



Diabetes

the chronic disease
that affects nearly one in ten people

In Alabama

A report from the

**ALABAMA DEPARTMENT
OF PUBLIC HEALTH**

March 2007

**Alabama
Department of
Public Health**

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Perspective

According to a recent national survey, almost 1 in 10 people in Alabama has been diagnosed with diabetes. Thousands are unaware that they have the disease. Alabama ranks among the top states in the nation for the prevalence of diabetes, the sixth leading cause of death in the state. The disease directly contributes to the incidence of heart disease and strokes, also leading causes of death in the state, and is the primary cause of kidney failure, non-trauma related limb amputations and adult-onset blindness.

It is obvious that every one has family members or friends with diabetes. The disease can affect anyone, but some populations are more likely to develop Type 2, the most common form of the disease. African Americans, American Indians, those of Hispanic descent, the elderly, and those who have family members with diabetes are at greater risk. Other risk factors include being overweight, lack of physical activity, and 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 delay or prevent developing diabetes and to reduce complications related to the disease. The Diabetes Branch utilizes “Systems Thinking” to work toward opportunities to improve the health status of community. “Systems Thinking” is a creative, flexible, future-oriented problem solving and decision making processes. It allows stakeholders to view interrelationships rather than cause-effect chains. It is pro-active, manages the processes of change, and anticipates consequences of actions and responses.

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

The Alabama Diabetes Advisory Council, 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, 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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Alabama Diabetes
PROGRAM

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 enough 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.

Type 2 diabetes is the most common form of diabetes. About 90 to 95 percent 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. Type 2 diabetes occurs when the body produces enough

insulin but for some reason is unable to use that insulin effectively. Some people with type 2 diabetes are treated with oral medications (pills), while others are treated with insulin injections.

Gestational diabetes is a special 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 their lives.

SYMPTOMS OF DIABETES

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

Diabetes is a serious chronic disease that can lead to serious complications if not controlled.

Diabetes

Prevalence of Diabetes

Current estimates indicate that more than 20 million people in the United States have diabetes, with as many as one-third of those people unaware that they have the condition. Using data obtained from the 2005 Behavioral Risk Factor Surveillance Survey (BRFSS), it is estimated that approximately 333,500 Alabamians are aware that they have diabetes and based on CDC estimates as many as 200,000 more may have the condition but are unaware of it.

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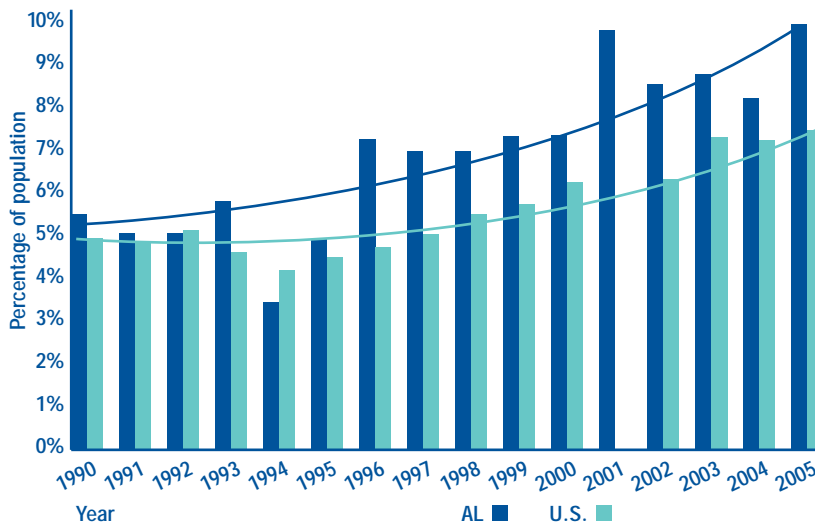


Figure 1
Trends in diabetes awareness,
Alabama and U.S., 1990-2005

- ▶ Prevalence rose from 8.11 percent in 2004 to **9.74 percent** in 2005.
- ▶ This rate of increase within Alabama was greater than the increase seen nationally.
- ▶ Data from the Centers for Disease Control and Prevention (CDC) Diabetes Division indicate that **Alabama is among the top 10 states in the country** in the percentage of adults who have diabetes.

In the 2005 BRFSS, **diabetes was reported more often among older age groups.** The proportion of persons aged 45 to 64 reporting diabetes is approximately five times higher than the proportion of persons aged 18 to 44. This pattern is not unexpected, since national studies have indicated that the **prevalence of diabetes increases with age** and that **diabetes is often diagnosed between the ages of 45 and 65.**

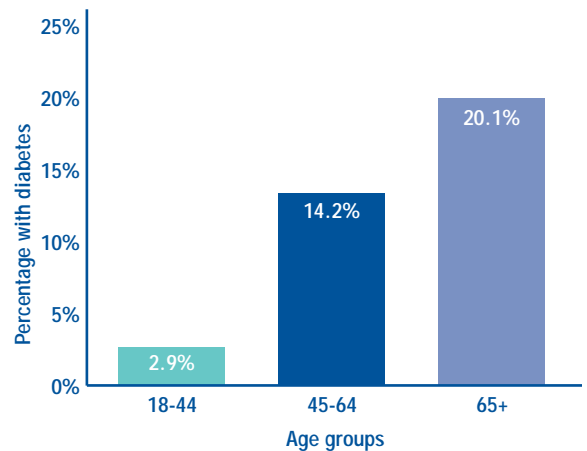


Figure 2
Diabetes in Alabama
by age categories, 2005

There is not a significant difference between Alabama men and women in the proportion reporting diabetes. Diabetes is very similar among men (10.2%) and women (9.4%) in Alabama.

There were notable differences between white and black Alabamians. As depicted in Figure 3, **the prevalence of diabetes among blacks is more than the prevalence of diabetes among whites.**

