the community. Systems thinking is a creative, flexible, and future-oriented problem solving and decision making process. It proposes that stakeholders adopt a holistic and systematic view and consider the interrelationship among individual components as a series of feedback loops instead of mere cause-and-effect chains. It is proactive, manages the processes of change, and anticipates consequences of actions and responses.

The program promotes good nutrition, physical activity, weight loss, and smoking cessation as key factors in preventing or delaying the onset of diabetes. The program also works to increase the percentage of people with diabetes who receive recommended influenza and pneumococcal vaccines, foot exams, eye exams, and HbA1c tests, as better management of diabetes helps people live longer, healthier lives.

The Alabama Diabetes Network, a group of diabetes advocates and experts from the public and private sectors, advises and supports the Alabama Department of Public Health's Diabetes Program. Members represent many different organizations, linking the Health Department and diabetes resources across the state. The Council meets three times each year to assess needs, to modify the state plan to improve diabetes prevention and care efforts, and to reduce racial disparities related to the incidence, treatment, and complications of diabetes in Alabama.

One of the responsibilities of the Diabetes Program is to assess the impact of diabetes in Alabama and to develop recommendations, policies, and programs that address related issues. This report is intended to inform policy makers, governmental and non-governmental organizations, health care providers, community-based organizations, businesses, local health departments, media sources, and the general public about the status of diabetes in the state. It is hoped that it will serve as a call to action for everyone willing to meet the growing challenges presented by the disease in Alabama.

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Diabetes is a serious chronic disease that affects millions of people of all ages in the United States and Alabama. Diabetes, sometimes called diabetes mellitus, is a metabolic disorder affecting the way cells in the body take in glucose, their primary source of energy. Cells absorb glucose from the bloodstream by using insulin, a hormone that is produced in the pancreas.

In persons without diabetes, the body produces and releases precisely the right amount of insulin to enable glucose to enter cells. More insulin is produced and released when more glucose is present – for example, soon after a meal.

In persons with diabetes, the body either does not produce or release enough insulin or is not able to use the insulin that is present. The result is that glucose does not get taken up by the cells and builds up in the bloodstream. This build-up of glucose in the blood is known as *hyperglycemia*.

There are several types of diabetes:

Type 1 Diabetes occurs when the pancreas does not produce insulin, usually because the body's own immune system has destroyed the cells in the pancreas that produce insulin. Type 1 Diabetes develops most often in children and young adults, and the symptoms usually appear over a short period of time. Persons with Type 1 Diabetes need daily injections of insulin to survive. Approximately 5-10% of persons with diabetes have Type 1 Diabetes.

Type 2 Diabetes is the most common form of diabetes. About 90-95% of persons with diabetes have Type 2 Diabetes. This form of diabetes usually develops in older adults (over the age of 40) but is becoming more common among young adults and teenagers. In Type 2 Diabetes either the body does not produce enough insulin or the cells ignore the insulin. Some people with Type 2 Diabetes are treated with oral medications (pills), while others are treated with insulin injections.

Gestational Diabetes is a form of diabetes that occurs only in pregnant women. It usually disappears when the pregnancy is over, but women who have had gestational diabetes are more likely to develop Type 2 Diabetes later in life.

Pre-diabetes defines those Individuals who are borderline diabetics. Pre-diabetics are individuals whose blood glucose levels are higher than the norm, but are not yet in the diabetes diagnostic range. Many complications of diabetes are said to be developing even at this early stage if left untreated and uncontrolled. People with pre-diabetes have a 70% lifetime risk to develop diabetes with an annual risk of 5-7%, nearly 10 fold that of the general population.

Diagnosis of Diabetes

The following guidelines are used to diagnose an individual with diabetes. If an individual has at least one of the following, he or she is considered to be diabetic:

- Hgb A1C ≥ 6.5% **or**
- Fasting Plasma Glucose ≥ 126 mg/dl
  (termed: Impaired Fasting Glucose (IFG)) **or**
- 2-hr Plasma Glucose ≥ 200 mg/dl post 75g oral glucose challenge
  (termed: Impaired Glucose Tolerance (IGT)) **or**
- Random Plasma Glucose ≥ 200 mg/dl with symptoms of:
  - Polyuria
  - Polydipsia
  - Unexplained Weight Loss

Diagnosis of Pre-Diabetes

The following guidelines are used to diagnose an individual with pre-diabetes. If an individual has at least one of the following, he or she is considered to be pre-diabetic:

- Hgb A1C 5.7-6.4% **or**
- Fasting Plasma Glucose 100-125 mg/dl
  (termed: Impaired Fasting Glucose (IFG)) **or**
- 2-hr Plasma Glucose 140-199 mg/dl post 75g oral glucose challenge
  (termed: Impaired Glucose Tolerance (IGT))

Symptoms of Diabetes

- frequent urination
- unusual thirst
- extreme hunger/weakness
- unexplained weight loss
- extreme fatigue
- blurred vision
- sexual problems
- irritability
- itchy skin
- slow healing of cuts and bruises
- frequent infections of skin, gums, and bladder
- tingling/numbness in legs, feet, and hands

Current estimates indicate that more than 25 million people in the United States have been diagnosed with diabetes. Using data obtained from the 2009 Behavioral Risk Factor Surveillance Survey (BRFSS), it is estimated that approximately 434,800 Alabamians are aware that they have diabetes, and based on the Centers for Disease Control and Prevention (CDC) estimates, as many as 200,000 or more have the condition but are unaware of it. Currently, The American Diabetes Association (ADA) estimates that there are 57 million individuals in the United States who have pre-diabetes and within two to six years, 25 million of these people with pre-diabetes are estimated to become diabetic.

Approximately

434,800

Alabamians have been diagnosed with diabetes.

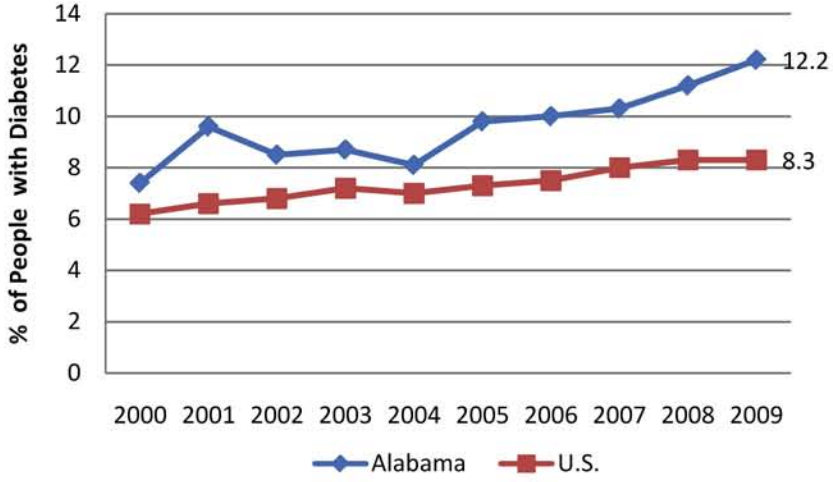

Figure 1:
Trends in Diabetes Prevalence, Alabama vs U.S. 2000-2009

- While national prevalence has begun to level out, Alabama's prevalence rose from 10.3% in 2007 to 11.2% in 2008, then to 12.3% in 2009.

