



**Testimony before the
Subcommittee on Health
Committee on Energy and Commerce
United States House of Representatives**

**The Battle Against Diabetes: Progress Made,
Challenges Unmet**

Statement of

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Introduction

Mr. Chairman, Mr. Shimkus, and distinguished members of the Subcommittee, thank you for the opportunity to participate in this hearing. I am Dr. Ann Albright, Director of the Division of Diabetes Translation at the Centers for Disease Control and Prevention (CDC), an agency of the Department of Health and Human Services (HHS). CDC's Diabetes Program translates the science of diabetes into practical strategies to control and prevent diabetes in the U.S. population and implements these strategies through leadership, research, programs, and policy. Our work stretches from surveillance and reduction of diabetes risk factors, to prevention of diabetes, to management and surveillance of diabetes and complications in those who already have the disease. Today, I will describe how we accomplish this work, and how our work complements that of our sister divisions and agencies.

Background

Diabetes is a group of diseases marked by high blood glucose (sugar) resulting from a shortage of insulin, a decreased ability to use insulin, or both. When diabetes is not controlled, glucose and fats remain in the blood and damage vital organs. Diabetes is the leading cause of new cases of blindness, kidney failure, and non-traumatic lower-extremity amputations among adults. Women of childbearing age with diabetes and who become pregnant are at increased risk of having babies with major birth defects, a major cause of infant mortality and life-long disabilities. In addition, children born to women with diabetes are at increased risk for developing diabetes as adolescents or adults. Adults being treated for diabetes are just as likely to have a heart attack or stroke or die from cardiovascular causes as people who have had a prior heart attack, and are twice as likely to die following a heart attack as people without diabetes.

[1]

Medical costs associated with diabetes are substantial. Total national cost associated with diabetes in 2007 exceeded \$218 billion. Pre-diabetes (a condition in which blood sugar is elevated but has not reached the levels that would result in a diagnosis of diabetes) costs \$433 annually per person (medical costs only); undiagnosed diabetes, \$2,864; type 2 diabetes, \$9,677; and type 1 diabetes, \$14,856. Gestational diabetes cost per case averaged \$3,514 in 2007 - \$3,305 in higher pregnancy cost and \$209 additional cost during the newborn's first year of life.

[2] Diabetes was the seventh leading cause of death listed on U.S. death certificates in 2007. [3]

Diabetes has changed from a public health concern to a widespread epidemic. Data from CDC's 2003 - 2006 National Health and Nutrition Examination Survey (NHANES) reveal that nearly 24 million Americans now have diabetes [4], as compared to 10.2 million in 1997. [5] One in three children born in 2000 are at risk of developing diabetes during their lifetime. [6]

Diabetes can be in the form of type 1 (shortage of insulin), type 2 (decreased ability to use insulin), or gestational diabetes (GDM) (diabetes first diagnosed during pregnancy). Type 1 diabetes usually is first diagnosed in children and young adults, although it can occur at any age. Type 1 diabetes, an autoimmune disease that is not currently preventable, accounts for 5 percent of diabetes cases. [6] People with diabetes diagnosed before the age of 20 years have a life expectancy that is 15 to 27 years shorter than people without diabetes. [7] Until recently, diabetes diagnosed in children and adolescents was almost entirely considered to be type 1. However, while still rare, type 2 diabetes in youth is increasingly occurring in those under 20 years of age, particularly minority youth, probably due to obesity in youth. Type 2 diabetes is also increasing among women of childbearing age.

Type 2 diabetes accounts for 90 to 95 percent of diabetes cases. [6] Data from the 2004 – 2006 National Health Interview Survey (NHIS) for people 20 years and older indicate that 6.6 percent of non-Hispanic whites, 7.5 percent of Asian Americans, 10.4 percent of Hispanics, and 11.8 percent of non-Hispanic blacks had diagnosed diabetes. [8] Risk factors associated with type 2 diabetes include increasing age, family history of diabetes, history of gestational diabetes, race, and ethnicity. These are risk factors that we cannot change. Type 2 diabetes is closely linked to obesity and physical inactivity. These risk factors can be changed. The vast majority of cases of diabetes in the U.S. today are preventable.

Gestational diabetes is of concern because of potential consequences for both the mother and the baby. For the mother, this includes an increased risk for high blood pressure and eclampsia, a condition that causes seizures. For the baby, potential consequences include, increased birth weight, increased risk for birth trauma, and low blood sugar. Gestational diabetes affects 3 to 7 percent of all pregnancies in the United States. [9] An estimated 40 to 60 percent of women with gestational diabetes will develop type 2 diabetes within ten years. [10] Because women with type 2 diabetes are at increased risk for having babies with birth defects, women with a history of gestational diabetes should receive targeted intervention strategies to prevent

type 2 diabetes before they become pregnant, during pregnancy, postpartum and between pregnancies.