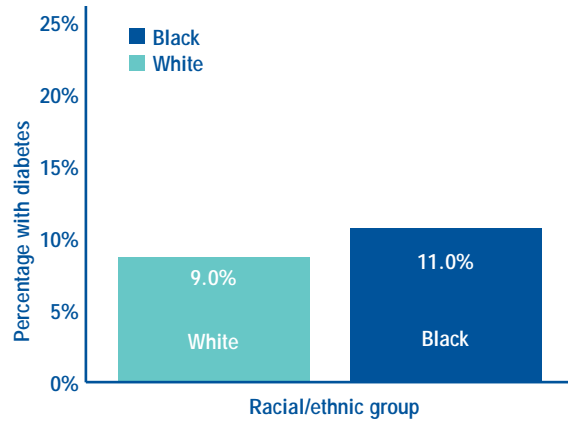


Figure 3
Diabetes in Alabama by race, 2005

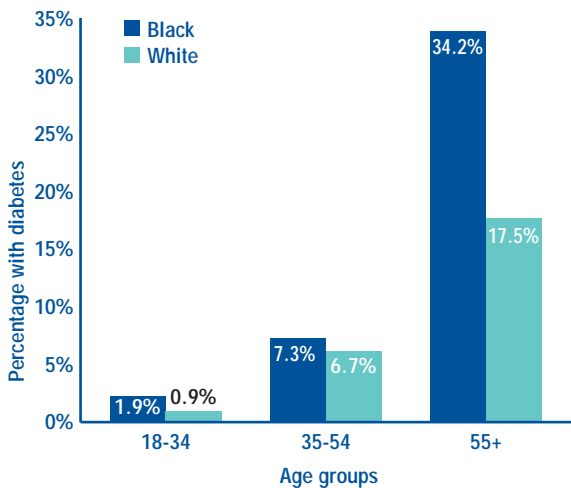


Figure 4
Diabetes in Alabama by race within age groups, 2005

Further, the disparities between blacks and whites are apparent within every age group. In the middle age group (between 35 and 54 years of age), the percentage of persons with diabetes among blacks is higher than the percentage of persons with diabetes among whites. In the youngest age group (persons 18 to 34 years of age) and in the oldest age group (persons 55 years of age and older), there appears to be a significant difference in percentages, with blacks showing a significantly greater percentage of persons with diagnosed diabetes than whites.

Figure 5 is a graphic representation of the estimated distribution of diabetes in the state of Alabama by county. The estimates for each county were calculated using statewide 2005 BRFSS data and 2005 U.S. Census Bureau county population and demographic estimates. The counties are separated into quartiles with those colored in blue representing the highest prevalence of diabetes.

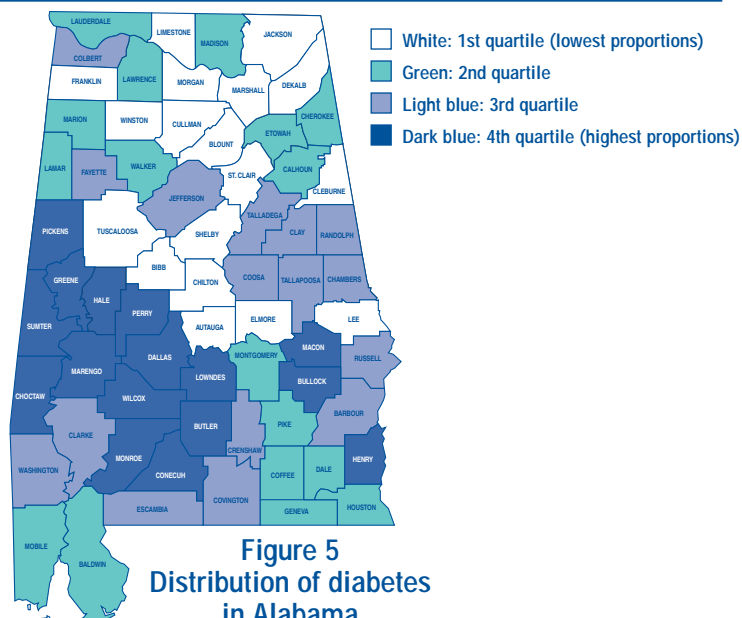
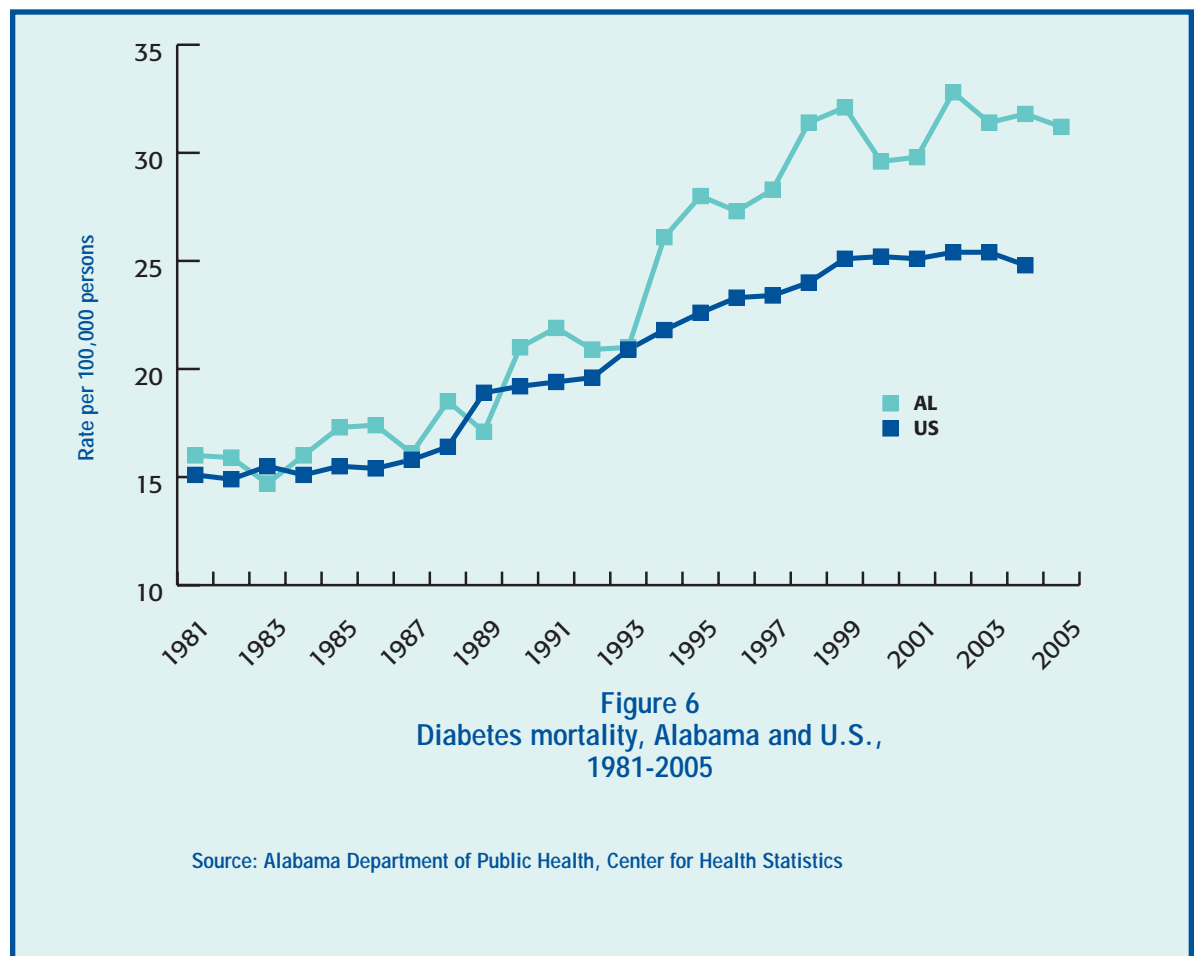


Figure 5
Distribution of diabetes in Alabama

The CDC reports that in 2002, diabetes was the cause of more than 73,249 deaths in the United States. That translates into 25 deaths per 100,000 persons (taking the age of the population into consideration). Diabetes was the 6th most common cause of death that year. Diabetes is a major cause of mortality in the United States. However, the picture is more serious

than even those numbers might suggest. Persons with diabetes are also between 2 and 4 times more likely to die of heart disease or stroke than are persons that do not have diabetes. Deaths caused by kidney disease are also more common among persons with diabetes than among persons who do not have diabetes.

