

POLICY BRIEF:

The Effectiveness of Community-based Diabetes Prevention Programs

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MAIN FINDINGS

Lifestyle interventions can work outside of research settings. The Diabetes Prevention Program, sponsored by National Institutes of Health (NIH-DPP), can be modified to work in nonclinical, community-based, and group settings.

Little is known about effective interventions for racial and ethnic minorities. Very few studies include adequate numbers of racial and ethnic minorities despite the high prevalence of diabetes among blacks and Latinos.

The long-term effects of community-based interventions are unknown. Most studies of diabetes prevention programs did not follow participants beyond one year.

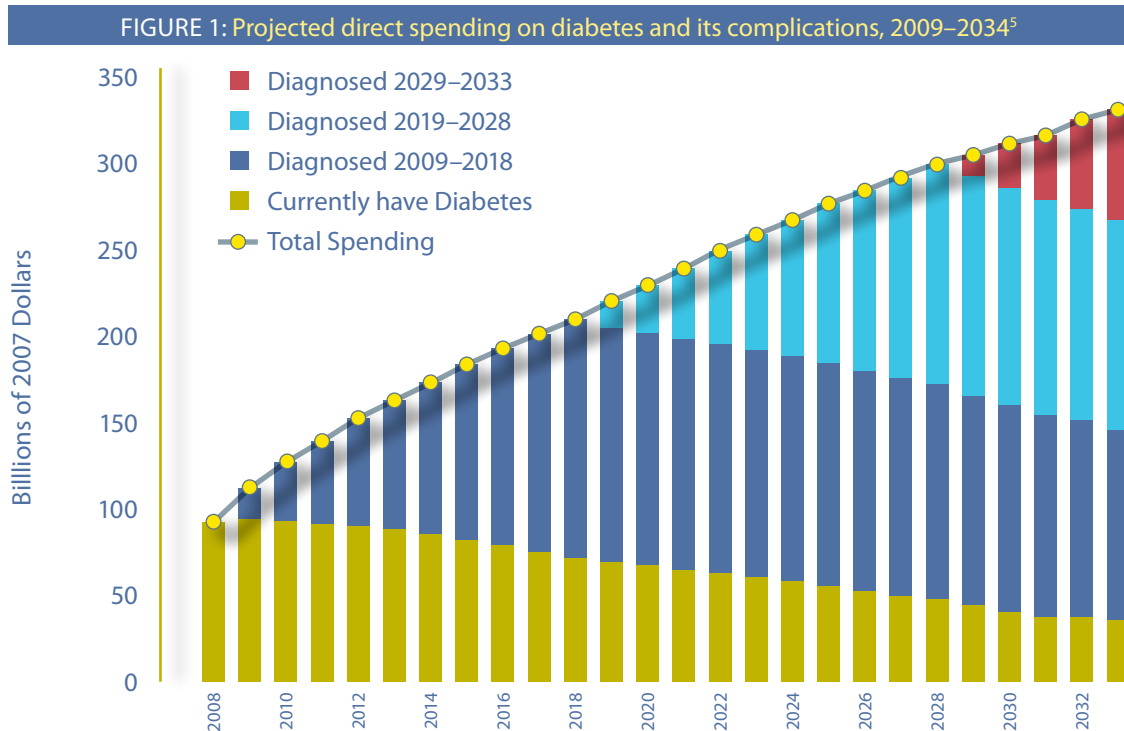
WHY IS THIS ISSUE IMPORTANT TO POLICYMAKERS?

Type 2 diabetes is a rising epidemic, affecting almost 1 out of 10 Americans.¹ By 2050 the Centers for Disease Control and Prevention (CDC) projects the prevalence of diabetes to double, affecting 1 out of 5 adults in the United States.² In addition to the number of people with diabetes, CDC estimates as many as 86 million people in the United States—more than 1 in 3 adults—have prediabetes.³ People with prediabetes have moderately elevated blood sugar levels and are at a higher risk for developing diabetes.

Diabetes is costly. The diabetes epidemic has serious implications for health care costs. Annual health care costs from diabetes are projected to triple from \$113 billion in 2007 to \$336 billion in 2034.⁴

Type 2 diabetes is preventable. Some people are inherently at risk for diabetes based on age, gender, race, ethnicity, or family history, but other risk factors can be controlled or modified, including weight, physical inactivity, and smoking. Reducing or eliminating the major modifiable risk factors could prevent a large proportion of diabetes cases.

Main Findings (continued)



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THE NIH-DPP

The Diabetes Prevention Program, sponsored by the National Institutes of Health (NIH-DPP), is the gold standard in the United States for a well-designed randomized control to determine whether diet, exercise, or drugs can prevent or delay the onset of Type 2 diabetes.

The study included more than 3,200 participants—nearly half of whom were racial and ethnic minorities. Participants received intensive counseling on diet and exercise or the drug metformin.

Participants who received the lifestyle counseling cut their risk of diabetes in half. Those who received metformin reduced their risk of developing diabetes by almost one-third.

