

Presentation

Improving health and equity in diabetes and cardiovascular disease

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#Rosenthal2019
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The Case for Improving Health and Equity in Diabetes

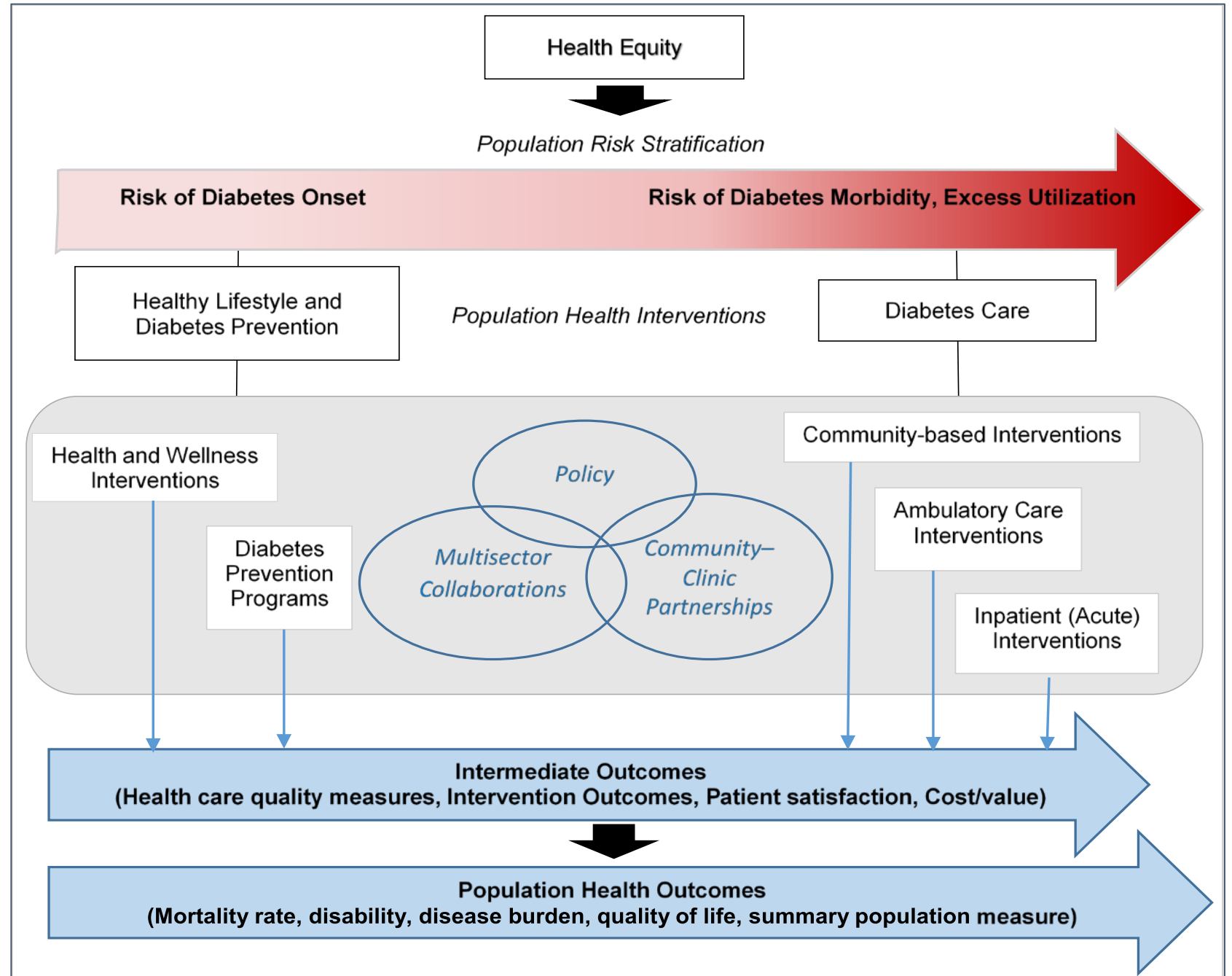
In the US:

- 1 in 10 people has diabetes
- 1 in 3 adults has prediabetes
- In 2017, total economic cost of diagnosed diabetes was \$327 billion USD
- Ranked first in combined public health and health care (hospitalizations, emergency care, outpatient care, skilled nursing facility care) spending

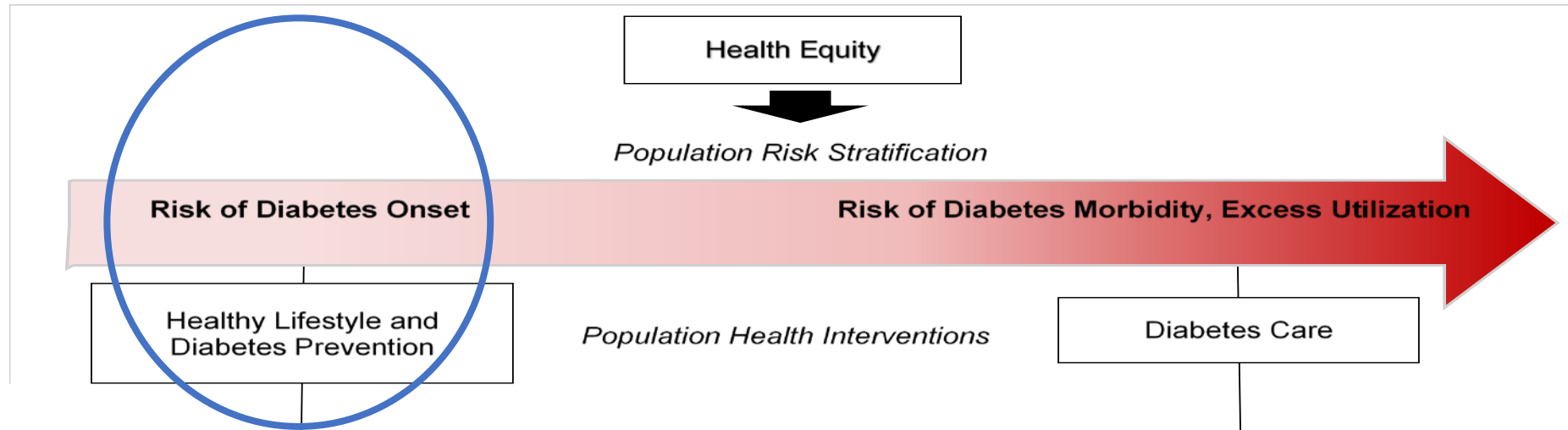
Diabetes is a disease of health inequities by socioeconomic status, race/ethnicity, and geography

Behavioural and social determinants account for 60 – 70% of disease outcomes

Diabetes Population Health Model



Interventions for Population Health *Improvement*



- Proactive initiatives with goals of *prevention, risk reduction, health equity, and health promotion*
- Reduce need for care before individuals enter the healthcare system
- Reduce reliance on healthcare services by addressing the social and behavioural determinants that give rise to care that could have been avoided

Behavioural and Social Determinants in Diabetes



American Association of Diabetes Educators AADE 7 Behaviors. Social Determinants of Health. Healthy People 2020. U.S. Department of Health and Human Services. Haire-Joshu and Hill-Briggs. *Annu Rev Public Health*. 2019 Jan 2.

U.S. Diabetes Prevention Program (DPP)

Example of an Intensive Lifestyle Intervention's Path from Research to Policy and Practice

The New England Journal of Medicine

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REDUCTION IN THE INCIDENCE OF TYPE 2 DIABETES WITH LIFESTYLE INTERVENTION OR METFORMIN

DIABETES PREVENTION PROGRAM RESEARCH GROUP*

ABSTRACT

Background Type 2 diabetes affects approximately 8 percent of adults in the United States. Some risk factors — elevated plasma glucose concentrations in the fasting state and after an oral glucose load, overweight, and a sedentary lifestyle — are potentially reversible. We hypothesized that modifying these factors with a lifestyle-intervention program or the administration of metformin would prevent or delay the development of diabetes.