- Data from CDC indicate that Alabama is ranked 3rd in the United States and its territories for percentage of adults who have diabetes.

According to the 2009 BRFSS, the mean age of diabetes diagnosis was 51.9. Diabetes is more commonly reported in older populations, more specifically, in those over the age of 55. This pattern is not unexpected, since national studies have indicated that the prevalence of diabetes increases with age.

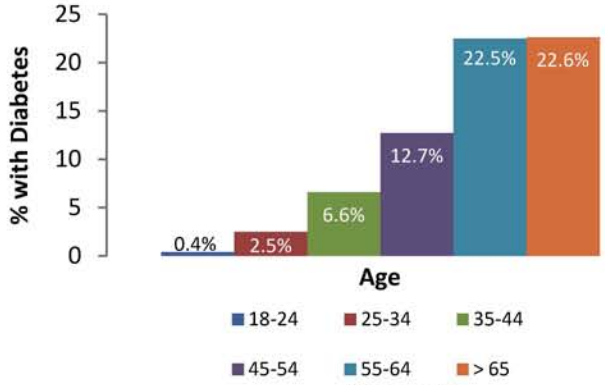

Figure 2:
Diabetes Prevalence by Age in Alabama, 2009

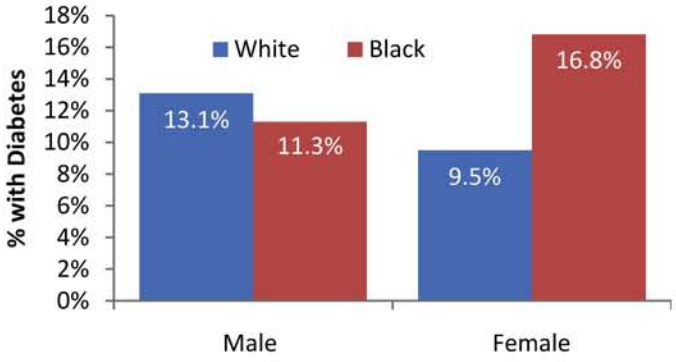

Figure 3:
Diabetes Prevalence by Race and Gender in Alabama, 2009

The overall prevalence of diabetes is 13.0% for males and 11.5% for females. By race, the prevalence is 14.1% for blacks and 11.2% for whites. When stratified by race and gender, the picture is a bit more interesting. The prevalence among black males is nearly 2% lower than the prevalence among white males. The prevalence among black females is over 7% higher than the prevalence among white females. Thus, black females primarily contributed to the overall disparity in diabetes prevalence among whites and blacks in 2009.

An interesting variable to consider for diabetes prevalence is socioeconomic status (SES). SES has several indicators, primarily education level and income. Diabetes prevalence among those with annual incomes below $35,000 is significantly higher than those with annual incomes greater than $35,000. Low annual income is usually associated with a lower education level, which translates into decreased awareness about diabetes and its prevention. Low income levels could result in the inability to purchase healthier foods and even a poorer overall quality of health.

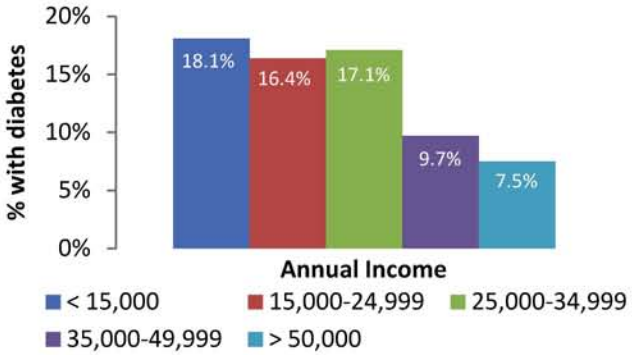

Figure 4:
Diabetes Prevalence by Income In Alabama, 2009

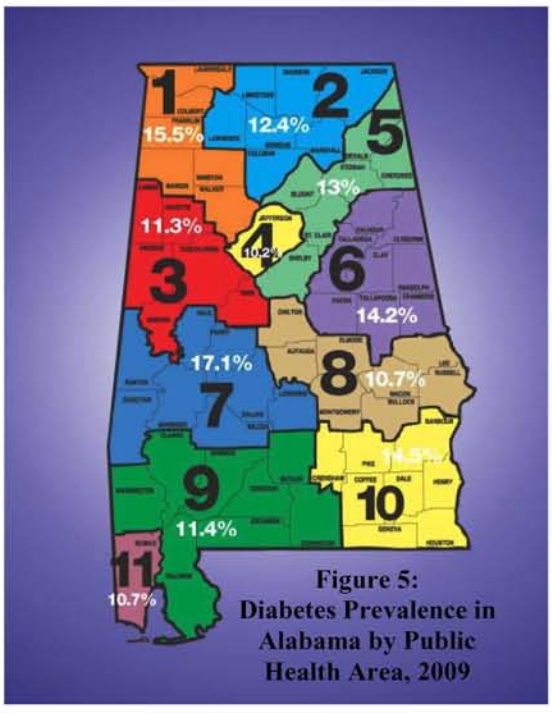

Figure 5:
Diabetes Prevalence in Alabama by Public Health Area, 2009

Alabama is divided into Public Health Areas (PHA) to facilitate coordination and development of public health services. Figure 5 is a graphic representation of the estimated distribution of diabetes in Alabama by PHA. The Alabama BRFSS survey is stratified by the PHAs. The PHA with the highest diabetes prevalence is PHA 7 (17.1%) including Choctaw, Dallas, Hale, Lowndes, Marengo, Perry, Sumter, and Wilcox counties, while PHA 4, Jefferson County, has the lowest prevalence (10.2%). All 11 PHAs have diabetes prevalence greater than the national prevalence of 8.3%.

The CDC reports that in 2007 diabetes was the 4th leading cause of death in the United States among 15-19 year olds, the 6th leading cause of death among adults older than 45, and the 7th leading cause of death for all ages. The disease may be more serious than even these rankings might suggest.

People with diabetes are two to four times more likely to die of heart disease or stroke than those without diabetes. Also, deaths caused by kidney disease are more common among those with diabetes than among those without diabetes.