The NIH-DPP was the first large-scale clinical trial in the United States to show that lifestyle interventions can prevent or delay the onset of diabetes.

Since then, many programs have adapted the NIH-DPP intervention in the hope of replicating its success in a real-world setting. This policy brief looks at the effectiveness of community-based programs to reduce the risk of Type 2 diabetes.

METHODOLOGY

Studies included in the synthesis evaluated the effectiveness of diabetes prevention programs by looking at outcome measures such as changes in weight, cholesterol, or blood sugar levels. The heterogeneity in outcome measures makes it difficult to compare the effectiveness of one study to another. As a result, the synthesis adopted a multivariate prediction model of diabetes risk.⁶ This peer-reviewed model allowed the authors to compare studies by predicting the most important direct outcome measure—the reduction in risk of developing diabetes.

Main Findings *(continued)*

After estimating the risk of developing diabetes from the model, the authors calculated the relative risk reduction (RRR) for each study, which permits comparison of interventions across studies. More information can be found on this model in the [synthesis](#).

HOW EFFECTIVE ARE COMMUNITY-BASED DIABETES PREVENTION PROGRAMS?

There is modest evidence that full lifestyle interventions implemented in community settings can reduce the risk of diabetes, but the effect of the interventions is highly variable across studies. Using the statistical model described above, two of the nine randomized control trial (RCT) studies of full lifestyle interventions—those that include both diet and physical activity—had large effects. Studies by Ma et al. (2013) and Katula et al. (2011), reduced the relative risk of diabetes by 24% and 19%, respectively.⁷ The remaining RCTs reduced the relative risk of diabetes by 5% or less.⁸ Among the large non-RCT studies, only Vanderwood et al. (2010)⁹ had a large RRR (30%), whereas the other studies had modest reductions of 13% or less.¹⁰ Programs that focus on either healthy diet or increased activity—but not both—do not show much promise for reducing the risk of diabetes.¹¹

Lifestyle interventions can work outside of research settings and can be modified from an individual intervention to a group-based intervention. The NIH-DPP was a clinically based individual intervention. The studies in the synthesis evaluated interventions that took place in a variety of community-based settings, including primary care facilities, YMCAs, churches, homes, and neighborhoods. Nearly all of the studies modified the intervention to group settings.

Full lifestyle interventions were more successful than pharmacological interventions at reducing the risk of diabetes. The effect of the strongest pharmacological interventions, while positive, was less than the effectiveness of the strongest full lifestyle interventions.¹² This finding is consistent with that of the NIH-DPP.

Despite the high prevalence of diabetes and prediabetes among blacks, Latinos, and Native Americans, we know little about successful interventions for racial and ethnic minorities. The majority of the participants in nearly all studies in the synthesis were white, non-Hispanic, and primarily female. Three studies did take place in black churches, and all reduced the relative risk of diabetes among participants; however, these studies had 10 or fewer participants.¹³

The long-term effects of community-based lifestyle interventions have not been extensively evaluated. The NIH-DPP followed participants for almost three years. Although community-setting studies have shown that their interventions were effective during and immediately after the interventions, very few studies tracked the effect beyond one year.

Other modifications of the NIH-DPP study, including fewer intervention sessions and virtual interventions, have promising but limited evidence. Reducing the number of coached interventions or providing the interventions through DVD or the Internet successfully reduced participants' risk of diabetes in a number of studies, but further research is needed.¹⁴ If successful, these modifications could both reduce the cost of the interventions and increase participation.

Main Findings *(continued)*

HOW MUCH DO COMMUNITY-BASED DIABETES PREVENTION PROGRAMS COST?

The costs of community-based prevention efforts are largely unknown. Most studies included in the synthesis did not report cost information or reported incomplete information. One study that did report costs estimated them to be between \$275 and \$375 per participant compared with the NIH-DPP cost of approximately \$1,400 per participant.¹⁵ Researchers from CDC estimate that a nationwide community-based diabetes prevention program could save \$5.7 billion over 25 years.¹⁶

CONCLUSIONS AND POLICY IMPLICATIONS

Lifestyle interventions can work in community-based and group settings. These modifications make the intervention less resource intensive and more feasible for communities with modest funds to implement.

Standardization of study descriptions and outcome measures would improve the ability to identify successful community-based programs. Synthesizing research results revealed the need for standards for describing eligibility, interventions, and outcome results.

Efforts must be made to include more racial and ethnic minorities in studies of diabetes prevention programs. Blacks, Latinos, and Native Americans are overrepresented in the population at risk for diabetes, but underrepresented in studies of diabetes prevention programs. Support from policymakers could help identify the most effective recruitment channels to reach the most vulnerable populations.

Support for post-intervention monitoring is needed. It is not enough to know that the intervention has been successful in reducing the risk of diabetes. Diabetes prevention involves a lifelong commitment to healthy eating and physical activity. Studies need to evaluate the long-term health and financial effects of community-based diabetes prevention programs.

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