In Alabama, diabetes accounts for approximately 3 percent of deaths. In 2005, this meant that diabetes was the documented cause of death for some 1,420 Alabama citizens. However, as seen in Figure 6, mortality associated with diabetes is increasing over time. While the national rates appear to be stabilizing at the end of the period, Alabama's diabetes mortality rate continues to climb.



A particular concern is the disparity that exists in diabetes mortality in Alabama by race. In 2005, the overall diabetes mortality rate was 31.2 per 100,000. The diabetes mortality rate for whites was 27.2 per 100,000. The diabetes mortality rate for blacks was 41.0 per 100,000. This disparity among blacks and whites is striking.

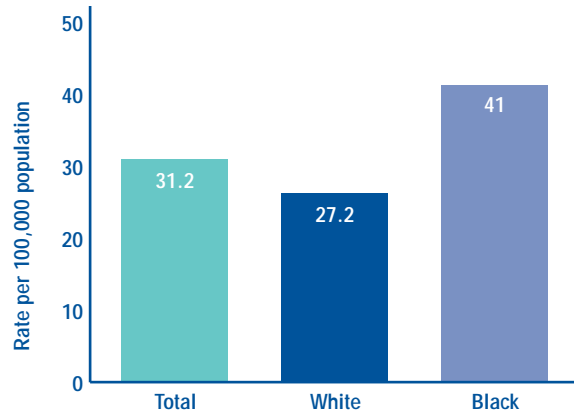


Figure 7
Diabetes mortality, Alabama 2005

Source: Center for Health Statistics, Statistical Analysis Division

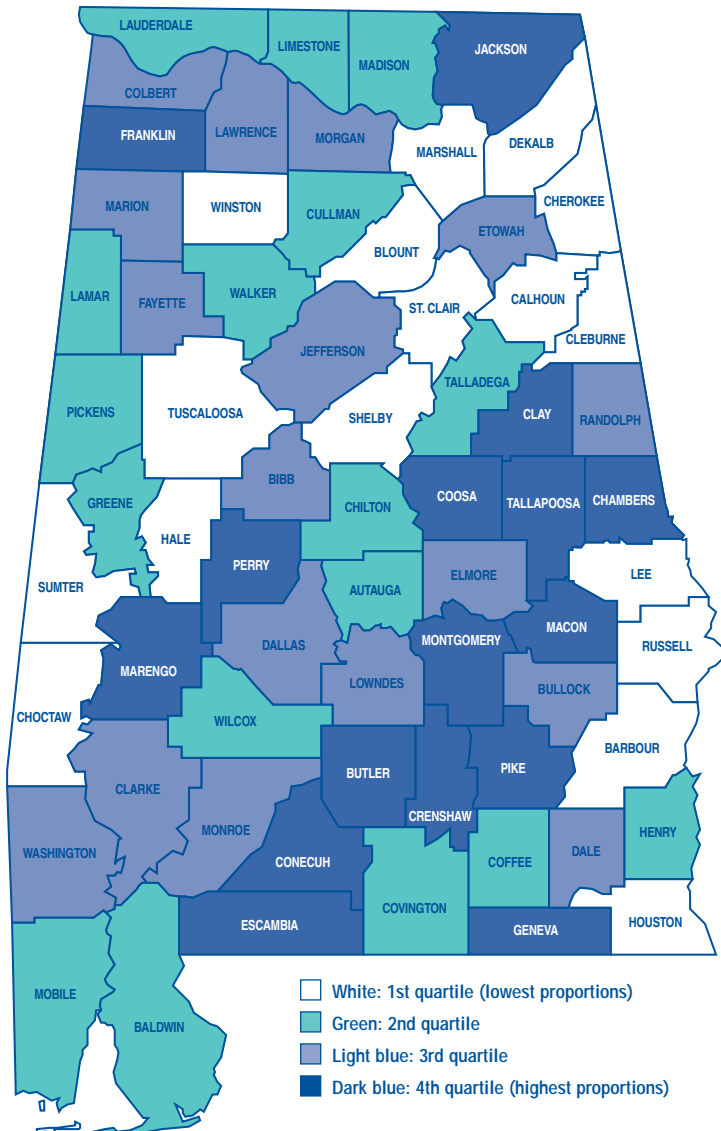


Figure 8 depicts diabetes mortality in Alabama in 2005. Those counties with the highest rates are depicted in darker colors. Clearly, there are portions of the state with greater mortality associated with diabetes compared to other counties.

Figure 8
Diabetes mortality by Alabama county,
2005

If left untreated or uncontrolled, diabetes can lead to devastating complications. Some conditions that may result from uncontrolled diabetes include:

- **HEART DISEASE** – Adults with diabetes are 2 to 4 times more likely to die of heart disease than adults without diabetes.
- **STROKE** – Persons with diabetes are 2 to 4 times more likely to have a stroke than persons without diabetes.
- **HIGH BLOOD PRESSURE** – It is estimated that approximately 73 percent of people with diabetes also have high blood pressure.
- **BLINDNESS** – Diabetes is the primary cause of new cases of blindness in adults. Nationally, diabetic retinopathy causes from 12,000 to 24,000 new cases of blindness each year. On Alabama's 2005 Behavioral Risk Factor Surveillance Survey, nearly 1 in every 4 persons with diabetes (24%) reported that they had been told that their diabetes had affected their eyes.

In Alabama, nearly one in every 4 persons with diabetes (24%) reported that they had been told that their diabetes had affected their eyes.

- **NERVOUS SYSTEM DISEASE** – As many as 60 to 70 percent of people with diabetes have some form of nervous system damage, which may include impaired sensation or pain in the feet or hands, slower digestion of food in the stomach, carpal tunnel syndrome, and/or other nerve problems.
- **KIDNEY DISEASE** – Diabetes is also the leading cause of end-stage renal disease (ESRD), responsible for about 44 percent of all new cases.