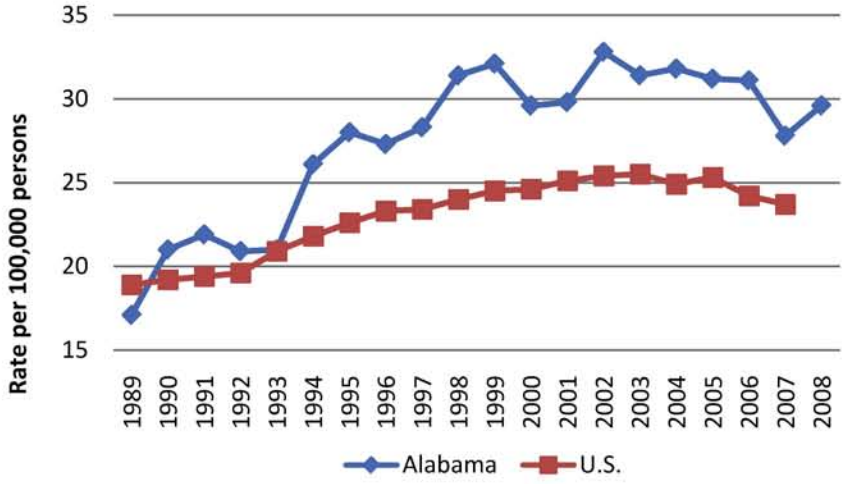

Figure 6:
Trends in Diabetes Mortality, Alabama vs U.S.
1989-2008

Source: Alabama Department of Public Health, Center for Health Statistics

The national diabetes mortality rate is stabilizing while Alabama's mortality rate continues to fluctuate and consistently remains above the national rate. In 2007, Alabama's diabetes mortality rate decreased from 31.1 in 2006 to 27.8 in 2007, and then increased to 29.6 in 2008.

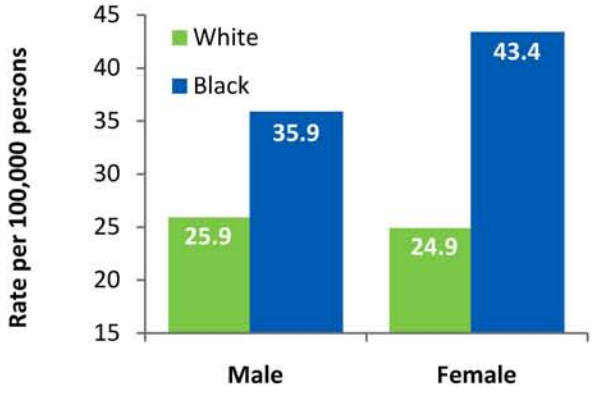

Figure 7:
Diabetes Mortality Rates in Alabama, 2008

Source: Alabama Department of Public Health, Center for Health Statistics

A particular concern is the disparity that exists in diabetes mortality in Alabama by race. This disparity is even more evident when stratified by gender. In both males and females, the diabetes mortality rate is significantly higher among blacks than whites. Black females exhibited the highest mortality rate of 43.4 per 100,000. The overall mortality rate for Alabama in 2008 was 29.6 per 100,000.

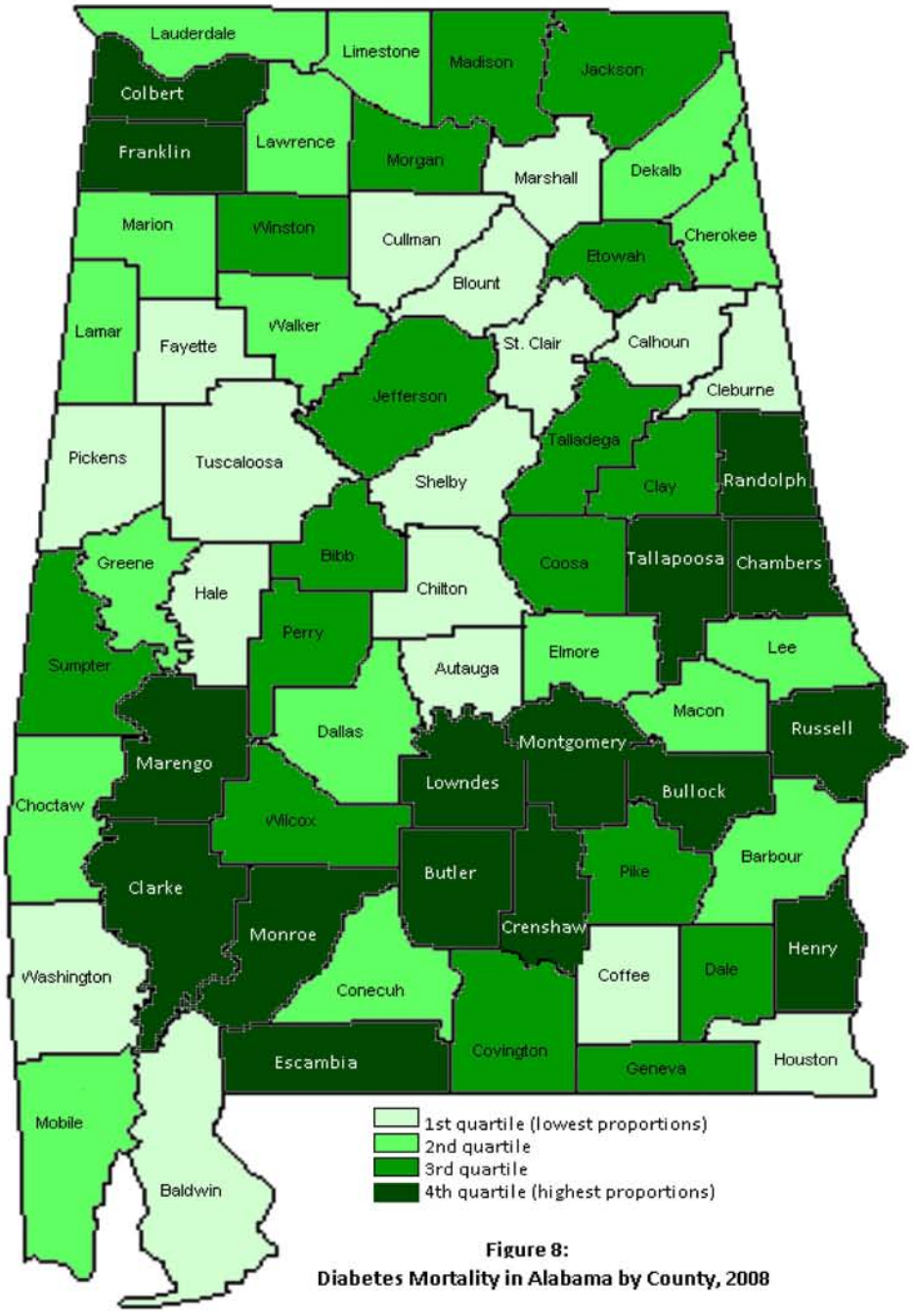

Figure 8:
Diabetes Mortality in Alabama by County, 2008

Source: Auburn Montgomery Center for Demographic Research, 2010

Figure 8 depicts the diabetes mortality rate in Alabama by county. The mortality rates increase with the darkness of the color. Of special interest are the counties that are ranked in the 4th quartile (highest proportions of diabetes-related mortality). Many of these counties are in the black belt region of the state, which has very high poverty rates. These counties should be targeted for diabetes prevention and management programs.

