RISING TO THE CHALLENGE
PREVENTING AND MANAGING TYPE 2 DIABETES

Report of the WISH Diabetes Forum 2015

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FOREWORD

The rise in diabetes around the globe is one of the greatest health catastrophes the world has seen. Rates have soared over recent decades with 380 million people now affected by the condition, which causes heart disease, stroke, amputations, kidney failure, blindness and premature death.

The global epidemic, fueled by increasing urbanization and the spread of Western lifestyles, is imposing an immense burden on health systems and national economies. At present rates of growth, one in ten of the world's adult population – 600 million people – will suffer from diabetes in 20 years' time.

Diabetes is a metabolic disorder due to decreased insulin amount and effect. Nine out of ten sufferers have type 2 diabetes. While type 2 diabetes used to be rare in younger age groups, prevalence rates among children have soared as well with rising obesity rates. As the condition comes on slowly, it often causes complications before it is diagnosed. Life long intervention is needed and includes both medical – and political – support.

This is not a counsel of despair. It is instead a clarion call to action. There is much that we can, and must, do. While there is still no cure, the disease is preventable – both its onset and its complications. There is now a clear consensus on how to manage the disease through drug treatment, screening, self-management and behavior change. The question in diabetes is not what to do, but how to do it.

Our aim in this report is to help policymakers rise to the challenge. We describe three policy goals that together will reduce incidence of diabetes through behavior change, curb complications with better disease management and support those at risk through screening and interventions. Each policy goal is supported by case studies of innovative approaches, providing policymakers with practical tools.

Diabetes has not had the profile of more dramatic diseases such as cancer and heart disease. That must now change.

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EXECUTIVE SUMMARY

At a global level, type 2 diabetes is one of the major challenges facing policymakers today. The statistics of rising prevalence and the associated health and economic impact are staggering.

The challenge is recognized by the United Nations (UN) General Assembly, the World Health Organization (WHO) and the World Economic Forum: all have called for collective commitment to prevent diabetes and improve the quality of life of the people who suffer from it. The challenge is serious, urgent and universal.

- It is serious for two reasons. First, the health consequences of type 2 diabetes are more severe than generally recognized, and include an increased susceptibility to blindness, lower limb amputations, kidney failure, heart attacks and stroke. Secondly, the direct and indirect costs are a serious drain on healthcare budgets and productivity, amounting to an estimated 2 percent of national gross domestic product (GDP) in many countries.
- The challenge is urgent because prevalence rates are rising. When this growth is combined with the increase in the length of time that people live with diabetes, it puts further pressure on GDP in most countries. Type 2 diabetes affects about 350 million people worldwide. If the trend continues, an estimated 10 percent of the world's adult population (nearly 600 million people) will suffer from the condition by 2035.
- The challenge is universal because it impacts on everyone. Every country will experience growing rates of diabetes prevalence over the coming years. Developed countries may record lower growth rates, but they often have higher costs of care and so cannot escape the economic burden. Developing countries currently have lower healthcare expenditure, but they will record the fastest growth rates in diabetes prevalence. Already, 80 percent of the world's diabetic population lives in countries where only 20 percent of the global budget for healthcare is spent.

Now that the challenge is recognized globally, the ways of resolving it are becoming clearer. There is a large and growing body of evidence about what is needed to improve diabetes care, enhance screening, and prevent people at risk of diabetes from developing the condition. This information can be found in guidance and toolkits published by WHO, the International Diabetes Federation (IDF) and many others.

If 'what' needs to be done is clear, the main issue is the 'how'. Diabetes lacks the public or political priority that it should have, proportional to its health and social impact. It is not a dramatic disease like cancer or heart disease, and both its health and economic consequences are often underestimated. Effective surveillance, management and prevention of diabetes requires a health service that takes the initiative and considers population health over a long period of time. It must also explore ways to promote healthy living in all areas of society, and take a positive role in stimulating behavior change. The implementation path for the long-term prevention of diabetes

involves co-ordinating multiple actions across many government departments and advocacy groups. The nature and scale of these interventions are difficult for most policymakers to engage with easily.

This paper proposes three key policy goals for policymakers:

1. **Improve disease management for people with diabetes to reduce complication rates**

   The evidence of what works is strongest here. Policymakers now have access to comprehensive, evidence-based approaches to treatment, screening, self-management and patient education. This paper explores accountable care models of healthcare delivery, the innovative use of technology to improve self-management, and approaches to improve the healthcare of hard-to-reach patients.

2. **Establish effective surveillance to identify and support those at risk of type 2 diabetes**

   Policymakers can draw on known cost-effective approaches to the screening of high-risk populations and a strong evidence base of interventions. This paper looks at innovative ways to improve the cost-effectiveness of screening through the use of incentives, tailoring to different cultural circumstances and sharing the cost burden of screening with other diseases.

3. **Introduce a range of interventions that help to create an environment focused on prevention**

   To create an environment that encourages healthy living and prevents diabetes, policymakers will need to address risk factors rather than focus solely on the disease. This requires a wide variety of interventions to change population behavior, ranging from soft nudges to tough legislation. Sustaining these initiatives requires a clear case for change and co-ordination at many levels. The evidence on ways to achieve change is more limited because the actions have to be customized to local cultures. This paper covers a range of innovative approaches to influence behavior on nutrition and physical activity. It highlights examples of cross-disease strategies for healthy living and different approaches to co-ordinate the delivery of these strategies.

Policymakers know the global imperative for action, and they know the 'what'. The challenge now is to translate those into the 'how'. Through an exploration of 33 case studies, this paper provides examples to help policymakers set off in the right direction.

DIABETES: THE STAGGERING FACTS

Diabetes is one of the great health challenges of our time, and impacts on every country. It is a metabolic disorder in which the body cannot produce enough insulin, or cannot use insulin effectively, which now contributes to millions of deaths annually. It is chronic, incurable and costly – and it is also eminently preventable.

Box 1: Ten facts about diabetes

1. There is a global epidemic of diabetes that can be traced back to rapid increases in overweight, obesity and physical inactivity.
2. Total deaths from diabetes are projected to rise by more than 50 percent in the next 10 years. Most notably, they are projected to increase by over 80 percent in upper-middle income countries.
3. Type 1 diabetes is characterized by a lack of insulin production, and type 2 diabetes results from the body's ineffective use of insulin.
4. Type 2 diabetes is much more common than type 1 diabetes, and accounts for around 90 percent of all cases.
5. Reports of type 2 diabetes in children, which used to be rare, have increased worldwide. In some countries, type 2 accounts for almost half of newly diagnosed cases in children and adolescents.
6. A third type of diabetes is gestational diabetes. This type is characterized by hyperglycemia, or raised blood sugar, which presents during pregnancy.
7. In 2005, 1.1 million people died from diabetes. The full impact is much larger because, although people may live for years with diabetes, their cause of death is often recorded as heart disease or kidney failure.
8. Eighty percent of diabetes deaths are now occurring in low- and middle-income countries.
9. Lack of awareness about diabetes, combined with insufficient access to health services, can lead to complications such as blindness, amputation and kidney failure.
10. Diabetes can be prevented: 30 minutes of moderate-intensity physical activity on most days and a healthy diet can drastically reduce the risk of developing type 2 diabetes.

Adapted from: Fact file: 10 facts about diabetes, World Health Organization, 2013

The facts about diabetes are staggering:

- According to estimates, there are over 380 million adults worldwide with diabetes: as many as 180 million of these are undiagnosed.[1] This means that about 8.3 percent of the world's adult population currently has diabetes. By 2035, it is estimated that the global prevalence rate among people aged 20–79 will have risen to over 10 percent, which means that nearly 600 million people will be living with diabetes.
- Type 2 diabetes is increasingly being seen in younger people. The estimate is that between 2013 and 2035 there will be a 19 percent growth in the global population of people with diabetes aged 20–39.[2]
- As life expectancy increases and populations age, the total number of people with diabetes will increase. For example, in the United States (US), a 60-year-old man diagnosed today with diabetes can expect to live for a further 18 years, whereas in 1985–89, that figure was only 13 years.[3]

Together, the increasing incidence, earlier onset and aging population with longer life expectancy create a multiplier effect. The forecast for 2035 is a 55 percent increase in the total number of people aged 20–79 with diabetes, reaching over 590 million worldwide.

The challenge of diabetes is universal. The IDF forecasts that nearly every country will experience growing prevalence of diabetes over the coming years. This rise in prevalence is due mostly to changes in nutrition and exercise, and the associated weight gain.[4] In recent years, with greater urbanization and the technology revolution, obesity rates have soared, and so too has the incidence of type 2 diabetes. More than 80 percent of people diagnosed with type 2 diabetes are either overweight or obese.

