



Introduction

Since 2000, the *IDF Diabetes Atlas* has detailed the extent of diabetes and this seventh edition shows how it is impacting every country, every age group and every economy across the world.

Notably, healthcare costs continue to increase with 12% of global health expenditure dedicated to diabetes treatment and related complications that account for the majority of the total expenditure. Increases in future health expenditure will be driven by the population growth expected in low- and middle- income countries, as well as increasing urbanisation and lifestyle changes.

There are some changes to be found in the figures reported in this latest edition. In 2013, the *IDF Diabetes Atlas* produced estimates of high blood glucose in pregnancy for the first time, estimating that 21.4 million live births were affected. With adjustments in data calculation, this has decreased slightly in 2015, to 20.9 million, which still accounts for a staggering one in 7 births.

Certain sectors of the population, such as indigenous peoples, often have higher prevalence rates than the surrounding population. This is particularly evident for gestational diabetes, with some indigenous women having at least two-fold higher rates of gestational diabetes compared to non-indigenous women.

We also witness the worrying growth of type 1 diabetes in children. The trend toward more children developing type 1 diabetes has continued and now in 2015, more than half a million children are estimated to be living with type 1 diabetes.

These estimates and the countless others published in the *IDF Diabetes Atlas* have been produced through extensive modelling based on raw data from sources and surveys conducted

worldwide, and validated by a scientific committee with experts from all over the world. Such is the importance of the data, that a new chapter has been created, which explains in detail the methodology used to generate the 2015 *IDF Diabetes Atlas* figures. Furthermore, uncertainty intervals have been produced that provide a plausible range within which the true diabetes prevalence can be expected to lie.

There may be some discrepancies between estimates in the *IDF Diabetes Atlas* and other reported national estimates. This may be due to a difference in sampling methods or populations. The *IDF Diabetes Atlas* 2015 uses age-stratified data and a consistent methodology to estimate the diabetes prevalence in adults aged 20-79 years, across 220 countries and territories. As a result, other national estimates may report a higher number of diabetes cases.

While much research has been done, further studies are required to provide a more accurate picture of the prevalence of diabetes. Half of all countries and territories worldwide have no recent nationwide studies, and their estimates are based on extrapolations from other similar countries. In the Africa Region, over three-quarters of all countries and territories lack primary data on the diabetes prevalence in adults.

Tackling this global epidemic is a monumental task and the International Diabetes Federation (IDF) continues to act as an advocate for people with diabetes by educating both individuals and governments on the steps that can be taken for prevention and management of the disease. Further research will serve as a catalyst for governments and organisations to act with more haste and greater effectiveness to put in place early interventions, improved screening and timely management to reduce the impact of diabetes on the individual and society.

Diabetes: A global emergency

Diabetes is one of the largest global health emergencies of the 21st century. Each year more and more people live with this condition, which can result in life-changing complications. In addition to the 415 million adults who are estimated to currently have diabetes, there are 318 million adults with impaired glucose tolerance, which puts them at high risk of developing the disease in the future.

Many countries are still unaware of the social and economic impact of diabetes. This lack of understanding is the biggest barrier to effective prevention strategies that could help halt the inexorable rise of type 2 diabetes.

Despite better awareness and new developments in treatment of type 1 and type 2 diabetes and prevention of type 2 diabetes, each edition of the *IDF Diabetes Atlas* has shown an unrelenting increase in the number of people with the disease.

This 2015 edition is no exception. The seventh edition looks at the current status of diabetes worldwide and shows a vision of the future by estimating what will happen in 2040 should present growth continue.