The prevention of diabetes ultimately depends on the reduction of risk factors in individuals and in the population as a whole. Risk factors for diabetes can be classified as either modifiable or non-modifiable. Non-modifiable risk factors include those attributes that are inherent to the individual and are not able to be changed. These include age, sex, race, and family history of disease. Modifiable risk factors are those that can be changed by the individual. These include weight status, physical activity, diet, hypertension, high cholesterol, smoking, and other tobacco use.

Risk Factor: Obesity

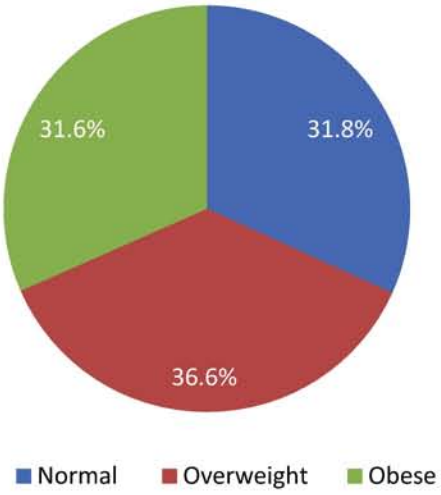

Figure 9:
Weight Status of Alabamians, 2009

The weight status distribution for Alabama as a whole is fairly evenly distributed among the three categories. However, that translates as approximately 1/3 of the population with a normal weight, and the remaining 2/3 as either overweight or obese. Weight status is a predominate risk factor for diabetes and many other complications. This creates a large pool of individuals at higher risk for developing diabetes in the future. Being obese or overweight is not only a risk factor for diabetes but also for related conditions like hypertension, cardiovascular disease, and stroke.

According to the 2009 BRFSS survey, among diabetics, 48.8% were obese, 32.3% were overweight, and 14.9% were of normal weight. When looking at BRFSS data from 2005, it was reported that 48.9% of diabetics were obese, 29.9% were overweight, and 21.2% were of normal weight. The distribution by weight status is changing where more diabetics are falling into the overweight or obese categories, as evidenced by the increase in the overweight percentage and decrease in the normal weight percentage.

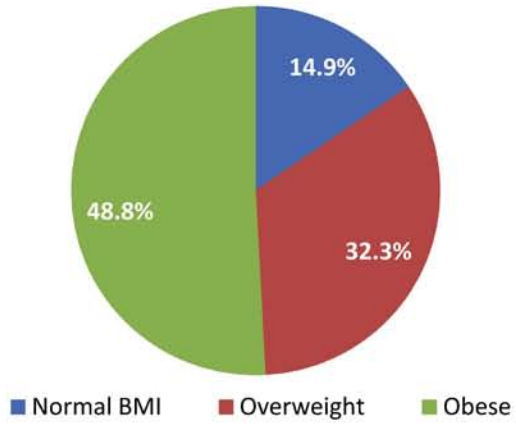

Figure 10:
Diabetics in Alabama by Weight Status, 2009

Risk Factors: Physical Activity and Diet

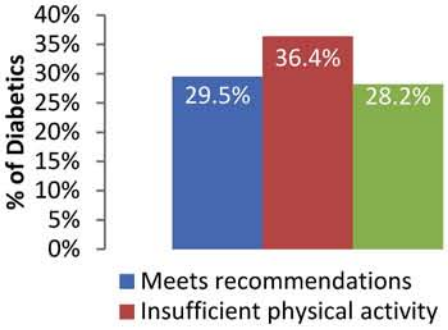

Figure 11:
Physical Activity Among Diabetics in Alabama, 2009

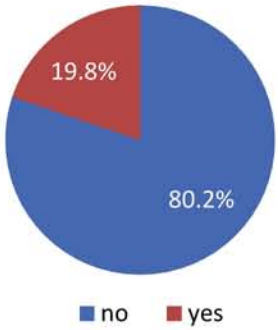

Figure 12:
Percentage of Diabetics in Alabama who Consume 5 or more Servings of Fruits and Vegetables Daily, 2009

Physical inactivity and an unhealthy diet are other modifiable risk factors for diabetes. Only 29.5% of diabetics in Alabama meet the recommended physical activity level, 36.4% engage in an insufficient amount of physical activity, and 28.2% engage in no physical activity. Furthermore, only 19.8% of Alabama diabetics report eating five or more servings of fruits and vegetables daily. Physical activity and diet are directly linked to weight status and accordingly are also risk factors for hypertension, cardiovascular disease, and stroke—all complications of diabetes.

Other risk factors related to diet include high blood pressure and high cholesterol; 74.7% of diabetics have high blood pressure, and 35.2% of diabetics have high cholesterol. These risk factors, when combined with being overweight/obese, create a rather precarious situation.

Risk Factor: Smoking

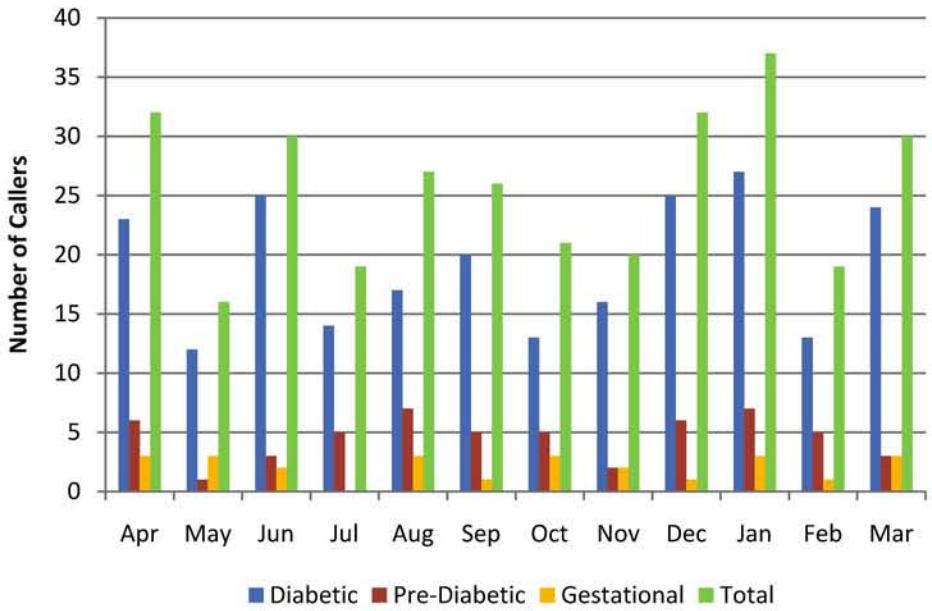

Figure 13:
Diabetic Smokers Calling the Alabama Quitline
April 2009-March 2010

According to the 2009 BRFSS survey, 19.2% of diabetics in Alabama are current smokers. Figure 13 shows the number of diabetics (including those with pre-diabetes and a history of gestational diabetes) that called in to the Alabama Smoking Quitline between April 2009 and March 2010. Of the 309 callers to the Alabama Smoking Quitline, 229 identified themselves as diabetic, 55 were pre-diabetic, and 25 had gestational diabetes.

