25 Years and Counting: Centers for Disease Control and Prevention Identifies Opportunities and Challenges for Diabetes Prevention and Control

The number of persons with diabetes, especially type 2 diabetes, has increased dramatically worldwide (1, 2) and is expected to grow substantially over the next several decades (3). This increased burden places more responsibility on patients, health care professionals, and society. Diabetes has always been a challenge to manage (4). Despite recent scientific advances in our understanding of its pathophysiology (5), awareness of the many factors that affect its care (6), and improved treatment options (7), diabetes still remains a complex and challenging chronic condition. Diabetes is more than merely abnormal glucose metabolism with consequent microvascular complications (8); it also involves cardiovascular disease with adverse macrovascular outcomes (9). Furthermore, recent studies have established a possible bicausal relationship between diabetes and depression (10, 11), thus supporting the link between this condition and psychological functioning.

Recognizing and incorporating the role these various factors play in the prevention and control of diabetes move us beyond solely “treating” diabetes with drugs (12). This progress offers opportunities to complement effective diabetes management with a public health approach that considers availability of medical insurance (13, 14), community resources (15), family structure and support (16), and effective health communications that include advice about risk reduction and cues to action (17).

During the past 25 years, the Division of Diabetes Translation at the Centers for Disease Control and Prevention (CDC) has depended on available scientific findings to guide its public health programs. From 1979 through the early 1990s, the CDC focused on tertiary prevention, such as screening and treatment for diabetic retinopathy (18) and preventing the development of diabetic foot disorders and amputations (19). During this same period, most diabetes public health programs, including those supported by the CDC, provided actual clinical care for people who cannot participate in private health care systems. In 1993 and 1994, the CDC altered both the content and the methods of its public health programs. Because of the important Diabetes Control and Complication Trial (20), secondary prevention—that is, glycemic control—was added to existing tertiary prevention strategies. Furthermore, although there was (and still is) a need to assist individuals who are underinsured or uninsured, the CDC recognized that it was not applying its public health strategy for all people with diabetes in the United States. Consequently, primarily through its state-based Diabetes Prevention and Control Programs (21), the CDC began to develop a “model of influence,” or system-based, approach that involves national, regional, and local partners in ensuring adoption of the health care, community, organizational, and public policy systems—changes that ultimately would help improve the delivery and sustainability of good-quality diabetes care for everyone affected (22, 23).

While the CDC’s “model of influence” approach to diabetes programs has continued, diabetes science also has progressed, resulting in the addition of cardiovascular disease prevention initiatives among patients with diabetes (9), as well as primary prevention of type 2 diabetes among those at high risk for developing this disease (24).

This supplement provides 6 original papers based on presentations shared at the CDC’s “Diabetes and Public Health 25th Anniversary Symposium” held in September 2003 in Atlanta, Georgia. Articles address the evolution of the diabetes epidemic in the United States, primary prevention of type 2 diabetes, translational research, environmental issues in diabetes self-management, analysis of the economic impact of diabetes, and the CDC’s efforts to use findings from important clinical studies to establish public health programs within the national NDPC program.

Engelgau and associates describe the evolution of the diabetes epidemic and the burden imposed by diabetes complications in the United States. They discuss the prevalence and incidence of diabetes among adults, as well as the increasing burden of diabetes among children and adolescents. This article concludes by briefly discussing the major risk factors for diabetes-related complications, diabetes-related mortality, future projections of the burden of diabetes into the 21st century, and a rationale for including primary prevention in future diabetes programs.

The CDC Primary Prevention Working Group summarizes the scientific evidence supporting lifestyle interventions to prevent type 2 diabetes. The group emphasizes the importance of consensus in 4 policy areas: identification of persons needing interventions, integration of lifestyle interventions into medical care systems, economic considerations, and ethical implications.

Narayan and colleagues discuss the challenge of extending the results of numerous studies that had shown efficacy of diabetes treatments into actual clinical practice, an extension still slowly progressing and inadequate in reach. This article provides examples of interventions that, through translational efforts, allow providers, health systems, and patients to improve diabetes care. The authors conclude by briefly discussing the critical importance of maintaining a multidisciplinary perspective in translational research.

Jack and colleagues qualitatively reviewed 8 studies...
that contained sufficient evidence to show that including diabetes self-management education in community settings can improve glycemic control. The authors emphasize the important dimensions of specifications of theory, cultural appropriateness of interventions, and use of quality instruments to capture intervention effects.

Zhang and associates address the growing importance of economic analyses to help health care providers and policymakers determine the most appropriate use of scarce resources. They identify the financial impact that diabetes exerts on the health care system and the economic cost of diabetes in the United States. They discuss economic methods for evaluating an intervention in health and medicine, as well as cost–utility or cost–benefit ratios of interventions for preventing and treating diabetes. The authors also describe future directions for economic research.

This supplement concludes with a timely and appropriate discussion of the CDC’s National Diabetes Prevention and Control Program, the cornerstone of public health efforts to reduce the burden of diabetes in the United States. Murphy and colleagues provide a rationale for this national program’s use of system-based interventions that consider moderating factors such as intervention settings, population characteristics, and financial and human resource constraints on diabetes prevention and control.

In summary, although we know more about how to prevent and control diabetes and its complications today than we did 25 years ago, the threat of diabetes to individuals, families, communities, and society is still a major—and growing—concern. To fully translate this important knowledge, efforts in the physician’s office need to be complemented by effective public health interventions where people live, work, and play. Collaborative partnerships with persons given a diagnosis of diabetes, purchasers, and payers of health care services, policymakers, and political decision makers are essential in this process. Because of our quarter-century of experience in public health, the CDC is well positioned to apply the best available evidence and practices from both the clinical and public health worlds to combat the growing burden of diabetes in the United States and throughout the world.

Frank Vinicor, MD, MPH
Leonard Jack Jr., PhD, MSc
Centers for Disease Control and Prevention
Atlanta, GA 30341-4002

Potential Financial Conflicts of Interest: None disclosed.

Requests for Single Reprints: Frank Vinicor, MD, MPH, Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Woodcock Boulevard, Room 2044, Atlanta, GA 30341-4002; e-mail, FVinicor@cdc.gov.

Current author addresses are available at www.annals.org.


References

Current Author Addresses: Dr. Vinicor: Division of Diabetes Translation, National Center for Chronic Disease Prevention, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Woodcock Boulevard, Room 2044, Atlanta, GA 30341-4002.

Dr. Jack: Community Intervention Section, Program Development Branch, Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Woodcock Boulevard, Room 1062, Atlanta, GA 30341-4002.