Approximately 400,000 Alabamians, one in eleven, have chronic kidney disease, and most of those persons are unaware. About 6,000 Alabamians with chronic kidney disease are on dialysis, with 3,000 persons having had a kidney transplant. Figure 9 shows the mean age of entry into dialysis in Alabama for African Americans and Whites. African Americans begin dialysis almost eight years earlier at a mean age of 57.75 years compared to 65.39 years for Whites.

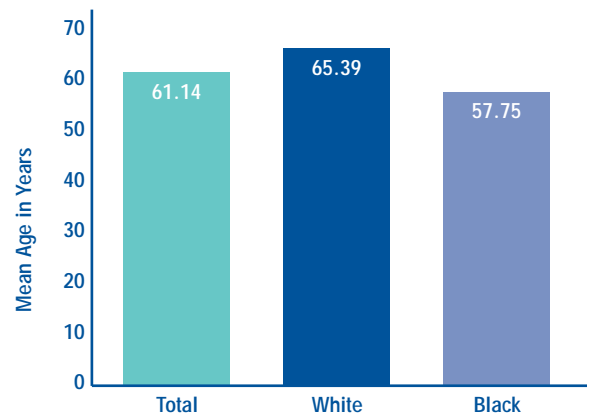


Figure 9
Mean age at start of End Stage Renal Disease Therapy, Alabama 2004

Source: U.S. Renal Data System
USRDS 2006 Annual Data Report

- **AMPUTATIONS** – While data are not available for Alabama specifically, CDC reports that more than half of lower limb amputations in the United States occur in people with diabetes.
- **DENTAL DISEASE** – Periodontal disease (a type of gum disease that can lead to tooth loss) is more common and often more severe among people with diabetes than among their non-diabetic counterparts. Periodontal disease has been reported to be a problem for as many as one-third of adults with type 1 diabetes.
- **COMPLICATIONS OF PREGNANCY** – Poorly controlled diabetes before conception and during the first trimester of pregnancy can cause major birth defects in 5% to 10% of pregnancies and spontaneous abortions in 15% to 20% of pregnancies. Poorly controlled diabetes during the second or third trimesters of pregnancy can result in excessively large babies, posing a risk to the mother and the child.
- **OTHER COMPLICATIONS** – Diabetes can directly cause acute life-threatening events, such as diabetic coma. In general, people with diabetes are more susceptible to many other illnesses. For example, they are more likely to die of pneumonia or influenza than people who do not have diabetes.

Diabetes

Diabetes accounts for large portions of the direct and indirect costs of health care, including inpatient and outpatient medical care, home health care, pharmaceuticals, lost productivity, and lost years of productive life.

The chart below lists the estimated prevalence of diabetes by county in the state of Alabama. These estimates were calculated using the statewide 2005 BRFSS data and the 2005 United States Census Bureau county population and demographic estimates. The counties having a larger prevalence of diabetes often have similar patterns of population distribution.

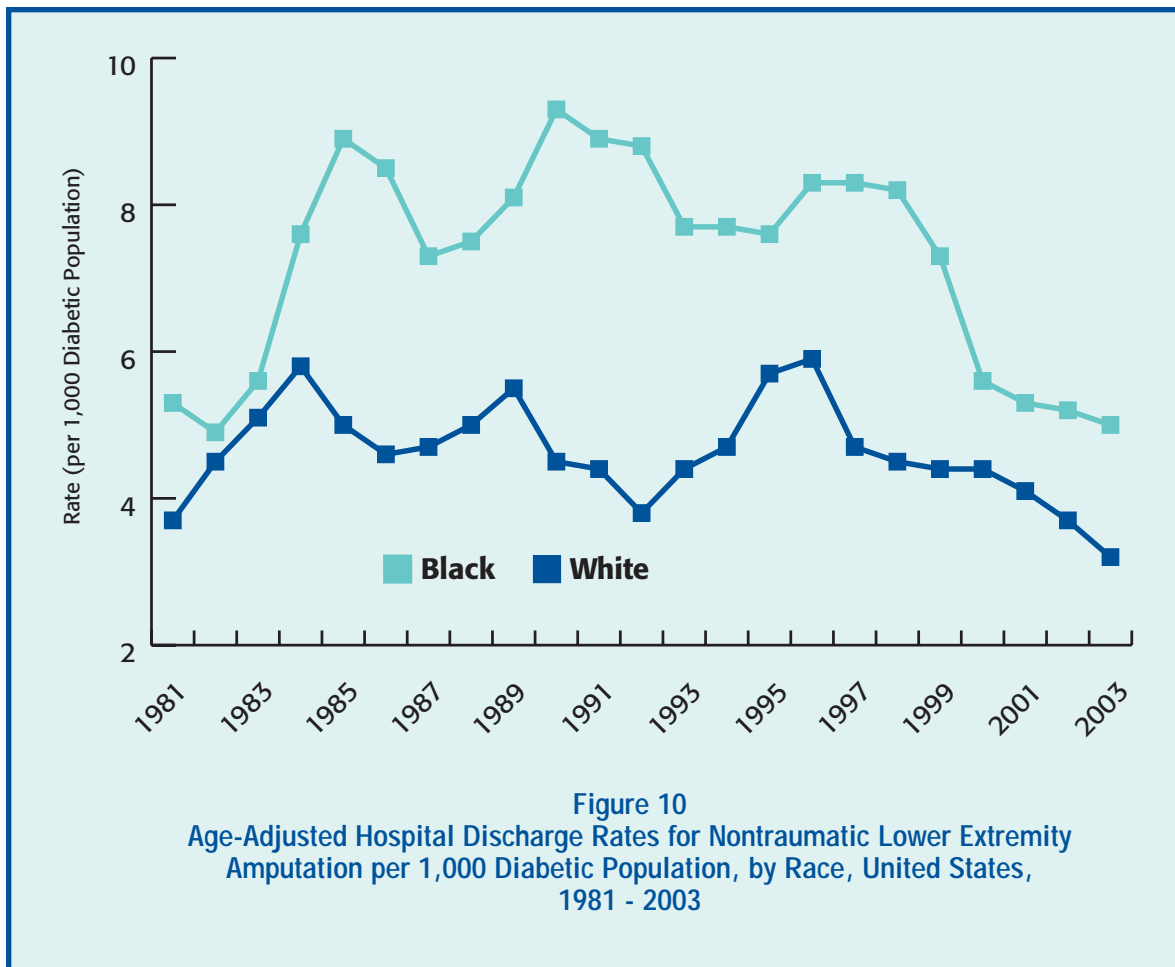
Estimated Diabetes Prevalence by County, Alabama 2005		
Alabama(state) .. 9.74%	Dale..... 9.40%	Marengo 11.70%
Autauga 9.00%	Dallas 11.90%	Marion 9.50%
Baldwin 9.90%	DeKalb 8.80%	Marshall 8.90%
Barbour 10.30%	Elmore 8.80%	Mobile..... 9.90%
Bibb..... 9.20%	Escambia 10.20%	Monroe..... 11.00%
Blount..... 8.80%	Etowah 9.80%	Montgomery..... 9.90%
Bullock..... 11.50%	Fayette 10.00%	Morgan 9.10%
Butler 11.40%	Franklin 9.00%	Perry..... 12.50%
Calhoun 9.70%	Geneva 9.90%	Pickens..... 11.30%
Chambers..... 10.90%	Greene 13.60%	Pike..... 9.80%
Cherokee 9.90%	Hale..... 11.40%	Randolph 10.20%
Chilton 9.10%	Henry 11.00%	Russell 10.40%
Choctaw..... 11.70%	Houston 9.90%	St. Clair..... 8.90%
Clarke 10.90%	Jackson..... 9.20%	Shelby..... 8.40%
Clay..... 10.10%	Jefferson..... 10.20%	Sumter 12.20%
Cleburne..... 9.20%	Lamar 9.70%	Talladega 10.00%
Coffee 9.90%	Lauderdale..... 9.40%	Tallapoosa 10.60%
Colbert 10.00%	Lawrence 9.40%	Tuscaloosa 9.00%
Conecuh..... 11.40%	Lee..... 7.70%	Walker..... 9.40%
Coosa 10.60%	Limestone..... 8.80%	Washington 10.40%
Covington..... 10.20%	Lowndes..... 12.20%	Wilcox..... 12.20%
Crenshaw..... 10.70%	Macon..... 12.80%	Winston..... 9.00%
Cullman 9.00%	Madison 9.40%	

