



A global brief on HYPERTENSION

Silent killer, global public health crisis

World Health Day 2013



World Health
Organization

© World Health Organization 2013

All rights reserved. Publications of the World Health Organization are available on the WHO web site (www.who.int) or can be purchased from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel.: +41 22 791 3264; fax: +41 22 791 4857; e-mail: bookorders@who.int).

Requests for permission to reproduce or translate WHO publications - whether for sale or for non-commercial distribution - should be addressed to WHO Press through the WHO web site (www.who.int/about/licensing/copyright_form/en/index.html).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

Design and layout: MEO design – communication – web, Switzerland

**Photos: p. 14: WHO/Jim Holmes; p. 19: WHO/C. Black; p. 20: WHO/C. Black;
p. 31: WHO/Harold Ruiz; p. 33: WHO; p.36: WHO/S. Hollyman**

Printed by: WHO

Document number: WHO/DCO/WHD/2013.2

Any queries regarding this document should be addressed to: communications@who.int

A GLOBAL BRIEF ON HYPERTENSION

World Health Day 2013

CONTENTS

| | |
|----|--|
| 5 | FOREWORD |
| 7 | EXECUTIVE SUMMARY |
| 8 | SECTION I Why hypertension is a major public health issue |
| 16 | SECTION II Hypertension: the basic facts |
| 22 | SECTION III How public health stakeholders can tackle hypertension <i>Governments and policy-makers</i> <i>Health workers</i> <i>Civil society</i> <i>Private sector</i> <i>Families and individuals</i> <i>World Health Organization</i> |
| 34 | SECTION IV Monitoring the impact of action to tackle hypertension |

FOREWORD

We live in a rapidly changing environment. Throughout the world, human health is being shaped by the same powerful forces: demographic ageing, rapid urbanization, and the globalization of unhealthy lifestyles. Increasingly, wealthy and resource-constrained countries are facing the same health issues. One of the most striking examples of this shift is the fact that noncommunicable diseases such as cardiovascular disease, cancer, diabetes and chronic lung diseases have overtaken infectious diseases as the world's leading cause of mortality.

One of the key risk factors for cardiovascular disease is hypertension - or raised blood pressure. Hypertension already affects one billion people worldwide, leading to heart attacks and strokes. Researchers have estimated that raised blood pressure currently kills nine million people every year.

But this risk does not need to be so high. Hypertension can be prevented. Doing so is far less costly, and far safer for patients, than interventions like cardiac bypass surgery and dialysis that may be needed when hypertension is missed and goes untreated.

Global efforts to tackle the challenge of noncommunicable diseases have gained momentum since the 2011 United Nations Political Declaration on the prevention and control of noncommunicable diseases. The World Health Organization is developing a Global Plan of Action, for 2013-2020, to provide a roadmap for country-led action for prevention and control of non-communicable diseases. WHO's Member States are reaching consensus on a global monitoring framework to track progress in preventing and controlling these diseases and their key risk factors. One of the targets envisaged is a substantial reduction in the number of people with raised blood pressure.

Hypertension is a silent, invisible killer that rarely causes symptoms. Increasing public awareness is key, as is access to early detection. Raised blood pressure is a serious warning sign that significant lifestyle changes are urgently needed. People need to know why raised blood pressure is dangerous, and how to take steps to control it. They need to know that raised blood pressure and other risk factors such as diabetes often appear together. To raise this kind of awareness, countries need systems and services in place to promote universal health coverage and support healthy lifestyles: eating a balanced diet, reducing salt intake, avoiding harmful use of alcohol, getting regular exercise and shunning tobacco. Access to good quality medicines, which are effective and inexpensive, is also vital, particularly at the primary care level. As with other noncommunicable diseases, awareness aids early detection while self-care helps ensure regular intake of medication, healthy behaviours and better control of the condition.

High-income countries have begun to reduce hypertension in their populations through strong public health policies such as reduction of salt in processed food and widely available diagnosis and treatment that tackle hypertension and other risk factors together. Many can point to examples of joint action - across sectors - that is effectively addressing risk factors for raised blood pressure. In contrast, many developing countries are seeing growing numbers of people who suffer from heart attacks and strokes due to undiagnosed and uncontrolled risk factors such as hypertension.

This new WHO global brief on hypertension aims to contribute to the efforts of all Member States to develop and implement policies to reduce death and disability from noncommunicable diseases. Prevention and control of raised blood pressure is one of the cornerstones of these efforts.



Dr Margaret Chan

*Director-General
World Health Organization*

EXECUTIVE SUMMARY

Hypertension, also known as high or raised blood pressure, is a global public health issue.

It contributes to the burden of heart disease, stroke and kidney failure and premature mortality and disability. It disproportionately affects populations in low- and middle-income countries where health systems are weak.

Hypertension rarely causes symptoms in the early stages and many people go undiagnosed. Those who are diagnosed may not have access to treatment and may not be able to successfully control their illness over the long term.

There are significant health and economic gains attached to early detection, adequate treatment and good control of hypertension. Treating the complications of hypertension entails costly interventions such as cardiac bypass surgery, carotid artery surgery and dialysis, draining individual and government budgets.

Addressing behavioural risk factors, e.g. unhealthy diet, harmful use of alcohol and physical inactivity, can prevent hypertension. Tobacco use increases the risk of complications of hypertension. If no action is taken to reduce exposure to these factors, cardiovascular disease incidence, including hypertension, will increase.

Salt reduction initiatives can make a major contribution to prevention and control of high blood pressure. However, vertical programmes focusing on hypertension control alone are not cost effective.

Integrated noncommunicable disease programmes implemented through a primary health care approach are an affordable and sustainable way for countries to tackle hypertension.