Box 2: Countries with largest comparative prevalence rates

1.	Marshall Islands	37.1%
2.	Micronesia	36.3%
3.	Tokelau	29.6%
4.	Kiribati	26.4%
5.	Cook Isl	25.5%
6.	French Polynesia	24.4%
7.	Saudi Arabia	23.9%
8.	Vanuatu	23.7%
9.	Nauru	23.3%
10.	Kuwait	23.1%

Source: IDF Diabetes Atlas (6th edition – 2014 update)

Importantly, there is a genetic component too. This means that the changing environmental factors affect some populations more than others. Therefore, certain populations that are more susceptible to developing the disease will experience an even greater increase in the prevalence of type 2 diabetes.[5]

Increases in prevalence are not just caused by genetic susceptibility, but also by factors associated with high GDP growth rates. That presents a particular challenge for some countries in the Middle East. The IDF forecasts that between 2013 and 2035 the countries with the highest growth in diabetes prevalence will be the United Arab Emirates, Oman and Qatar.[6]

WHY POLICYMAKERS NEED TO ACT

Policymakers need to address the diabetes challenge for two reasons:

- The health impact of diabetes.
- The economic impact of diabetes.

The health impact of diabetes

The seriousness of the health impact is often not appreciated. That is because type 2 diabetes is typically a disease with slow progression, and its early stages may be largely symptom-free. Diabetes is not as dramatic as cancer or heart disease, but its consequences in the longer term are extremely serious:[7, 8]

- Diabetes doubles the risk of coronary heart disease in men, and quadruples it among women.
- Stroke in people with diabetes is three times higher than in people without diabetes.
- Diabetes is the leading cause of end stage renal disease.
- Diabetic retinopathy accounts for 5 percent of all cases of blindness globally.
- Someone with diabetes is at more than 25 times greater risk of limb amputation than someone without diabetes.

As a result of these complications, type 2 diabetes can reduce a person's life expectancy by up to 10 years,[9] and according to the IDF there were around 5 million deaths in 2014 as a result of diabetes and its related diseases. Nearly half of these deaths were of people aged under 60.[10]

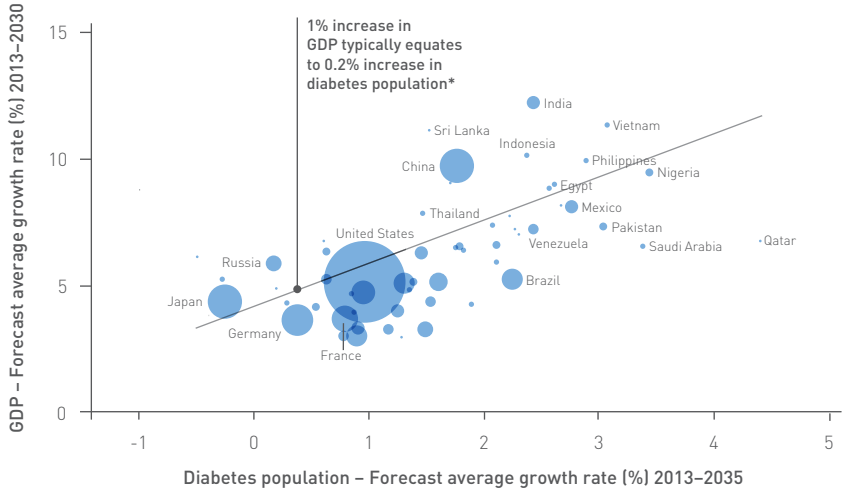
The economic impact of diabetes

The cost of direct healthcare for diabetes and its complications was around 11 percent of total healthcare costs worldwide in 2014. This is equivalent to $612 billion, which is greater than the entire GDP of countries such as Nigeria or Sweden. This cost is due both to the high prevalence of diabetes and to the fact that people with diabetes incur higher lifetime healthcare costs than their peers. For example, in the US lifetime healthcare cost are 2.3 times higher for people with diabetes compared to the average population.[11]

Unchecked, these costs will continue to rise for two important reasons.

First, as GDP grows so does the prevalence of diabetes. This is in part due to the environmental factors discussed above and the increased life expectancy linked to the growth in national wealth. Based on IDF and Economist Intelligence Unit forecasts, for every 1 percent increase in a country's GDP, there will be a 0.2 percent increase in that country's population of people with diabetes (see Figure 1).

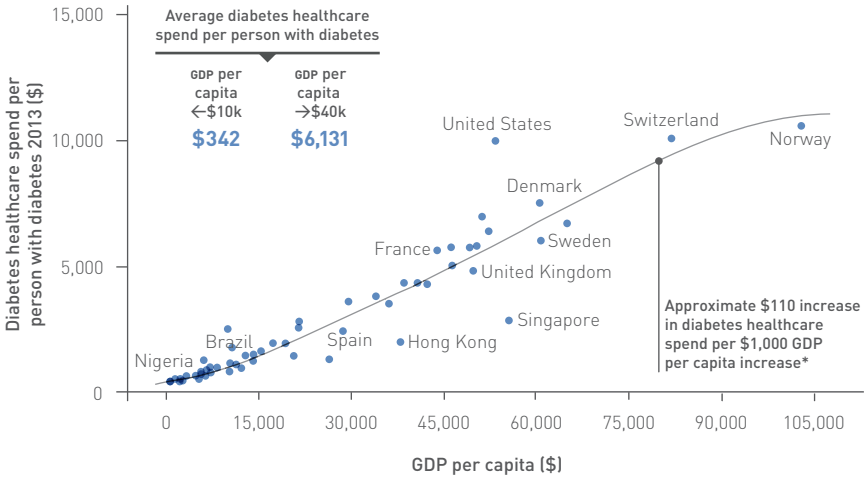
Figure 1: Comparison between GDP forecast growth and forecast growth in diabetes population



*Illustrative impact calculated using trend formula of y = 0.2189x + 0.0019
Source: IDF Global Atlas of Diabetes, 6th edition; GDP forecasts from Economist Intelligence Unit, except Qatar GDP forecast from Euromonitor International

Second, as GDP rises so does the diabetes healthcare spend for each person with diabetes. Figure 2 shows average diabetes healthcare spend compared to GDP. For countries with a GDP below $10,000 per capita, the average diabetes-related healthcare spend per person with diabetes is $342, while for countries with a GDP above $40,000 per capita, the average spend is $6,131.

Figure 2: Comparison between GDP per capita and the diabetes healthcare spend per person with diabetes



*Illustrative impact calculated using an $1,000 increase at $20,000 GDP per head, using trend formula: y = -1E-11x3 + 2E-06x2 + 0.0419x + 123.83
Source: IDF World Atlas 2013; Economist Intelligence Unit

GDP per capita and diabetes healthcare spend correlate closely. On average, the increase in diabetes-related healthcare spend per person with diabetes is approximately $110 for every $1,000 increase in GDP per capita. Developing countries tend to have lower prevalence rates and lower diabetes spend per case. In these countries, diabetes spend is expected to increase rapidly as their GDP grows.

In addition to the direct healthcare costs, there are the indirect costs of diabetes to consider, such as lost productivity, earlier retirement and increased requirements for social support. They are often as high as, if not higher than, the direct costs.[12] Combined, the total cost could exceed 2 percent of GDP in many countries.

The seriousness, urgency and the universal nature of the challenge of type 2 diabetes have now been widely acknowledged. The UN General Assembly, WHO, and the World Economic Forum have all sounded the alarm (see Figure 3).

Figure 3: What the world says about diabetes

> **In September 2011, the UN General Assembly recognized diabetes... as a global health and development challenge... let us commit to greater collective effort to prevent diabetes and improve the quality of life of all who suffer from it, particularly the poor and disadvantaged.**
> Ban Ki-moon, Secretary-General of the United Nations

> **Diabetes cost the global economy nearly US$500 billion in 2010, and that figure is projected to rise to at least US$745 billion in 2030, with developing countries increasingly taking on a much greater share of the outlays.**
> World Economic Forum

> **The 66th World Health Assembly saw the unanimous adoption of a voluntary Global Action Plan for the prevention and control of NCDs. Diabetes is now prominent on the global health agenda... Still, we must not miss this opportunity. Governments and policymakers, health professionals and those affected by the disease must remain engaged in the fight.**
> Global Action Plan 2013–2020, The World Health Organisation

Source: United Nations: Secretary General's Statement on World Diabetes Day, 14 November 2012; IDF: Roadmap to the Future Development Agenda; WEF: The Global Economic Burden of Non-communicable Diseases

In the view of many observers, however, the alarm has not yet been successfully translated into action. Much more needs to be done to address the two issues that all countries face:

- The need to reduce the rate of costly complications, by improving the screening and management of people with diabetes.
- The need to halt the rise in incidence of type 2 diabetes by focusing on prevention through environmental factors and lifestyle changes.

