

WHO Global report on diabetes: A summary

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ABSTRACT

The first WHO Global Report on Diabetes was launched on World Health Day 7th April 2016 which was dedicated to Diabetes (1). Diabetes has been described in ancient scripts and recognized as a serious illness, but it does not appear to have been frequently encountered by physicians or healers. It is in the past few decades that human health and development is increasingly affected by the rising numbers of people with this condition. Diabetes, together with cardiovascular disease, cancer and chronic respiratory disease has been targeted in the Political Declaration on the Prevention and Control of Noncommunicable Diseases (NCDs) at the Un High-level Political Meeting in 2011. In 2013 WHO member states endorsed a global monitoring framework for noncommunicable diseases, with 9 targets to be reached by 2025. Diabetes and its key risk factors are strongly reflected in the targets and indicators – reduction of exposure to unhealthy diet and physical inactivity, zero rise in the prevalence of diabetes, improved access to treatment and reduction of premature mortality. As part of the 2030 Agenda for Sustainable Development, Member States have set an ambitious target to reduce premature mortality from NCDs – including diabetes – by one third; achieve universal health coverage; and provide access to affordable essential medicines – all by 2030(<http://www.un.org/sustainabledevelopment/sustainable-development-goals/>).

Key Words: Diabetes, global report, WHO

Introduction

The first WHO Global Report on Diabetes was launched on World Health Day 7th April 2016 which was dedicated to Diabetes.^[1] Diabetes has been described in ancient scripts and recognized as a serious illness, but it does not appear to have been frequently encountered by physicians or healers. It is in the past few decades that human health and development is increasingly affected by the rising numbers of people with this condition.

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What is diabetes?

Diabetes is a chronic illness characterized by elevated levels of blood glucose, accompanied by disturbed metabolism of fats and proteins. Blood glucose rises because it cannot be metabolized in the cells, due to lack of insulin production by the pancreas or the inability of the cells to effectively use the insulin that is being produced. There are three major types of diabetes: (1) Type 1, in which the pancreas does not produce insulin; (b) type 2 in which the body cells are resistant to the action of insulin that is being produced and over time the production of insulin progressively decreases; and (c) gestational diabetes which occurs in pregnancy and can cause some complications during the pregnancy, and at birth and increases the risk of type 2 diabetes in the mother and obesity in the offspring.

In addition, there are two other categories of glucose intolerance – impaired fasting glucose (IFG) and impaired fasting glycemia (IGT) that are intermediate conditions between normal and diabetic blood glucose levels, although the transition is not inevitable. People with IFG and IGT are at increased risk of CVD than people with normal blood glucose values.

Risk factors for diabetes

Type 1 occurs most frequently in children, adolescents, and young adults. The cause or causes are not known. A combination of genetic susceptibility and environmental factors is believed to lead to type 1 diabetes. Despite extensive research into potential biological, chemical, nutritional, and behavioral causes, none has as yet been identified as the cause of a significant number of cases beyond reasonable doubt. The risk factors for type 2 diabetes are better known. Although the genetic component is substantial, the majority of cases occur in the presence of risk factors – age, overweight and obesity and physical inactivity. Smoking has also been shown to increase the risk of diabetes, but by far the strongest risk factor is increased body fat. Some ethnic groups, such as people of Southeast Asian origin are more sensitive than others to the diabetogenic effect of excess body fat. Several dietary practices, such as a high sugar and fat intake have also been linked to increased risk of type 2 diabetes. The risk factors for gestational diabetes are not only similar to those for type 2 diabetes – family history, age, overweight and obesity, physical inactivity but also include excessive weight gain during pregnancy.

Complications of diabetes

Uncontrolled diabetes leads to complications in many organs. Damage to small and large blood vessels and nerves leads to loss of vision and kidney function, heart attacks, strokes, and lower limb amputations. Diabetes causes disability and shortens lives.

Economic impact of diabetes

It is estimated that losses in gross domestic product, including both direct and indirect costs of diabetes, will total US\$ 1.7 trillion, comprise US\$ 800 billion for low- and middle-income countries. Besides the economic burden on the health-care system and national economy, diabetes often imposes catastrophic personal expenditures from out-of-pocket payments and loss of income due to disability and premature death.

Global burden of diabetes

Mortality

One and a half million people died directly from diabetes in 2012. However, blood glucose levels that are higher than optimal but are below the diagnostic threshold for diabetes also increases the risk of death, particularly from CVD, and have caused an additional 2.2 million deaths. The largest number of deaths due to high blood glucose has occurred in upper middle-income countries. Almost one-half of all deaths attributable to high blood glucose are premature – before the age of 70 years. In low-income countries, more than half of the deaths attributable to high blood glucose are premature, in contrast to high-income countries where about one-fifth of deaths are premature. This is probably the result of later detection and poorer management in low-income countries. High blood glucose age-standardized mortality rates per 100 000 people 20-year-old and older range from 55.7 in the WHO European Region to 138.3 in the WHO Eastern Mediterranean Region.