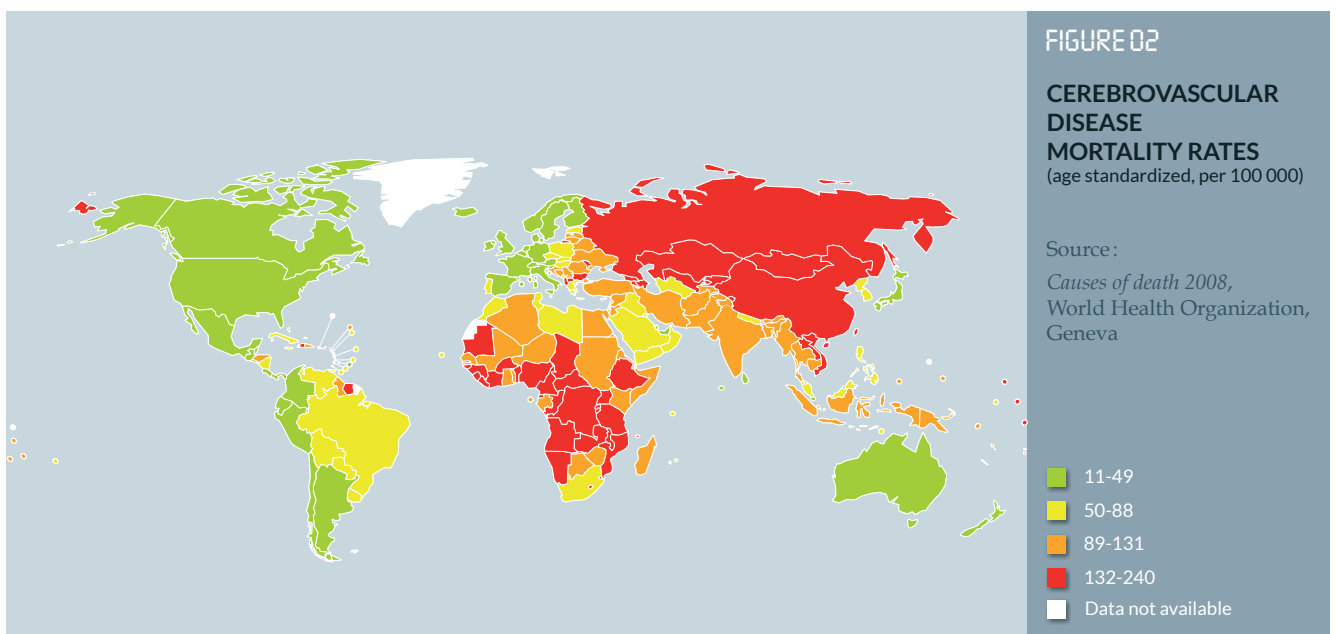
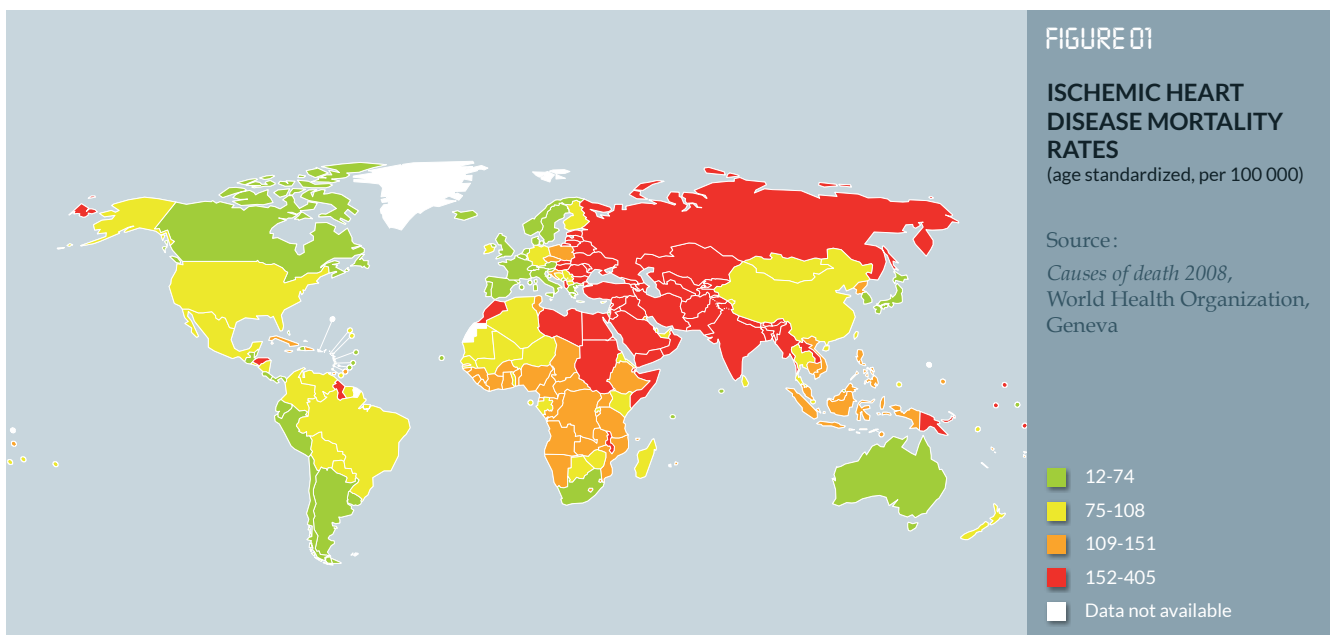
Prevention and control of hypertension is complex, and demands multi-stakeholder collaboration, including governments, civil society, academia and the food and beverage industry. In view of the enormous public health benefits of blood pressure control, now is the time for concerted action.