The levers and resources available for meeting these two needs will vary from country to country, but there are some common approaches, which this paper discusses.

MEETING THE CHALLENGES

We know what works

There is a paradox in type 2 diabetes: the prevalence and impact of the disease continue to grow, even though we know what needs to be done to tackle it. There is now a large and growing body of evidence about what works in diabetes management and prevention. The purpose of this paper is not to repeat in detail what works because that information can be found in sources such as those listed below.

Guidance on the management of type 2 diabetes

- IDF: Global guidelines for type 2 diabetes.
- WHO: Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings.

Guidance on surveillance and prevention for high-risk populations

- Li et al: Cost-effectiveness of interventions to prevent and control diabetes mellitus: A systematic review.
- IMAGE: Take action to prevent diabetes – the IMAGE toolkit for the prevention of type 2 diabetes in Europe.

Guidance on the creation of an environment focused on prevention

- WHO: Global action plan for the prevention and control of noncommunicable diseases.
- WHO: A framework for implementing the set of recommendations on the marketing of foods and non-alcoholic beverages to children.

Guidance on diabetes advocacy, communications and national policy development

- IDF: Advocacy and communications toolkit.
- IDF: A guide to national diabetes programmes.
- European Policy Action Network on Diabetes. The ExPAND policy toolkit on diabetes.

There is a more detailed list of resources in Appendix 1.

The paradox persists, because knowing what to do is a different matter from knowing how to do it. What is needed is to translate the 'what' into a workable 'how'.

The challenge of 'how'

Policymakers face a number of challenges when they attempt to implement changes needed for improved management and prevention of diabetes. These challenges are highlighted below, and discussed in more detail later (see the section entitled 'Policy goals').

Health service reform: The effective surveillance and management of diabetes may require rethinking traditional models of healthcare. The ideal model is one that takes an active approach to support patient health over the long term, and a positive role in activating behavior change. It might involve, for example, greater use of non-traditional providers, such as expert patients or fitness coaches managing their services, together with formal healthcare professionals.

Disease versus broader health focus: To gain support for the prevention of type 2 diabetes, policies need to include a broader, cross-disease perspective that concentrates on risk factors rather than on the disease. This approach creates a more compelling and consistent program for action. However, it also asks policymakers to think about population behavior in a very broad way, such as how people exercise or travel and how children are influenced, making it far from easy to implement.

Health ministry versus cross-government: Many elements of diabetes care are managed by the health ministry. However, the wider preventive agenda calls for a cross-departmental approach that involves other ministries such as education, planning, transport and industry.

Long time frame: Turning the tide on diabetes will take longer than a single parliamentary cycle. Therefore the emphasis should be on developing and embedding co-ordinated multi-party commitment to action that is sustainable over the medium term.

Tailored approach: There will be no one-size-fits-all solution. Suitable interventions differ from country to country, in line with the countries' different cultures and the degree to which they already have an environment focused on prevention. In addition, governments will often need broad civil-society support before they decide to take the restrictive legislative and financial measures needed. The development of this support will take longer in some countries than in others.

Prioritization: Carrying out the extensive agenda for managing and preventing diabetes requires both time and resources. To secure these, it is necessary to make diabetes a priority for both the public and politicians. This is not easy, given the competing priorities that these groups have.

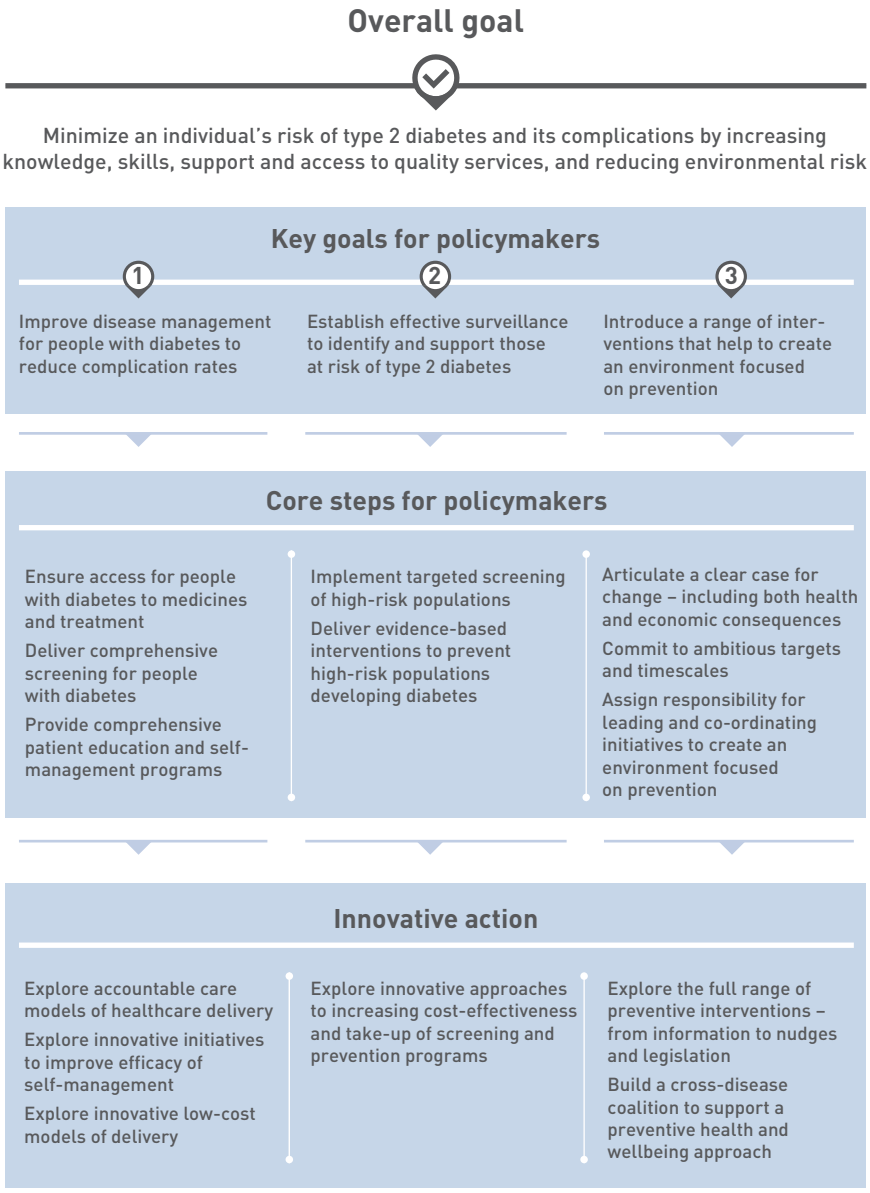
The building blocks are in place for policymakers to bring about the necessary changes. The agenda may be long and complex, but it breaks down into a series of actions, so policymakers can proceed undeterred. Their efforts can be supported by many innovative proven practices, which are outlined in this paper.

POLICY GOALS

We propose three key goals for policymakers:

1. Improve disease management for people with diabetes to reduce complication rates.
2. Establish effective surveillance to identify and support those at risk of type 2 diabetes.
3. Introduce a range of interventions that help to create an environment focused on prevention.

Figure 4: Diabetes framework for interventions



These goals are ordered by the degree to which they are in the control of health policymakers. Nevertheless, it is crucial that policymakers put a significant effort into all three goals.

This paper will examine each goal in turn, explain why it is important for policymakers to act in each area, identify what needs to be achieved, and describe how various innovative practices can make an impact.

Policy goal 1: Improve disease management for people with diabetes to reduce complication rates

The starting point for policymakers is to ensure continual improvements in disease management for their population with diabetes. Such improvements will enhance the quality of life for those with the disease and reduce complication rates. In turn, this will ease the pressure on the health system and reduce overall spend. Improving diabetes care lies firmly in the control of health ministries. These types of interventions, rather than initiatives aimed at prevention, have the potential to produce a fast return on investment.

The basic means to achieve improvements are well-evidenced in global and national clinical guidelines. At a high level they include:

- Access to medicines and medical treatment.
- Supporting people in self-management.
- Screening for complications.

In addition, there are standards for low-resource environments, research into the cost-effectiveness of interventions, and policymaker guides and toolkits.

To get diabetes care right, it may be necessary to make adjustments to traditional healthcare systems. This could involve:

- Creating incentives for healthcare providers to achieve improved outcomes.
- Improving the efficacy and cost-effectiveness of self-management.
- Delivering interventions to hard-to-reach patients.

The case studies below illustrate how innovation can produce these changes.