Methods We randomly assigned 3234 nondiabetic persons with elevated fasting and post-load plasma glucose concentrations to placebo, metformin (850 mg twice daily), or a lifestyle-modification program with the goals of at least a 7 percent weight loss and at least 150 minutes of physical activity per week. The mean age of the participants was 51 years, and the mean body-mass index (the weight in kilograms divided by the square of the height in meters) was 34.0; 68 percent were women, and 45 percent were members of minority groups.

Results The average follow-up was 2.8 years. The incidence of diabetes was 11.0, 7.8, and 4.8 cases per 100 person-years in the placebo, metformin, and lifestyle groups, respectively. The lifestyle intervention reduced the incidence by 58 percent (95 percent confidence interval, 48 to 66 percent) and metformin by 31 percent (95 percent confidence interval, 17 to 43 percent), as compared with placebo; the lifestyle intervention was significantly more effective than metformin. To prevent one case of diabetes during a period of three years, 6.9 persons would have to participate in the lifestyle-intervention program, and 13.9 would have to receive metformin.

Conclusions Lifestyle changes and treatment with metformin both reduced the incidence of diabetes in persons at high risk. The lifestyle intervention was more effective than metformin. (N Engl J Med 2002; 346:393-403.)

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TYPE 2 diabetes mellitus, formerly called non-insulin-dependent diabetes mellitus, is a serious, costly disease affecting approximately 8 percent of adults in the United States.¹ Treatment prevents some of its devastating complications^{2,3} but does not usually restore normoglycemia or eliminate all the adverse consequences. The diagnosis is often delayed until complications are present.⁴ Since current methods of treating diabetes remain inadequate, prevention is preferable. The hypothesis that type 2 diabetes is preventable^{5,6} is supported by observational studies and two clinical trials of diet, exercise, or both in persons at high risk for the disease^{7,8} but not by studies of drugs used to treat diabetes.⁵

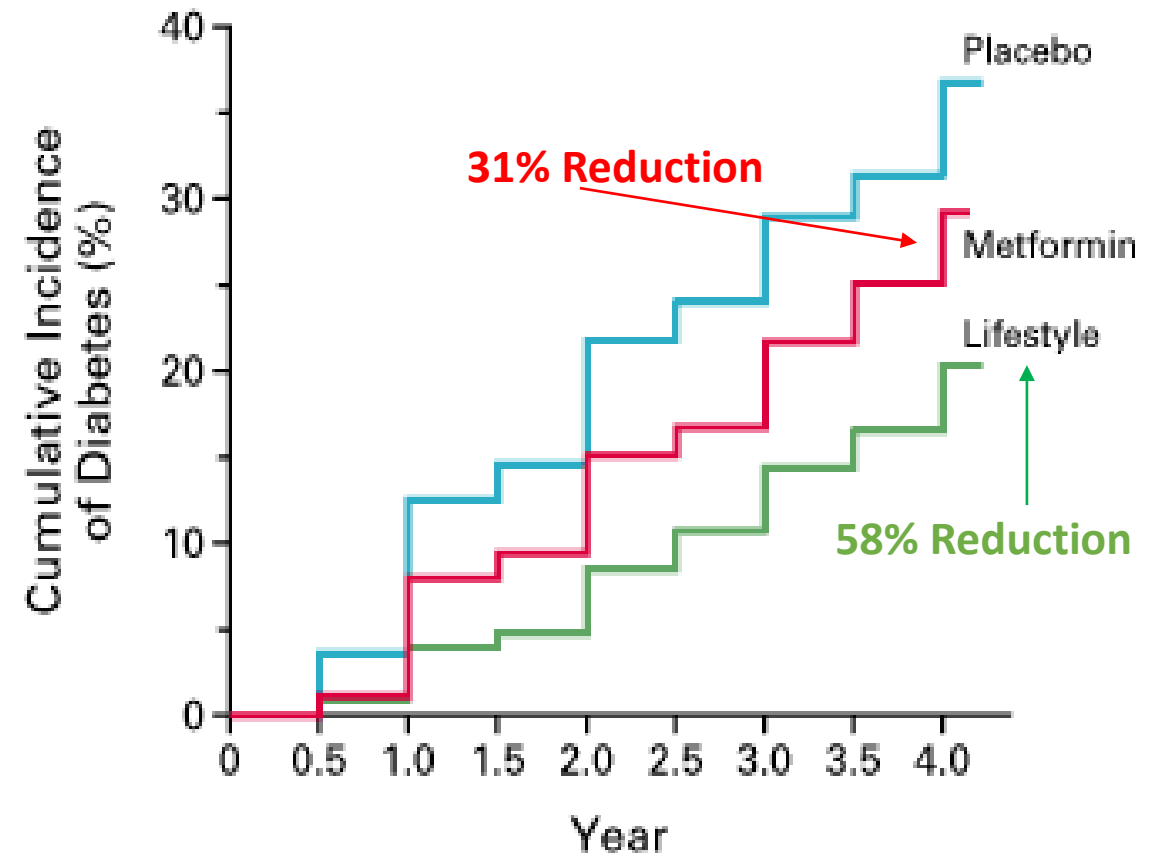
The validity of generalizing the results of previous prevention studies is uncertain.⁹ Interventions that work in some societies may not work in others, because social, economic, and cultural forces influence diet and exercise. This is a special concern in the United States, where there is great regional and ethnic diversity in lifestyle patterns and where diabetes is especially frequent in certain racial and ethnic groups, including American Indians, Hispanics, African Americans, Asians, and Pacific Islanders.¹⁰