Prevalence and incidence

The number of people with diabetes has increased from 180 million in 1980–422 million in 2014. This increase is attributed to population growth and ageing (40%), rise in age-specific prevalence (28%) and interaction of the 2 (32%). Age-standardized prevalence trends are shown in Figure 1. Age-standardized prevalence in adults 18-year-old and above has almost doubled, from 4.7% in 1980 to 8.5% in 2014. In 1980, the prevalence was highest in high-income countries (5.2%) and lowest in low-income

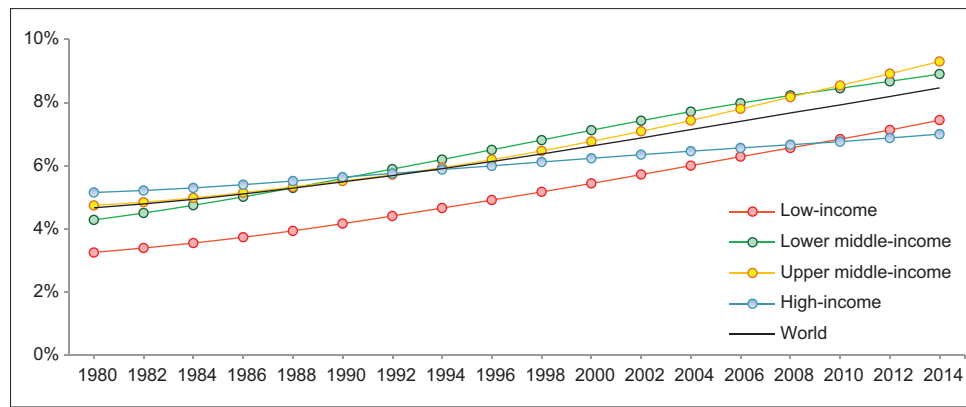


Figure 1: Trends in prevalence of diabetes, 1980–2014, by country income group

countries (3.3%). By 2014, the prevalence in low-income countries has become higher in low-income (7.4%) than in high-income (7.0%) countries. The prevalence of diabetes has risen faster in low- and middle-income countries and is currently highest in upper middle-income countries (9.3%). In WHO regions, the prevalence is highest in the Eastern Mediterranean region (13.7%) and lowest in the African region (7.1%). The data country-by-country are available online at www.who.int/diabetes/global-report.

The precise prevalence of diabetes by type is not known as prevalence surveys rarely distinguish between type 1 and type 2 using the current definitions, but a large majority of diabetes cases are type 2 diabetes. While there are few data on the incidence of type 2 diabetes, more studies of type 1 incidence have been done, most of them in children under 15 years of age. The incidence of type 1 diabetes in children is highest in Scandinavia, Sardinia and Kuwait, and lowest in Asia and Latin America. However, data are lacking for many countries, particularly sub-Saharan Africa. In high-income countries, the annual incidence of type 1 diabetes seems to be rising steadily by 3% per year.

Prevalence of risk factors

The rise in diabetes prevalence mirrors the rise in its main risk factors—overweight and obesity, and physical inactivity. In 2014, more than one in three adults aged over 18 years were overweight (body mass index [BMI] ≥ 25 –29.9), and more than one in 10 were obese (BMI ≥ 30). The prevalence of being overweight or obese is highest in high-income countries (>50%) and in the WHO Region of the Americas. It is lowest in low-income countries (15% in men and 27% in women) and the WHO Southeast Asian Region (19.3% in men and 25.3% in women).

Data from 2010 show that just under a quarter of adults aged over 18 years were classified as insufficiently physically active.

It is even more alarming in adolescents, with about 80% not meeting the minimum requirements for physical activity.

Complications

There are no global estimates of diabetes-related CVD, renal failure, lower-extremity amputations of pregnancy complications. The risk of CVD in adults with diabetes is two to three times higher than in their peers without diabetes. Data from some high-income countries indicate that the risk of CVD has been falling substantially in the past two decades, largely attributable to better management of diabetes and reduction in the prevalence of smoking. The risk of lower limb gangrene due to infected foot ulcers which lead to amputation is 10–20 times higher in people with diabetes than in those without. Recently, a few high-income countries have documented a reduction in amputation rates in people with diabetes. Diabetic retinopathy caused 2.6% of blindness in 2010. Diabetes also increases the risk of end-stage renal disease (ESRD) up to 10 times. Based on data from 54 countries, at least 80% of cases of ESRD are caused by diabetes and hypertension and are potentially preventable.

