



Diabetes

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PROGRESS REVIEW



In the fifth session in the second series of assessments of *Healthy People 2010*, ADM John O. Agwunobi, Assistant Secretary for Health, chaired a focus area Progress Review on Diabetes. He was assisted by staff of the co-lead agencies for this *Healthy People 2010* focus area, the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH), where programs related to diabetes are centered in the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). Also participating in the review were representatives from other U.S. Department of Health and Human Services (HHS) offices and agencies. In his introduction to Progress Review participants, ADM Agwunobi characterized success in the fight against diabetes as a key indicator of the nation's ability to meet the threat of chronic disease. He stated that the Diabetes focus area, through efforts in prevention, aims to reduce the disease toll and economic burden of diabetes and to improve the quality of life for all individuals who have or who are at risk for diabetes. The specific objectives encompassed by the focus area measure both the processes and outcomes of preventive programs and identify and attempt to mitigate health disparities.

The complete text for the Diabetes focus area of *Healthy People 2010* is available online at www.healthypeople.gov/document/html/volume1/05diabetes.htm. More recent data used in the Progress Review for this focus area's objectives and their operational definitions can be accessed at wonder.cdc.gov/data2010. For comparison, the report on the first-round Progress Review (held on December 18, 2002) is archived at www.healthypeople.gov/data/2010prog/focus05/2002fa05.htm. The meeting agenda, tabulated data for all focus area objectives, charts, and other materials used in the Progress Review can be found at a companion site maintained by the National Center for Health Statistics (NCHS)/CDC: www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa05-diabetes2.htm.

Data Trends

Richard Klein of the NCHS Health Promotion Statistics Branch gave an overview of the status of the objectives, followed by a more detailed examination of selected objectives that were highlighted during the Progress Review. He stated that diabetes affected 20.6 million adults in the United States in 2005, or nearly 10 percent of the adult population. It is the sixth leading underlying cause of death and, in 2002, imposed a total cost of \$132 billion—\$92 billion in direct medical costs and \$40 billion in indirect costs, including disability, work loss, and premature

death. The prevalence of diabetes has greatly increased over the last decade. Whereas in 1995, just two states had a rate of diabetes among the adult population of over 6 percent, in 2004, only six states had a rate that was not above 6 percent.

(Obj. 5-2): In 2003–2005, the 3-year average age-adjusted rate of new cases of diabetes among adults aged 18 to 84 years was 7.4 per 1,000 population, compared with 5.5 per 1,000 for 1997–1999. For selected racial and ethnic populations, the rates per 1,000 in 2005 were

as follows: for non-Hispanic whites, 6.6; for Asians, 9.1; for Hispanics, 9.8; and for non-Hispanic blacks, 10.4. By education level for 2003–2005, individuals aged 25 to 84 years who had not completed high school had a new case rate of 12.0 per 1,000, compared with 8.8 per 1,000 for high school graduates and 7.3 per 1,000 for those who had some college education. The target is 3.8 new cases per 1,000.

(Obj. 5-3): In 2005, the overall age-adjusted total rate for clinically diagnosed diabetes (prevalence) was 54 per 1,000 population, an increase from 40 per 1,000 in 1997. The 2005 rates per 1,000 for selected racial and ethnic populations were as follows: Asians, 47; non-Hispanic whites, 49; Hispanics, 73; non-Hispanic blacks, 84; and American Indians or Alaska Natives, 101. The 2005 rate for females was 52 per 1,000, compared with a male rate of 57 per 1,000. There was a wide difference between the rate for people with disabilities (111 per 1,000) and the rate for people without disabilities (42 per 1,000). The target is 25 per 1,000.

(Obj. 5-4): Data from 2001 to 2004 show that the age-adjusted proportion of adults with diabetes aged 20 years and older whose condition had been diagnosed was 71 percent, an increase from 64 percent in the period 1988 to 1994. The 2001–2004 proportions for diagnosed diabetes among selected racial and ethnic populations were as follows: non-Hispanic whites, 70 percent; Mexican Americans, 73 percent; and non-Hispanic blacks, 78 percent. Among persons with diabetes, the condition had been diagnosed in 81 percent of women and 63 percent of men. The target is 78 percent.

(Obj. 5-5): In 2003, the age-adjusted rate for diabetes-related deaths was 78 per 100,000, with rates per 100,000 for selected racial and ethnic populations as follows: Cubans, 44; Asians or Pacific Islanders, 58; non-Hispanic whites, 70; American Indians or Alaska Natives, 109; Mexican Americans, 113; Puerto Ricans, 113; and non-Hispanic blacks, 138. The 2003 rate for diabetes-related deaths for females was 67 per 100,000, compared with 92 per 100,000 for males. Health service

areas in which diabetes mortality rates were particularly high include southern Texas, the Central Valley of California, Appalachia, and the easternmost portion of North Carolina. In contrast, rates were comparatively low in southern Nevada, Arizona, and southern Florida. There was little change between 1999 and 2003 in the overall rate for diabetes-related deaths and in the rates for most population groups for whom data were collected. The target is 46 per 100,000.