The Diabetes Prevention Program Research Group conducted a large, randomized clinical trial involving adults in the United States who were at high risk for the development of type 2 diabetes. The study was designed to answer the following primary questions: Does a lifestyle intervention or treatment with

The writing group (William C. Knowler, M.D., Dr.P.H., Elizabeth Barrett-Connor, M.D., Sarah E. Fowler, Ph.D., Richard E. Hammann, M.D., Dr.P.H., John M. Lachin, Sc.D., Elizabeth A. Walker, D.N.Sc., and David M. Nathan, M.D.) takes responsibility for the contents of this article. Address reprint requests to the Diabetes Prevention Program Coordinating Center, Biostatistics Center, George Washington University, 6110 Executive Blvd., Suite 750, Rockville, MD 20852.

*The members of the Diabetes Prevention Program Research Group are listed in the Appendix.

Cumulative Diabetes Incidence By Treatment Arm



Translating the Diabetes Prevention Program into the Community

The DEPLOY Pilot Study

Ronald T. Ackermann, MD, MPH, Emily A. Finch, MA, Edward Brizendine, MS, Honghong Zhou, PhD,
David G. Marrero, PhD

Background: The Diabetes Prevention Program (DPP) found that an intensive lifestyle intervention can reduce the development of diabetes by more than half in adults with prediabetes, but there is little information about the feasibility of offering such an intervention in community settings. This study evaluated the delivery of a group-based DPP lifestyle intervention in partnership with the YMCA.

Methods: This pilot cluster-randomized trial was designed to compare group-based DPP lifestyle intervention delivery by the YMCA to brief counseling alone (control) in adults who attended a diabetes risk-screening event at one of two semi-urban YMCA facilities and who had a BMI ≥ 24 kg/m², ≥ 2 diabetes risk factors, and a random capillary blood glucose of 110–199 mg/dL. Multivariate regression was used to compare between-group differences in changes in body weight, blood pressures, HbA1c, total cholesterol, and HDL-cholesterol after 6 and 12 months.

Results: Among 92 participants, controls were more often women (61% vs 50%) and of nonwhite race (29% vs 7%). After 6 months, body weight decreased by 6.0% (95% CI=4.7, 7.3) in intervention participants and 2.0% (95% CI=0.6, 3.3) in controls ($p < 0.001$; difference between groups). Intervention participants also had greater changes in total cholesterol (-22 mg/dL vs +6 mg/dL controls; $p < 0.001$). These differences were sustained after 12 months, and adjustment for differences in race and gender did not alter these findings. With only two matched YMCA sites, it was not possible to adjust for potential clustering by site.