Because Alabama does not have a hospital discharge reporting system, it is not possible to know exactly how many lower extremity amputations have been performed and what proportion of those were performed in persons with diabetes. Nationally, however, it has been reported that rates of nontraumatic lower extremity amputation are substantially higher for blacks with diabetes compared to whites with diabetes and that the rate differences increase with age (see Figure 10).

People with diabetes should have a complete foot exam each year. Amputations have been necessary for some persons who have atherosclerosis obliterans, which results in closing of the blood vessels, high long term blood glucose levels, or who need dialysis. Foot ulcers may be caused by

peripheral neuropathy, nerve damage, pressure on the sole of the foot, repeated rubbing against the foot, and injuries caused by things like improper cutting of toenails or falls. Doctors can check for calluses, hammertoes, bunions, dry skin, fissures (cracks), other skin problems and joint flexibility. Loss of feeling in the feet can keep people from realizing they are getting a foot ulcer. Monofilament, a thin plastic thread to touch the foot, or other tests may be used to check for loss of feeling. People with diabetes should talk to their doctor about the right footwear, ways to check their feet every day, and any foot problems they may have.

Costs are highest, of course, for those patients with higher HbA1c levels over time.



Once an individual has diabetes, disease management and the prevention of complications become the highest priorities. The Centers for Disease Control and Prevention, along with the American Diabetes Association, recommend the following:

Care Activities	Frequency/ Recommendation
General	
Pneumonia vaccination	Once in a lifetime or as recommended by doctor
Flu vaccination	Once each flu season
Diabetes Control	
Self-monitoring of blood glucose	Type 1 – 3 to 4 times a day Type 2 – at least daily
HbA1c (percentage)	At least 2 times a year or more frequently as recommended by doctor; maintain less than 7%
Prevention	
Diabetic eye disease (retinopathy)	Yearly dilated eye exam
Kidney disease (nephropathy)	
Urinalysis for protein	Yearly
Microalbumin	Yearly (if urinalysis is negative for protein)
Serum creatinine	Yearly
Nerve disease (neuropathy)	At least yearly
Comprehensive foot exam	Foot exam with each doctor visit Daily by patient
Cardiovascular Assessment	
Blood pressure	Every visit – maintain less than 130/80
Cholesterol	Annually
LDL cholesterol	Less than or equal to 100 mg/dL
HDL cholesterol	Greater than 45 mg/dL
Total cholesterol	Less than 200 mg/dL
Triglycerides	Less than 200 mg/dL
Healthy Lifestyle Habits	
Exercise	20-45 minutes, 3 days a week, or as doctor recommends
Physical activity	Incorporate physical activity into daily activities
Smoking	No tobacco use
Weight management	Achieve and maintain healthy weight

The Centers for Disease Control and Prevention’s Diabetes Control Program has set national objectives related to increasing the percentage of persons with diabetes who receive the recommended dilated eye exams, foot exams, glycosylated hemoglobin (HbA1c) testing, and influenza and pneumococcal vaccinations. Alabama’s Diabetes Program, in partnership with physicians, nurses, public health practitioners, eye specialists, diabetes educators, and other concerned groups

and individuals throughout the state, is actively working to ensure that persons with diabetes in Alabama have the appropriate information about their disease and its management and have access to comprehensive, affordable care.

The National Kidney Foundation recommends the use of the estimated glomerular filtration rate (EGFR) to indicate if a person may have early chronic disease or may indicate a need to be referred to a specialist.

The Behavioral Risk Factor Surveillance System provides annual information concerning the program's progress toward 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 the immediate assistance of a health care professional. Other activities - for example, having a dilated eye exam, a flu shot, or HbA1c testing – requires the direct assistance of a physician or other health care provider. In 2005 the survey indicated that:

- ▶ More than half of persons with diabetes reported that they check their blood glucose levels at least daily. A somewhat larger percentage (71.14%) indicated that their physician had checked HbA1c levels at least twice within the past year.
- ▶ Approximately two-thirds (69.27%) of the persons with diabetes reported that they check their own feet daily and a similar number (71.06%) reported that a health care professional had performed at least one foot exam within the past 12 months.
- ▶ Similarly, nearly two-thirds (66.78%) of persons with diabetes reported having a dilated eye exam within the past year.
- ▶ Approximately half of the persons with diabetes reported that they had received a flu vaccination within 12 months (46.7%) or a pneumonia vaccination at some point in their lifetimes (48.4%).