Defining and Monitoring Diabetes

The ability to identify the magnitude of a problem through ongoing surveillance is a foundation of CDC's work. CDC developed and maintains the National Diabetes Surveillance System, the world's first system for monitoring diabetes. It relies on national and state-based household, telephone, and hospital-based surveys, and vital statistics to monitor trends in diabetes, its risk factors, levels of care, and complications. In collaboration with the National Institutes of Health (NIH), CDC has also initiated the largest major surveillance system to quantify and track the diabetes burden in those under 20 years of age, the SEARCH for Diabetes in Youth study. This study provides population-based information on the underlying factors, trends, impact, and levels of care provided to American youth who develop either type 1 or type 2 diabetes. Among other things, SEARCH allows us to clarify the degree to which type 2 diabetes is affecting youth of different racial and ethnic backgrounds.

CDC uses its surveillance data to understand the diabetes epidemic, identify vulnerable at-risk populations, set prevention objectives for the nation, and monitor success of our programs over time, all at the national level. The system also provides essential data on the levels of behavioral risk factors, preventive care practices, and prevalence (percent of the population who has diabetes) and incidence (fraction of the population that develops a new case of diabetes in any given year) at the state level. It uses a variety of mechanisms, such as fact sheets, publications, and the internet, to provide data on diabetes to a variety of audiences, including policymakers, professional organizations, and state health departments. In the last two years, CDC has developed a methodology to estimate levels of diabetes and obesity at the county level, providing policy makers and communities with new information to guide program planning and resource allocation.

Findings from the National Diabetes Surveillance System document several successes in the public health response to diabetes over the past decade but have also revealed areas of major concern and continuing threats to the public's health. Rates of blood glucose being out of control and cardiovascular disease risk factors, as well as incidence of amputations, end stage renal disease, and deaths due to high blood sugar among the adult U.S. population with diagnosed diabetes, have all declined. These findings suggest that people with diabetes live

longer, healthier lives than people who were diagnosed with the condition in prior decades. However, these improvements hide considerable variation and disparities in diabetes care and outcomes across the country. For example, CDC's recently published county level estimates of diabetes and obesity indicate that wide sections of the Southeast, Appalachia, and some tribal lands in the West and Northern Plains have the nation's highest rates of obesity and diabetes. [11] In many counties in those regions, rates of diagnosed diabetes exceed 10 percent and obesity reaches more than 30 percent. [11] Concerning disparities also persist in the levels of risk for complications. For example, African Americans have notably increased risk of high blood pressure, diabetes-related kidney disease, and diabetes itself. In addition, people of lower education and income have higher risk for diabetes and numerous complications. [12]

Various factors influence low levels of testing and post partum care for women with a history of GDM (e.g., gaps in surveillance system, lack of awareness about GDM and future risk for type 2 diabetes, health system infrastructure challenges). Through strategic collaborations, research and education, CDC works to impact and improve outcomes for women at risk for and with GDM. In collaboration with the National Association of Chronic Disease Directors' Women's Health Council and the Agency for Healthcare Research and Quality, we are working to conduct a GDM validation project to: 1) establish a 5-state collaboration to identify, catalogue, and validate routinely collected data about GDM; 2) identify gaps in quality of GDM prevalence data; and 3) determine implications for care.

Our greatest concern is the continued increase in the rate of new cases of diabetes. This is evident in virtually all segments of society, regardless of age, race/ethnicity, and gender. This continued increase in the rate of development of new cases is unfortunately negating many of the successes that clinical and public health efforts have achieved in reducing rates of complications among people with diabetes. The continued increase in diabetes incidence calls for two major efforts in public health., First, the trends indicate a need for improved surveillance at regional, state, and local levels to improve the ability of programs to put resources where they can be most effective; second, these findings indicate a need for comprehensive implementation of a multi-tiered diabetes prevention strategy.

Reducing Risk Factors for Type 2 Diabetes

CDC is engaged in risk reduction efforts on multiple levels, including a focus on obesity, nutrition, and physical activity for the general population. CDC is actively working with the

First Lady on the *Let's Move!* initiative, providing scientific expertise in the areas of healthy eating and physical activity, and communication support to the campaign's public service advertising efforts. Additionally, CDC, in collaboration with HHS, is implementing the Communities Putting Prevention to Work (CPPW) program as part of the American Recovery and Reinvestment Act. Through CPPW, CDC is funding communities, states, and territories to advance nutrition, physical activity, and obesity-related policy and environmental strategies with the goal of stabilizing or beginning to decrease adult and youth overweight/obesity, thus reversing long term trends of obesity and related chronic diseases.