SECTION I

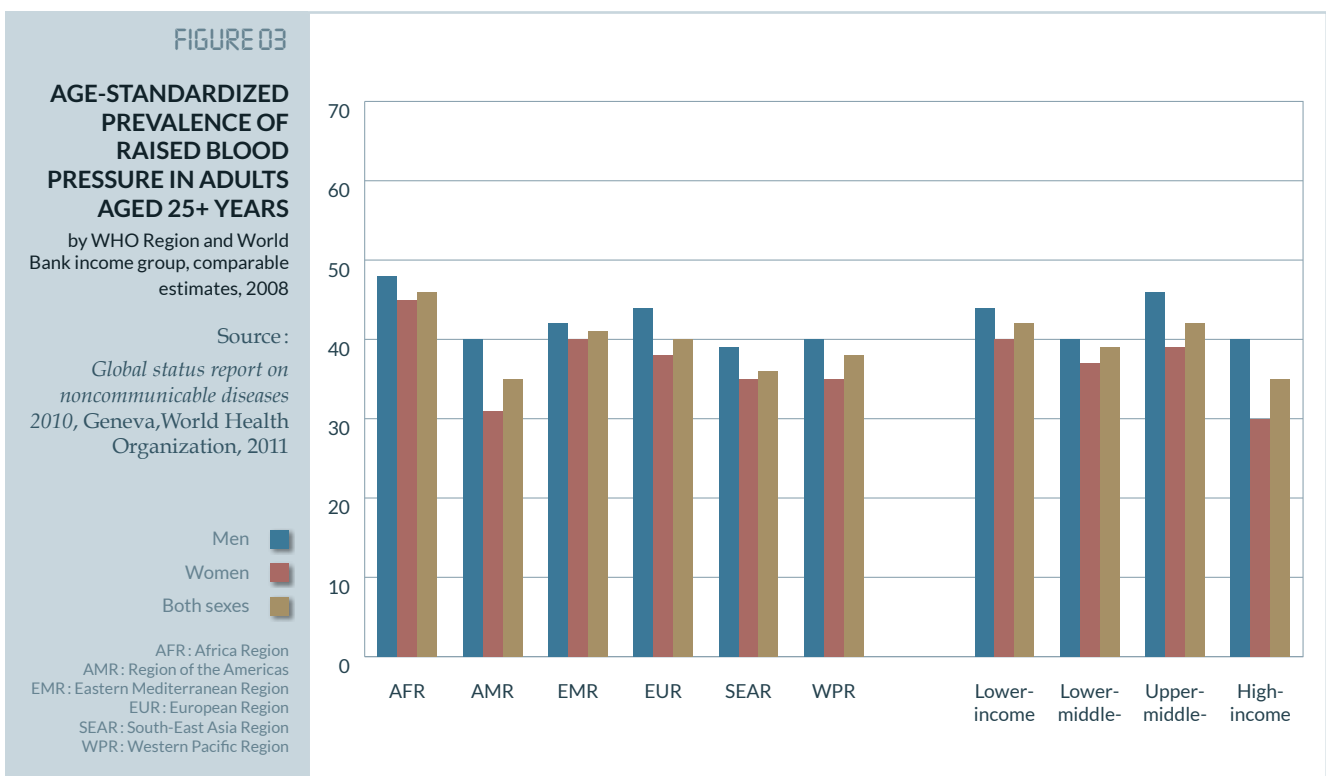
Why hypertension is a major public health issue

Globally cardiovascular disease accounts for approximately 17 million deaths a year, nearly one third of the total (1). Of these, complications of hypertension account for 9.4 million deaths worldwide every year (2). Hypertension is responsible for at least 45% of deaths due to heart disease (total ischemic heart disease mortality is shown in Fig. 1), and 51% of deaths due to stroke (total stroke mortality is shown in Fig. 2). (1)



In 2008, worldwide, approximately 40% of adults aged 25 and above had been diagnosed with hypertension; the number of people with the condition rose from 600 million in 1980 to 1 billion in 2008 (3). The prevalence of hypertension is highest in the African Region at 46%

of adults aged 25 and above, while the lowest prevalence at 35% is found in the Americas (Fig. 3). Overall, high-income countries have a lower prevalence of hypertension - 35% - than other groups at 40% (3, 4).



Not only is hypertension more prevalent in low- and middle-income countries, there are also more people affected because more people live in those countries than in high-income countries. Further, because of weak health sys-

tems, the number of people with hypertension who are undiagnosed, untreated and uncontrolled are also higher in low- and middle-income countries compared to high-income countries.

The increasing prevalence of hypertension is attributed to population growth, ageing and behavioural risk factors, such as unhealthy diet, harmful use of alcohol, lack of physical activity, excess weight and exposure to persistent stress.

The adverse health consequences of hypertension are compounded because many people affected also have other health risk factors that increase the odds of heart attack, stroke and kidney failure. These risk factors include tobacco use, obesity, high cholesterol and diabetes mellitus. Tobacco use increases the risk of complications among those with hypertension. In 2008, 1 billion people were smokers and the global prevalence of obesity

has nearly doubled since 1980. The global prevalence of high cholesterol was 39% and prevalence of diabetes was 10% in adults over 25 years (3). Tobacco use, unhealthy diet, harmful use of alcohol and physical inactivity are also the main behavioural risk factors of all major noncommunicable diseases, i.e. cardiovascular disease, diabetes, chronic respiratory disease and cancer (5-9).

If appropriate action is not taken, deaths due to cardiovascular disease are projected to rise further (Fig. 4).