Patient-completed care activities



Physician-completed care activities

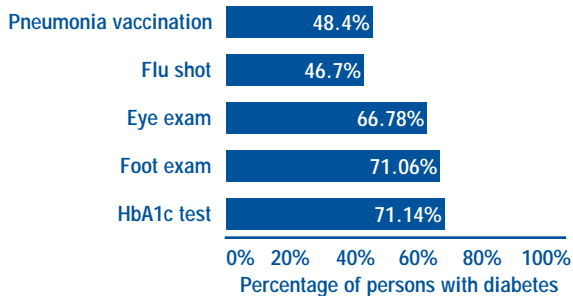


Figure 11
Preventive care among persons with diabetes, Alabama 2005

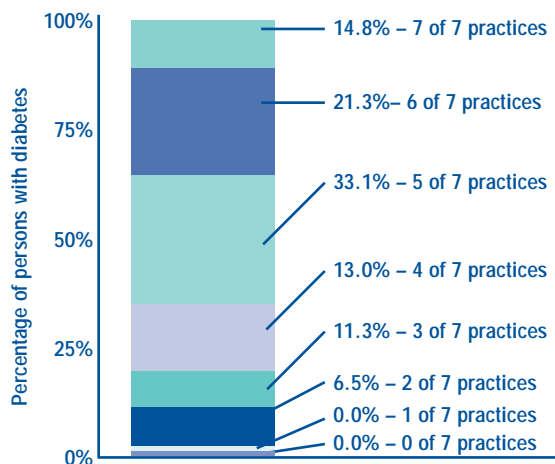


Figure 12
Patterns of preventive care among persons with diabetes, Alabama 2005

Care practices: Dilated eye exam, foot exam, flu shot, pneumonia vaccination, ≥ 2 HbA1c tests, daily foot check, daily blood sugar check

To characterize the degree to which persons with diabetes comply with the preventive care recommendations, responses by persons with diabetes to the 2005 Behavioral Risk Factor Surveillance System questions concerning preventive care were summed to indicate the number of recommendations met for each individual. The patterns of care that emerged are depicted in Figure 12. One in four persons with diabetes reported that they engaged in at least 6 of the 7 care practices, and 85% of the people with diabetes reported they engaged in at least four or more of the seven recommended practices. What is troublesome is the 6.5% of people with diabetes reporting they engaged in only two of the seven preventive care practices.

Diabetes

Access to Care

It is well documented that early diagnosis of diabetes and the control of blood sugar levels are important components in the fight to reduce the burden of diabetes in Alabama. Good glycemic control is key to preventing complications associated with diabetes. Prevention of the serious potential complications of disease – including heart, kidney, and eye disease, as well as lower extremity amputations – serves to improve the quality of life for persons with diabetes and reduce the costs associated with care over the 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 dramatically¹.

Persons with diabetes receive their primary care from a number of health care professionals – primary care physicians (internists, family practitioners, general practitioners, gerontologists), endocrinologists, nurse practitioners, and diabetes educators. They also receive specialty care from cardiologists, optometrists and ophthalmologists, podiatrists, and dentists. Each of these specialties and others play a key role in the treatment of diabetes and the prevention of further disease and complications.

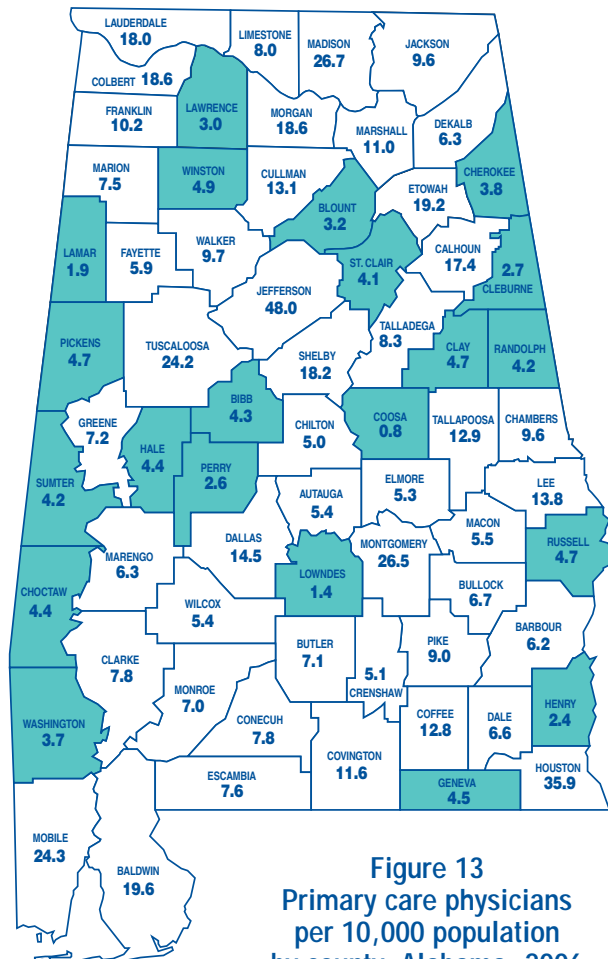


Figure 13
Primary care physicians
per 10,000 population
by county, Alabama, 2006

Data source: Alabama Department of Public Health,
Center for Health Statistics

However, health care professionals are not evenly distributed across the state. As the maps in this section show, health care for diabetes tends to be concentrated in counties with larger population bases, the more urban areas of the state, with many fewer resources available to those persons who live in more rural areas. Over 30 percent of Alabama's counties have five or fewer primary care physicians per 10,000 population, and the majority of counties (55) do not have an endocrinologist practicing within the county. **More than half (42) do not have a diabetes educator in the county, according to the American Association of Diabetes Educators.**

