Attention:

A Major Change in Methods from the National Diabetes Fact Sheet, 2007

In the National Diabetes Fact Sheet, 2011, we defined undiagnosed diabetes and prediabetes based on both fasting glucose and hemoglobin A1c (A1c) levels. This is in contrast to the National Diabetes Fact Sheet, 2007, that used fasting glucose levels only.

Diagnosed and undiagnosed diabetes in the United States, all ages, 2010

Methods:
The total number of people with diabetes is the sum of the number of those aged 20 years or older with diagnosed or undiagnosed diabetes and the number of those younger than 20 years with diagnosed diabetes. Detailed methods are available in the next section for those aged 20 years or older and in the following section for those younger than 20 years.

The total number of people with diagnosed diabetes in 2010 is the sum of the estimated numbers of those younger than 20 years and those aged 20 years or older with diagnosed diabetes.

The total number of people with undiagnosed diabetes in 2010 is the estimated number of those aged 20 years or older with undiagnosed diabetes. Estimates of undiagnosed diabetes for people younger than 20 years are not available.

These estimates have some variability due to the limits of the measurements and estimation procedures. The procedures assumed that percentages of adults with diabetes (diagnosed and undiagnosed) in 2010 were the same as they were in earlier time periods (e.g., 2005–2008), and that the percentages of adults with diabetes in the resident population are identical to those in the civilian, noninstitutionalized population. Deviations from these assumptions may result in over- or under-estimated numbers and percentages.

Diagnosed and undiagnosed diabetes among people aged 20 years or older, United States, 2010

Data source:

Method:
The percentage of people aged 20 years or older with diabetes (diagnosed or undiagnosed) was obtained using the fasting subsample from the 2005–2008 NHANES data. People who self-reported having been told by a doctor or health professional that they had diabetes were classified as having diagnosed diabetes. Those without a history of diabetes but with a fasting plasma glucose greater than or equal to 126 mg/dl or an A1c level greater than or equal to 6.5% were classified as having undiagnosed diabetes. We used both fasting glucose and A1c levels to define undiagnosed diabetes because these are the tests most frequently used in clinical settings. These tests have limitations in identifying populations with undiagnosed diabetes and the implications of the age and race differences between groups in the estimates of undiagnosed diabetes are not known. Research is ongoing to ascertain the best use of laboratory blood tests to detect people who may have undiagnosed diabetes (see the National Glycosylated Standardization Program at http://www.ngsp.org/) and to improve the understanding of who has undiagnosed diabetes. The estimated percentage of diagnosed or undiagnosed diabetes was then applied to the 2010 U.S. resident population aged 20 years or older to derive the total number of adults with diabetes. These estimates were obtained by age groups (20–44 years, 45–64 years, and 65 years or older), by sex (men and women), and by race/ethnicity (non-Hispanic whites and non-Hispanic blacks). Information on the use of NHANES data to measure diabetes (including diagnosed and
undiagnosed diabetes) is available from the following:

References:


**Diagnosed diabetes among people younger than 20 years of age, United States, 2010**

Data sources:


Methods:
The percentage of people younger than 20 years with diagnosed diabetes was obtained from the 2007–2009 NHIS data. Information on diagnosed diabetes was obtained from a knowledgeable adult family member residing in the household for people younger than 18 years, and was self-reported for people 18–19 years of age. The estimate of diagnosed diabetes was applied to the 2010 U.S. resident population younger than 20 years to derive the number of people with diagnosed diabetes in this age group. Estimates of undiagnosed diabetes for people younger than 20 years are not available.

**Racial and ethnic differences in diagnosed diabetes**

Data sources:

Indian Health Service (IHS), National Patient Information Reporting System (NPIRS).

Methods:
With the exception of diagnosed diabetes among American Indians and Alaska Natives (AI/ANs), race/ethnicity-specific estimates of diagnosed diabetes were calculated using the 2007–2009 NHIS data. People aged 20 years or older who self-reported having been told by a doctor or health professional that they had diabetes were classified as having diagnosed diabetes. The percentages were age-adjusted — using age groups 20–39, 40–59, and ≥60 — by the direct method to the 2000 U.S. Census standard population. The estimate of diagnosed diabetes for the Native Hawaiian and other Pacific Islander population was not included because the NHIS estimate for this group is considered unreliable due to a small sample size.