Preventing diabetes

The majority of diabetes cases are type 2 diabetes, which is preventable to a great extent. Unfortunately, the cause of type 1 diabetes is unknown, and it remains unpreventable. Several strategies have been and are being tried, so far with little success.

In the population

Population-based programs that target modifiable risk factors for type 2 diabetes have the potential to reduce the incidence of type 2 diabetes, as well as some other NCDs in the population. Addressing overweight and

obesity is critical to type 2 diabetes prevention. This calls for a “whole-of-government” approach, with all sectors considering the impact of policies in trade, agriculture, transport, education, and urban planning as health is strongly influenced through policies in these areas. Policies should support access to healthy food, create opportunities for physical activity and restrict access to unhealthy food, without the interference from food and beverage companies. The WHO Global Action Plan 2013–2020 sets out policy options for reducing modifiable NCD risk factors. These include trade measures and regulatory policies such as taxes on unhealthy foods and beverages, package labeling, and restricting marketing of unhealthy foods and soft drinks. Industry self-regulatory schemes tend to be less effective than government regulation.

In people at high risk

Research in several parts of the world and different populations has consistently shown that people with IGT (with or without IFG) and overweight or obesity can substantially lower their risk of type 2 diabetes by a healthy diet and physical activity. Several medicines have also been shown to lower this risk, but less effectively than diet and physical activity. The effect on diabetes incidence seems to continue well beyond the duration of the trial, including some benefits in CVD risk. The decision to systematically search for people with high risk of type 2 diabetes should be based on the numbers likely to be identified and the resources available to intervene in those at high risk. Whether or not systematic assessment of risk is undertaken, primary health-care services must be equipped to provide counseling on a healthy diet, physical activity, and smoking cessation to people identified as being at high risk of diabetes.

Managing diabetes

Diagnosis and early detection

Even in high-income countries a substantial proportion of cases of type 2 diabetes are undiagnosed because of lack of pronounced symptoms. Diabetes is diagnosed by measuring glucose in a blood sample taken in the fasting state or 2 h after a 75 g oral glucose load. Glycated hemoglobin A1c (HbA1c) can also be used to diagnose diabetes, but is more costly than blood glucose measurement. Basic diagnostic testing should be available in primary health-care settings. The decision to put in place or not put in place systems for early detection of diabetes should be based on whether the local health-care resources are sufficient to cope with the extra workload.

Core components of diabetes management

Diabetes is a lifelong illness, and continuity of care is key to improving outcomes. Primary health-care facilities should be equipped to deliver patient education and counseling on healthy diet, physical activity, and self-care measures introduce medication and monitor control of blood glucose, blood pressure, and blood lipids. National guidelines and management protocols are a useful tool in achieving a standardized approach. They should include guidance on patient education and self-care, medication for blood glucose, medication for CVD risk, periodic exams for early detection of vascular and neuropathic complications, and criteria for referral to higher levels of health-care for detection and management of complications. This set of interventions depends on appropriate structures for health-care delivery. Diabetes management can be improved even in low-resource settings through the implementation of the WHO Package of Essential NCD Interventions in Primary Health Care. Access to essential medicines, particularly life-saving ones such as insulin, is still inadequate in many countries. A national regulatory system should promote the use of generic medicines and assure their quality, improve procurement, improve affordability through regulation of markups and tax exemption. Low-income countries generally tend to pay more for insulin than high- and middle-income countries [Figure 2]. Decisions about insulin purchasing – choice of products and delivery devices, choice of supplier, tendering practices can have big impacts on budgets and costs to patients.

National capacity for prevention and control of diabetes

The results of the WHO NCDs Country Capacity Survey conducted in 2015 show that most countries have national policies on diabetes, either stand-alone or integrated with other NCDs, but their implementation is uneven. About 70% of countries have national guidelines for diabetes management, but less than half of countries report their full implementation. Essential medicines for glucose lowering are reported to be generally available in at least half of primary health-care facilities in < 50% of low-income countries and in over 90% of high-income countries. Metformin is the most frequently available medicine (82% of all countries). Only 23% of low-income countries reported that insulin was generally available [Figure 3].