Creating incentives for healthcare providers to achieve improved outcomes

The effective management of diabetes requires a healthcare system with particular characteristics: one that considers the totality of the health needs of its patients; is proactive in offering support to patients before they contract diseases; and acts in a co-ordinated way to ensure that patients receive the right care at the right time to achieve the best possible outcomes.

Many healthcare systems do not have all these characteristics, and fail to give patients the best possible care. For example, the Time2DoMore project recently highlighted the phenomenon of 'clinical inertia', as a result of which patients recently diagnosed with type 2 diabetes fail to start treatment promptly, and long-established patients fail to have their treatment escalated at the most appropriate time.[13]

The use of accountable care models

A 2013 WISH paper set out one model of healthcare that can improve outcomes for patients. Accountable care is an approach to healthcare delivery that aligns the goals, incentives and delivery for payers, providers and patients.

In accountable care systems, a group of providers share the responsibility for delivering outcomes for a particular population of patients, and have various incentives to excel. There are five elements involved:

- Accountability for a specified population.
- Defined outcomes for health and wellness.
- Metrics and a process to monitor outcomes and learn from deviations.
- Performance incentives and risk-sharing tied to agreed outcomes.
- Collaboration among providers to deliver all aspects of care to achieve outcomes.

Policymakers can initiate improvements in any of these areas, in keeping with the requirements of their particular health system at that particular time. Once all five of the features are firmly in place, patients receive proactive, integrated care, tailored to their particular needs. The health system is then able to identify health challenges promptly, and to focus on early intervention and prevention.

The accountable care model has proved effective in improving diabetes outcomes (see case studies below). The key to its success was the set of incentives, at both an organizational and an individual level, to change clinician behavior.

Case study 1: Geisinger Diabetes Care (US)[14, 15, 16]

Geisinger designed a system for providing consistent evidence-based diabetes care. This approach helped align traditional healthcare providers, and gave them incentives for delivery. Features included:

- Identifying metrics from the American Diabetes Association's Standards of Care and other audits. Among these metrics are:
  - An all-or-none set of diabetes measures to evaluate outcomes.
  - Performance measures tracked monthly.
- Using electronic health records as tools to integrate measures into clinical flow through notifications and nudges.
- Redesigning care around teams that consist of providers, nurses and front-office personnel.
- Developing joint incentives for the members of these teams to meet their all-or-none goals.
- Creating change by adapting the enablers and incentives of clinical staff.
- Introducing clear incentives for staff based on monthly performance feedback and joint and individual bonuses for healthcare team members.

The results of the new system were reduced risks of retinopathy, stroke and myocardial infarction in three years. Specifically:

- For every 82 patients treated, 1 myocardial infarction was prevented.
- For every 178 patients treated, 1 stroke was prevented.
- For every 151 patients treated, 1 case of retinopathy was prevented.

The Geisinger example demonstrates how accountable care can deliver improved outcomes through traditional healthcare teams. However, an accountable care model – particularly one involving capitated payments – can also encourage engagement with non-traditional providers, as shown in the following case studies.

Case study 2: Rio Grande Accountable Care Organization (US)[17]

The Rio Grande Accountable Care Organization has taken a patient-centered approach to diabetes treatment. While still relying on established medical care, healthcare managers created a diabetes education center, where a diabetes educator works with patients to help them understand their disease. A nutritionist was assigned to meet with patients with poorly controlled diabetes, and run community diabetes walks from the center in collaboration with the local diabetes association. In some clinics, health coaches were hired, and a call center was established for patients. As a result of this approach, patient compliance with five core diabetes metrics has risen from 23 percent (the national average) to 43 percent, and the per-capita medical costs for Medicare patients declined by 14 percent.

Case study 3: NHS Year of Care pilot (UK)[18]

The UK National Health Service (NHS) piloted a 'Year of Care' model for diabetes care, which involved capitated payments to primary care providers to cover the full range of medical costs for their patients. Some providers used part of the funding on non-traditional methods to improve patient outcomes. In one example, Bengali men with diabetes were enrolled in a cooking course to help them understand how to eat healthily and manage their condition better.

Accountable care models show how policymakers can incentivize and encourage healthcare providers to deliver more integrated, outcome-focused care for people with diabetes.

There are other approaches that use payments and incentives to improve outcomes. For example, the NHS in England has used pay-for-performance in primary care to improve outcomes. While it does not promote innovative pathway design, it does encourage primary care providers to improve both the identification of diabetes and the delivery of care.

Case study 4: Quality Outcomes Framework (UK)

In 2004, the Quality Outcomes Framework, a pay-for-performance incentive scheme, was introduced into primary care in England. The scheme gives General Practitioners (GPs) financial rewards for meeting a range of quality targets related to the management of chronic conditions, practice organization and patient voice. GP practices are awarded points against a series of activity and outcome measures.

Analysis has shown that the scheme has been effective in improving diabetes care. For example, the proportion of patients with controlled glycated hemoglobin (HbA1c) rose from 38 percent to 55 percent between 1998 and 2007. Similarly, the proportion of patients with controlled blood pressure rose from 22 percent to 52 percent.[19] The incentives had a clear impact on behavior: metrics that were associated with the incentive payments improved at a faster rate than those that were not. Part of the scheme's success in improving clinical care lay in the rapid (almost annual) change in targets, which encouraged a corresponding effort to register improvements.[20]

Improving the efficacy and cost-effectiveness of self-management

Self-management is the cornerstone of diabetes care, since people with diabetes will spend the vast majority of their time away from the direct influence of the healthcare system. However, many people with diabetes do not control their condition well. For example, the latest audit by the US Centers for Disease Control and Prevention (CDC) found that nearly a quarter of US patients had HbA1c scores above 8 percent (normal HbA1c is less than 6 percent).[21] This is significant, given that research has shown a strong link between HbA1c levels and complication rates.[22]

Self-management relies on two factors. First, people need to receive the right education and skills training for them to be able to self-manage. Secondly, people need to have the right incentives (or absence of disincentives) for them to want to manage their condition. The following case studies show how these two factors can be adjusted to enhance the efficacy of self-management.

Community engagement and culturally appropriate interventions

The Desmond case study profiles a national scheme that tailors self-management materials to meet the needs of different cultural groups.

Case study 5: Desmond (UK)

Desmond is an education program for people with type 2 diabetes. Its aim is to empower participants, providing them with the knowledge and skills to understand and manage their own condition.

Some course modules and materials are specifically designed to take account of cultural differences. For Muslim patients, for instance, there is a toolkit called 'A Safer Ramadan'. For African and other ethnic-minority communities, culturally sensitive versions of modules are available. For the South Asian community, the course may be conducted in Punjabi, Gujarati, Urdu or Bengali, at local community venues, by healthcare professionals specially trained to work with that particular community.

The Desmond interventions have had a significant impact:[23]

- Participants in the course have shown greater weight loss than peers (an average 2.98kg compared to 1.86kg at 12 months).
- Participants showed a marked improvement in their understanding of diabetes.
- The estimated incremental cost per QALY (quality-adjusted life year) gained is £2,092.

The program has now been rolled out internationally, with modules being delivered in Western Australia by Diabetes WA, and has received the Therapeutic Patient Education Award from the European Association for the Study of Diabetes.

Case study 6: Be He@lthy, Be Mobile (Senegal)

Another program that focuses on supporting self-management in a culturally appropriate way is Be He@lthy, Be Mobile, which is being rolled out in Senegal by WHO and the International Telecommunication Union. The program uses text messages to target people with diabetes during the month of Ramadan, offering advice such as:

- Drink one liter of water every morning before you begin fasting.
- Take care not to overeat and watch out for foods high in sugar, such as dates.
- Ask your doctor to adapt the dose and timing of your diabetes medication before you fast.

Case study 7: Baylor Diabetes Health and Wellness Institute (US)

Integrating self-management in a community can be a successful way of improving effectiveness. The Baylor Diabetes Health and Wellness Institute, based in a community center in Dallas, Texas, is a collaboration between Baylor Healthcare and the Dallas Parks and Recreation Department. It combines clinical care with disease management, including lifestyle interventions that target unhealthy behaviors. Members of the community join by seeing an on-site physician and diabetes educator. The center offers them education and advice as well as access to community activities such as fitness classes, bible study and crafts.

Case study 8: Microclinic International (Jordan)[24, 25]

Another example of using communities to improve self-management is the Microclinics program. Microclinics are networks of small groups of people who share information resources, technology and social support. Rather than sharing a building or other workspace, they rely on personal relationships to empower local communities and build local capacity. To date, more than 1,500 microclinics have been established by Microclinic International (MCI) across four continents.

One example of an MCI initiative is a program in Jordan where diabetes patients were recruited and trained to set up their own microclinics. Small groups of two to eight people would come together to learn how to manage their diabetes better. Participants would attend sessions jointly for physical activity, healthy meals, health education and social activity. Peers were encouraged to support each other and to share their knowledge. Each microclinic was given a glucometer.