Conclusions: The YMCA may be a promising channel for wide-scale dissemination of a low-cost approach to lifestyle diabetes prevention.
(Am J Prev Med 2008;35(4):357–363) © 2008 American Journal of Preventive Medicine

Introduction

More than 60 million Americans have prediabetes, defined by impaired glucose tolerance (IGT) or impaired fasting glucose (IFG). People with prediabetes are at increased risk for developing diabetes,^{1–5} cardiovascular events,^{6–9} and other obesity-related adverse health outcomes. Because the prevalence of obesity is increasing in all segments of the population, the burden of prediabetes and diabetes will continue to escalate.¹⁰ Identifying strategies to prevent diabetes on a national scale is indeed a public health priority.

modest weight loss in overweight adults with IGT can significantly reduce the progression to diabetes.^{11,12} However, the DPP involved enrollment criteria and an intensive lifestyle intervention that are challenging to implement and sustain in busy healthcare settings.^{13,14} In this context, there has been an ongoing need for real-world adaptations of the DPP lifestyle intervention that balance fidelity to DPP procedures with new design elements that optimize effectiveness, minimize cost, and improve sustainability.¹⁵ Because healthcare settings have a limited capacity to offer intensive behavioral interventions,¹⁶ success in achieving this goal is

Federal Agency and Health Organization Prioritizing of Diabetes Prevention

1. *Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH)/NIDDK*
 - Reports and national statistics
 - Addition of prediabetes
2. *American Diabetes Association (ADA)*
 - Standards of Care chapter on Lifestyle Intervention for Prevention of Type 2 Diabetes
 - ADA Governmental Affairs advocacy
 - Risk Test
3. *U.S. Congressional Diabetes Caucus*
 - Combined Senate Diabetes Caucus and House Diabetes Caucus

The Diabetes Prevention Act of 2009

111TH CONGRESS
1ST SESSION

H. R. 4124

To amend the Public Health Service Act with respect to the prevention of diabetes, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 19, 2009

Mrs. DAVIS OF CALIFORNIA (for herself, Ms. RICHARDSON, Mr. LOEBSACK, and Ms. BORDALLO) introduced the following bill; which was referred to the Committee on Energy and Commerce

A BILL

To amend the Public Health Service Act with respect to the prevention of diabetes, and for other purposes.

Amends the Public Health Service Act to direct the Secretary of Health and Human Services (HHS), acting through the Director of the ***Centers for Disease Control and Prevention (CDC)***, to establish a **national diabetes prevention program targeted at persons at high risk for diabetes.**

CDC Establishes the U.S. National Diabetes Prevention Program (DPP)