Availability of basic technologies for diagnosis and management of diabetes in primary health-care follows a similar pattern. Although 85% of all countries reported

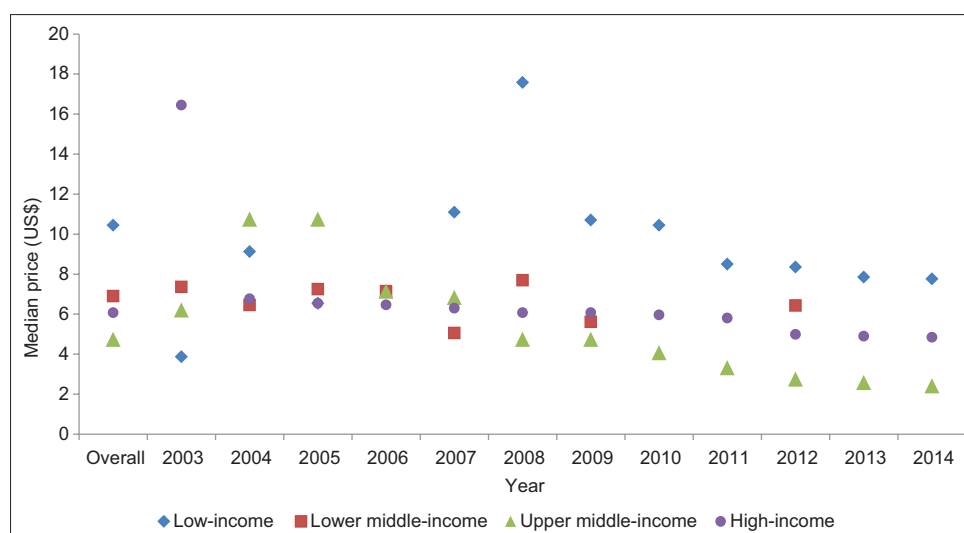


Figure 2: Median annual prices for a 10 ml vial of 100 IU insulin during 2003–2014, by country income group

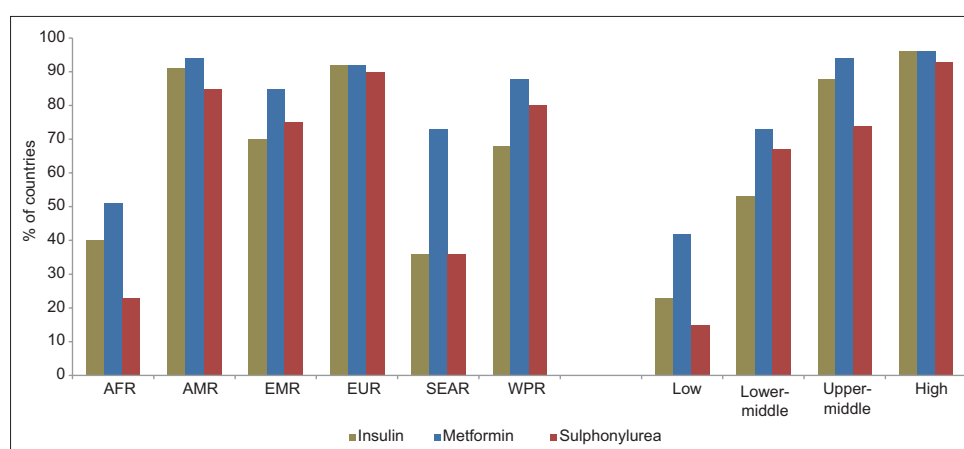


Figure 3: Percentage of countries reporting essential medicines are generally available in publicly funded pharmacies in primary health-care facilities

availability of blood glucose measurement, it was available in only 50% of facilities in low-income countries. Measurement of HbA1c is available in over 90% of high-income primary care facilities, but in only 4% in low-income countries. Hemodialysis for renal failure is available in <50% of middle-income and <30% low-income countries.

Conclusions and Recommendations

Countries can take a series of actions, in line with the objectives of the WHO NCD Global Action Plan 2013–2020, to reduce the impact of diabetes: Establishment of national mechanisms such as high-level multisectoral commissions can ensure political commitment, resource allocation and effective leadership for an integrated NCD response, with specific attention to diabetes.

Setting national targets and indicators and reporting on their achievement can foster accountability.

A set of actions can be prioritized to prevent people becoming overweight and obese, beginning before birth and in early childhood. A combination of fiscal policies, legislation, changes to the environment and raising awareness of health risks works best for promoting healthier diets and physical activity at the necessary scale.

Strengthening of the health system response to NCDs, including diabetes, particularly at primary care level is critical to improve coverage of the population. Primary care facilities can also provide care continuum with involvement of the family and peer groups.

Policies and programs are needed to ensure equitable access to essential technologies for diagnosis and management, especially for human insulin all who need them.

Collection, analysis and the use representative data on the burden and trends of diabetes and its key risk factors

will help to monitor the impact of interventions. There are no simple solutions for addressing diabetes but coordinated; multicomponent intervention can make a significant difference.

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Conflicts of interest

There are no conflicts of interest.

Reference

1. World Health Organization. Global report on diabetes. Geneva: World Health Organization; 2016.