



**EXECUTIVE
SUMMARY**

Diabetes and **cardiovascular** disease

www.idf.org/cvd



**International
Diabetes
Federation**



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Beat NCDs



The #beatNCDs campaign and symbol are initiatives of the World Health Organization.

The symbol is a half ribbon; the four strokes that create it symbolize the four diseases that account for the majority of non-communicable disease deaths worldwide – diabetes, cardiovascular disease, cancer and chronic respiratory disease. The symbol also evokes the idea of legs walking.

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Executive summary

Non-communicable diseases

The four main types of non-communicable diseases are diabetes, cardiovascular disease (CVD), cancer and chronic respiratory diseases. Many of these diseases share modifiable risk factors such as unhealthy eating, physical inactivity, excess alcohol and tobacco use.



NON-COMMUNICABLE DISEASES INCLUDE:

-  Diabetes
-  Cardiovascular diseases
-  Chronic respiratory diseases
-  Cancer

Diabetes

Diabetes is a non-communicable disease that occurs when the body cannot produce enough insulin and/or cannot use insulin effectively, and is diagnosed by observing raised levels of glucose in the blood. Over time, high levels of glucose in the blood (known as hyperglycaemia) can lead to the development of disabling and life-threatening health complications.

Diabetes is one of the largest global health emergencies of the 21st century, with the number of people with diabetes growing rapidly worldwide. In 2015, 415 million adults were estimated to live with diabetes around the world. This number is predicted to increase to 642 million by 2040.

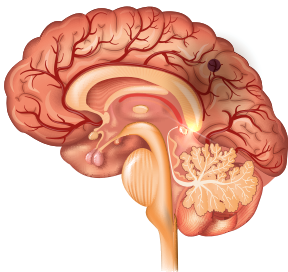
Cardiovascular disease

CVD is a major cause of death and disability among people with diabetes. CVD includes stroke, coronary artery disease and peripheral artery disease (Figure E.1). People with

diabetes are at increased risk of CVD, and these events generally occur at an earlier age compared to people without diabetes. As the number of people with diabetes is predicted to increase, the outlook for CVD becomes even more alarming.

Figure E.1
THE MAIN TYPES OF CARDIOVASCULAR DISEASE

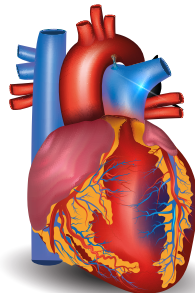
STROKE



AFFECTS THE BLOOD VESSELS SUPPLYING BLOOD TO THE BRAIN

includes:
cerebrovascular disease,
cerebral arterial disease,
intracerebral hemorrhage,
cerebral infarction

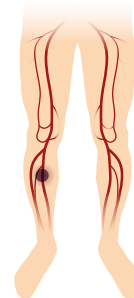
CORONARY ARTERY DISEASE



AFFECTS THE BLOOD VESSELS SUPPLYING BLOOD TO THE HEART

includes:
ischaemic heart disease,
atherosclerotic heart disease,
coronary heart disease,
angina pectoris, heart attack
(myocardial infarction),
sudden coronary death