A person with diabetes has high blood glucose either because they are **not producing enough insulin**, or because **the body does not respond properly to insulin**

The three main types of diabetes

Type 1 diabetes

- Risk factors: family history of diabetes, genetics, infections and other environmental influences
- Appears very suddenly and is currently incurable
- Without insulin, a person with type 1 diabetes will die

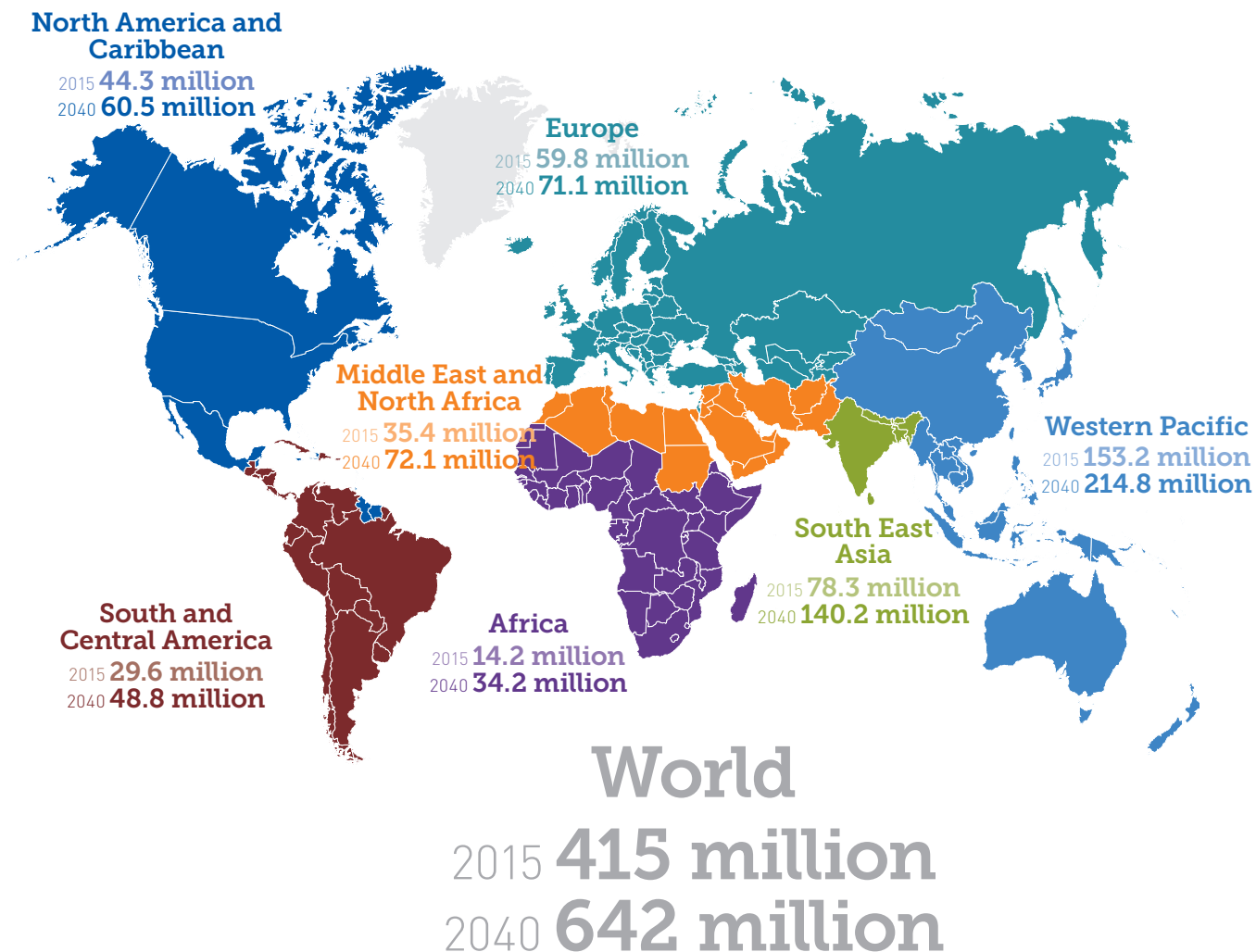
Type 2 diabetes

- Risk factors: excess body weight, physical inactivity, poor nutrition, genetics, family history of diabetes, past history of gestational diabetes and older age
- Can go unnoticed and undiagnosed for years
- Can often be managed with dietary changes and increasing physical activity. In some cases medication is required

