# National Diabetes Fact Sheet
## United States, 2003

## General Information

### What is diabetes?

Diabetes mellitus is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can be associated with serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications.

### Types of diabetes

**Type 1** diabetes was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes. Type 1 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. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. Type 1 diabetes may account for 5% to 10% of all diagnosed cases of diabetes. Risk factors for type 1 diabetes may include autoimmune, genetic, and environmental factors.

**Type 2** diabetes was previously called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes may account for about 90% to 95% of all diagnosed cases of diabetes. It usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. African Americans, Hispanic/Latino Americans, American Indians, and some Asian Americans and Native Hawaiians or Other Pacific Islanders are at particularly high risk for type 2 diabetes. Type 2 diabetes is increasingly being diagnosed in children and adolescents.

**Gestational diabetes** is a form of glucose intolerance that is diagnosed in some women during pregnancy. Gestational diabetes occurs more frequently among African Americans, Hispanic/Latino Americans, and American Indians. It is also more common among obese women and women with a family history of diabetes. During pregnancy, gestational diabetes requires treatment to normalize maternal blood glucose levels to avoid complications in the infant. After pregnancy, 5% to 10% of women with gestational diabetes are found to have type 2 diabetes. Women who have had gestational diabetes have a 20% to 50% chance of developing diabetes in the next 5-10 years.

**Other specific types** of diabetes result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, drugs, malnutrition, infections, and other illnesses. Such types of diabetes may account for 1% to 5% of all diagnosed cases of diabetes.

## Treating diabetes

- To survive, people with type 1 diabetes must have insulin delivered by injections or a pump.
- Many people with type 2 diabetes can control their blood glucose by following a careful diet and exercise program, losing excess weight, and taking oral medication.
- Many people with diabetes also need to take medications to control their cholesterol and blood pressure.
- Diabetes self-management education is an integral component of medical care.
- Among adults with diagnosed diabetes, 12% take both insulin and oral medications, 19% take insulin only, 53% take oral medications only, and 15% do not take either insulin or oral medications.

## Prediabetes: Impaired glucose tolerance and impaired fasting glucose

- Prediabetes is a term used to distinguish people who are at increased risk of developing diabetes. People with prediabetes have impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Some people may have both IFG and IGT.
- IFG is a condition in which the fasting blood sugar level is elevated (100 to 125 milligrams per deciliter or mg/dL) after an overnight fast but is not high enough to be classified as diabetes.
- IGT is a condition in which the blood sugar level is elevated (140 to 199 mg/dL after a 2-hour oral glucose tolerance test), but is not high enough to be classified as diabetes.
- In a cross-section of U.S. adults aged 40-74 years who were tested from 1988 to 1994, 33.8% had IFG, 15.4% had IGT, and 40.1% had prediabetes (IGT or IFG or both). Were these percentages applied to the 2000 U.S. population, about 35 million adults aged 40-74 would have IFG, 16 million would have IGT, and 41 million would have prediabetes.
- Progression to diabetes among those with prediabetes is not inevitable. Studies suggest that weight loss and increased physical activity among people with prediabetes prevent or delay diabetes and may return blood glucose levels to normal.
- People with prediabetes are already at increased risk for other adverse health outcomes such as heart disease and stroke.

## Prevention or delay of diabetes

Research studies have found that lifestyle changes can prevent or delay the onset of type 2 diabetes among high-risk adults. These studies included people with IGT and other high-risk characteristics for developing diabetes. Lifestyle interventions included diet and moderate-intensity physical activity (such as walking for 2 1/2 hours each week). In the Diabetes Prevention Program, a large prevention study of people at high risk for diabetes, the development of diabetes was reduced 58% over 3 years.

Studies have also shown that medications have been successful in preventing diabetes in some population groups. In the Diabetes Prevention Program, people treated with the drug metformin reduced their risk of developing diabetes by 31% over 3 years. Treatment with metformin was most effective among younger, heavier people (those 25-40 years of age who were 50 to 80 pounds overweight) and less effective among older people and people who were not as overweight. Similarly, in the STOP-NIDDM Trial, treatment of people with IGT with the drug acarbose reduced the risk of developing diabetes by 25% over 3 years. Other medication studies are ongoing. In addition to preventing progression from IGT to diabetes, both lifestyle changes and medication have also been shown to increase the probability of reverting from IGT to normal glucose tolerance.