The findings were impressive:[26]

- Of the 315 participants who began the program, 83 percent completed it.
- By the end of the program, participants had lost an average of 2.9kg in weight.
- After 24 months, participants had maintained an average weight loss of 1.6kg. They also showed a 0.43 point reduction in body mass index (BMI), and a 0.97 percent absolute reduction in HbA1c from the baseline figures.

Use of new technologies

Social media and new information technologies provide opportunities for improving self-management. Useful developments include:

- The use of gaming to incentivize people with diabetes to self-manage.
- The use of social media and new technologies.

Case study 9: MySugr (Austria and US)[27]

Founded in 2011, MySugr consists of a set of computer and smartphone apps. It now has about 150,000 users. The apps are free, although an optional paid-for 'pro' expansion is available.

MySugr provides incentives for improved self-management by presenting diabetes management as a game. Users have to tame a diabetes monster each day. They earn points each time they input a blood glucose recording into the app, and can then win additional points by answering questions correctly in the quiz app. The aim is to increase people's commitment to and concentration on self-managing the condition.

Users can set their own personal goals and challenges, and chart their progress. There is also an option to engage with other users, sharing progress, scores and even photos. This creates an element of social competition, and builds a supportive community network where users do not want to let themselves or others down.

MySugr has received a CE Marking for a class 1 medical device from European authorities, is FDA-registered in the US, and has been approved by Health Canada and Australia's Therapeutic Goods Administration. A three-month study, although limited in size, showed that users increased their blood glucose testing frequency by 10–20 percent.

Case study 10: Diabetes Voyager (US)[28]

Another use of gaming can be found in the recent collaboration between Novo Nordisk, Oculus Virtual Reality and Microsoft Kinect. The initiative has developed a virtual reality experience called Diabetes Voyager, which takes the user to the heart, brain and vascular systems in the body of a person with diabetes. The user then completes challenging tasks related to disease management, such as achieving normal HbA1c levels. Though not yet used widely, this program represents a positive approach to engaging and educating patients who might otherwise be apathetic.

Case study 11: Glooko (US)[29]

Medical apps can be of use to patients and providers alike. For example, Glooko offers devices that allow patients to sync their blood glucose reading to mobile devices. An app then enables them to make sense of these readings by adding lifestyle context, including diet, insulin intake and activity levels. The system also serves healthcare providers, who can use it to communicate with or monitor their patients, and to plan interventions where needed.

Case study 12: #OurD (UK)[30]

Social media offers increased opportunities for patients to support one another. For example, #OurD is a community-led online development that uses Twitter to educate and support people with diabetes. The community offers weekly web chats and access to blogs that provide diabetes-related information. The account has approximately 2,000 followers, and nearly 1,000 tweets per month are sent using #OurD.

Delivering interventions to hard-to-reach patients

A final challenge facing policymakers is how to deliver effective care such as screening in locations that have limited resources or are difficult to access. The following case study, RetiDiag, shows how this can be achieved through the use of new technology.

Case study 13: RetiDiag (Chile)[31]

The RetiDiag model enables primary healthcare centers to screen people with diabetes and detect diabetic retinopathy at low cost, by using retinal photographs and telemedicine evaluation. Specially developed software allows healthcare workers to convert retinal photographs into a PDF report, which can then be sent electronically to a large health center where ophthalmologists examine them remotely.

In the first five months of activity, RetiDiag was able to evaluate over 5,000 people with diabetes. RetiDiag uses telemedicine and remote examination to overcome the shortage of trained ophthalmologists and the challenges of travelling to remote communities. The program has a clearly defined target population and a very specific purpose; offering only one service allows the use of a relatively simple model. In 2014, RetiDiag was identified by the Inter-American Development Bank as one of the most innovative start-ups improving lives in Latin America and the Caribbean.

Policy goal 2: Establish effective surveillance to identify and support those at risk of type 2 diabetes

Intuitively, screening for diabetes makes sense. Up to 80 percent of cases of type 2 diabetes can be prevented through lifestyle or drug treatments,[32] creating a clear opportunity to reduce the number of people with diabetes and the cost burden that diabetes imposes. Screening for diabetes has been proven to be cost-effective.[33, 34]

However, some communities are hard to reach, and even where the screening is readily available and convenient, the take-up rate is often low. There are a range of tools and approaches that can support policymakers in their efforts to increase screening.

The key for policymakers is to make screening more accessible and appealing for people, and at sustainable cost. This section outlines innovative ways to achieve this aim.

Improving the efficacy of screening

There are a number of approaches to improving take-up rates for screening, including:

- Providing incentives for people to be screened.
- Targeting healthcare providers to encourage take-up.
- Tailoring screening to cultural circumstances.
- Sharing the cost and inconvenience by screening for other diseases at the same time.
- Targeting high-risk populations.

Offering incentives to healthcare providers can succeed in increasing screening rates. Clinicians tend to be in contact with high-risk patients through the normal course of their work, and are therefore in a strong position to influence them. Patients too will respond positively to incentives, as long as the incentives outweigh the time, effort, discomfort and perhaps money that the patients have to put into being screened.

In the following case study, a screening initiative that began with a disappointingly low take-up was eventually transformed, thanks to the introduction of meaningful financial incentives.

Case study 14: Weqaya Program (Abu Dhabi)[35, 36]

The Weqaya Program, a screening and management initiative in Abu Dhabi, began with a wide-ranging publicity effort that used media and community campaigns. The organizers tried to remove the more obvious disincentives by reducing screening times to 10 minutes and improving access, including evenings and weekends, to a network of 25 government-run clinics.

Despite these efforts, take-up remained lower than expected. To achieve the desired take-up rates, the organizers adopted positive incentives. In particular, they linked the screening to the issuing of a card providing access to free and comprehensive health insurance (Thiqa). People who were unwilling to be screened were still able to receive their card, but it required a deliberate opt-out and an informed consent process.

Screening rates duly rose, and more than 94 percent of the population has now been screened. Over 9,000 people previously undiagnosed have been identified with type 2 diabetes and are now being treated.

The process is comprehensive and has had a significant impact. All screened individuals receive details of their risk score and information on healthy living. Those diagnosed with diabetes receive personalized intervention plans. They have recorded substantially better control of diabetes than patients who have bypassed the scheme, with 42 percent of patients achieving HbA1c lower than 7.5 compared to 24 percent.

One reason why many people fail to undergo screening is that it is difficult for them to access. The solution is to make the screening as convenient and as simple for people as possible. In Qatar, a recent initiative has proved highly effective, by taking advantage of routine behavior.

Case study 15: Diabetes screening during Ramadan (Qatar)

A simple form of screening is the finger-prick blood-stick test. Its main drawback is that it should be taken during fasting to produce more accurate results. A Qatar screening program was therefore implemented during Ramadan when the population would be fasting during daylight hours. In addition, the venue chosen for the screening was conveniently located near the venue for Friday Prayers.

By tuning in to local habits, the program's sponsors ensured a remarkably high take-up. They screened over 2,000 people in two hours, as well as distributing information and advice about diabetes.

In Australia, the Life! Program overcame the challenge of accessibility by providing a wide range of ways for people to get screening and treatment. In addition, the program extended beyond diabetes, and also screened for susceptibility to heart disease and stroke. This wider approach contributed to engaging further support for the program. The Life! Program also provides a good example of an initiative that offers incentives to providers to make referrals.

Case study 16: The Life! Program (Australia)

The Life! Program was founded in 2007, funded by the Victorian Government with Diabetes Australia. The state-wide initiative provides evidence-based interventions to change lifestyle and behavior in high-risk individuals, to reduce their risk of progressing to type 2 diabetes and cardiovascular disease.

A key aim was to raise awareness and encourage participation among the population, and a wide range of co-ordinated incentives and interventions was developed to identify those at risk of diabetes:

- Individuals can access a free online test, which quickly and easily identifies their risk of developing diabetes and invites them to enroll in the program if appropriate.
- Mechanisms such as social-media campaigns, state-wide marketing and stands at public events are used for reinforcing awareness of diabetes and reminding at-risk individuals of their vulnerability and the importance of making lifestyle changes.
- A telephone service was established for people who wanted to understand their risk more clearly and participate in prevention courses.
- Funding incentives were devised for healthcare providers to encourage referrals: clinics receive AUS$20 for each eligible patient referred and AUS $30 when the patient completes the introductory session.