Gestational diabetes

- Appears during pregnancy
- Can lead to serious health risks for both the mother and child
- Associated with an increased risk of both mother and child developing type 2 diabetes later in life

Estimated number of people with diabetes worldwide and per region in 2015 and 2040 (20-79 years)



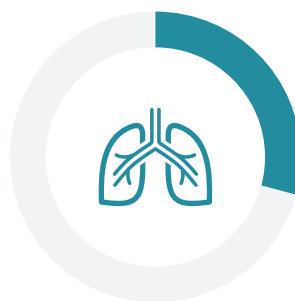
Adults who died from diabetes, HIV/AIDS, tuberculosis, and malaria



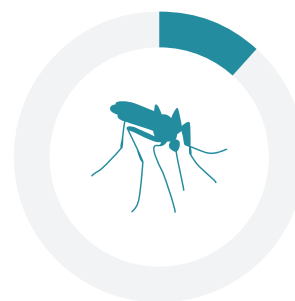
5.0 million
from diabetes
2015
IDF



1.5 million
from HIV/AIDS
2013
WHO Global Health
Observatory Data
Repository 2013



1.5 million
from tuberculosis
2013
WHO Global Health
Observatory Data
Repository 2013



0.6 million
from malaria
2013
WHO Global Health
Observatory Data
Repository 2013

Diabetes around the world

The human cost

Diabetes and its complications are major causes of death in most countries.

Type 2 diabetes is the most prevalent form of diabetes and has increased alongside cultural and societal changes. In high-income countries up to 91% of adults with the disease have type 2 diabetes¹⁻⁴. It is estimated by IDF that 193 million people with diabetes are undiagnosed

and are therefore more at risk of developing complications.

Furthermore, one in 15 adults is estimated to have impaired glucose tolerance, and one in seven births is affected by gestational diabetes. Both of these conditions are associated with an increased risk of developing type 2 diabetes in later life.

The prevalence of diabetes

2015



One in 11 adults has diabetes

2040



One in 10 adults will have diabetes

Diabetes by gender

Number of **men** with diabetes



2015 215.2 million
2040 328.4 million

Number of **women** with diabetes



2015 199.5 million
2040 313.3 million

Diabetes in urban and rural environments

Diabetes in **urban** areas



2015 269.7 million
2040 477.9 million

Diabetes in **rural** areas



2015 145.1 million
2040 163.9 million

One in **two** adults with
diabetes is **undiagnosed**

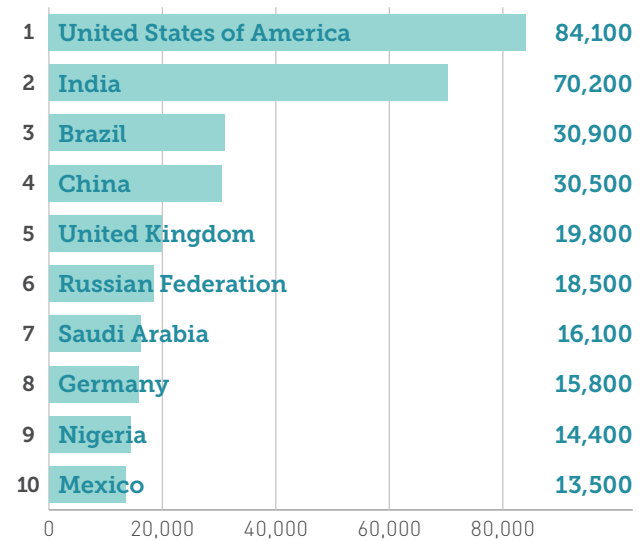
Diabetes in children

Whilst type 1 diabetes is less common, it is still increasing by around 3% every year, particularly among children. Around 86,000 children develop type 1 diabetes each year and when insulin is not available, the life expectancy for a child with type 1 diabetes is very short. The IDF Life For A Child programme supplies insulin to 17,000 children in 46 countries.