(Obj. 5-6): The age-adjusted rate for diabetes-related deaths among persons with diabetes was 7.6 per 1,000 in 2003, a decrease from 8.8 per 1,000 in 1999. The 2003 rates per 1,000 for females and males were 6.9 and 8.3, respectively, representing declines from the 1999 rates of 8.1 and 9.8, respectively. The target is 7.8 per 1,000, already exceeded by females, non-Hispanic whites, and Hispanics.

(Obj. 5-10): In 2002–2004, the 3-year age-adjusted average rate for lower extremity amputations among persons with diabetes was 4.4 per 1,000, compared with 6.6 per 1,000 in 1997–1999. In 2004, the rates per 1,000 were as follows: females, 2.9; males, 6.0; whites, 3.2; and blacks, 5.9. For persons with diabetes aged 65 years and younger, the age-specific rate for lower extremity amputations was 4.1 per 1,000; for persons aged 65 to 74 years, the rate was 6.3 per 1,000; and for persons aged 75 and older, 7.7 per 1,000. For all populations, except when grouped by age, the target is 2.9 per 1,000.

(Obj. 5-12): In 2004, the age-adjusted proportion of persons aged 18 years and older with diabetes who had a glycosylated hemoglobin (A1c) test at least twice a year was 65 percent, which met the target. The proportions for various racial and ethnic populations were as follows: Hispanics, 58 percent; non-Hispanic blacks, 61 percent; non-Hispanic whites, 68 percent; American Indians or Alaska Natives, 70 percent; and Asians, 86 percent. Among persons aged 25 years and older, 69 percent of those with some college education had an A1c test, compared with 65 percent of high school graduates and 56 percent of non-high-school graduates. The target is 65 percent.

(Obj. 5-13): In 2003, the age-adjusted proportion of persons with diabetes aged 18 years and older who had an annual dilated eye examination was 58 percent, compared with 49 percent in 1998. The proportions for various racial and ethnic populations in 2003 were as follows: Hispanics, 53 percent; non-Hispanic whites, 57 percent; and non-Hispanic blacks, 67 percent. Among persons aged 25 years and older, 66 percent of those with some college education had an annual dilated eye exam, compared with 53 percent of high school and non-high-school graduates. The target is 76 percent.

(Obj. 5-15): In 2005, the age-adjusted proportion of persons with diabetes aged 20 years and older who had an annual dental examination was 58 percent. For selected racial and ethnic populations, the proportions in 2005 were as follows: Hispanics,

44 percent; non-Hispanic blacks, 50 percent; and non-Hispanic whites, 62 percent. By age group, the age-specific proportions were as follows: 18 to 44 years, 60 percent; 45 to 64 years, 56 percent; 65 to 74 years, 48 percent; and 75 years and older, 37 percent. The target for all populations, except those grouped by age, is 71 percent.

(Obj. 5-17): In 2004, the age-adjusted proportion of adults with diabetes aged 18 years and older who monitored their blood glucose level at least once a day was 61 percent, meeting the target. In 1998, the proportion was 43 percent. By race and ethnicity, the 2004 proportions were as follows: Asians, 48 percent; Hispanics, 52 percent; non-Hispanic blacks, 62 percent; American Indians or Alaska Natives, 63 percent; and non-Hispanic whites, 64 percent. The proportions for each of these populations had improved since 1998.

Key Challenges and Current Strategies

In presentations that followed the data overview, the principal themes were introduced by Janet Collins, Director of CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP); Michael Engelgau, Acting Director of the CDC/NCCDPHP Division of Diabetes Translation; Griffin Rodgers, Acting Director of NIH/NIDDK; and Judith Fradkin, also of NIH/NIDDK. These agency representatives set the stage for discussions among Progress Review participants, identified a number of barriers to achieving the objectives, and discussed activities under way to meet these challenges, including the following:

- Within the United States, the prevalence of type 2 diabetes tracks closely with rates of overweight and obesity. About 54 million people have prediabetes, a condition defined by having blood sugar levels that are higher than normal but not high enough to meet the criterion for diabetes.
- While it is well known that excess body weight is a risk factor for diabetes, findings also indicate that

individuals of low birth weight are more insulin resistant as adults, relative to their body size, than individuals of normal birth weight. This information is of particular relevance to minority populations for whom the risk for low birth weight is increased, possibly compounding genetic risk factors.