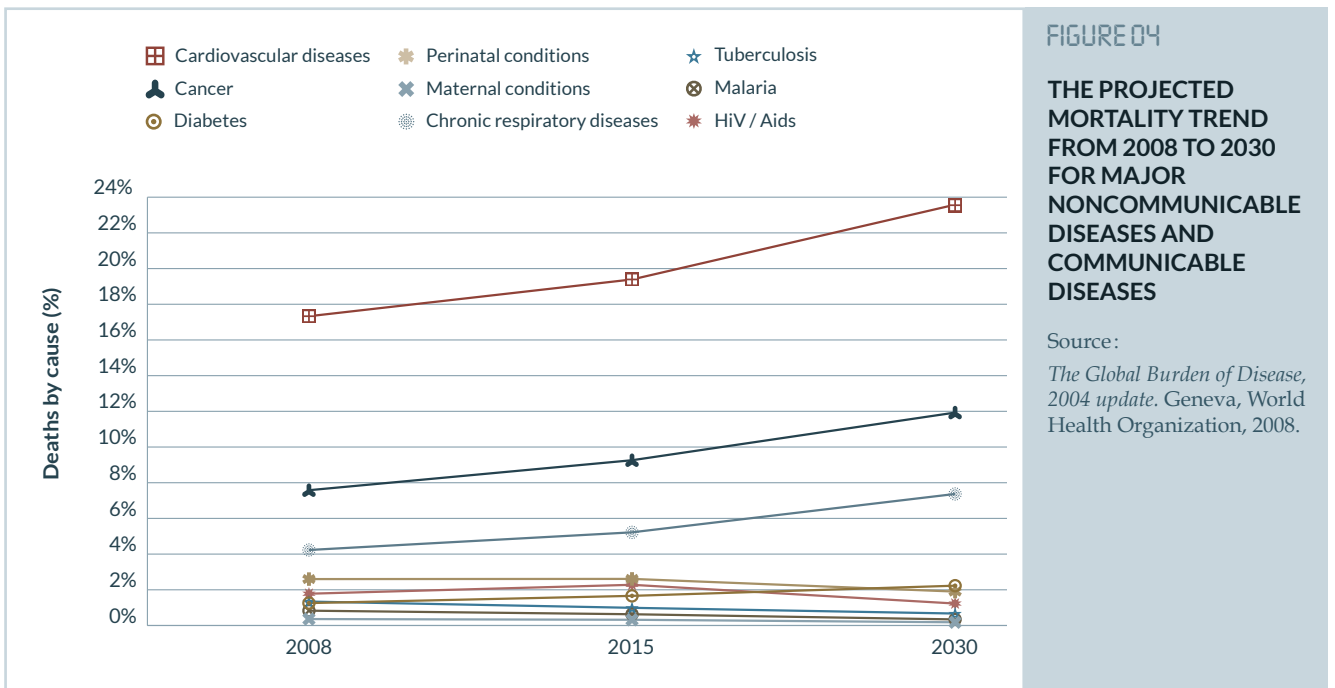


FIGURE 04

THE PROJECTED MORTALITY TREND FROM 2008 TO 2030 FOR MAJOR NONCOMMUNICABLE DISEASES AND COMMUNICABLE DISEASES

Source:
The Global Burden of Disease, 2004 update. Geneva, World Health Organization, 2008.

Populations around the world are rapidly ageing (Fig. 5) and prevalence of hypertension increases with age (6).

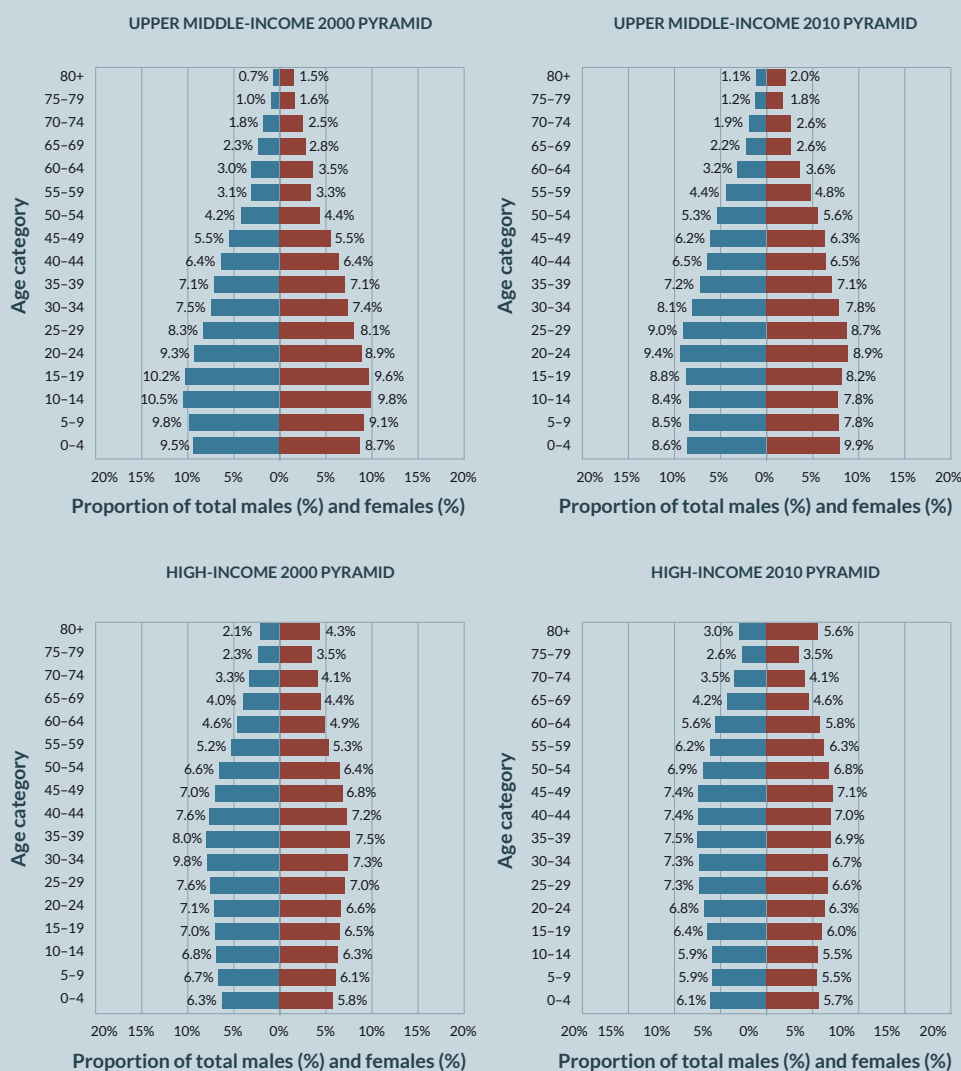
FIGURE 05

COMPARISON OF THE AVERAGE AGE PYRAMIDS IN 2000 WITH 2010, UPPER MIDDLE-INCOME AND HIGH-INCOME COUNTRIES

Source :

World population prospects : The 2010 revision, CDROM Edition, Department of Economic and Social Affairs, Population Division, New York, United Nations, 2011.

