The Economic Case for Prevention: Michigan Research Team Shows Diabetes Prevention Programmes Pay Dividends

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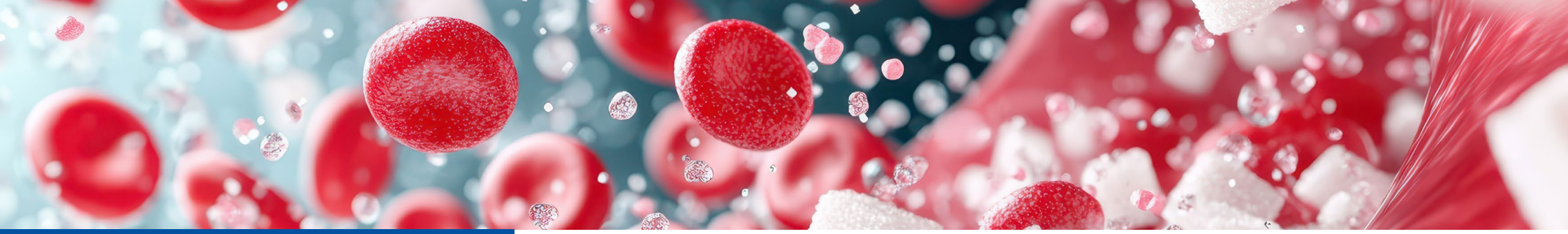


The Economic Case for Prevention: Michigan Research Team Shows Diabetes Prevention Programmes Pay Dividends

For decades, healthcare systems have focused primarily on treating diseases rather than preventing them. Now, groundbreaking research from the University of Michigan demonstrates that investing in prevention – particularly for type 2 diabetes – can improve health outcomes and significantly reduce costs. Their comprehensive studies provide compelling evidence that could reshape how we approach chronic diseases.

The Growing Diabetes Challenge

Type 2 diabetes affects nearly 15% of American adults, with rates continuing to climb. In 2022 alone, the direct medical costs of diagnosed diabetes reached $307 billion in the United States. People with diabetes typically spend 2.6 times more on healthcare than those without the condition, creating an immense burden on both individuals and the healthcare system.

Before someone develops diabetes, they often have a condition called prediabetes – where blood sugar levels are elevated but not yet high enough to be classified as diabetes. This creates a crucial window of opportunity for prevention. Currently, an estimated 98 million American adults, representing 38% of the adult population, have prediabetes, though most are unaware of their condition.

The Science of Prevention

The concept of diabetes prevention through lifestyle changes gained scientific backing in 2002 when a landmark clinical trial called the Diabetes Prevention Programme demonstrated that intensive lifestyle modification could reduce the risk of developing type 2 diabetes by 58% over three years. The intervention focused on helping participants make sustainable changes to their diet and physical activity levels.

Based on these promising results, the Centers for Disease Control and Prevention (CDC) launched the National Diabetes Prevention Programme (National DPP) in 2010. This structured year-long lifestyle change programme was designed to be delivered in communities across the country, making prevention more accessible to those at risk.

A Living Laboratory at Michigan

Dr William Herman and his colleagues at the University of Michigan saw an opportunity to study prevention programmes by examining what happened when the university began offering the National DPP to its employees, retirees, and their dependents through their health insurance plan.

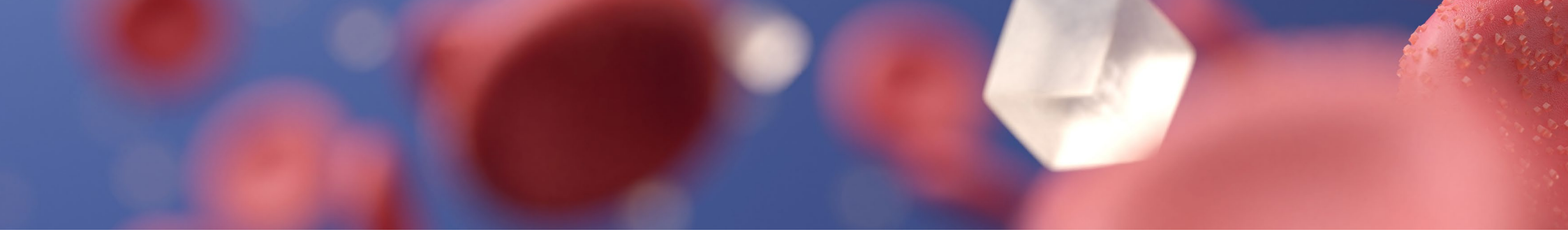
Starting in 2015, Dr Herman's team worked with the university's health plan to identify individuals with prediabetes through medical claims and laboratory results. They found over 8,000 eligible people in their workforce and encouraged them to enroll in diabetes prevention programmes.