- Previously known as an adult disease, type 2 diabetes is increasingly being observed in children, particularly minority youth, according to scientific reports. Diagnosis of type 2 diabetes in childhood is especially alarming because, as younger people develop the disease, the complications, morbidity, and mortality associated with diabetes are all likely to occur earlier.
- Opportunities to reduce the health and economic burden of diabetes are largely located at four transition points within the course of the disease: *primary prevention*, which can stop the development of diabetes if successful; *screening/early diagnosis*, which moves a patient from

unrecognized to recognized diabetes; *access to care*, in which the patient receives specialized diabetes care; and *quality of care*, which marks the transition from inadequate care to the state-of-the-art standard of care.

- The Diabetes Prevention Program (DPP) demonstrated that individuals at substantial risk of developing type 2 diabetes can prevent or delay disease onset and potentially improve their blood glucose levels and even have those levels return to normal with only modest behavioral improvements, mostly involving diet and exercise. These lifestyle modifications work equally well in men, women, and all ethnic groups. Individuals with prediabetes can reduce the likelihood of progression to type 2 diabetes by an average 50 percent, and in people aged 60 and older by as much as 70 percent.
- Other research studies have shown that it is now feasible to screen newborns to identify those who are at genetic risk for the disease. Researchers can, therefore, follow at-risk children for many years to identify environmental factors that may predispose them to disease, or protect them from it.
- Current guidelines for control of glucose levels, blood pressure, and low-density cholesterol in patients with diabetes reflect information developed in carefully designed, well-controlled clinical trials. The Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study showed the importance of strict blood glucose control in delaying complications from both type 1 and type 2 diabetes. Later studies demonstrated that intensive control of blood glucose levels in patients with type 1 diabetes also has long-term beneficial effects on the risk for cardiovascular disease, the leading cause of death in people with diabetes.
- Launched in 1997, the National Diabetes Education Program (NDEP) disseminates the landmark findings of the DCCT and has now been expanded to disseminate the findings of the DPP. Co-chaired by CDC and NIH, NDEP seeks to coordinate diabetes messages to the public, health professionals, and people with diabetes. Through this initiative, the two agencies support national minority organizations in their implementation of tailored interventions through their established networks. More than 2.3 million NDEP publications have been distributed through the National Diabetes Information Clearinghouse. Between 1998, shortly after NDEP was formed, and 2004, the percentage of people who had heard of hemoglobin A1c or the A1c test increased twofold.
- CDC provides funding for state-based diabetes prevention and control programs (DPCPs) in all 50 states, the District of Columbia, and eight U.S.-affiliated island jurisdictions. DPCP activities include to determine the size and nature of diabetes-related problems within their jurisdictions, to develop and evaluate new strategies for diabetes prevention, to improve access to quality diabetes care, to establish partnerships to prevent diabetes problems, and to increase awareness of diabetes prevention and control opportunities among the healthcare and business communities, people with diabetes, and the public. Awards to DPCPs for capacity building average \$270,000. For basic implementation, awards average \$725,000.
- Preventive practices have proven their worth in reducing and controlling the complications of diabetes: Eye exams can lead to a 60 percent decrease in blindness, foot exams to an 85 percent decrease in lower extremity amputations, and glucose control to a 40 percent decrease in kidney failure.

Approaches for Consideration

Participants in the review made the following suggestions for public health professionals and policymakers to consider as steps to enable further progress toward achievement of the objectives for Diabetes:

- Further accelerate the translation into clinical practice of the scientific and economic evidence supporting the benefits of improved diabetes management.
 - To help increase access to quality health care for people with diabetes, strive to make appropriate health insurance coverage more widely available.
 - Direct additional research to determining how best to prevent risk factors for type 2 diabetes in children, as well as to identify strategies to treat the disease in those who already have it.
 - To help disrupt the cycle of overweight predisposing to diabetes, intensify outreach activities to raise levels of physical activity and good nutrition practices among all sectors of society, with particular attention to children and youth in schools.
- Step up efforts to raise the low levels of public awareness about the seriousness of diabetes and its treatment.
 - Target more public education campaigns and demonstration programs at men, whose rates of awareness and participation have been low compared with women, even though their risk for diabetes has been higher historically.
 - Seek to better define and disseminate information about the optimal balance between medication and lifestyle changes in individual patients with diabetes.
 - Encourage research on the development of an artificial pancreas to both monitor patients' blood glucose levels continuously and respond by releasing appropriate amounts of insulin as needed.

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[Signed February 27, 2007]

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