Men 
Women 



Not addressing hypertension in a timely fashion will have significant economic and social impact.

Nearly 80% of deaths due to cardiovascular disease occur in low- and middle-income countries. They are the countries that can least afford the social and economic consequences

of ill health. Current age standardized mortality rates of low-income countries are higher than those of developed countries (Fig. 6) (1,3).

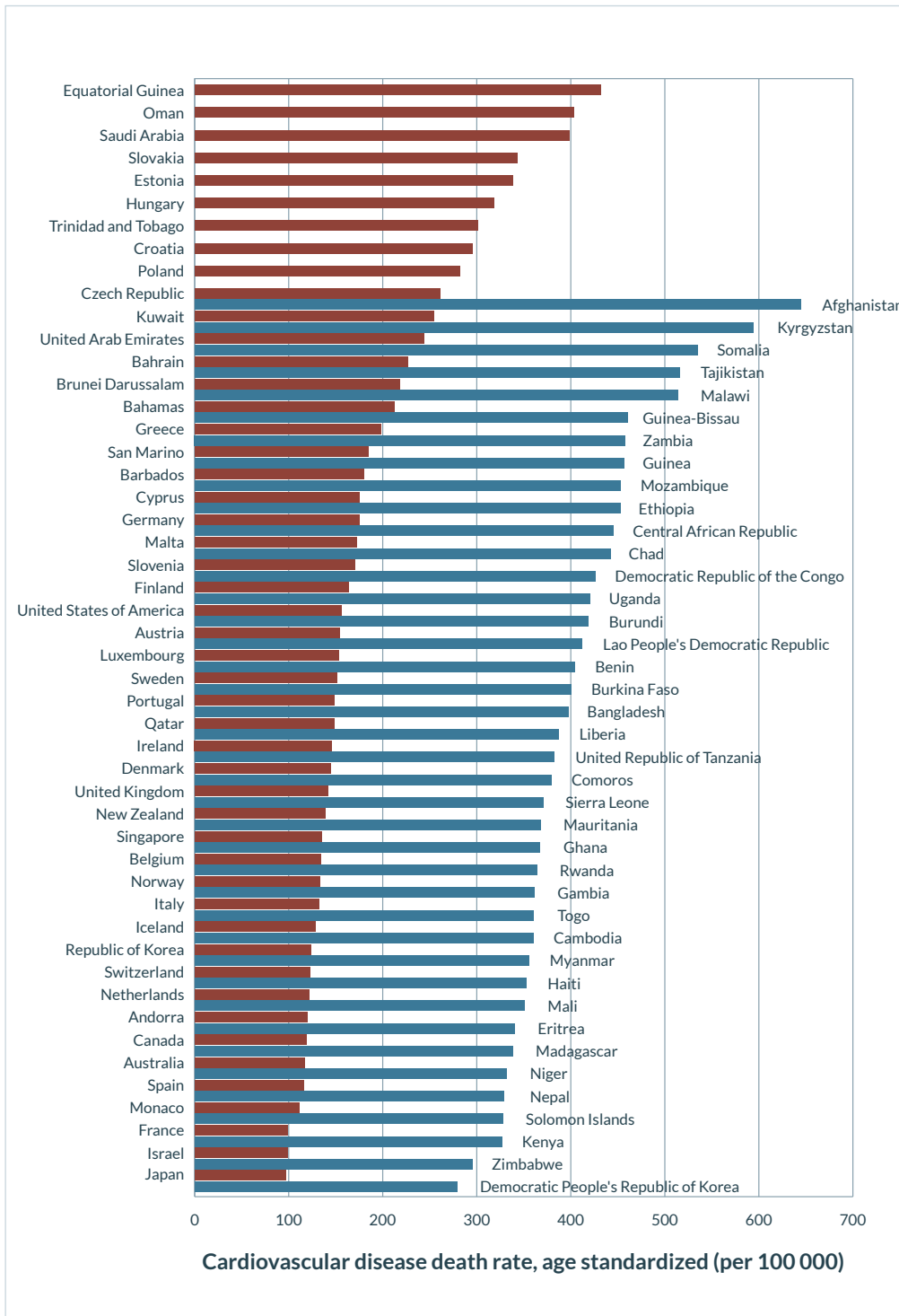


FIGURE 06

MORTALITY RATES OF CARDIOVASCULAR DISEASES IN HIGH-INCOME AND LOW-INCOME COUNTRIES (age standardized, 2008)

Source :

Causes of death 2008, [Online Database]. Geneva, World Health Organization.

Low-income countries
High-income countries

Early detection and treatment of hypertension and other risk factors, as well as public health policies that reduce exposure to behavioural risk factors, have contributed to the gradual decline in mortality due to heart disease and stroke in high-income countries over the last three decades. For example, in 1972, comprehensive preventive interventions were initiated in a community project in North Karelia, in Finland. At that time Finland had an extremely high mortality rate from heart disease. Within five years, many positive changes were already observed in the form of dietary changes, improved hypertension control, and smoking reduction. Accordingly a decision was made to expand the interventions nationally. Now, some 35 years later, the annual cardiovascular disease mortality rate among the working-age population in Finland is 85% lower compared to the rates in 1977. Observed reductions in population risk factors (serum cholesterol, blood pressure and smoking) have been shown to explain most of the decline in cardiovascular mortality. Concurrent improvements in early detection and treatment of risk factors have also contributed to the decline in cardiovascular disease mortality.

Premature death, disability, personal and family disruption, loss of income, and health-care expenditure due to hypertension, take a toll on families, communities and national finances. In low- and middle-income countries many people do not seek treatment for hypertension because it is prohibitively expensive. Households often then spend a substantial share of their income on hospitalization and care following complications of hypertension, including heart attack, stroke and kidney failure. Families face catastrophic health expenditure and spending on health care, which is often long term in the case of hypertension complications, pushing tens of millions of people into poverty (11). Moreover, the loss of family income from death or disability can be devastating. In certain low- and middle-income countries, current health expenditure on cardiovascular diseases alone accounts for 20% of total health expenditure.