Diagnosed diabetes among AI/ANs was calculated using 2009 data from the IHS NPIRS. This system includes patient registration and visit data that are received directly from IHS facilities, tribally operated programs and contract health systems. These health care facilities serve about 1.9 million AI/ANs who belong to 564 federally recognized tribes in 35 states. Data for 847,319 active patients aged 20 years or older were used to calculate these estimates. Patients were considered active if they received health care services at the IHS, tribally operated programs, or contract health care facilities during the preceding three years. Diabetes cases among these patients were identified using the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) diagnostic codes 250.0–250.93 from the patient visit data. Patients were considered to have a diagnosis of diabetes if they had at least two visits with the ICD 250 diagnosis code reported during fiscal year 2009.
For many U.S. racial/ethnic minority populations, sufficient data are not available to derive total prevalence estimates of diabetes (diagnosed and undiagnosed). However, national estimates of diagnosed diabetes are available for some but not all minority groups. Resources to obtain data for minority groups at the state or local level include the Behavioral Risk Factor Surveillance System http://www.cdc.gov/brfss/stateinfo.htm and the California Health Interview Survey http://www.chis.ucla.edu. For more information on U.S. racial/ethnic minority groups, see the Census glossary http://factfinder.census.gov/home/en/epss/glossary_a.html.

New cases of diagnosed diabetes among people aged 20 years or older, United States, 2010

Data sources:


Methods:
The rate of new cases was calculated using 2007–2009 NHIS data on respondents’ age at diagnosis and age at interview. Adults who reported being diagnosed with diabetes were asked at what age they were diagnosed. We calculated the number of years since diagnosis of diabetes for each person by subtracting the age at which they were diagnosed from their current age. Adults who had a value of zero were identified as having been diagnosed with diabetes within the last year. In addition, we assumed that half of the adults who had a value of one were classified as having been diagnosed with diabetes within the last year. To calculate the rate, we used as the numerator the number of adults who were diagnosed with diabetes within the last year, and the denominator was the estimate of the adult population, excluding adults who had been diagnosed with diabetes for more than one year and adults who on the NHIS were categorized as “refused,” “don’t know,” or who had missing values on the diabetes status question. To estimate the number of new cases of diabetes in each age group in 2010, we applied the age-specific rates of new cases to 2010 estimates of the U.S. resident population without diabetes diagnosed in the past year.

New cases of diagnosed diabetes among people younger than 20 years of age, United States, 2002–2005

Data source:
SEARCH for Diabetes in Youth Study

Methods:
SEARCH is a multicenter observational study to examine diabetes among children and adolescents in the United States (see http://www.cdc.gov/diabetes/projects/diab_children.htm). The youth population being studied in 8 locations throughout the United States—more than 5 million, or 6 percent, of all American children younger than 20 years—is not nationally representative. However, the SEARCH sites were selected for their ability to reach minority populations, making this study group the largest and most racially and geographically diverse group ever involved in a youth diabetes study. It entails ascertaining new cases of physician-diagnosed diabetes in noninstitutionalized, civilian people younger than 20 years of age in 2002–2005: a) in geographically defined populations in Ohio, Washington, South Carolina and Colorado; b) among health plan enrollees in Hawaii (Hawaii Medical Service Association, Med-Quest, Kaiser Permanente Hawaii) and California (Kaiser Permanente Southern California excluding San Diego); and c) among American Indian populations in Arizona and New Mexico. Race/ethnicity-specific estimates were pooled across sites using 5 categories: non-Hispanic white (NHW), non-Hispanic black (NHB), Hispanic (H), Asian-Pacific Islander (API), and American Indian (AI). The annual total number of new cases of diabetes in people younger than 20 years of age was estimated by applying the age-, sex-, and racial/ethnic group-specific rates of new cases from SEARCH to the corresponding U.S. resident population. The data presented in the following table were derived from the March 2009 Diabetes Care supplement listed in the footnote to the table below; data for AIs were provided by the SEARCH Coordinating Center.
### References:


### Prediabetes among people aged 20 years or older, United States, 2010

**Data sources:**


**Methods:**

With the exception of American Indians, the percentage of people aged 20 years or older with prediabetes was estimated using the fasting subsample from the 2005–2008 NHANES data. People without diabetes were classified as having prediabetes if they had fasting plasma glucose values of 100 to 125 mg/dL or A1c values of 5.7% to 6.4%. The prediabetes estimate was applied to the 2010 U.S. resident population aged 20 years or older to derive the number of adults with prediabetes. We used both fasting glucose and A1c levels to define prediabetes because these are the tests most frequently used in clinical settings. These tests have limitations in identifying populations with prediabetes and the implications of the age and race differences between groups in the prediabetes estimates are not known.