There are no known methods to prevent type 1 diabetes. Several clinical trials are currently in progress or being planned.

## Prevention of diabetes complications

Diabetes can affect many parts of the body and can lead to serious complications such as blindness, kidney damage, and lower-limb amputations. Working together, people with diabetes and their health care providers can reduce the occurrence of these and other diabetes complications by controlling the levels of blood glucose, blood pressure, and blood lipids and by receiving other preventive care practices in a timely manner.

## Glucose control

- Research studies in the United States and abroad have found that improved glycemic control benefits people with either type 1 or type 2 diabetes. In general, for every 1% reduction in results of A1C blood tests (e.g., from 8.0% to 7.0%), the risk of developing microvascular diabetic complications (eye, kidney, and nerve disease) is reduced by 40%.

## Blood pressure control

- Blood pressure control can reduce cardiovascular disease (heart disease and stroke) by approximately 33% to 50% and can reduce microvascular disease (eye, kidney, and nerve disease) by approximately 33%.
- In general, for every 10 millimeters of mercury (mm Hg) reduction in systolic blood pressure, the risk for any complication related to diabetes is reduced by 12%.

## Control of blood lipids

- Improved control of cholesterol or blood lipids (for example, HDL, LDL, and triglycerides) can reduce cardio-vascular complications by 20% to 50%.

## Preventive care practices for eyes, kidneys, and feet

- Detecting and treating diabetic eye disease with laser therapy can reduce the development of severe vision loss by an estimated 50% to 60%.
- Comprehensive foot care programs can reduce amputation rates by 45% to 85%.
- Detecting and treating early diabetic kidney disease by lowering blood pressure can reduce the decline in kidney function by 30% to 70%. Treatment with ACE inhibitors and angiotensin receptor blockers (ARBs) are more effective in reducing the decline in kidney function than other blood pressure lowering drugs.

# National Estimates on Diabetes

## Methods

The data in this fact sheet were derived from various surveys of the Centers for Disease Control and Prevention (CDC)—the National Health Interview Survey (NHIS), the National Health and Nutrition Examination Surveys (NHANES III and NHANES 1999-2000), the National Hospital Discharge Survey, and surveys conducted through the Behavioral Risk Factor Surveillance System (BRFSS). Other data sources include CDC's National Vital Statistics System, the outpatient database of the Indian Health Service (IHS), the U.S. Renal Data System of the National Institutes of Health (NIH), and published studies. Many of the estimates were calculated from these data sources by CDC and NIH staff.

Estimates of the total number of people with diabetes and the prevalence of diabetes (both diagnosed and undiagnosed) per 100 population are model-based estimates calculated from NHIS data, NHANES data, and population estimates. Age-race-sex-specific diabetes prevalence estimates from the 1999-2001 NHIS and the 2002 outpatient database of the IHS were applied to 2002 census estimates to calculate the number of diagnosed cases of diabetes. The number of persons with undiagnosed diabetes was calculated by applying age-specific estimates from NHANES 1999-2000 to 2002 census estimates. Total prevalence was calculated based on the number of people with both diagnosed and undiagnosed diabetes.

The summary estimates reported in this fact sheet have some variability due to the limits of the measurements and the estimation procedures. However, it is the consensus opinion of the participating organizations that they are the best current estimates of the burden of diabetes. More detail on the data sources, references, and methods are available at http://www.cdc.gov/diabetes/pubs/factsheet.htm.

**Total prevalence of diabetes in the United States, all ages, 2002**

**Total: 18.2 million people — 6.3% of the population — have diabetes.**
**Diagnosed: 13.0 million people**
**Undiagnosed: 5.2 million people**

## Prevalence of diagnosed diabetes among people under 20 years of age, United States, 2002

About 206,000 people under 20 years of age have diabetes. This represents 0.25% of all people in this age group. Approximately one in every 400 to 500 children and adolescents has type 1 diabetes. Although type 2 diabetes is a problem among youth, nationally representative data to monitor diabetes trends among youth are not available. Clinic-based reports and regional studies indicate that type 2 diabetes is becoming more common among children and adolescents, particularly in American Indians, African Americans, and Hispanic/Latinos.