Youth at Risk

For diabetes, as with most other chronic diseases, prevention is key. Monitoring the establishment of proper eating habits and regular physical activity among teenagers is important as these teens could become the diabetic population of the future. The Youth Risk Behavior Survey (YRBS) is administered to Alabama youth (grades 9th - 12th) every two years and provides important information about the health behaviors of the state's youth.

According to the YRBS, 62.7% of youth in 9th-12th grades are physically active for 60 minutes a day for at least five days a week and 22.4% do not participate in 60 minutes of physical activity on any days. Furthermore, only 22.3% of Alabama teens report consuming at least five fruits and vegetables a day. Lack of physical activity and an unhealthy diet can contribute directly to the prevalence of overweight and obese youth in Alabama.

Figure 14 indicates that 17.5% of Alabama teens are overweight, and Figure 15 shows that 13.5% of Alabama teens are obese. More females are overweight, but more males are obese. Both of these percentages are higher than the national percentages.

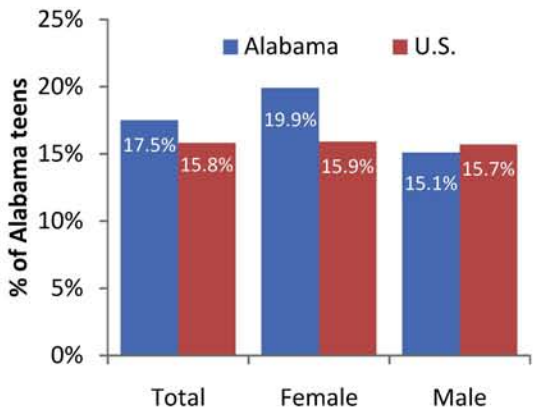

Figure 14:
Percentage of Alabama teens (grades 9 - 12) who are overweight

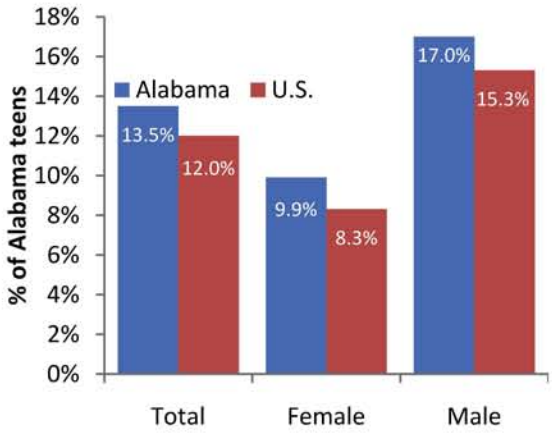

Figure 15:
Percentage of Alabama teens (grades 9 - 12) who are obese

These findings suggest that a large percentage of Alabama residents, both adults and youth, are at risk for developing diabetes. Weight control, including physical activity and adopting a healthy diet, is a primary risk reduction strategy that should be encouraged, particularly among high risk groups.

Some of the personal characteristics that place an individual at risk of developing diabetes cannot be modified. These non-modifiable risk factors include:

- Being aged 40 years or older
- Being African American, Hispanic, Native American, or Asian
- Having one or more parents with diabetes
- Having had gestational diabetes
- Having had a child weighing over nine pounds

However, other risk factors for diabetes CAN be modified. These risk factors include:

- Obesity
- Lack of physical activity
- Hypertension
- Unhealthy diet
- High triglyceride levels
- Low levels of High Density Lipoproteins (HDL)
- Smoking and other tobacco use

Positive changes in these risk factors can delay or prevent Type 2 Diabetes

TO DELAY OR PREVENT THE ONSET OF TYPE 2 DIABETES:

- Achieve and maintain a healthy weight
- Be more physically active
- Maintain a healthy blood pressure
- Eat a healthy diet
  - Eat foods rich in fiber
  - Eat the recommended five to nine servings of fruits and vegetables daily
  - Use less salt
- Have your cholesterol checked regularly and keep it low
- Stop smoking and other tobacco use

Diabetes self management is important for preventing and reducing complications associated with diabetes. If left untreated or uncontrolled, diabetes can lead to devastating complications. Some of the conditions that may result from uncontrolled diabetes include:

Cardiovascular Disease

Cardiovascular disease is the leading cause of death in diabetic individuals. Individuals who are diabetic are two times more likely to die of heart disease than non-diabetic individuals. Diabetics are at an increased risk of developing cardiovascular disease and having a heart attack or stroke. In 2009, the prevalence of people with diabetes who reported that a doctor, physician assistant (PA), nurse practitioner (NP), nurse, or other health professional had ever told them they had a heart attack was 14.6%, compared to the state prevalence of 5.5% for people without diabetes. The prevalence of people with diabetes who reported that a doctor, PA, NP, nurse, or other health professional had ever told them they had a stroke was 10.2%, compared to the state prevalence of 3.8% for people without diabetes.

High Blood Pressure

Diabetic individuals are more likely to develop high blood pressure than an individual living without diabetes. According to the Alabama BRFSS, 74.7% of people with diabetes in 2009 reported having high blood pressure. High blood pressure can result in increased risk for eye complications, cardiovascular disease, and kidney disease. Lowering blood pressure levels can help reduce many complications associated with diabetes.

Eye Complications

Diabetes is a primary cause of blindness in adults. Diabetes can cause vision problems or blindness due to damage to the blood vessels in the eyes. Uncontrolled blood sugar can cause vision problems such as retinopathy, glaucoma, and cataracts. Although normal adults may also develop these eye complications, diabetic individuals are at greater risk. Among people with diabetes, 22.2% reported being told by their nurse, doctor, or other health professional that diabetes had affected their eyes or that they had retinopathy. Proper management of blood pressure and blood sugar levels are keys in preventing eye complications as well as yearly dilated eye examinations.