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<tr>
<th>Age 0 – 9 Years</th>
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<th></th>
<th>Type 2</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Rate (per 100,000/year)</td>
<td>95% CI*</td>
<td>Rate (per 100,000/year)</td>
<td>95% CI</td>
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<td>NHW</td>
<td>24.8</td>
<td>(23.5 – 26.1)</td>
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<td>(0.1 – 0.4)</td>
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<td>NHB</td>
<td>15.7</td>
<td>(13.7 – 17.9)</td>
<td>1.1</td>
<td>(0.7 – 1.9)</td>
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<td>H</td>
<td>14.1</td>
<td>(12.4 – 16.1)</td>
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<td>(0.3 – 1.0)</td>
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<tr>
<td>API</td>
<td>6.4</td>
<td>(4.8 – 8.5)</td>
<td>0.6</td>
<td>(0.3 – 1.5)</td>
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<td>AI</td>
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<td>(2.4 – 7.5)</td>
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<td>(0.1 – 2.2)</td>
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<td>ALL</td>
<td>19.7</td>
<td>(18.8 – 20.6)</td>
<td>0.4</td>
<td>(0.3 – 0.6)</td>
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</table>

<table>
<thead>
<tr>
<th>Age 10 – 19 Years</th>
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<th></th>
<th>Type 2</th>
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<tbody>
<tr>
<td></td>
<td>Rate (per 100,000/year)</td>
<td>95% CI*</td>
<td>Rate (per 100,000/year)</td>
<td>95% CI</td>
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<tr>
<td>NHW</td>
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<td>(21.4 – 23.8)</td>
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<td>(17.8 – 19.4)</td>
<td>8.5</td>
<td>(8.0 – 9.1)</td>
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</tbody>
</table>

*Confidence interval
Research is ongoing to ascertain the best use of laboratory blood tests to detect people who may have prediabetes (see the National Glycosylated Standardization Program at http://www.ngsp.org/CAC2009.asp) and to improve the understanding of who has prediabetes.

References:
Personal communication from B. V. Howard, MD, MedStar Research Institute, Hyattsville, MD, concerning unpublished data from the Strong Heart Study on the estimated age-adjusted percentage of American Indians aged 15 years or older with impaired fasting glucose.


### Gestational diabetes in the United States

References:


Treatment of diabetes, United States, 2007–2009

Data source:

Methods:
The distribution percentage of treatment type among civilian, noninstitutionalized adults aged 18 years or older with diagnosed diabetes was calculated using the following treatment questions from the 2007–2009 NHIS: “Are you now taking insulin?” “Are you now taking diabetic pills to lower your blood sugar?”

Deaths among people with diabetes, United States, 2007

Data source:
The number of deaths with diabetes as any-listed cause of death among U.S. residents was obtained from the multiple cause-of-death dataset, National Center for Health Statistics, Centers for Disease Control and Prevention, using the Tenth Revision of the International Classification of Diseases cause-of-death codes E10–E14.

References:


Estimated diabetes costs in the United States, 2007

Reference:

The estimated costs of diabetes in the United States were based on a study by the Lewin Group, Inc., for the American Diabetes Association and are 2007 estimates of both the direct (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 used a specific cost-of-disease methodology to estimate the health care costs due to diabetes.

Complications of diabetes in the United States

Heart disease and stroke

Reference:
Tables 1–2 in the above reference provide the data for the bullets on heart disease and stroke. A total of 174,130 death certificates in 2004 mentioned diabetes as a cause of death among people aged 65 years or older (Table 1). Among these 174,130 deaths, 117,810 (68%) also mentioned heart disease as a cause of death and 27,874 (16%) mentioned stroke (Table 2).


Hypertension

Data source:

Methods:
The percentage of adults aged 20 years or older with self-reported diabetes that have hypertension was estimated based on blood pressure greater than or equal to 140/90 millimeters of mercury or current use of prescription medication for hypertension.

Blindness and eye problems

References:


Kidney disease

Data source:

Nervous system disease

References:


Amputations

Data source:

Reference:
Li Y, Burrows N, Gregg E, Geiss L. Declining Trends in Hospitalizations for Non-traumatic Lower Extremity Amputation in the Diabetic
Dental disease

References:


Complications of pregnancy

References:
Personal communication from T. A. Buchanan, MD, Professor of Medicine, Obstetrics and Gynecology, and Physiology and Biophysics, USC Keck School of Medicine, Los Angeles, CA.


Other complications

References:


Preventing diabetes complications

Glucose control

References:

The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and


**Blood pressure control**

References:


**Control of blood lipids**

References:


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

References:


Parving HH, Lehnert H, Brochner-Mortensen J, Gomis R, Andersen S, Arner P; Irbesartan in Patients with Type 2 Diabetes and


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**What is diabetes?**

**References:**


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**Prevention or delay of type 2 diabetes**

**References:**