PERIPHERAL ARTERY DISEASE

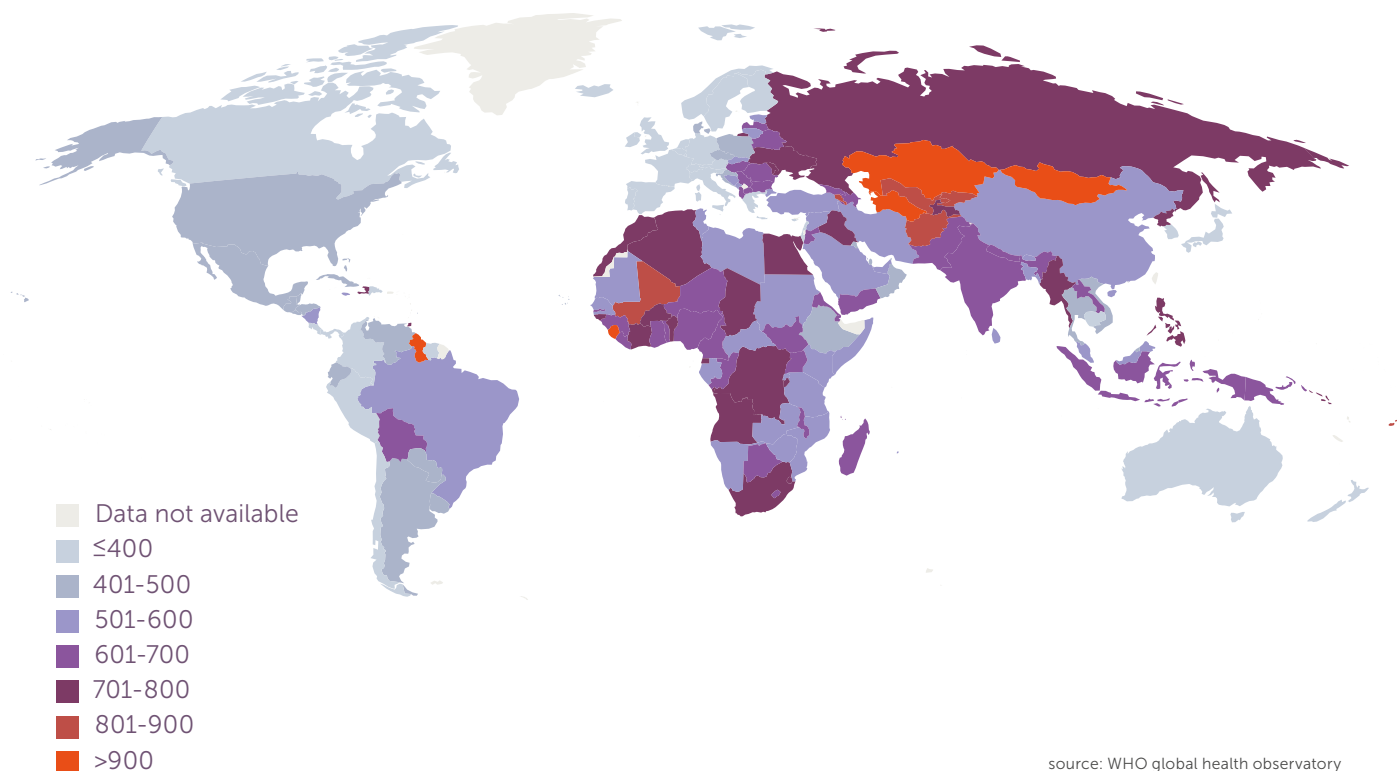


AFFECTS THE BLOOD VESSELS SUPPLYING BLOOD TO THE LEGS AND FEET

includes:
lower-extremity arterial disease,
limb threatening ischaemia,
intermittent claudication,
critical limb ischaemia