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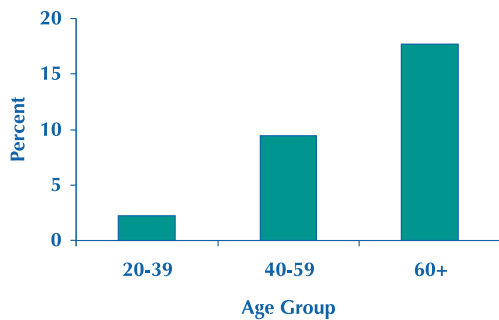## Total prevalence of diabetes among people aged 20 years or older, United States, 2002
**Age 20 years or older: 18.0 million; 8.7% of all people in this age group have diabetes.**
**Age 60 years or older: 8.6 million; 18.3% of all people in this age group have diabetes.**
**Men: 8.7 million; 8.7% of all men aged 20 years or older have diabetes.**
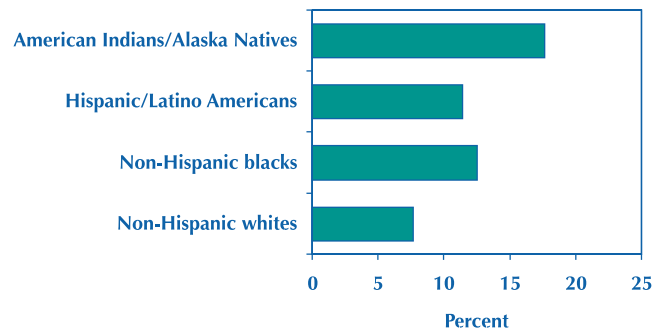**Women: 9.3 million; 8.7% of all women aged 20 years or older have diabetes.**

### Total prevalence of diabetes in people aged 20 years or older, by age group—United States, 2002

Source: 1999–2001 National Health Interview Survey and 1999-2000 National Health and Nutrition Examination Survey estimates projected to year 2002

### Age-adjusted total prevalence of diabetes in people aged 20 years or older, by race/ethnicity—United States, 2002

Source: 1999–2001 National Health Interview Survey and 1999-2000 National Health and Nutrition Examination Survey estimates projected to year 2002. 2002 outpatient database of the Indian Health Service.

## Total prevalence of diabetes by race/ethnicity among people aged 20 years or older, United States, 2002

**Non-Hispanic whites:** 12.5 million; 8.4% of all non-Hispanic whites aged twenty years or older have diabetes.

**Non-Hispanic blacks:** 2.7 million; 11.4% of all non-Hispanic blacks aged twenty years or older have diabetes. On average, non-Hispanic blacks are 1.6 times as likely to have diabetes than non-Hispanic whites of similar age.
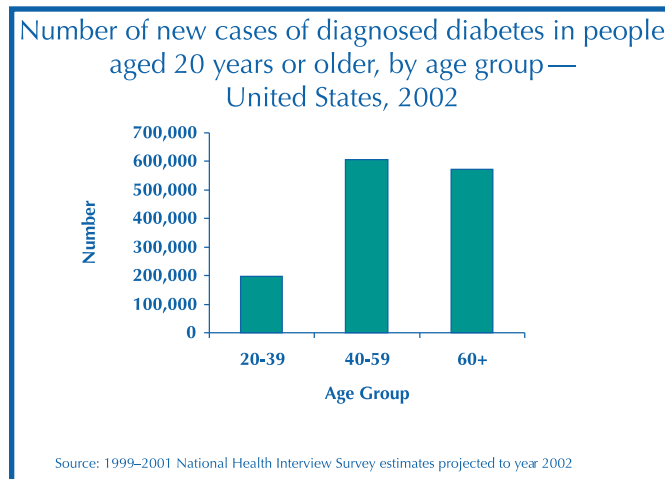
**Hispanic/Latino Americans:** 2.0 million; 8.2% of all Hispanic/Latino Americans aged twenty years or older have diabetes. On average, Hispanic/Latino Americans are 1.5 times more likely to have diabetes than non-Hispanic whites of similar age. Mexican Americans, the largest Hispanic/Latino subgroup, are over twice as likely to have diabetes as non-Hispanic whites of similar age. Similarly, residents of Puerto Rico are 1.8 times more likely to have diagnosed diabetes than U.S. non-Hispanic whites. Sufficient data are not available to derive more specific current estimates for other Hispanic/Latino groups.