Over the period 2011-2025, the cumulative lost output in low- and middle-income countries associated with noncommunicable diseases is projected to be US\$ 7.28 trillion (Table 1) (12). The annual loss of approximately US\$ 500 billion due to major noncommunicable diseases amounts to approximately 4% of gross domestic product for low- and middle-income countries. Cardiovascular disease including hypertension accounts for nearly half of the cost (Fig. 7) (13).

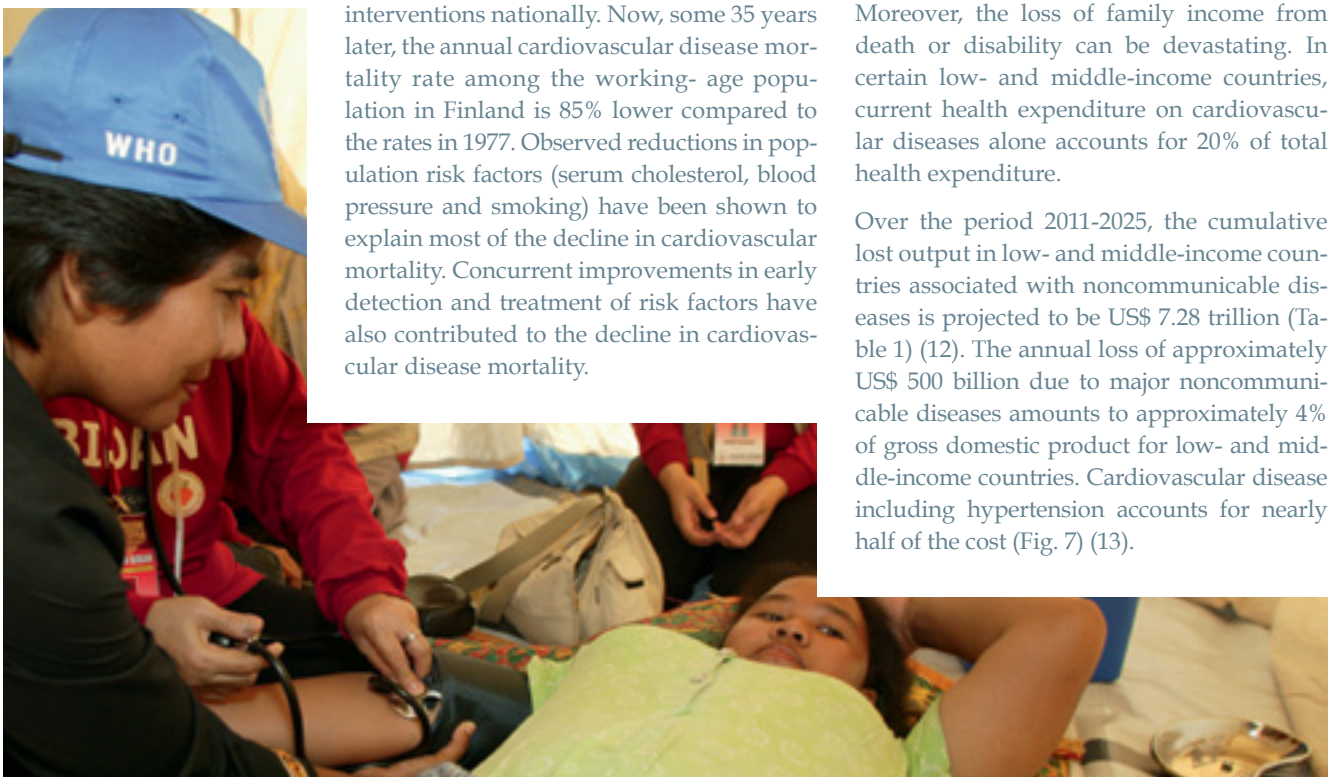
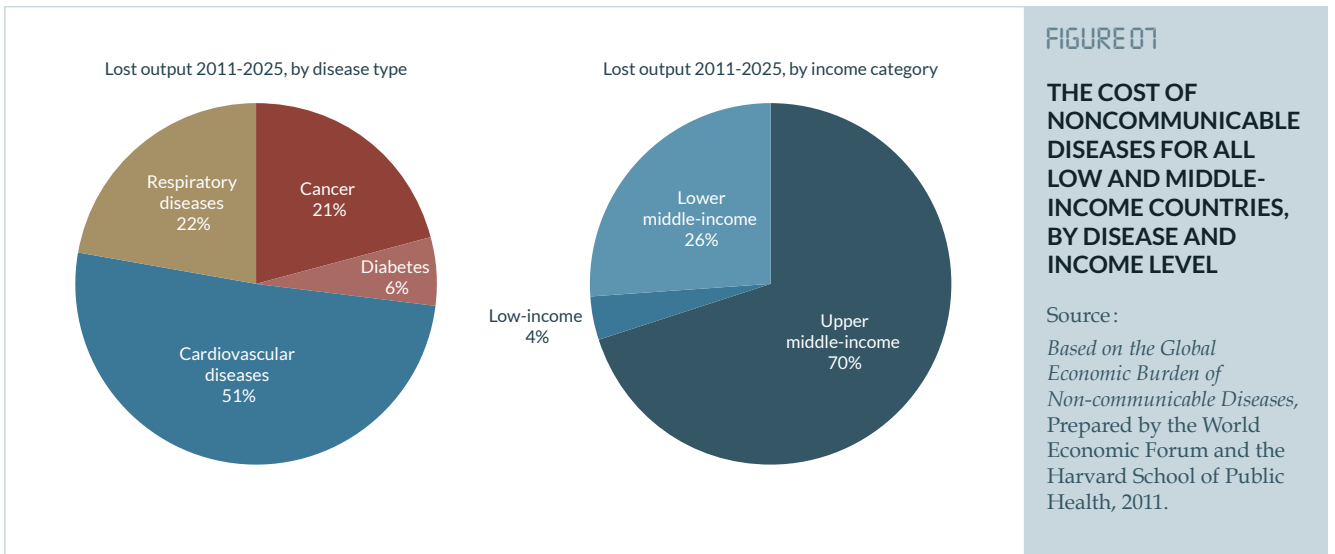


TABLE 01 ECONOMIC BURDEN OF NONCOMMUNICABLE DISEASES, 2011-2025 (US\$ TRILLION IN 2008).