Figure E.2

ESTIMATED AGE-STANDARDISED MORTALITY DUE TO CARDIOVASCULAR DISEASES PER 100,000



Global impact of non-communicable diseases

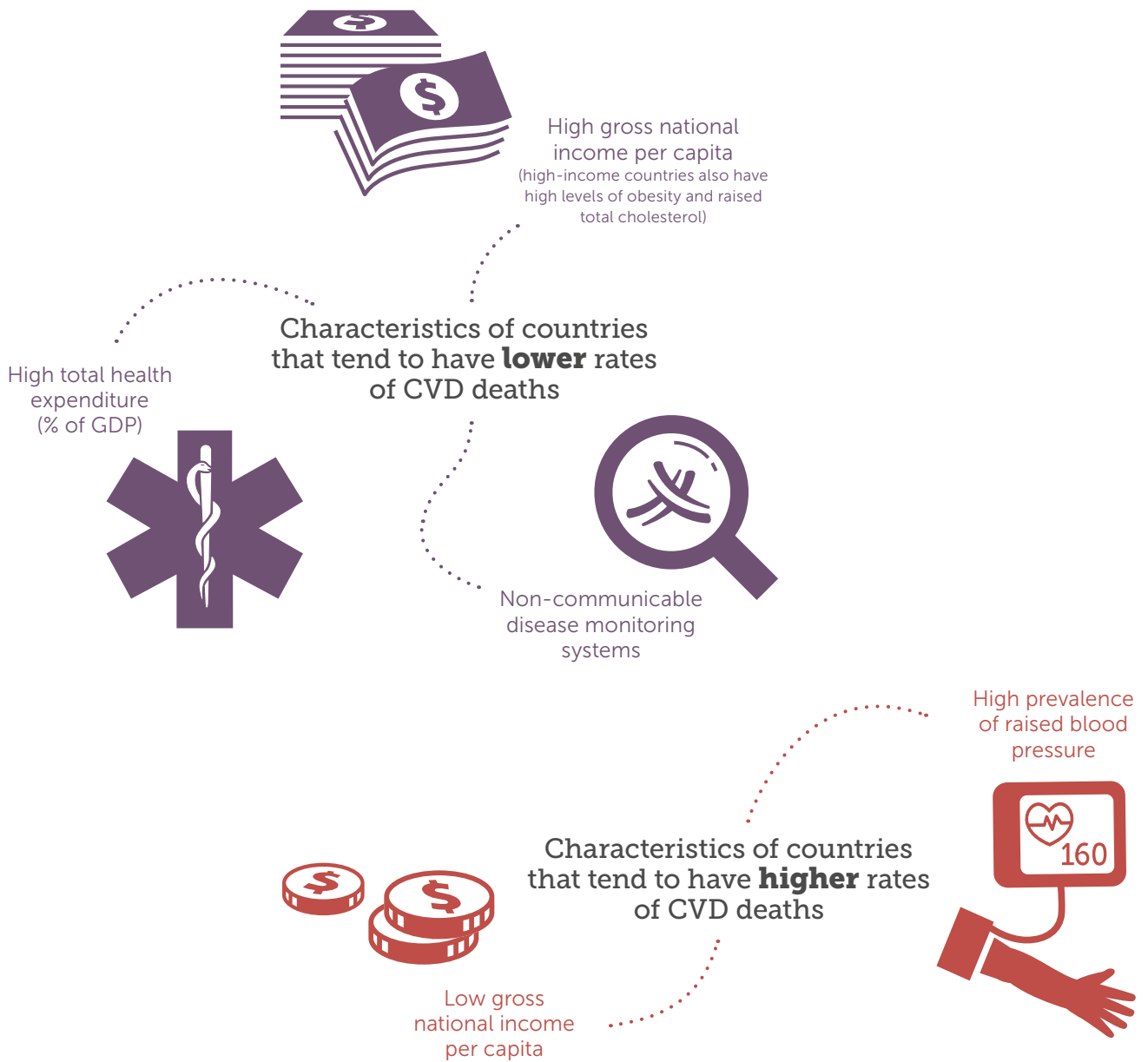
In 2012, it was estimated that over 37.9 million people worldwide died from non-communicable diseases, of which 17.5 million were due to CVD. In 2015, approximately 5.0 million were estimated to have died from diabetes, the majority of these as a result of cardiovascular complications. The regions with the highest rates of age-standardised CVD disease mortality are situated in Central Asia, the Middle East and Africa (Figure E.2). The countries with the highest diabetes-attributable mortality rates are Mauritius and Pacific Islands in the Western Pacific Region.

Populous countries have the largest absolute number of people dying from CVD, and include China, India and the Russian Federation. High-income countries are more likely to have low CVD mortality rates, despite having a high prevalence of CVD risk factors such as diabetes, obesity and raised cholesterol. This suggests a beneficial impact of investment in healthcare and access to essential medicines.

Countries with lower rates of age-standardised CVD mortality rates are likely to have high gross national income per

Figure E.3

CHARACTERISTICS OF COUNTRIES WITH HIGH AND LOW RATES OF AGE-STANDARDISED CARDIOVASCULAR DISEASE (CVD) MORTALITY



source: WHO global health observatory

capita, have high total health expenditure as a proportion of gross domestic product and have non-communicable disease monitoring systems. Countries with higher rates of age-standardised CVD mortality rates are likely to have a high prevalence of raised blood pressure (Figure E.3).

In high-income countries, non-communicable diseases are associated with over 6.3 million deaths per year. In many of these regions, such as Australia, North America, Western Europe and Japan, policymakers should be aware that most people with diabetes are over 50 years of age, and are at a higher risk of CVD than people without diabetes. Integrated non-communicable disease monitoring systems using the most recent International Classification of Diseases classification system should be adopted in all high-income countries.

In middle-income countries, non-communicable diseases are responsible for nearly 10 million deaths per year. Policymakers in Central Asia should be aware that they have the world's highest rates of age-standardised CVD mortality, and that increasing economic growth will be associated with higher prevalence rates of diabetes, obesity and cholesterol.

In low-income countries, non-communicable diseases are responsible for over 1.8 million deaths per year. In Africa, policymakers should be aware of the very high rates of age-adjusted CVD-related mortality in the region, and know that diabetes is an additional risk factor.

Community health workers should be trained to check for high blood pressure and diabetes, give appropriate lifestyle advice, and offer access to effective treatments. These services should be integrated into existing health services, such as those for TB, HIV and antenatal clinics.

Cardiovascular disease in people with diabetes

People with diabetes are at increased risk of CVD, compared to people without diabetes. The risk of CVD also increases with age.

A global systematic literature review on CVD in diabetes was conducted. There were substantial differences found in the methodologies used in the studies on CVD in people with diabetes in different countries, meaning that accurate global estimates of CVD in people with diabetes were not able to be produced. There is a need for future studies to utilise standardised methodology that incorporates the most recent International Classification of Diseases classifications, to enable better comparability across countries and more accurate meta-analyses. There is also a lack of data for people with diabetes living in low-income countries.