The impact has been positive:[37]

- 26,000 referrals have been made, and 19,500 of the people referred have been assigned to a high-risk course.
- Participants completing six sessions lost an average of 2.4kg in weight and 3.8cm in waist circumference.
- Between the first and the sixth session there was a marked rise in the proportion of participants achieving the healthy eating goal and physical-activity goal, which rose from 31 percent to 65 percent, and from 11 percent to 18 percent respectively.
- The risk reduction in participants of developing diabetes has been estimated at 21–39 percent, and the average saving in lifetime healthcare cost has been estimated at AUS$1,087 per person.

As shown above, the efficacy of diabetes screening initiatives can be improved by sharing the burden with screening for other diseases. It has the benefit of reducing overall cost, as well as potentially making for a more compelling offer for the population being targeted. The following example shows how related conditions can be used to develop a more targeted screening approach.

Case study 17: Screening for diabetes in people with tuberculosis (China)

Diabetes increases a person's susceptibility to tuberculosis infection, and according to estimates, 10 percent of China's tuberculosis burden can be attributed to diabetes. The prevalence rates for both conditions are rising, so the public health challenge is considerable. Following WHO guidance on the Collaborative Framework for Care and Control of Tuberculosis and Diabetes, China has initiated a bi-directional screening program. In a pilot project, 9,000 tuberculosis patients were screened and 13 percent were found to have diabetes. More importantly, 3 percent of screened patients, or about a quarter of people identified with diabetes, were unaware that they had the disease. This high yield of new diagnoses shows the potential of bi-directional screening as a cost-effective way to find diabetes patients.[38]

Policy goal 3: Introduce a range of interventions to create an environment focused on prevention

A critical contribution to slowing or even reversing the tide of type 2 diabetes comes from achieving population-level behavior change, aimed at encouraging societies to attend more conscientiously to their health, be less sedentary, and have better nutrition. To influence the population and bring about the desired behavior change, policymakers need to commit to creating an environment focused on prevention – one that supports healthy choices and encourages healthy behaviors. The benefits extend beyond diabetes to other non-communicable diseases (NCDs), including cardiovascular disease, respiratory diseases, many cancers and dementia.

Creating the improved prevention-focused environment is not an easy task. People have hundreds of opportunities to make less healthy choices every day – at home, work, school and while travelling, shopping or engaging in leisure pursuits. Each decision is shaped by a wide range of factors: the information available, incentives, peer pressure and social norms.

Box 3: Lessons from tobacco control

The history of tobacco control can offer some useful lessons for creating an environment focused on prevention. To tackle smoking, policymakers utilized a wide range of interventions to have sustained impact – moving through a sequence of initiatives, from public information to nudges, taxation and finally legislation.

Novotny and Mamudu have highlighted five key policy drivers that proved effective in tobacco control:

- Science to inform the public and policymakers about health risks, economic costs and to inform policy.
- Information strategies to educate consumers and support behavior change.
- Advocacy to stimulate interventions and hold decision-makers to account.
- Legal actions to develop regulations.
- International collaboration to embed change globally.

Source: *Progression of tobacco control policies: Lessons from the United States and implications for global action,* Novotny and Mamudu, 2008

The difficulty of the task is for some policymakers a reason not to attempt it. Our view is that the task cannot be avoided because the impact of diabetes is too great for policymakers to ignore.

Helpful lessons can be learnt from successful population health initiatives in other areas such as road safety, control of HIV/AIDS and tobacco control (see Box 3). These initiatives show the value of using multiple interventions of different types through different channels, from public information and nudges that influence people's choices, to legislation that restricts or eliminates choices. Policymakers need to build support from stakeholders across society and disease groups, and to work across ministries to influence all aspects of people's lives.

Based on previous public health campaigns,[39, 40, 41] we have devised a set of steps for policymakers to create an environment focused on prevention.

Articulate the case for change

To ensure continued political and public support for action against diabetes, it is crucial to create a well-articulated case for change. This case for change should include an evidence base informing policymakers of the health, social, and economic impacts of diabetes, as well as clear and achievable targets for improvement.

Build an evidence base to inform the public and policymakers about health risks and economic costs

The facts about diabetes – the prevalence, the growth rate and the health impact – are staggering, but to rally government support beyond the health ministry, these facts need to be translated into economic costs or impact on the standard of living. A good example of this re-positioning is the approach adopted in Australia.

Case study 18: Treasury-focused approach (Australia)

Adopting a treasury-focused approach helped Australia to prioritize NCDs across the government. Australia's National Health Priority Areas (NHPAs) were the illnesses or conditions identified as having the greatest social and economic burden.

The country's National Preventative Health Strategy was driven in part by the challenge of NCDs, including diabetes, and their damaging effect on the productivity and competitiveness of the workforce. The strategy was set nationally, but implemented by the individual states through the involvement of the Council of Australian Governments (COAG). It concentrated on reducing risk factors such as obesity, smoking and alcohol, to reduce the prevalence of all NCDs and their adverse economic impact.[42]

Set clear goals and targets to underpin the case for change

Clear, nationally agreed goals are essential to encourage action. The goals could be based on the global long-term targets that most nations have already signed up to, but they need to be brought into the medium-term to signal the urgency of the initiative. Having a clearly articulated target helps to make programs sustainable beyond a single parliamentary cycle.

The WHO targets on NCDs for 2025 include:[43]

- An overall target outcome of a 25 percent reduction in mortality caused by NCDs.
- Stopping the rise in diabetes and obesity.
- A relative reduction of at least 10 percent in prevalence of physical inactivity.
- Achieving 80 percent availability of affordable basic technologies and essential medicines.
- Enabling 50 percent of eligible people to receive drug therapy and counseling (including glycemic control).

Deliver a range of interventions to shape population behavior

A wide range of interventions is available to encourage population behavior change. As we know from previous successful public health campaigns, the interventions are often adopted most effectively if introduced in succession, starting with public information to raise awareness, and then moving from soft measures (or nudges) to hard measures, including legislation.

Hard measures such as fiscal interventions and regulation prove most impactful once a politically relevant case for change has been developed,[44] and strong civil-society support for change has been secured. Policymakers can draw on many emerging examples of initiatives that help create an environment focused on prevention. A selection is provided in Table 1.

Table 1: Overview of preventive interventions

Approach	Case studies
Information Provision of education and information to the public; restriction of advertising	**Case study 19: New South Wales menu labeling (Australia)** The Government of New South Wales has piloted a scheme in which fast food and snack outlets were required to display kilojoule (kJ) information on their menus. This labeling was supported by information on a website, a YouTube video and a smartphone app. During the pilot period, the median kilojoules purchased per transaction decreased by 15 percent from 3,355kJ to 2,836kJ.[45] Recently, the US has followed a similar path. The Food and Drugs Administration requires restaurants with at least 20 locations to display the calorie count of food items on their menus.[46] **Case study 20: Advertising restrictions (Republic of Korea)** In 2010, the Republic of Korea restricted television advertising of energy-dense and nutrient poor (EDNP) foods targeted at children, during hours when they were most likely to be watching TV. Research showed that in the year following there was a dramatic reduction in both advertising spend and number of adverts for EDNP foods during both regulated and non-regulated hours.[47]
Nudges Changes to the physical or social environment to encourage changes in behavior	**Case study 21: New York City Active Design Guidelines (US)** In 2010, New York City released guidelines intended to provide architects and urban designers with an array of strategies to create healthier buildings, streets and urban spaces. Since its publication, the Active Design Guidelines have been incorporated into city contracting procedures for construction, as well as into policies for making stairwells accessible. The City Department of Transportation is also promoting pedestrian and age-friendly streets, traffic calming, extra bicycle lanes and improved bus transit. The effect has been an increased use of cycling and public transportation by commuters, and a decrease in traffic fatalities and traffic volumes. **Case study 22: Food interventions (Chile)** Chile has implemented restrictions that forbid fast food outlets from including toys with children's meals, to remove the nudge association between toys and fast food. The authorities have also introduced a new labeling system that requires an explicit warning on foods high in sugar, salt, calories or fat.
Non-fiscal incentives Market-based incentives stimulating or discouraging certain behaviors	**Case study 23: Vitality (South Africa)** This healthy living rewards program is run in association with insurance providers. In return for pursuing healthier lifestyles, members receive rewards such as discounted gym membership, cash back on healthy food purchases, or points towards vouchers for travel, cinema or shopping.