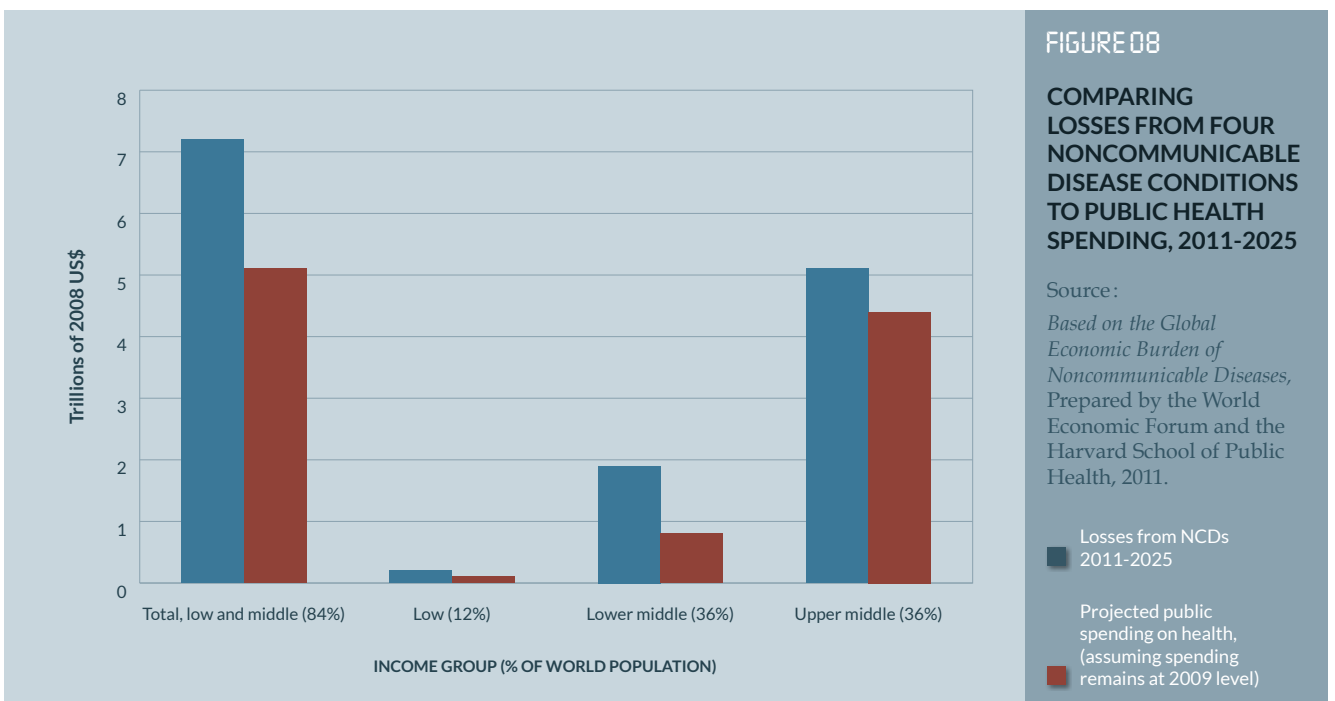
| COUNTRY INCOME GROUP | DIABETES | CARDIOVASCULAR DISEASES | RESPIRATORY DISEASES | CANCER | TOTAL |
|-------------------------|----------|-------------------------|----------------------|--------|-------|
| Upper middle | 0.31 | 2.52 | 1.09 | 1.20 | 5.12 |
| Lower middle | 0.09 | 1.07 | 0.44 | 0.26 | 1.85 |
| Low | 0.02 | 0.17 | 0.06 | 0.05 | 0.31 |
| Total of low and middle | 0.42 | 3.76 | 1.59 | 1.51 | 7.28 |

The increasing incidence of noncommunicable diseases will lead to greater dependency and mounting costs of care for patients and their families unless public health efforts to prevent these conditions are intensified. The Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases, adopted

by the United Nations General Assembly in September 2011, acknowledges the rapidly growing burden of noncommunicable diseases and its devastating impact on health, socioeconomic development and poverty alleviation. The Political Declaration commits governments to a series of concrete actions (8).



If no action is taken to tackle hypertension and other noncommunicable diseases, the economic losses are projected to outstrip public spending on health (Fig. 8).





SECTION 2

Hypertension: the basic facts

Blood is carried from the heart to all parts of the body in blood vessels. Each time the heart beats, it pumps blood into the vessels. Blood pressure is created by the force of blood pushing against the walls of blood vessels (arteries) as it is pumped by the heart.

Hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure.

The higher the pressure in blood vessels the harder the heart has to work in order to pump blood. If left uncontrolled, hypertension can lead to a heart attack, an enlargement of the heart and eventually heart failure. Blood vessels may develop bulges (aneurysms) and weak spots due to high pressure, making them more likely to clog and burst. The pressure in the blood vessels can also cause blood to leak out into the brain. This can cause a stroke. Hypertension can also lead to kidney failure, blindness, rupture of blood vessels and cognitive impairment.

01

HOW hypertension is defined

Blood pressure is measured in millimetres of mercury (mm Hg) and is recorded as two numbers usually written one above the other. The upper number is the systolic blood pressure - the highest pressure in blood vessels and happens when the heart contracts, or beats. The lower number is the diastolic blood pressure - the lowest pressure in blood vessels in between heartbeats when the heart muscle relaxes. Normal adult blood pressure is defined as a systolic blood pressure of 120 mm Hg and a diastolic blood pressure of 80 mm Hg.