Kidney Disease

Diabetes can cause diabetic nephropathy, a kidney disease resulting from high blood sugar levels. This condition affects the kidneys' ability to properly filter waste and toxins from the blood. Uncontrolled blood sugar can cause severe damage to the kidney that can progress to end-stage renal disease (ESRD). ESRD is the last stage of renal failure where the kidneys are unable to function properly. An individual with ESRD may require dialysis treatment to remove toxic waste.

Foot and Skin Problems

Individuals with diabetes are more prone to developing foot and skin problems. Uncontrolled diabetes can damage nerves and as a result, reduce blood flow to extremities, especially the feet. The lack of blood flow to the feet results in the slow healing of sores and cuts. Proper foot care is essential to diabetes self management.

Amputations

Possible nerve damage and poor foot care in diabetics can result in amputations. Individuals who do not care for their feet properly can develop severe ulcers or infections that may require amputation. According to the National Institute of Diabetes and Digestive and Kidney Disease, diabetes related amputations accounted for more than 60% of all non-traumatic lower-limb amputations.

Dental Disease

The decrease in blood supply to the gums as a result of diabetes can result in an increased risk for dental disease. Periodontal disease (a type of gum disease that can result in tooth loss) is more common and often more severe among individuals who are diabetics than among non-diabetics. Diabetics are encouraged to brush and floss teeth regularly and see their dentist every six months.

Complications during Pregnancy

Poorly controlled diabetes before and during pregnancy can cause severe health problems for the mother as well as the baby. Individuals without diabetes prior to pregnancy may develop gestational diabetes, a condition that results from uncontrolled blood sugar during pregnancy. Poorly controlled diabetes during the latter part of pregnancy can result in excessively large babies, causing risks for the mother and baby.

Other Complications

Diabetes can cause other complications such as diabetic coma which results from hyperglycemia (high blood sugar) or hypoglycemia (low blood sugar). Individuals who are diabetic are also more likely to become sick from other illnesses such as influenza and pneumonia when compared to individuals without diabetes. Diabetics may also experience sexual problem such as erectile dysfunction.

Cost of Diabetes-Care and Complications

Medical costs are a direct consequence of the complications of diabetes. The financial burden of diabetes in the United States in 2007, according to ADA, was more than $174 billion. In 2007, individuals with diagnosed diabetes incur average expenditures of $11,744 per year, of which $6,649 results from diabetes.

The cost for a diabetes-related heart attack is about $28,000, and the cost for kidney dialysis can be up to $70,000 annually. With 11.1% of diabetics in Alabama having no form of medical insurance according to BRFSS 2009 data, and 16.5% being unable to afford seeing a doctor in the past 12 months, paying for medical care is quite burdensome.

In Alabama, the projected cost of diabetes for 2006 was $2.5 billion dollars: $1.64 billion in medical costs related directly to treating diabetes as well as chronic conditions related to diabetes, and $859 million in indirect costs, such as loss of productivity as a result of absenteeism, disability, and early mortality. The risk for diabetes-related complications and their associated costs can be greatly reduced if not prevented by proper diabetes management and preventative care.

Preventative Care for Management

Diabetes is a chronic disease that requires individuals to take charge of their health through self-management of their condition. Self-management is the key to controlling diabetes and should become the highest priority. Through self-management training, individuals diagnosed with diabetes can become knowledgeable about diabetes and what actions they should take to optimize their health as well as reduce the risks of complications associated with diabetes. Self-management actions include preventive practices to help prevent and delay the complications that may be associated with diabetes.

BRFSS provides annual information concerning the program's progress towards achieving these goals, as well as the percentage of persons with diabetes that engage in various care activities in collaboration with their physicians. Some activities, such as checking one's feet and blood glucose levels, can be accomplished by the individual alone, without immediate assistance of a health care professional. Other activities, for example, having a dilated eye exam, a flu shot, or an HbA1c test, requires the direct assistance of a physician or other health care provider.

The CDC 's Diabetes Control Program has set national objectives related to increasing the percentage of persons with diabetes who receive dilated eye exams, foot exams, glycosylated hemoglobin (HbA1c) testing, and influenza and pneumococcal vaccinations. These objectives are enumerated in the Healthy People 2010 initiative. Alabama's Diabetes Program, in partnership with physicians, physician assistants, public health practitioners, nurses, eye specialists, diabetes educators, and individuals throughout the state, is actively working to ensure that persons with diabetes in Alabama have the appropriate information about diabetes and its management.

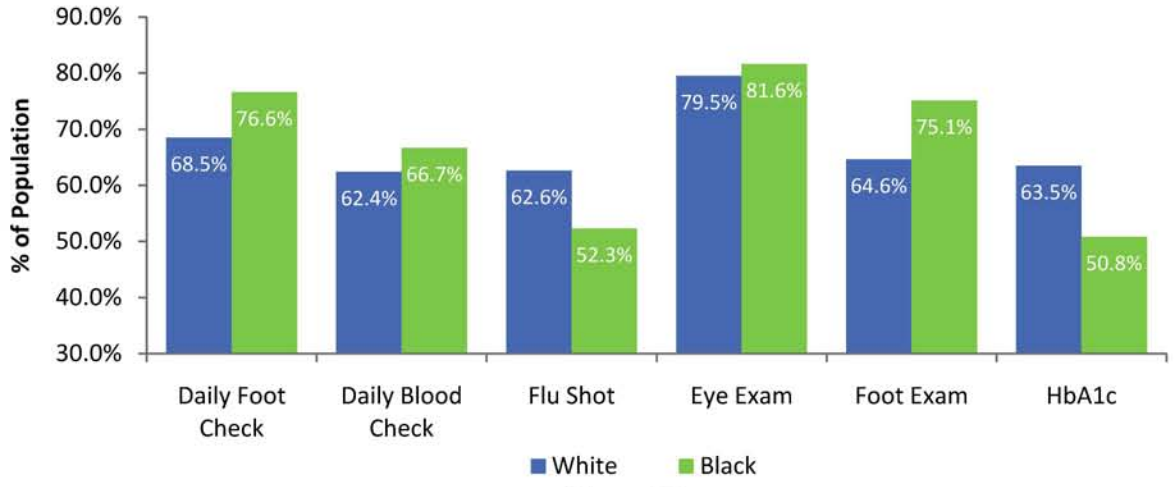

Figure 16:
Patient and Physician Completed Care Activities, 2009

Figure 16 shows the distribution of patient and physician completed care activities in Alabama in 2009 by race. In many categories, the percentage of completed care activities by the black population exceeds the white population.

The table below describes the diabetes care activities recommended by the CDC and the ADA for proper management of diabetes. This table also shows the percentage of Alabama diabetics who completed the activity in 2009 according to the recommendations in comparison to the Healthy People 2010 Objectives.