In 2015 the number of
children
 with type 1 diabetes
 exceeded **half a**
million for
 the first time

Children with diabetes

Top 10 countries for number of **children** with type 1 diabetes (0-14 years)

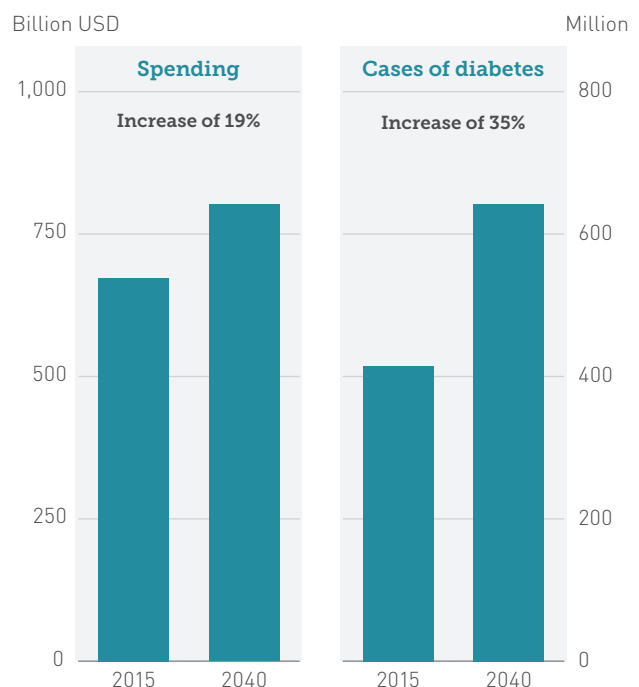


Number of children with type 1 diabetes worldwide 542,000

The financial cost

In addition to placing a large financial burden on individuals and their families due to the cost of insulin and other essential medicines, diabetes also has a substantial economic impact on countries and national health systems. This is because of an increased use of health services, loss of productivity and the long-term support needed to overcome diabetes related complications, such as kidney failure, blindness or cardiac problems. The majority of countries spend between 5% and 20% of their total health expenditure on diabetes. With such a high cost, the disease is a significant challenge for healthcare systems and an obstacle to sustainable economic development.

Global health spending to treat diabetes



A regional perspective

Most regions have seen a continuous increase in diabetes. The heavily populated Western Pacific Region has 153 million adults with diabetes; substantially more than any other region. It is however, the North America and Caribbean Region which has the highest prevalence per capita with one out of eight adults with the disease.

Europe has the highest number of children with type 1 diabetes; approximately 140,000, and faces an increase of around 21,600 new cases per year.

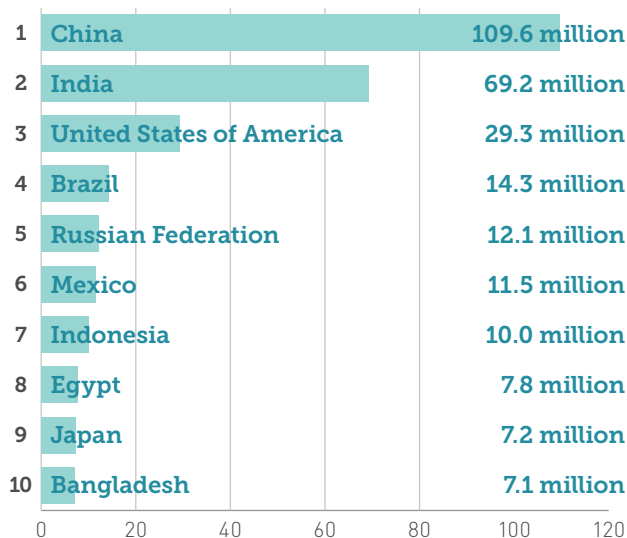
In the South-East Asia Region, 24.2% of all live births are affected by high blood glucose during pregnancy. In the Middle East and North Africa Region, two out of five adults with diabetes are undiagnosed. In the South and Central America Region, the number of people with diabetes will increase by 65% by 2040.