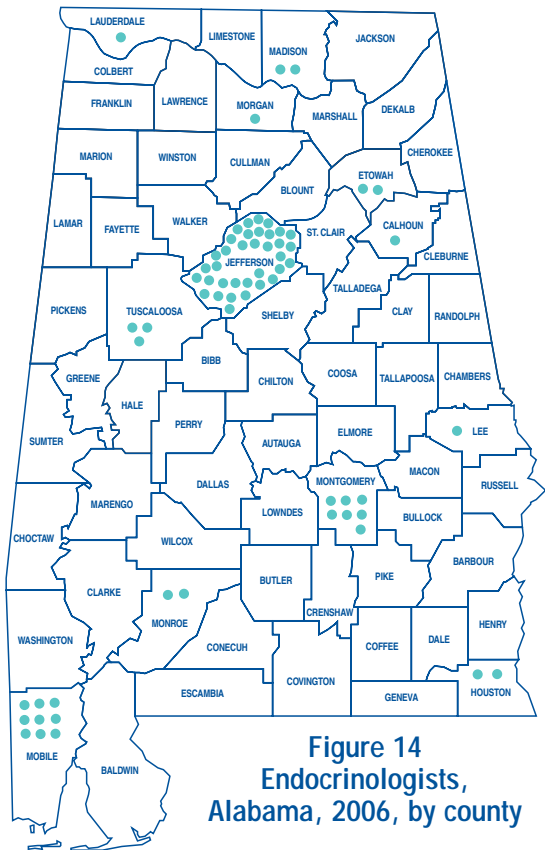


Figure 14
Endocrinologists,
Alabama, 2006, by county

Source: Alabama Board of Medical Examiners, 2006

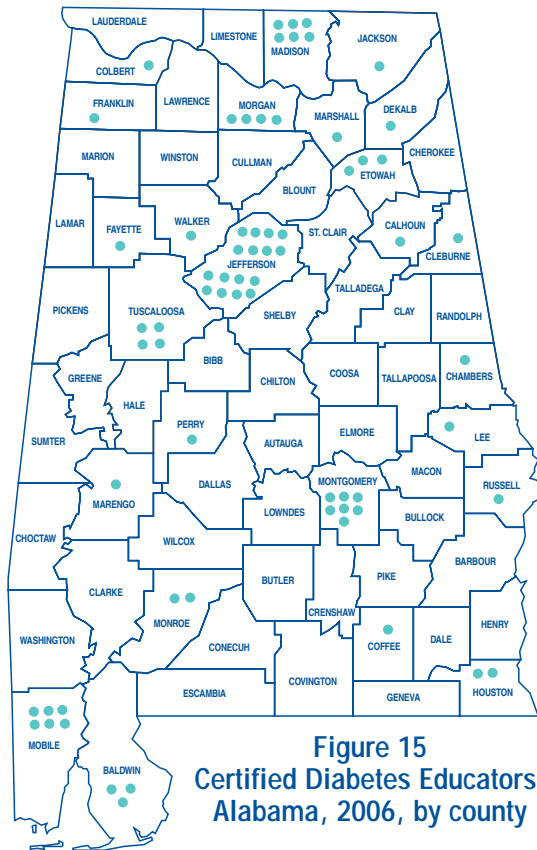


Figure 15
Certified Diabetes Educators,
Alabama, 2006, by county

Source: American Association of Diabetes Educators, 2006

This geographic disparity in health care resources means that those persons with diabetes who live in areas with more limited access to care incur greater costs associated with getting care (for example, time, travel expenses, and lost wages). Unfortunately, many of these persons also live in areas of the state that have very high levels of poverty. On the 2005 Behavioral Risk Factor Surveillance Survey, 9 percent of persons with diabetes reported that they were *not currently covered by any health plan* and, thus, incurred more out-of-pocket expenses for health care. Unfortunately, in the year 2005, results from the BRFSS indicated that 18.9 percent of the persons with diabetes (that is, an estimated 30,000 persons statewide) had at some time within the previous 12 months been *unable to afford a visit to the doctor*.

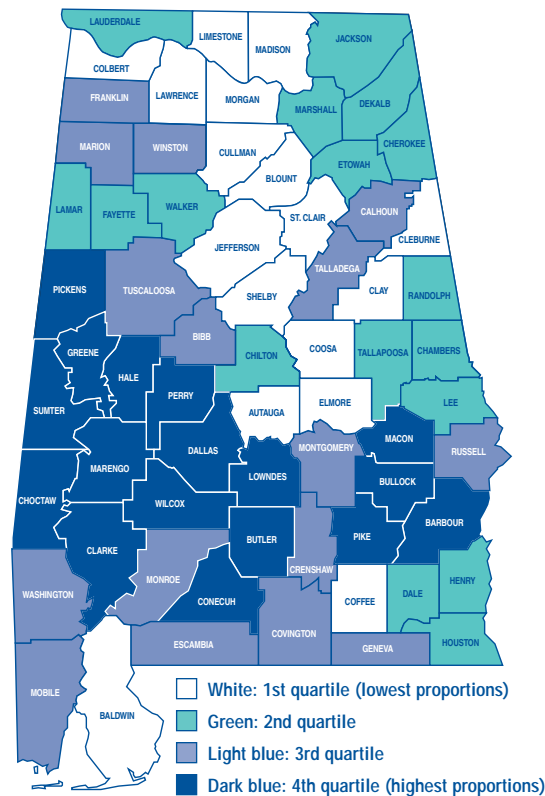


Figure 16
Percentage of persons in poverty by county,
Alabama, 2003 (estimated)

Source: Center for Demographic Research, Auburn University Montgomery and Center for Health Statistics.

The prevention of diabetes depends ultimately on the reduction of risk factors in individuals and in the population overall. The major risk factor for diabetes is obesity, which is influenced by physical activity and eating habits.

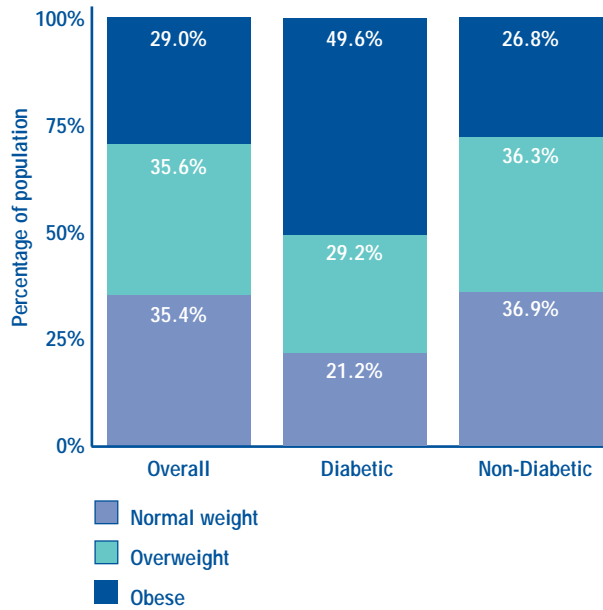


Figure 17
Weight status, by body mass index, Alabama adults, 2005

The Behavioral Risk Factor Surveillance Survey (BRFSS) is the primary source of information concerning the status of Alabamians on the critical risk factor of weight and influential behaviors. As noted in Figure 17, this survey in 2005 indicated that roughly 65% of Alabamians could be categorized as being overweight or obese, using reported height and weight to calculate body mass index. The trend in the past decade, both in Alabama and in the United States overall, indicates that the percentage of obesity is rising over time. Further, as seen in Figure 17, persons with diabetes are more likely to be obese or overweight than persons without diabetes.

The BRFSS also provides information concerning physical activity and nutritional patterns in the state. The results in 2005 indicate that approximately 60% of Alabama adults with diabetes reported engaging in physical activity and 71.5% of Alabama non-diabetic adults reported engaging in physical activity within the previous month. CDC guidelines include daily moderate physical activity.