CDC's Division of Diabetes Translation focuses on obesity, nutrition, and physical activity in those with or at risk for diabetes. American Indians and Alaska Natives are at extremely high risk for diabetes. [13] About 16 percent of American Indians and Alaska natives have diabetes. [13] CDC focuses on American Indians with its Native Diabetes Wellness Program. The Native Diabetes Wellness Program works with 17 American Indian and Alaska Native communities to improve access to local, fresh produce, including traditional foods like squash and berries. For many people living on reservations, grocery stores can be dozens of miles away. These efforts focus on preserving and renewing cultural identity. For example, CDC is providing funds to the Standing Rock Nation, bordering North and South Dakota, in partnership with the U.S. Department of Agriculture, to offer fresh-produce vouchers that the elderly can use at local farmers markets. Redemption rates for these vouchers are more than 50 percent. [14]

Preventing Diabetes

Several research studies, including the NIH-led U.S. Diabetes Prevention Program, have demonstrated that a structured lifestyle program, which results in a modest weight loss of 5 to 7 percent while encouraging a healthy diet and increasing physical activity, can reduce risk for type 2 diabetes by 58 percent in those at high risk for diabetes or who have pre-diabetes. Based on the findings of the Diabetes Prevention Program clinical trial and subsequent NIH-supported studies that have translated these research findings into real world settings, CDC and our partners are implementing the National Diabetes Prevention Program. This program focuses on delivering the proven intervention in group settings for a cost of about \$250 to \$300 per person per year. The National Diabetes Prevention Program takes a four-pronged approach: training the

workforce, a recognition program for quality assurance, funding sites to deliver the intervention, and health marketing to increase the program's utilization.

In partnership with Emory University, CDC established the Diabetes Training and Technical Assistance Center which is developing a Diabetes Prevention Program Master Trainer Curriculum to educate master trainers who train lifestyle coaches. The lifestyle coaches will deliver the evidence-based structured lifestyle intervention in group settings across the country. This systematic training will help build a workforce that can sustain the National Diabetes Prevention Program and prevent or delay type 2 diabetes in high-risk individuals.

The recognition program sets recognition standards for diabetes prevention programs, monitors recognized diabetes prevention programs, and maintains a national registry of recognized diabetes prevention programs and a master trainer directory. The recognition process assures the quality and fidelity of the National Diabetes Prevention Program and provides a registry to track and report data, performance, and outcomes of the National Diabetes Prevention Program for quality assurance, monitoring, and reporting purposes.

The National Diabetes Prevention Program is currently offered in select communities across the country. CDC convened public and private partners, including the YMCA-USA, UnitedHealth Group, University of Pittsburgh, and Indiana University to ensure successful uptake, referral, and delivery of the National Diabetes Prevention Program. In the first phase, CDC is funding ten YMCA sites, and UnitedHealth Group is funding six YMCA sites to deliver the lifestyle program. This program will be systematically rolled out, scalable, and sustainable. In future phases, other organizations will also deliver the intervention as they become CDC-recognized. Sustainability is particularly important. UnitedHealth Group will cover the cost of participation for its beneficiaries. This represents the first time private insurance, in this case UnitedHealth Group, has entered into a partnership to cover prevention of diabetes to a community-based national organization. Work is under way to bring on additional organizations and third party payers to fund the intervention.

A CDC-NIH collaboration, the National Diabetes Education Program's 2008 Survey of the Public's Knowledge Attitudes, and Practices Related to Diabetes, revealed significant gaps between perceived and actual risks. For example, only 29 percent of the people at high risk for diabetes understood their risk for the disease, and only about a third of people with pre-diabetes understood that they were at risk for diabetes. NHANES data from 2005 – 2006 show that 30

percent of U.S. adults 20 years or older had pre-diabetes. Only 7 percent of those determined by the medical exam portion of this survey to have pre-diabetes reported that they had been told that they had the condition, and 48 percent of adults with pre-diabetes reported a test for diabetes or high blood sugar in the past three years. [15] These numbers clearly indicate the need for education, both for people at risk for diabetes and for clinicians. A CDC-led strategic marketing effort will focus on increasing the understanding of diabetes among people at risk for diabetes, such as women with a history of GDM, and referring clinicians.

Diabetes Management

CDC is active in preventing complications among people who already have diabetes. Control of A1c (a measure of average blood sugar over the last three months), blood pressure, cholesterol, and smoking cessation are crucial, and are emphasized in all our efforts.