Approach	Case studies
Fiscal incentives Government-led adjustments to the prices of goods or services to increase/ decrease their attractiveness relative to alternatives	**Case study 24: Tax breaks (Canada)** This initiative allows parents a tax credit of up to CAD$500 for any child under the age of 16 who registers in an eligible program of physical activity. Over 1.5 million taxpayers have claimed the credit. Evaluations have shown that participation in physical activity programs has increased for both high- and low-income families.[48] **Case study 25: Chip tax (Hungary)** In 2011, Hungary introduced a tax on products considered excessively salty or sweet or with high caffeine levels. The tax was levied on the producer or first distributor, and combined with a public health campaign. The average cost of taxed products increased by 27 percent, and within a year consumption of these products fell by 10–15 percent. The revenue raised by the tax was spent on a pay rise for doctors and nurses, as well as on development programs such as building new ambulance stations.[49] **Case study 26: Sugar tax (Mexico)** In 2013, the Mexican Senate approved a tax of approximately one peso per liter of soda. Early signs are that it has been effective. There has been a 10 percent reduction in the consumption of sugary beverages in the first three months of 2014 compared to the previous year, and a 7 percent rise in consumption of beverages not subject to the tax (such as bottled water).[50]
Legislation and regulation Restrictions on activities, goods or services; requirement for individuals or bodies to act in a certain way	**Case study 27: Mississippi State Board of Education (US)** The 2007 Mississippi Healthy Students Act imposed a number of requirements on schools. It specified minimum amounts of physical activity and health education in schools, as well as regulating food and beverage choices, including the promotion of healthy options to students. Financial incentives were provided for schools to participate in the Healthier US School Challenge and to train food service personnel to cook healthier food. Childhood obesity rates dropped from 43 percent in 2005 to 37 percent in 2011. The proportion of schools serving no fried foods doubled from 18 percent in 2009 to 38 percent in 2012.[51]

Put in place structures to ensure sustainable delivery

Creating an environment focused on prevention is a long-term goal, and will require sustained commitment and delivery. To ensure this, policymakers should consider a cross-disease advocacy approach, co-ordination of the different interventions and international collaboration.

Promote cross-disease advocacy to stimulate interventions and hold decision-makers to account

Creating an environment focused on prevention requires an approach that extends beyond diabetes, and tackles the risk factors that cause the disease.

Traditional health advocacy groups often start by focusing on a single disease. These groups can have greater impact, however, if they come together and form a coalition of organizations: in that way, they can all benefit from an environment focused on prevention, and can jointly help to mobilize civil society behind change. This joint approach can create clearer messages, a stronger voice and, ultimately, more powerful advocacy. Below is an example of the coalition approach.

Case study 28: Healthy Caribbean Coalition

The Healthy Caribbean Coalition was established with the aim of reducing death and disability from chronic diseases among people in the Caribbean. The group uses advocacy and influencing strategies to change behaviors in government, private enterprise, non-governmental organizations (NGOs), academia, international partners and the Caribbean population.

The Coalition contributes to public health education campaigns, and helps to devise population-based programs on tobacco control, increased physical activity, nutrition, and disease management and detection. These activities raise awareness among policymakers, and equip the general population with the knowledge and skills to reduce their risk of developing a chronic disease.

Much of the coalition's work aims at mobilizing people and creating a mass movement. The Coalition consists of more than 50 Caribbean-based health NGOs, more than 55 not-for-profit organizations, and over 200 individual and organizational members based in the Caribbean and across the globe. With such strong backing, the coalition can exert influence over policy- and decision-makers. For example, an online petition to increase screening for, and vaccination against, cervical cancer elicited more than 13,000 signatures.

Other cross-disease groups include the National Vascular Disease Prevention Alliance in Australia and the Richmond Group of Charities in the UK. This cross-disease approach has been taken further, and adopted into cross-disease national strategies, notably the OneLife strategy in Finland.

Case study 29: OneLife strategy (Finland)

In 2000, Finland launched a national diabetes program called Dehko. Its focus was on prevention of type 2 diabetes, self-management support and improving the quality of care. Although successful, the Dehko project was ended in 2011 to make way for an integrated approach. In 2012, the Finnish Brain Association, the Finnish Diabetes Association and the Finnish Heart Association combined their respective health promotion campaigns and projects into a single, joint initiative: the OneLife project. The project aims to improve prevention, increase early diagnosis, reduce complications and support rehabilitation in several diseases. This cross-disease approach increases synergies and decreases duplication of resources and expense. Most importantly, it ensures that information and education for the public and other stakeholders are clear and consistent.

In the same way that it took many years for anti-smoking measures to make an impact, it will take several electoral cycles to create a prevention-focused environment. It is therefore important to maintain pressure beyond a single parliamentary cycle.

Case study 30: Parliamentary Diabetes Support Group (Australia)

In 2000, the Parliamentary Diabetes Support Group (PDSG) was established in the Federal Parliament of Australia. The group raises awareness of diabetes among MPs and their staff, and gives them clear direction on the need to address the disease and ways of doing this. The group's activities include:

- Conducting high-profile events such as hosting a renal dialysis in Parliament House, or staging 'Kids in the House' where children with diabetes and their carers are invited to the National Parliament to talk with legislators.
- Initiating debates to share ideas and increase knowledge of the condition.
- Liaising with industry, not-for-profit groups, research organizations and allied health professionals to secure advice and support in spreading knowledge of diabetes.

The PDSG targets policymakers, specifically aiming to secure more attention and funding for diabetes management. The results have been very positive:

- Following the live dialysis, the Prime Minister committed to support the investment of AUS $23.5 million to establish the Transplantation Global Center of Excellence into Research.
- Rebates have been introduced for ancillary services such as podiatry and nurse educator schemes, which are known to be effective in reducing complications associated with diabetes.
- In 2008, AUS $5.5 million was allocated in the federal budget to make insulin pump technology available on a subsidized basis to lower-income families.
- In 2014, an investment of AUS $35 million was agreed for continuing the search for a cure.

At its peak, the PDSG membership boasted about 30 percent of the federal MPs. Parliamentary diabetes groups have also been established in several other countries, including the UK, US, Malta and Finland, as well as a global group through the IDF.

Another approach that has been used is to appoint a 'Tsar', a nominated individual, usually non-political, to champion a particular issue in government. Analysis in the UK has found that Tsars are effective in gaining a commitment to policy change and in securing changes in policies and people's behaviors.[52]

Assign responsibility for co-ordinating the prevention initiatives

The healthy living agenda is so complex that it is important to define responsibility for delivery, and to give that responsibility to a body that can work across and beyond government.

The co-ordination of preventive or healthy living interventions can occur at a single or at multiple levels: national, regional or municipal. The exact approach needs to be determined by each local system. Examples of co-ordination at different levels are given below.

Case study 31: National co-ordination – Centers for Disease Control and Prevention (US)[53]

The Centers for Disease Control and Prevention (CDC), a federal agency under the Department of Health and Human Services, is the national public health agency in the US. It has overall responsibility for promoting and co-ordinating cost-effective, evidence-based diabetes prevention and control in the country. The CDC's Division of Diabetes Translation was founded in 1989, and has four main goals:

- Defining the diabetes burden using public health surveillance.
- Conducting applied translational research.
- Overseeing national diabetes programs.
- Co-ordinating media strategies and providing public information.

The CDC does not directly deliver interventions. Instead, it works through partnerships, including those with state health departments, to deliver evidence-based intervention. This co-ordination and surveillance role allows the CDC to take a strategic overview of interventions to address diabetes nationally. A good example of this co-ordination role is the National Diabetes Prevention Program (National DPP).

- The National DPP is an evidence-based lifestyle change program for preventing type 2 diabetes in those at high risk. The program provides an infrastructure to facilitate collaboration among federal and state government agencies, community-based organizations, employers, insurers, healthcare professionals, academia, and other stakeholders.
- The CDC certifies local programs that meet the national program standards. There are now over 500 organizations in the CDC Recognition Program, with data on more than 15,000 program participants.
- Participants in the programs work with a lifestyle coach in a group setting. They receive a one-year lifestyle-change program that includes 16 core sessions (usually one per week) and six post-core sessions (one per month). Participants learn and practice strategies for incorporating physical activity into daily life and for eating healthily.
- The DPP research study showed that making modest behavior changes helped participants lose 5–7 percent of their body weight. These lifestyle changes reduced the risk of developing type 2 diabetes by 58 percent in people with pre-diabetes.

Case study 32: Regional co-ordination – Agita São Paolo (Brazil)[54]

The Agita São Paulo Program seeks to promote physical activity to the 37 million inhabitants of the state of São Paulo, Brazil. It is co-ordinated by the Studies Center of the Physical Fitness Research Laboratory of São Caetano do Sul, with financial support from the Health Secretariat of the state of São Paulo. The governance structure includes both a scientific and an executive board to ensure that the program has a strong scientific basis.

The program aims to deliver its core message of adopting an active lifestyle, which includes at least 30 minutes of moderate physical activity five days of the week. The program uses the three following approaches:

- **Mega events:** For example, Agita Galera (Move, Crowd) is held on the last Friday in August, and disseminates the program's message to over six million students via education sessions and student activities in community parks, squares and clubs.
- **Working with partners:** More than 300 partners deliver activity-related initiatives under the Agita banner such as workplace health drives or dog-walking events.
- **Engagement with municipalities:** Civic authorities have agreed to health-improving measures such as enhancing sidewalks, creating more cycle lanes and leisure spaces, and opening school sports facilities at weekends.