Care Activities	Frequency/Recommendation	BRFSS 2009 %	Goal[1]
Patient-Completed Care Activities			
Self-Monitoring of Blood Sugar	Those with Type-1 Diabetes are recommended to check their blood sugar 3-4 times a day. Those with Type-2 Diabetes are recommended to check their blood sugar at least once a day.	**64.0%**	60%
Self-Administered Foot Exam	The ADA recommends that diabetics check their feet at least once a day for blisters, cuts, swelling, or red spots.	**70.7%**	*
Physician-Completed Care Activities			
HbA1c	HbA1c exams provide a retrospective measurement of blood sugar levels 2-3 months prior to the exam. It is recommended that diabetics have this measurement at least two times a year or more frequently as recommended by the doctor. Diabetics should maintain a HbA1c measurement less than 7%.	**74.4%**	50%
Dilated Eye Exam	Diabetics are recommended to get a yearly dilated eye exam to check for diabetes-related eye conditions such as retinopathy.	**66.1%**	75%
Comprehensive Foot Exam	It is recommended that patients ask their doctors to perform a comprehensive foot exam at each doctor visit.	**67.7%**	75%
Diabetes Management Education	Diabetes management education equips the diabetic with the information to properly manage diabetes and prevent or reduce further complications that may develop. Diabetics are encouraged to receive formal training.	**54.7%**	60%
Pneumonia Vaccination	Diabetics are at increased risk of mortality and morbidity from pneumonia. Thus, they should be vaccinated once in a lifetime or as recommended by doctor.	**54.8%**	60%[2] or 90%[3]
Flu Vaccination	Diabetics are at increased risk of mortality and morbidity from influenza. It is recommended that they be vaccinated once each flu season.	**58.6%**	
Cholesterol Levels	A cholesterol profile should be taken yearly. Diabetics should maintain the following levels: -LDL: ≤100 mg/dL -HDL: > 45 mg/dL -Total Cholesterol: < 200 mg/dL -Triglycerides: < 200 mg/dL	**95.8%**	*
Blood Pressure	Blood pressure should be measured at each doctor visit and maintained at < 130/80.	*	*

[1]Goals obtained from Healthy People 2010 National Objectives for Diabetes

[2]Goal for Non-institutionalized high-risk adults aged 18-64 and institutionalized adults (persons in long-term or nursing homes) for both influenza and pneumococcal vaccinations

[3]Goal for Non-institutionalized adults > 65 for both influenza and pneumococcal vaccinations

*Data Not Available

Early diagnosis of diabetes and the control of blood sugar levels are important components in reducing the burden of diabetes in Alabama. Good glycemic control is necessary to prevent complications associated with diabetes. Prevention of diabetes-related complications serves to improve the quality of life for persons with diabetes and reduce the costs associated with care over a lifetime. Recent research has indicated that with every incremental increase in levels of HbA1c, the risk of complications and the costs associated with their treatment rise dramatically. Persons with diabetes receive their primary care from a number of health care professionals: primary care physicians (internists, family practitioners, and gerontologists), endocrinologists, PAs, NPs, and diabetes educators. They also receive specialty care from cardiologists, optometrists, and ophthalmologists. Adequate health care coverage is an important component of people with diabetes management plan.

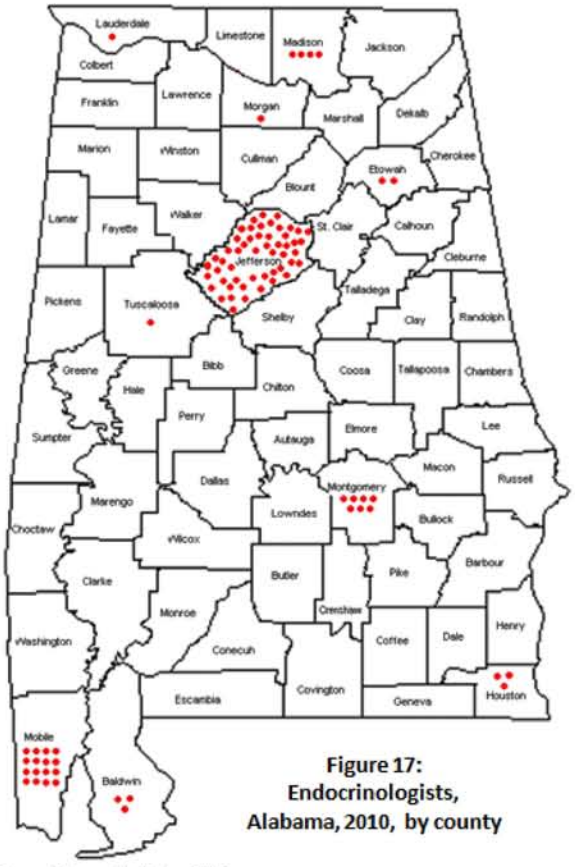

Figure 17: Endocrinologists, Alabama, 2010, by county

Source: UCompareHealthCare, 2010

Figure 18: Certified Diabetes Educators, Alabama, 2010, by county

Source: American Association of Diabetes Educators, 2010

Figures 17 and 18 represent the numbers of endocrinologists and diabetes educators, respectively, by Alabama County. Each dot represents a single doctor or diabetes educator located within the county. Both tend to be concentrated in highly populated urban areas, such as Jefferson, Mobile, Montgomery, and Madison counties. Fifty-seven of the 67 counties in Alabama do not have an endocrinologist and 45 of the 67 counties in Alabama do not have a certified diabetes educator. Access to both of these specialists is important to diabetics not only for medical attention but for information on managing the disease. Access to healthcare for diabetics is a serious issue in Alabama.