The CDC-led Translating Research into Action for Diabetes project is a ten-year, six-center study of managed care and diabetes quality of care. The Translating Research into Action for Diabetes project was created to determine the key factors in managed care systems and patients that influence the progression and outcomes of diabetes care. The ultimate goal is to provide practical information on how to better implement effective treatment in managed care settings. The Translating Research into Action for Diabetes project has taught us that, among other things, greater out-of-pocket costs are associated with lower rates of both eye exams and blood sugar monitoring and that physician reimbursement by salary or capitation is associated with better care than fee for service. [16] We, along with the CDC-funded state and territorial-based Diabetes Prevention and Control Programs, are using these findings to advance our work in improving the health care delivery system. For example, the Utah Diabetes Prevention and Control Program has partnered with nine major health care plans to improve diabetes care for state residents. Together, these partners developed initiatives to improve the quality and performance of important aspects of diabetes care. The health care plans that participated in the initiatives worked together to increase patient and provider awareness of key clinical targets and indicators for diabetes; increase systems-based support for the delivery of diabetes care and the measurement, tracking, and reporting of key health indicators; and implement patient reminder/call back systems that focus on key health indicators and medication adherence. Between 2004 and 2009, all diabetes quality of care measures improved as a result of the partnership efforts. These outcomes included increase in average blood glucose control (A1c

<7%) from 23 percent (baseline) to 43 percent; increase in lipid control from 18 percent (baseline) to 45 percent; increase in eye examination rates from 42 percent (baseline) to 64 percent; and increase in screening to assess kidney function from 33 percent to 69 percent. [16]

In addition, we have a special focus on vulnerable populations. For example, the Florida Diabetes Prevention and Control Program, in collaboration with Florida's Office of Minority Health, administers the Closing the Gap project in eight disease areas, including diabetes. Community-based organizations provide diabetes self management education, wellness education, community health worker services, and/or assist faith-based agencies with health ministry capacity building. This program has reached over 12,000 persons with diabetes. Results achieved include reductions in body mass index, lowering of A1c, and an increase in such preventive care services as foot exams, eye exams, and receipt of flu shots. [14]

Chronic kidney disease is the ninth leading cause of death in the United States, and diabetes accounts for nearly half of all new cases of people requiring dialysis or a kidney transplant. People with diabetes are at substantial risk for diabetic retinopathy, cataracts, and glaucoma, all of which can cause blindness. CDC's Congressionally-mandated Vision Health and Chronic Kidney Disease Initiatives develop partnerships with federal and non-federal organizations to establish new surveillance systems and integrate them with public health, effectiveness, and economic studies. These initiatives help prioritize interventions that reduce or prevent the development or progression of these complications.

Future Work

We are continuing to explore new frontiers of diabetes prevention and control. We have two new projects that will begin by September 30, 2010. In the National Program to Eliminate Diabetes-Related Disparities in Vulnerable Populations, CDC will fund six organizations to reduce morbidity, premature mortality, and eliminate health disparities associated with diabetes. This will be achieved by mobilizing community partners and assisting them to effectively plan, develop, implement, and evaluate community-based interventions to reduce the risk factors that influence the disproportionate burden of diabetes that vulnerable populations bear.

Beginning in 2010, CDC will initiate a new platform of research studies to examine the impact of population-targeted policies emanating from health systems, business and community organizations, and governments. The impetus behind this work is that many innovative public

health policies are initiated every year, but the true impact of these initiatives can only be fully assessed with further study.

Conclusion

People with diabetes now live longer than in the past. Improved awareness of diabetes has contributed to improved diagnosis. These factors, combined with our aging population, means that the percentage of the population with diagnosed diabetes will rise over the coming years. As recognized in Healthy People 2020 goals, reducing new cases of diabetes (incidence) requires an increased focus, while at the same time we continue to make advances in improving the health outcomes for those with diabetes.

Several steps must be taken to stem the diabetes epidemic. Work in risk factor reduction must continue so that fewer people develop pre-diabetes. The programs and policies for obesity prevention and control, both in the general population and those at risk for diabetes, are central to this effort. There is a critical need for effective programs that prevent people at high risk for diabetes from developing the disease. The first steps have been taken, in the form of the National Diabetes Prevention Program. The complications of diabetes have a very high cost, both in dollars and human suffering. While improvements have been made, much work remains to be done, especially in vulnerable populations.

The increasing number of new cases of diabetes demands an urgent response. CDC will continue to increase the reach of the National Diabetes Prevention Program by increasing the number of master trainers and lifestyle coaches who can implement the National Diabetes Prevention Program as resources permit and by managing the recognition program to assure quality and effectiveness. We will work with other organizations to expand the delivery and reimbursement for the National Diabetes Prevention Program.

Thank you for your attention. I will now take your questions.

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