Results have been positive. Between 2002 and 2008 the proportion of inactive individuals declined from 10 to 3 percent, and the proportion of very active individuals increased from 7 to 16 percent.

Case study 33: City co-ordination – Take Care New York (US)[55]

New York has adopted a high-profile approach to health and wellbeing, initiated by former Mayor Michael Bloomberg. Take Care New York is a comprehensive city health agenda that identifies clear priorities and measurable goals. The strategy is co-ordinated by the city's health department, but engages a wide range of partners in government and other sectors, as demonstrated by the range of initiatives:

- **Restricting the use of artificial trans fats** in foods in city restaurants.
- **Launching the Health Bucks program**, which provides low-income residents with coupons worth $2 of fresh fruit and vegetables at all farmers' markets in New York City. Some 66 farmers' markets collaborate to serve high-need neighborhoods.
- **Launching 1,000 mobile Green Cart vendors,** which sell only fruits and vegetables.
- **Adding 200 miles of bicycle lanes** between 2006 and 2009, constructed by the Department of Transportation. The City also installed 20 sheltered bicycle parking structures and 3,100 parking racks.
- **Designating Community Playstreets** where a single block of street is closed to cars at some point weekly or even daily to increase children's active play space and promote physical activity.
- **Getting schools to serve healthier breakfasts and lunches** following the introduction of health standards in the city.
- **Converting schoolyards to community playgrounds** for the general public to use outside of school hours as part of the Schoolyards to Playgrounds Program.

The impact has been considerable: in the first five years of the program New York saw increases in life expectancy ahead of national trends, a reduction in unnecessary hospitalization and a reduction in mortality from the most common causes such as heart disease.

Co-ordination of this kind adds a cumulative effect to individual projects. By assigning responsibility for the co-ordination to an existing organization, policymakers or politicians do not need to set up a new organization. A competent existing organization should be able to select and co-ordinate an appropriate set of intervention programs covering a comprehensive range, and can be sustained in the medium to long term rather than just for a single electoral cycle.

International collaboration to embed change globally

Diabetes, as one of the world's most prevalent NCDs, is gaining increasing prominence on the international stage. The impetus is led by WHO's global framework on the prevention of NCDs.

Historically, the international focus has been on education and capacity building, which are the key steps needed to raise the profile and launch focused activity to tackle type 2 diabetes. As the case with tobacco showed, however, more is needed. The globalization of the world's markets and the movement of populations means that the work to build a prevention-focused environment will require dedicated cross-border co-operation, from co-ordinating legislation and aligning trade tariffs on foods, to sharing of best practice in prevention and treatment.

CONCLUSION: THE NEXT STEPS FOR POLICYMAKERS

Turning the tide on diabetes is an imperative for policymakers. A global commitment now exists for improving diabetes prevention and care. We know the case for change, and we know what is needed. This paper has taken the next step, and explained how this knowledge can be put into effect.

Listed below are four steps for addressing the diabetes challenge based on the innovative practices described in this paper:

Recommendation	Actions
1. Articulate the case for change	• Use an evidence base to inform the public and policymakers about health risks, economic costs and the need to act. • Build the case for cross-government action – clearly articulating the economic and productivity case for diabetes management, for surveillance and for creating a wider prevention-focused environment. • Commit to ambitious targets and timescales on the three core policy goals: management, surveillance and prevention of diabetes.
2. Align incentives in the healthcare system to improve outcomes for people at risk of, or diagnosed with, type 2 diabetes	• Ensure that healthcare payment mechanisms move toward being outcomes-focused and capitated to incentivize healthcare providers to: – Invest in preventive care and innovate in service delivery. – Drive the involvement of community and peer models of self-management and prevention. – Use innovative technologies to improve prevention and care. – Invest in cost-effective surveillance to identify and support people at highest risk of type 2 diabetes.
3. Deliver a range of interventions to create an environment focused on prevention	• Start with information strategies to educate consumers. • Use positive and negative nudges to support behavior change. • Move to taxation as a stronger motivator, and legislation and regulation to directly shape the environment.

4. Put in place the structures to ensure sustainable delivery	• Promote cross-disease advocacy to make messages simpler and more powerful, stimulate interventions, and hold decision-makers to account. • Assign responsibility for leading and co-ordinating prevention initiatives to an appropriate body with a responsibility to work across and beyond government. • Develop a national strategy to co-ordinate the delivery of preventive interventions for diabetes and other NCDs. • Use international collaboration to further embed changes.

These actions, together with the standards and interventions referenced in this report, provide policymakers with a strong foundation for meeting the urgent challenge of type 2 diabetes.

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APPENDIX I: RESOURCES FOR POLICYMAKERS

Guidance on the management of type 2 diabetes

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- Taylor J (2011). A pragmatic review of risk identification and interventions to prevent type 2 diabetes in high risk adults in disadvantaged and vulnerable groups.

Guidance on the creation of an environment focused on prevention

- Institute for Government (2013). Mindspace: Influencing behavior through public policy.
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- Pan American Health Organization (2010). Compilation of legislation for the English-speaking Caribbean countries and territories on prevention and control of obesity, diabetes and cardiovascular diseases.
- UK Cabinet Office (2010). Applying behavioral insight to health.
- World Health Organization (2010). A framework for implementing the set of recommendations on the marketing of foods and non alcoholic beverages to children.
- World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013–2020.
- World Health Organization (2014). Population-based approaches to childhood obesity prevention.

Guidance on diabetes advocacy, communications and national policy development

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APPENDIX II: SUMMARY OF CASE STUDIES

Case example	Nation	Summary	Page
Improve disease management for people with diabetes to reduce complication rates			
1. Geisinger Diabetes Care	US	Accountable care approach to diabetes care	17
2. Rio Grande Accountable Care Organization	US	Accountable care approach to diabetes care – incorporating non-traditional providers	18
3. NHS Year of Care pilot	UK	Use of non-traditional providers in diabetes care	18
4. Quality Outcomes Framework	UK	Pay-for-performance incentive scheme to promote diabetes care	19
5. Desmond	UK	Patient education tailored to target cultural groups	20
6. Be He@lthy, Be Mobile	Senegal	Use of mobile technology to support self-management during Ramadan	20
7. Baylor Diabetes Health and Wellness Institute	US	Community-based self-management provision	21
8. Microclinic International	Jordan	Expert patient peer support for self-management	21
9. MySugr	Interna-tional	App to support self-management	22
10. Diabetes Voyager	US	Program to support diabetes education	22
11. Glooko	US	Medical apps and devices to improve self-management	23
12. #OurD	UK	Social media community that supports people with diabetes	23
13. RetiDiag	Chile	Use of telemedicine to diagnose retinal problems in diabetes patients	23

Case example	Nation	Summary	Page
Establish effective surveillance to identify and support those at risk of type 2 diabetes			
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15. Screening during Ramadan	Qatar	Approach to maximize take-up of screening	25
16. The Life! Program	Australia	Screening and treatment program for those at risk of diabetes	26
17. Screening for diabetes and tuberculosis	China	Targeted screening for diabetes by screening people with tuberculosis	27
Introduce a range of interventions that help to create an environment focused on prevention			
18. Treasury-focused approach	Australia	Creation of an economic case for action on NCDs	29
19. NSW menu labeling	Australia	Introduction of kilojoule labeling on fast food and snack menus	31
20. Republic of Korea advertising restrictions	Republic of Korea	Introduction of restrictions on advertising of energy dense and nutrient poor foods targeted at children	31
21. New York City Active Design Guidelines	US	City planning guidelines to create a healthier built environment	31
22. Food interventions	Chile	Regulation and legislation to promote a healthier lifestyle	31
23. Vitality	South Africa	Healthy living rewards program	31
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25. Chip tax	Hungary	Initiative to tax unhealthy foods	32
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Case example	Nation	Summary	Page
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29. OneLife strategy	Finland	National strategy targeting diabetes and brain and heart diseases	34
30. Parliamentary Diabetes Support Group	Australia	Cross-party diabetes lobbying group	34
31. National co-ordination: Centers for Disease Control and Prevention	US	Example of national co-ordination of diabetes program	35
32. Regional co-ordination: Agita São Paolo	Brazil	Example of state-level co-ordination of healthy living program	36
33. City co-ordination: Take Care New York	US	Example of city level co-ordination of healthy living program	37

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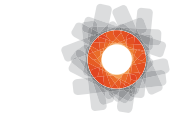

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