Figure E.4

PREVALENCE OF CARDIOVASCULAR DISEASE IN YOUNGER PEOPLE WITH TYPE 1 DIABETES IN HIGH- AND MIDDLE- INCOME COUNTRIES

In studies of middle-aged people with diabetes living in high- and middle-income countries:

Up to **16%**
had a history
of **CVD**

includes stroke, coronary artery disease, and peripheral artery disease

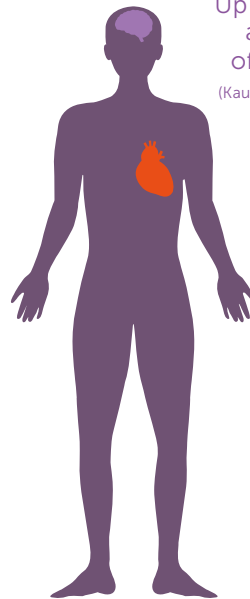
(David, 2010)

Up to **2%** had
a history
of **STROKE**

(Kautzy-Willer, 2013)

Up to **1%** had
a history of
HEART ATTACK

(Koivisto, 1996)



Mean age of study
population: 28 to 44 years

In high-income countries, in studies of people with type 1 diabetes where the mean age of the study population was between 28 and 44 years, the prevalence of all CVD ranged from 2.6% to 16.2%. (Figure E.4)

Figure E.5

PREVALENCE OF CARDIOVASCULAR DISEASE IN MIDDLE-AGED PEOPLE WITH DIABETES IN HIGH- AND MIDDLE- INCOME COUNTRIES

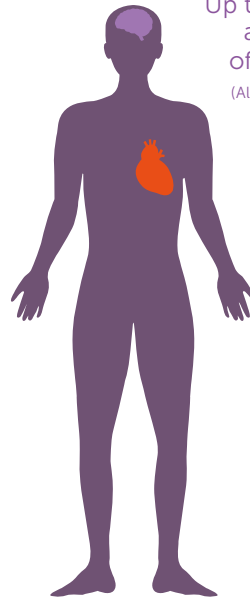
In studies of middle-aged people with diabetes living in high- and middle-income countries:

Up to **41%**
had a history
of **CVD**

includes stroke, coronary artery disease, and peripheral artery disease

(van Hateren, 2009)

Mean age of study population: 50 to 69 years



Up to **10%** had a history of **STROKE**

(Alwakeel, 2008)

Up to **14%** had a history of **HEART ATTACK**

(Alwakeel, 2008)

In high- and middle-income countries, in studies of people with type 1 and type 2 diabetes where the mean age of the study population was between 56 and 66 years, the prevalence of all CVD ranged from 14.8% to 40.5%. In high- and middle-income countries, in studies where the mean

age of the study population was between 53 and 67 years, the prevalence of stroke in people with diabetes ranged from 3.5% to 10.4% (Figure E.5). There is a lack of data for people with diabetes living in low-income countries.

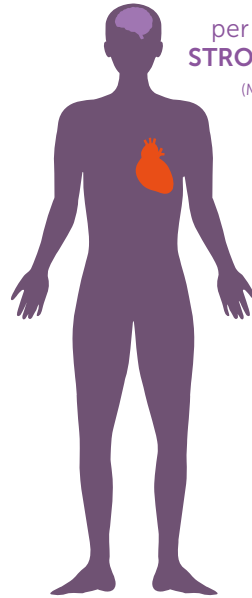
Figure E.6

CARDIOVASCULAR DISEASE MORTALITY IN MIDDLE-AGED PEOPLE WITH DIABETES

In studies of middle-aged people with diabetes living in high- and middle-income countries:

Up to **27**
per 1,000 died
from **CVD**
each year

(Miot, 2012)



Up to **9**
per 1,000 died
STROKE each year

(Mlacak, 1999)

Up to **7** per
1,000 died from
CORONARY ARTERY
DISEASE each year

(Bidel, 2006)

Mean age of study
population: 49 to 69 years

Mortality rates estimate the number of deaths that occur each year per 1,000 people. The most recent United Nations crude mortality rate for death by all causes was estimated at 7.8 deaths per 1,000 people per year.

In studies of middle-aged people with type 2 diabetes and unspecified diabetes

(mean age of study population 49 to 69 years), 2 to 27 people out of 1,000 died from CVD each year. Two to seven deaths were from coronary artery disease and one to nine deaths were from stroke (Figure E.6). The mortality risk increased with age. There is a lack of data for people with diabetes living in low-income countries.