The university offered four different CDC-recognised programme formats. The first was a health system programme offering in-person classes led by certified diabetes educators in an endocrinology clinic. The second was a community-based programme providing classes led by trained peer instructors across southeastern Michigan. The third operated from a fitness facility, combining education with physical activity opportunities. The fourth was an online digital programme offering flexible virtual meetings.

This variety of options created what researchers call a natural experiment – an opportunity to study what happens when prevention programmes are implemented in a real-world setting rather than a controlled research environment.

Understanding Who Participates

Dr Herman's team first examined who chose to participate when offered the programme at no cost. Of the 8,131 eligible people identified, 776 enrolled, representing approximately 9.5% of those eligible. While this participation rate might seem low, it was nearly four times higher than typical nationwide enrollment rates.



The researchers found several interesting patterns in participation. Enrollees tended to be older, with an average age of 53 compared to 50 for non-enrollees. They were also more likely to be women, with 72% of participants being female compared to 56% of non-participants. Programme participants typically had higher body mass index scores and were more likely to have received medical care in the previous year. They also tended to live in neighbourhoods with higher household incomes and lower unemployment rates.

Different Programmes for Different People

One of the most intriguing findings was how different types of people gravitated toward different programme formats. Dr Herman's team found that older individuals with existing health conditions like hypertension and cardiovascular disease were more likely to choose the classroom-based hospital programme. These participants often valued the medical setting and expertise of the certified diabetes educators.

The community programme attracted a different demographic. Participants in this format tended to come from areas with lower median neighbourhood incomes and were less likely to have home internet access. This suggested that offering programmes in community settings might be particularly important for reaching underserved populations. The familiar locations and peer instructors seemed to resonate with these participants.

The online programme proved most attractive to those who valued scheduling flexibility. These participants often cited work commitments and busy schedules as factors in their choice. Meanwhile, the fitness facility programme drew people who were particularly interested in physical activity and had convenient access to the location. Many of these participants appreciated the combination of education with immediate access to exercise facilities.

Understanding the Psychology of Prevention

To better understand what motivated people to join the programmes, Dr Herman's research team surveyed both enrollees and non-enrollees about their health beliefs and attitudes. This work, led by Dr Kevin Joiner, revealed several important insights about participation decisions.

Those who enrolled were more likely to believe that taking preventive action would help them avoid diabetes. This belief in the effectiveness of prevention appeared to be a crucial factor in participation. Enrolled participants were also more likely to have received some kind of prompt or encouragement to join, whether from their doctor, health plan, or other source.

Among those who didn't enroll, the most common reason was simply not remembering being invited to participate, with over half of non-participants citing this factor. This finding suggested that communication strategies might need improvement. The second most common reason was a belief that they could manage on their own, mentioned by about one-fifth of non-participants. Being too busy at work was the third most frequent reason. Surprisingly, only a small proportion cited a lack of doctor recommendation as a reason for not participating.

Measuring Real-World Outcomes

The next crucial question was whether the programmes worked in a real-world setting. Dr Herman's team tracked participants for two years, comparing health outcomes between those who enrolled and those who didn't. Their findings provided strong evidence for the effectiveness of prevention programmes outside of controlled clinical trials.

The researchers found that participants attended a median of 18 sessions over the course of the programme, with more than three-quarters remaining engaged through the first 18 weeks.

The community-based programme showed particularly strong retention at 44 weeks, suggesting that the local, peer-led format might help keep people engaged over time.

Age emerged as an important factor in programme completion. Older participants were more likely to stay engaged with the programme throughout its duration. Another key finding was that early success predicted longer participation – those who achieved initial weight loss and reported higher physical activity levels in the first few weeks were more likely to complete the full programme.