**American Indians and Alaska Natives who receive care from the Indian Health Service (IHS):** 110,814; 14.9% of American Indians and Alaska Natives aged 20 years or older and receiving care from IHS have diabetes. At the regional level, diabetes is least common among Alaska Natives (8.2%) and most common among American Indians in the southeastern United States (27.8%) and southern Arizona (27.8%). On average, American Indians and Alaska Natives are 2.3 times as likely to have diabetes as non-Hispanic whites of similar age.

**Asian Americans and Native Hawaiian or other Pacific Islanders:** In 2002, Native Hawaiians and Japanese and Filipino residents of Hawaii aged twenty years or older were approximately 2 times as likely to have diagnosed diabetes as white residents of Hawaii of similar age. Prevalence data for diabetes among other Pacific Islanders or Asian Americans are limited, but some groups within these populations are at increased risk for diabetes.

## Incidence of diabetes, United States, 2002

**New cases diagnosed per year: 1.3 million people aged 20 years or older.**



Number of new cases of diagnosed diabetes in people aged 20 years or older, by age group— United States, 2002

Source: 1999–2001 National Health Interview Survey estimates projected to year 2002

## Deaths among people with diabetes, United States, 2000

- Diabetes was the sixth leading cause of death listed on U.S. death certificates in 2000. This ranking is based on the 69,301 death certificates in which diabetes was listed as the underlying cause of death. Altogether, diabetes contributed to 213,062 deaths.
- Diabetes is likely to be underreported as a cause of death. Studies have found that only about 35% to 40% of decedents with diabetes have diabetes listed anywhere on the death certificate and only about 10% to 15% have it listed as the underlying cause of death.
- Overall, the risk for death among people with diabetes is about 2 times that of people without diabetes.

## Complications of diabetes in the United States

**Heart disease and stroke**

- Heart disease is the leading cause of diabetes-related deaths. Adults with diabetes have heart disease death rates about 2 to 4 times higher than adults without diabetes.
- The risk for stroke is 2 to 4 times higher among people with diabetes.
- About 65% of deaths among people with diabetes are due to heart disease and stroke.

**High blood pressure**

- About 73% of adults with diabetes have blood pressure greater than or equal to 130/80 mm Hg or use prescription medications for hypertension.

**Blindness**

- Diabetes is the leading cause of new cases of blindness among adults aged 20-74 years.
- Diabetic retinopathy causes 12,000 to 24,000 new cases of blindness each year.

### Kidney disease
- Diabetes is the leading cause of end-stage renal disease, accounting for 44 percent of new cases.
- In 2001, 42,813 people with diabetes began treatment for end-stage renal disease.
- In 2001, a total of 142,963 people with end-stage renal disease due to diabetes were living on chronic dialysis or with a kidney transplant.

### Nervous system disease
- About 60% to 70% of people with diabetes have mild to severe forms of nervous system damage. The results of such damage include impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, and other nerve problems.
- Severe forms of diabetic nerve disease are a major contributing cause of lower-extremity amputations.

### Amputations
- More than 60% of nontraumatic lower-limb amputations occur among people with diabetes.
- In 2000-2001, about 82,000 nontraumatic lower-limb amputations were performed annually among people with diabetes.

### Dental disease
- Periodontal (gum) disease is more common among people with diabetes.   Among young adults, those with diabetes have about twice the risk of those without diabetes.
- Almost one-third of people with diabetes have severe periodontal diseases with loss of attachment of the gums to the teeth measuring 5 millimeters or more.

### 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 and third trimesters of pregnancy can result in excessively large babies, posing a risk to the mother and the child.

### Other complications
- Uncontrolled diabetes often leads to biochemical imbalances that can cause acute life-threatening events, such as diabetic ketoacidosis and hyperosmolar (nonketotic) coma.
- People with diabetes are more susceptible to many other illnesses and, once they acquire these illnesses, often have worse prognoses. For example, they are more likely to die with pneumonia or influenza than people who do not have diabetes.

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### Cost of diabetes in the United States, 2002

**Total (direct and indirect): $132 billion**
**Direct medical costs: $92 billion**
**Indirect costs: $40 billion (disability, work loss, premature mortality)**

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*These data are based on a study conducted by the Lewin Group, Inc. for the American Diabetes Association and are 2002 estimates of both the direct costs (cost of medical care and services) and indirect costs (costs of short-term and permanent disability and of premature death) attributable to diabetes. This study uses a specific cost-of-disease methodology to estimate the health care costs that are due to diabetes.*

## Acknowledgments

## Note

## Citation

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