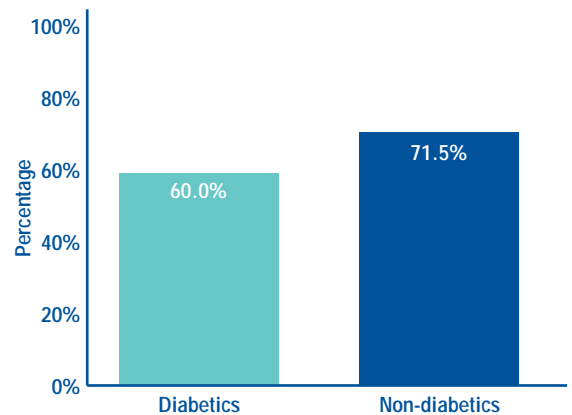


Figure 18
Physical activity during the past month, BRFSS 2005

Every two years respondents to the BRFSS have been asked to report on their consumption of fruits and vegetables, so that their compliance with the USDA or FDA recommendation to eat at least 5 servings of fruits and vegetables per day could be assessed. In the BRFSS 2005, **nearly 80 percent of Alabama adults reported not eating enough fruits and vegetables.** Again, the trend has been essentially stable over the decade, and the pattern in Alabama is not substantially different from the pattern reported by the CDC for the nation as a whole.

Of particular concern is the finding that a similar pattern of risk exists among Alabama teens. The Youth Risk Behavior Survey (YRBS) is administered to Alabama youth (grades 9 through 12) every two years and provides important information about the health behaviors of the state's youth. In 2005, only approximately **15 percent of Alabama teens reported that they ate the recommended 5 or more servings per day of fruits and/or vegetables** (see Figure 19). These proportions were substantially below the national averages.

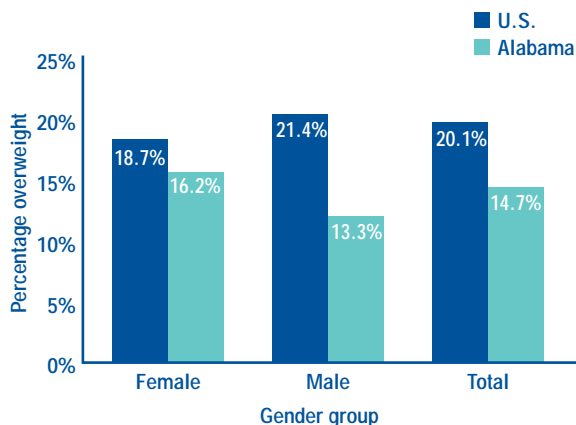


Figure 19
Percentage Alabama teens (grades 9-12) reporting consumption of ≥ 5 servings/day of fruits/vegetables

Source: YRBS, 2005

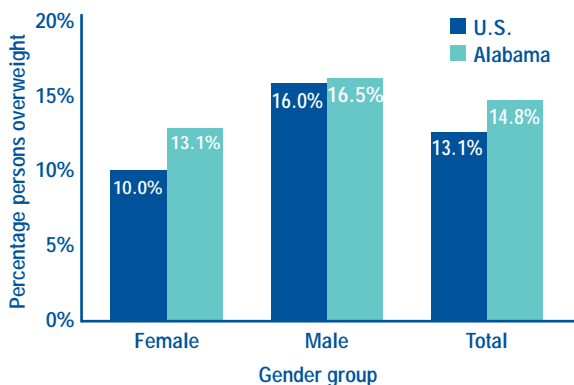


Figure 20
Percentage Alabama teens (grades 9-12) categorized as overweight*

* YRBS, 2005; calculated by CDC from self-reported height and weight; Overweight = ≥ 95th percentile for age and sex

Just over half (58%) of the Alabama teens completing the YRBS reported that they engaged in vigorous physical activity. This is below the proportion reported nationally. Similarly, less than half (45%) of Alabama students reported that they participate in physical daily education classes, compared to 33 percent nationally. These results suggest that less than half of Alabama's youth engage in regular, sustained physical activity at home or at school. Alabama teens also reported higher rates of being overweight than national rates (see Figure 20).

Taken together, 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 healthy eating, 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

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

- ▶ Obesity
- ▶ Hypertension
- ▶ High triglyceride levels
- ▶ Low levels of High Density Lipoproteins

Positive changes in these risk factors can delay or prevent the occurrence of Type 2 diabetes.

TO DELAY OR PREVENT THE ONSET OF TYPE 2 DIABETES:

- ▶ Achieve and maintain a healthy weight
- ▶ Be more physically active in your daily life
- ▶ Maintain a healthy blood pressure
- ▶ Eat a healthy diet
 - Eat foods rich in fiber
 - Eat the recommended 5 to 9 servings of fruits and vegetables daily
 - Use less salt
- ▶ Have your cholesterol checked regularly and keep it low
- ▶ Stop smoking

DEFINITIONS

- Age-adjusted rates or proportions:** A rate calculated in a manner that allows for the comparison of populations with different age structures.
- Overweight:** A body mass index (BMI) greater than 25.0 kg/m². Using weight (in pounds) and height (in inches), BMI is calculated as 705 times weight divided by the square of the height.
- Prevalence:** The percent (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.
- Normal weight:** Neither overweight nor obese (BMI < 25.0).
- Overweight:** BMI greater than or equal to 25.0 but less than 30.0.
- Obese:** BMI greater than or equal to 30.0.
- Insufficient physical activity:** (1) Engages 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 on fewer than 5 days a week; or (2) On days when engages 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 3 days a week for a total of at least 20 minutes per day.
- Inactive:** Engages in moderate activity for less than 10 minutes weekly and engages in vigorous physical 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 5 or more days per week, or vigorous activity for 20 or more minutes per day on 3 or more days per week.
-

METHODS

All statistical analyses were completed using SAS (Version 8.2) and/or SUDAAN. All analyses of Behavioral Risk Factor Surveillance Survey and Youth Risk Behavior Survey were weighted analyses, taking into consideration the surveys' designs and sampling frames. Age-adjusting was employed as appropriate to adjust for differences in age distributions between groups being compared. State-to-national comparisons were adjusted using the U.S. Year 2000 standard million; within-state comparisons were adjusted using the Alabama 2000 population as the standard.

Figure 7: Mortality data is provided by the Center for Health Statistics, Alabama Department of Public Health

Figure 8: The proportion adults with diabetes in each county are synthetic estimates. The state-wide prevalence of diabetes for 12 age-sex-race groups was calculated by utility data from the 2005 Behavioral Risk Factor Surveillance System surveys. The prevalences were applied to the demographic distribution for each county (as provided by the United States Census Bureau 2005 county estimates) to calculate the estimated number and proportion of persons in the county with diabetes. Thus, counties with relatively more blacks or older residents will have a higher synthetic estimate because blacks or older blacks or older residents are more likely to report they have diabetes. While these are statistically valid methods to estimate county level prevalence, patterns should be interpreted cautiously.