It is particularly challenging to estimate the total number of people with diabetes in the Africa Region, as more than three quarters of countries

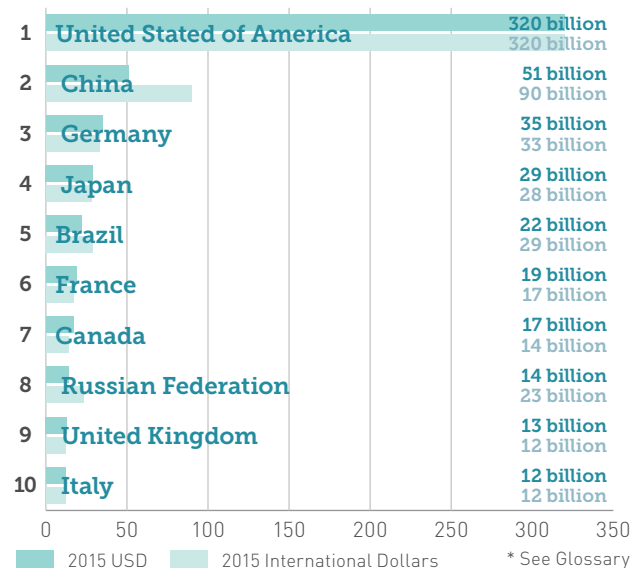
lack nationwide data, the highest of any IDF region. Thus, the regional estimate is produced by using the data from the 12 countries that had data to estimate the number of people with diabetes in the other 37 countries without data. In the sixth edition, the choice of which country to use for extrapolation was primarily based on similarities in World Bank income levels. In this seventh edition, countries for extrapolation were chosen on the basis of similar ethnicity, language, geography and World Bank income levels. In 2015, it is estimated that between 9.5 million and 29.3 million people live with diabetes in the Africa Region. Of these, three quarters are estimated to be undiagnosed, the highest of any IDF region.

For the first time, intervals have been produced to quantify the uncertainty around diabetes prevalence estimates. The uncertainty interval around the global estimate of adults with diabetes was estimated to range from 7.2% to 11.4% [339-536 million].

Top ten countries/territories for number of adults with diabetes



Top ten countries/territories for diabetes-related health expenditure (R=2*)





Halting the rise in diabetes

Greater education is needed to improve the diagnosis and management of all types of diabetes and to embed lifestyle changes that will slow the rise in type 2 diabetes. While educational programmes can help improve the management of people with diabetes, public health education is needed at the population level to encourage behaviour change to prevent type 2 diabetes.

Early diagnosis can prevent or delay the long-term health complications of people who are undiagnosed with type 2 diabetes. Progress has been made in introducing screening programmes, and diabetes risk scores have now been tested in 32 countries around the world.

IDF's call for action

IDF's mission is to promote diabetes care, prevention and a cure worldwide and it takes a leading role in influencing policy, increasing public awareness and encouraging improvements in health.

Notably in 2015, the United Nations Member States adopted the Sustainable Development Goals which included targets on non-communicable diseases. The previous Millennium Development Goals had omitted

diabetes and other non-communicable diseases which presented an obstacle to establishing resources and political focus to tackle diabetes.

During the 2015 G7 Summit, IDF launched a call to action for all G7 nations to develop and implement cost-effective policies to improve the health outcomes for people with diabetes and to prevent new cases.

In 2015, IDF published its Framework for Action on Sugar, which recognises the important role that excess sugar consumption has in increasing the risk of type 2 diabetes, and presents a series of policy initiatives aimed at reducing consumption of sugar and increasing production and availability of more healthy foods.

As part of IDF's work with The European Connected Health Alliance to create a global network of Diabetes Aware Cities, IDF piloted the Diabetes Prevention Score in 2015. This will enable cities globally to assess how their urban environments can be improved to support prevention of type 2 diabetes in communities.

By continuing to increase awareness of diabetes and promote care and prevention, IDF hopes that today's estimates for 2040 will be purely hypothetical.

United Nations Sustainable Development Goal:
By 2030, **reduce premature mortality** from non-communicable diseases **by one third**