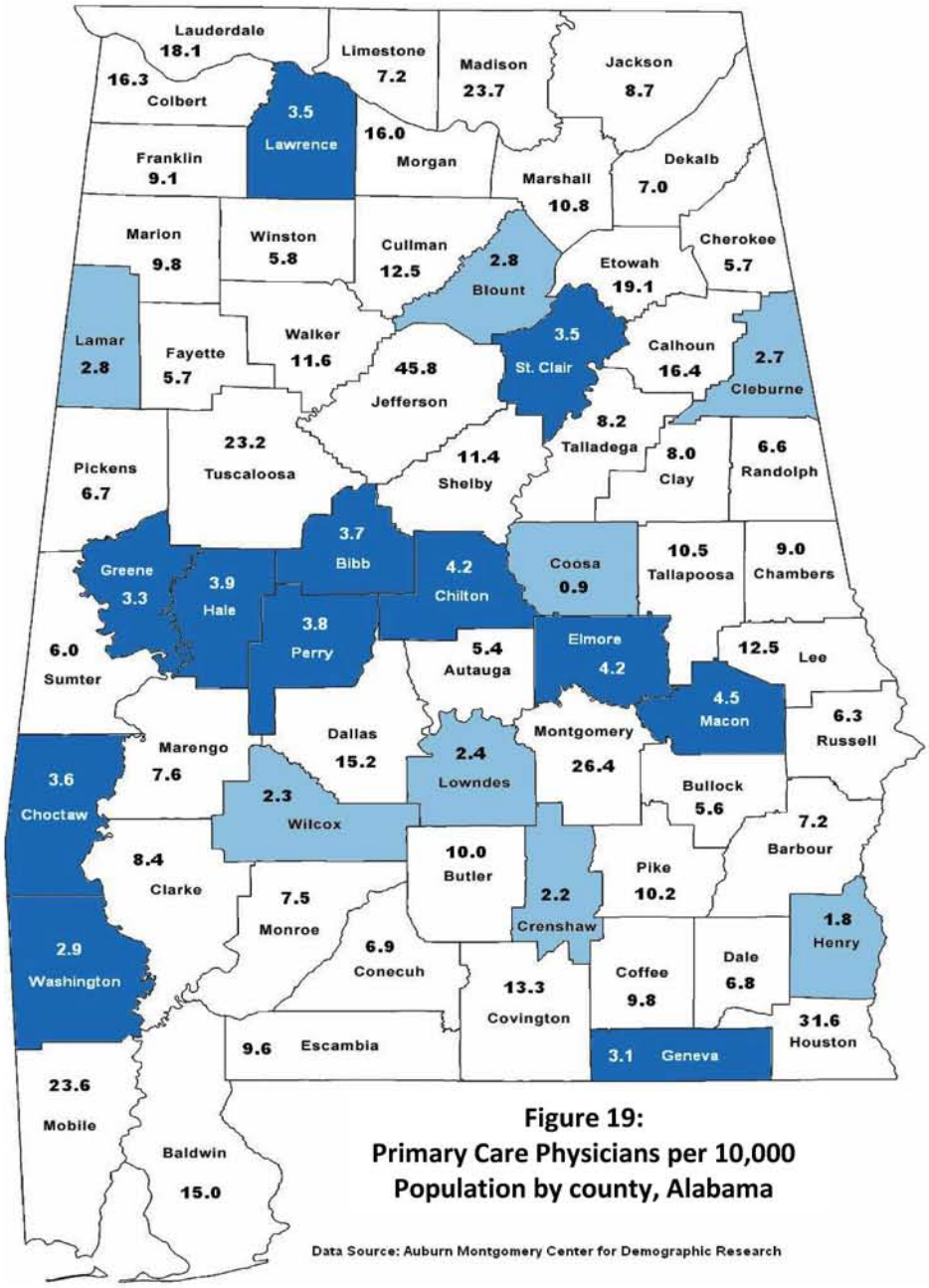

Figure 19:
Primary Care Physicians per 10,000 Population by county, Alabama

Data Source: Auburn Montgomery Center for Demographic Research

As the maps on the previous page indicate, healthcare for diabetes tends to be concentrated in counties with larger population bases. Much fewer resources are available to those persons who live in more rural areas of the state. In the above figure, the counties shaded in light blue are those that are considered by the U.S. Department of Health and Human Services to be Health Professional Shortage Areas (HPSA). These areas have less than one physician per 3,500 population (or ≈ 2.86 physicians per 10,000 population). The counties shaded in dark blue represent counties that are not considered a HPSA but are not deemed "adequately served" according to Health and Human Services. These areas have less than one primary care physician per 2,000 population (or ≈ 5 physicians per 10,000 population). Healthcare professionals are not evenly distributed throughout the state.

Prevention and Management Checklist

- ✓ Know the risk factors
- ✓ Know the signs and symptoms
- ✓ Know the complications of diabetes
- ✓ See your health care provider for pre-diabetes and diabetes screening test
- ✓ If you are Medicare eligible, ask your health care provider for the free screening for pre-diabetes and diabetes
- ✓ If you smoke, quit
  - If you need help call 1-800-QUIT NOW (1-800-684-8669) for free counseling and four weeks of nicotine replacement therapy, if qualified
- ✓ Take the Risk Test
  - Call American Diabetes Association at 1-800-342-2383 or go online at www.diabetes.org and click on Risk Test
- ✓ Lose 5-10% of your body weight and maintain it
- ✓ Be physically active, 30-60 minutes of moderate to vigorous physical activity five days a week.
- ✓ For healthy meals, restrict calorie intake, increase fiber, and limit carbohydrates
- ✓ Control blood pressure
  - Lower sodium (salt) intake
- ✓ Avoid excess alcohol consumption

Treatment Goals: The ABC's of Diabetes

A1C

- < 7% for general population
- Preprandial capillary plasma glucose 70-130 mg/dl
- Peak postprandial capillary plasma glucose < 180 mg/dl (usually 1-2 hours after the start of a meal)

Blood Pressure

- Systolic/Diastolic blood pressure <130 mmHg /<80 mmHg

Cholesterol

- LDL cholesterol <100 mg/dL
- HDL cholesterol Men >40 mg/dL, Women >50 mg/dL
- Triglycerides <150 mg/dL

Definitions

Age-adjusted rates or proportions: A rate calculated in a manner that allows for the comparison of populations with different age structures.

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

Risk Factor: A characteristic or behavior that is consistently associated with increased probability of disease or event.

BMI: Body mass index. Using weight in pounds and height in inches, BMI is calculated as 705 times weight divided by the square of the height.

Overweight: BMI greater than or equal to 25.0 but less than 30.0.

Obese: BMI greater than or equal to 30.0.

Normal Weight: Neither overweight nor obese (BMI < 25.0).

Insufficient Physical Activity: 1. Engaging in moderate physical activity (those activities that cause small increases in breathing, such as brisk walking, bicycling, vacuuming, gardening, etc.) for at least 10 minutes each time but fewer than five times a week. 2. On days when engaging in moderate physical activity, total time per day spent doing the activities is less than 30 minutes and does not engage in vigorous physical activity at least three days a week for a total of at least 20 minutes per day.

Inactive: Engaging in moderate or vigorous activity for less than 10 minutes weekly.

Does not meet guidelines for moderate physical activity: Moderate physical activity guideline defined as 30 or more minutes per day for five or more days per week, or vigorous activity for 20 or more minutes per day on three or more days per week.

Methods

All statistical analyses were completed using SAS 9.1.3. All analyses of BRFSS and the YRBS were weight analyses, taking into consideration the surveys' designs and sampling frames, age adjusting was employed as appropriate to adjust for differences in the age distributions between groups being compared.

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Alabama Department of Public Health

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Informational materials in alternative formats will be made available upon request.

This burden report was supported by Grant/Cooperative Agreement Number DP09-901 from the CDC. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.