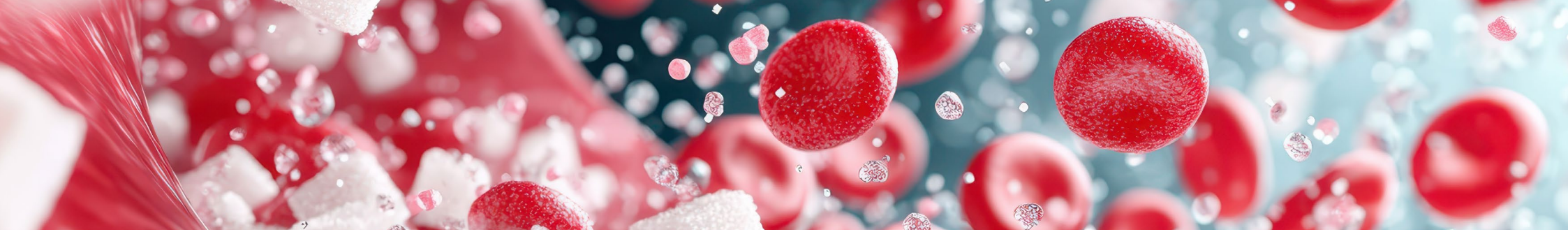
The results showed significant benefits for programme participants across multiple health measures. At one year, enrollees had lost an average of 4.8% of their starting body weight, while non-participants showed minimal changes. Blood pressure measurements demonstrated greater improvement among programme participants, as did triglyceride levels. Blood sugar control, measured by HbA1c tests, also showed greater improvement among those who participated.

Perhaps most importantly, programme participants were significantly less likely to develop diabetes. After two years of follow-up, approximately 11% of programme participants had developed diabetes, compared to 15% of non-participants. This represented a meaningful reduction in diabetes risk, particularly considering the relatively short-time frame.

The Financial Impact

Some of the most striking findings came from the economic analysis led by Dr Shihchen Kuo. The research team calculated all healthcare costs for both participants and non-participants in the two years following the programme offering. They examined everything from hospital stays to routine check-ups, emergency room visits, laboratory tests, diagnostic procedures, prescription medications, medical equipment, and other healthcare service.

The results proved remarkable. Programme participants had medical costs that were approximately $4,600 (£3,600) lower per person over two years compared to non-participants. The most



significant portion of these savings came from reduced costs of hospitalisations, which averaged about $3,000 (£2,000) less per person. Outpatient visit costs were roughly $1,200 (£900) lower, and emergency room visit costs were about $300 (£200) lower per person.

These savings remained substantial even after accounting for the cost of providing the prevention programme, which averaged $518 (£400) per participant. Statistical analysis demonstrated an 88% probability that the programme saved money overall and an 84% chance that it was cost-effective by common willingness-to-pay measures.

Comparing Programme Approaches

Different programme formats showed varying levels of success in different areas. The community-based programme achieved the highest average weight loss at one year, with participants losing nearly 8% of their initial body weight. The health system programme followed with 5% average weight loss, while both the online and fitness facility programmes averaged 4.3% weight loss.

The fitness facility programme excelled in a different area – physical activity engagement. Participants in this format were most likely to meet recommended activity levels, with seven out of ten reporting at least 150 minutes of activity weekly at the one-year mark. While the online programme showed lower retention rates overall, it proved valuable for those who needed scheduling flexibility and preferred virtual engagement.

The Role of Health Systems

Dr Herman's research highlights the crucial role that health systems play in successful diabetes prevention. Medical providers need effective methods to identify people with prediabetes and communicate this diagnosis clearly. Many study participants were either unaware they had prediabetes or didn't remember being told about their condition, suggesting room for improvement in diagnostic communication.

Healthcare providers emerged as key influencers in programme participation. When doctors actively recommended the programme, their patients were significantly more likely to enroll. This finding emphasised the importance of engaging medical professionals in prevention efforts.

The availability of multiple programme formats proved important for reaching different populations. Each format attracted different types of participants and accommodated various schedules and preferences. The research suggested that health systems should consider offering several options rather than taking a one-size-fits-all approach.

Dr Herman's work suggested that expanding insurance coverage for prevention programmes could yield significant benefits. The research also supported investing in community-based programme delivery and the development of virtual options to reach more people. The team found that increased funding for programme outreach and engagement could help overcome the awareness gap that prevented many eligible individuals from participating.