<https://www.cdc.gov/diabetes/prevention/index.html>

1. Intensive Lifestyle Change Program Standardization

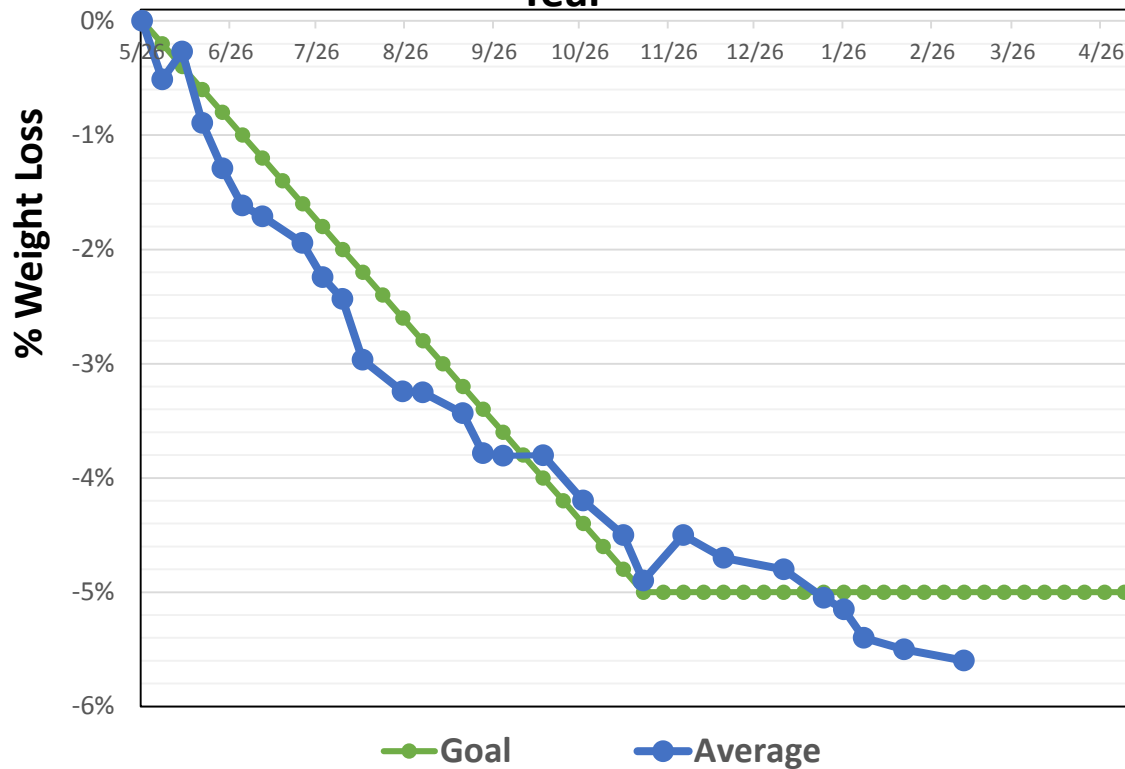
1. Structured curriculum
2. DPP Lifestyle Coach training and CDC certification
3. Specific goals, performance metrics, and reporting requirements
4. Deployment in public health and health care settings with CDC Recognition Program Requirements

2. Health Equity

1. Plain language (Plain Writing Act of 2010)
2. New community-based and non-clinical settings and workforces
3. Expanded delivery modes (groups, virtual)
4. Social cohesion and integration facets
5. Insurance reimbursement to community settings and DPP lifestyle coaches

Public Health Care Coverage for DPP in Vulnerable Populations: Medicare Effectiveness and Cost Effectiveness Trial (CMMI)