“Countries with non-communicable disease monitoring systems generally have lower rates of age-standardised CVD mortality, even when the income level of the country is taken into account.”

The way forward

A focus on preventing CVD events in high risk populations can reduce mortality as well as decrease the economic burden from heart attack and stroke. CVD can be prevented or delayed by controlling blood glucose, blood pressure and cholesterol, as well as by smoking cessation, eating healthily and increasing physical activity.

The threat of non-communicable diseases faces countries at all stages of development, with more than 80 percent of deaths related to diabetes and CVD occurring in low- and middle-income countries. Non-communicable diseases will continue to dominate mortality trends in the future, and by 2030, it is estimated that they will account for more than three-quarters of deaths worldwide.

CVD is a major cause of death and disability in people with diabetes, and a barrier to sustainable development. Action must be taken to decrease the impact of CVD in people with diabetes. This requires environments that promote healthy lifestyle choices as well as building health systems that can detect and manage diabetes and CVD (Figure E.7).

In order to decrease the impact of diabetes and CVD, national governments should:



implement public health policies and lifestyle interventions to increase healthy eating and physical activity.

As non-communicable diseases share many modifiable risk factors, integrated action to combat the risk of all non-communicable diseases and to reduce premature mortality is vital. However, the majority of countries worldwide do not have such comprehensive action plans in place. In addition, inter-sectorial collaboration is needed to strengthen health systems and implement cost-effective interventions.



prioritise control of blood pressure and access to essential medicines.

There is a very strong association between the prevalence of raised blood pressure and the national CVD mortality rate. Even when controlling for gross national income, the prevalence of raised blood pressure still shows a significant positive association with CVD mortality. Therefore, good blood pressure control is crucial in reducing CVD mortality. Prevalence of high blood pressure can be decreased through salt reduction, improved fruit and vegetable intake, increased physical activity and avoidance of excessive alcohol.

Access to essential medicines for diabetes and CVD should be increased, ensuring that these medicines are affordable and available for everyone at secondary, primary and community level. In order to improve access, good procurement practices such as bulk purchasing and efficient distribution should be implemented.



implement non-communicable disease monitoring systems.

Non-communicable disease monitoring systems include regular data collection on mortality by cause as well as risk factor surveillance. This information is essential in determining the impact of non-communicable diseases and for understanding how best to intervene. Countries with non-communicable disease monitoring systems generally have lower rates of age-standardised CVD mortality, even when the income level of the country is taken into account. However, only 20 percent of countries worldwide have implemented such a system, and they are very rare in low-income countries. All countries with appropriate resources should move towards implementing internationally standardised monitoring systems.

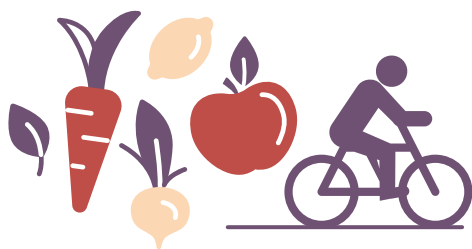


legislate and implement policies that eliminate use of tobacco.

Governments should implement the *WHO Framework Convention on Tobacco Control*. Actions should include raising tobacco taxes, implementing comprehensive bans on tobacco advertising and sponsorship, placing large health warnings on packaging and legislating for smoke-free environments. These actions will reduce the initiation of smoking, increase smoking cessation and reduce the exposure to second-hand smoke.

Figure E.7

STRATEGIES TO DECREASE THE IMPACT OF DIABETES AND CARDIOVASCULAR DISEASES



Increase **HEALTHY EATING** and **PHYSICAL ACTIVITY**



Implement non-communicable disease **MONITORING SYSTEMS** and **SCREENING** plans for diabetes in high-risk populations



Improve **BLOOD PRESSURE** control and access to essential **MEDICINES**



Decrease **TOBACCO** use

In order to reduce premature mortality from non-communicable diseases, an integrated action plan is needed in each country to strengthen health systems and implement cost-effective interventions.

The incidence of CVD in people with diabetes can be decreased through individual-level interventions such as reduction in intake of sugar, salt and fat, improved fruit and vegetable intake, increased physical activity, smoking cessation and avoidance of excessive alcohol. At a population level, the health care system should be strengthened, the education of people with non-communicable diseases should be improved and access to essential medicines should be increased.

The progress and efficacy of these interventions can be measured through internationally standardised monitoring systems and high quality epidemiological assessments.

The International Diabetes Federation endorses the recommendations in this report, and encourages all countries to work towards good health and well-being for all people living with diabetes.