Global Prospects and the Quest for Quality

As prevention programmes expand, maintaining consistent quality becomes increasingly important. Dr Herman and his colleagues developed methods to evaluate programme effectiveness across different formats and settings. Their research showed that regular monitoring of outcomes and standardised delivery methods helped maintain programme quality even as they scaled up to serve more participants.

While this research was conducted in the United States, its implications extend globally. Type 2 diabetes rates are increasing worldwide, particularly in developing countries. The Michigan team's findings suggest that investing in prevention could help address this growing global health challenge.

The research demonstrated that prevention programmes can be cost-effective even in the short term, though they require careful adaptation to local conditions. Community-based programmes' success suggested that prevention efforts could work in various cultural and economic contexts.

A Roadmap for Implementing Effective Prevention Programmes

Dr Herman and his colleagues continue studying ways to optimise programme delivery and increase participation. They are investigating strategies to better engage populations that currently have lower participation rates, including men and certain ethnic minorities. They are also studying ways to enhance programme effectiveness through improved teaching methods, technologies, and support systems. The key to success appears to lie in the systematic identification of eligible participants, clear communication about prediabetes diagnosis, multiple programme format options, removal of cost barriers, and support for ongoing participation. Regular monitoring of outcomes helps maintain programme quality and effectiveness.

This research provides compelling evidence that preventing diabetes through structured lifestyle programmes can improve health outcomes while reducing healthcare costs. Dr Herman's team demonstrated that prevention programmes can work in real-world settings outside of carefully controlled clinical trials when appropriately implemented. Their work suggests that the future of healthcare might lie not just in better treatments but in preventing chronic diseases from developing in the first place.

MEET THE RESEARCHERS

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Dr William Herman is the Stefan S. Fajans/GlaxoSmithKline Professor of Diabetes at the University of Michigan, where he holds dual appointments as Professor of Internal Medicine in the Division of Metabolism, Endocrinology and Diabetes, and Professor of Epidemiology in the School of Public Health. His research encompasses the broad areas of diabetes, health services research, and clinical economics. As a distinguished expert in these fields, Dr Herman's work contributes significantly to our understanding of diabetes management and health economics. His position as the Stefan S. Fajans/GlaxoSmithKline Professor reflects his prominent standing in diabetes research and clinical practice.

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Dr Shihchen (Stanley) Kuo is an Associate Research Scientist in the Division of Metabolism, Endocrinology and Diabetes in the University of Michigan's Department of Internal Medicine. His expertise lies in health pharmacoepidemiology, economics and outcomes research, with a particular focus on computer simulation modelling, and the prevention and control of diabetes. Dr Kuo's research contributes valuable insights to understanding the comparative effectiveness and economic impact of interventions for prediabetes and diabetes management, combining technical modelling expertise with practical healthcare applications.

Dr Laura N McEwen
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Dr Laura McEwen serves as a Statistician Staff Specialist in the Division of Metabolism, Endocrinology, and Diabetes in the University of Michigan's Department of Internal Medicine. Her research focuses on evaluating the implementation of the National Diabetes Prevention Program, specifically examining its effectiveness and cost-effectiveness in community settings. Dr McEwen's work plays a crucial role in understanding how diabetes prevention programs perform in real-world contexts, contributing to the development of more effective public health interventions.

Dr Kevin Joiner
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Dr Kevin Joiner is an Assistant Professor in the School of Nursing at the University of Michigan. His research centres on improving health outcomes and quality-of-life for individuals with diabetes through culturally informed interventions and educational initiatives. Dr Joiner's work particularly emphasises the examination of psychosocial factors in diabetes management, contributing to a more comprehensive and culturally sensitive approach to diabetes care and education.

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Dr Claudia Villatoro serves as a Clinical Instructor in the Division of Endocrinology, Metabolism and Lipid Research at Washington University in St Louis. As both a clinical endocrinologist and epidemiologist, her research focuses on nutritional epidemiology, obesity, type 2 diabetes, and health services delivery. Dr Villatoro's dual expertise in clinical practice and research enables her to bridge the gap between epidemiological findings and practical healthcare applications.

KEY COLLABORATORS

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