Average 5% Weight Loss at 6 months and 1 Year



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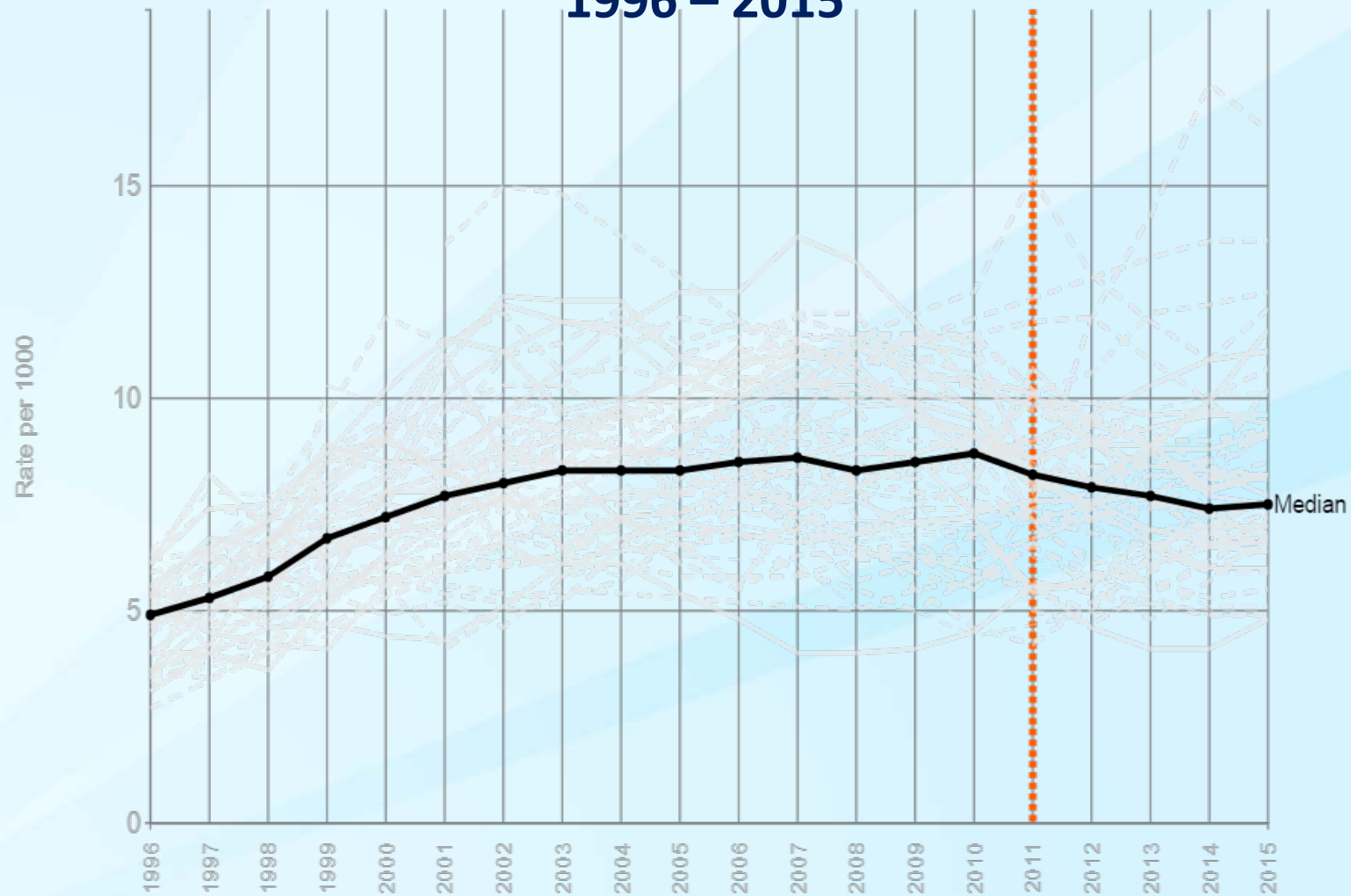
Independent experts confirm that diabetes prevention model supported by the Affordable

Cost savings: \$2,650/enrollee over 15 months compared to beneficiaries not in program

Sylvia M. Burwell announced that the independent Office of the Actuary in the Centers for Medicare & Medicaid Services (CMS) certified that expansion of the Diabetes Prevention Program, a model funded by the Affordable Care Act, would reduce net Medicare spending. The expansion was also determined to improve the quality of patient care without limiting coverage or benefits. This is the first time that a preventive service model from the CMS Innovation Center has become eligible for expansion into the Medicare program.

Currently, about [30 million - PDF](#) Americans have type 2 diabetes, resulting in two deaths every five minutes in this country. Additionally, [86 million - PDF](#) Americans have a high risk of developing diabetes, because one in every three adults has prediabetes, a condition that arises when blood glucose levels are higher than normal but not high enough for a diagnosis of diabetes. Prediabetes

Newly Diagnosed Diabetes, Age-Adjusted Rate per 1000 Adults Aged 18-76 Years-Total, 1996 – 2015



Source: www.cdc.gov/diabetes

Disclaimer: This is a user-generated report. The findings and conclusions are those of the user and do not necessarily represent the views of the CDC.

National Center for Chronic Disease Prevention and Health Promotion

Division of Diabetes Translation



Realizing the Full Health Equity Potential of the DPP: Challenges and Gaps

- Scaling to meet national and international demand
 - Improving effectiveness of virtual DPP programs in meeting DPP outcomes in socioeconomically diverse populations
- Maintaining program quality and fidelity as lay DPP Lifestyle Coach workforces grow
 - Infrastructure and support for data collection, monitoring, and reporting from community programs
- Implementing earlier intervention points on the continuum (shift from prediabetes to broader health promotion for physical inactivity, healthy eating, and weight management)