However, the cardiovascular benefits of normal blood pressure extend to lower systolic (105 mm Hg) and lower diastolic blood pressure levels (60 mm Hg). Hypertension is defined as a systolic blood pressure equal to or above 140 mm Hg and/or diastolic blood pressure equal to or above 90 mm Hg. Normal levels of both systolic and diastolic blood pressure are particularly important for the efficient function of vital organs such as the heart, brain and kidneys and for overall health and wellbeing.

02

CAUSES of hypertension

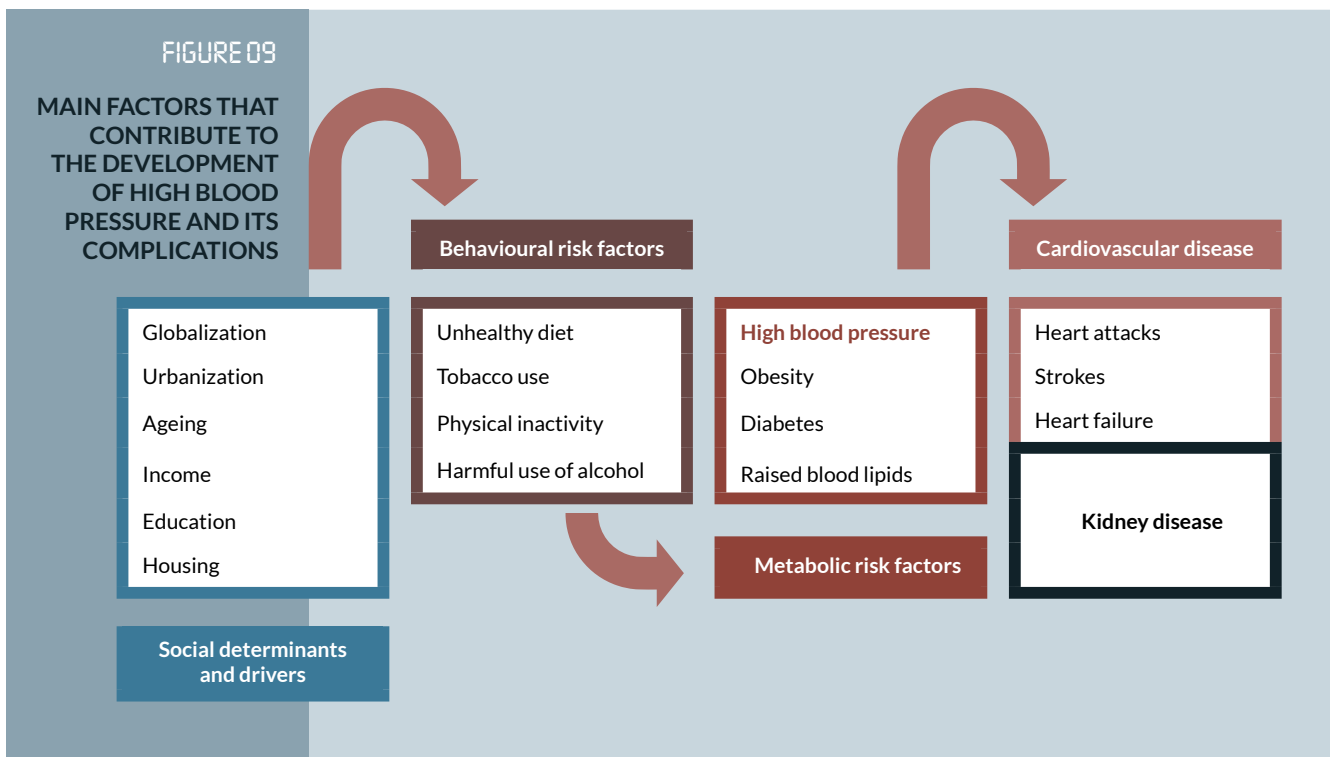
Behavioural risk factors

There are many behavioural risk factors for the development of hypertension (Fig. 9) including:

- consumption of food containing too much salt and fat, and not eating enough fruit and vegetables
- harmful levels of alcohol use
- physical inactivity and lack of exercise
- poor stress management.

These behavioural risk factors are highly influenced by people’s working and living conditions.

In addition, there are several metabolic factors that increase the risk of heart disease, stroke, kidney failure and other complications of hypertension, including diabetes, high cholesterol and being overweight or obese. Tobacco and hypertension interact to further raise the likelihood of cardiovascular disease.



Socioeconomic factors

Social determinants of health, e.g. income, education and housing, have an adverse impact on behavioural risk factors and in this way influence the development of hypertension. For example, unemployment or fear of unemployment may have an impact on stress levels that in turn influences high blood pressure. Living and working conditions can also delay timely detection and treatment due to lack of access to diagnostics and treatment and may also impede prevention of complications.

Rapid unplanned urbanization also tends to promote the development of hypertension as a result of unhealthy environments that encourage consumption of fast food, sedentary behavior, tobacco use and the harmful use of alcohol. Finally, the risk of hypertension increases with age due to stiffening of blood vessels, although ageing of blood vessels can be slowed through healthy living, including healthy eating and reducing the salt intake in the diet.

Other factors

In some cases there is no known specific cause for hypertension. Genetic factors may play a role, and when hypertension develops in people below the age of 40 years it is important to exclude a secondary cause such as kidney disease, endocrine disease and malformations of blood vessels.

Preeclampsia is hypertension that occurs in some women during pregnancy. It usually resolves after the birth but it can sometimes linger, and women who experience preeclampsia are more likely to have hypertension in later life.

Occasionally, when blood pressure is measured it may be higher than it usually is. For some people, the anxiety of visiting a doctor may temporarily raise their blood pressure (“white coat syndrome”). Measuring blood pressure at home instead, using a machine to measure blood pressure several times a day or taking several measurements at the doctor’s office, can reveal if this is the case.



03

THE SYMPTOMS of high blood pressure

Most hypertensive people have no symptoms at all. There is a common misconception that people with hypertension always experience symptoms, but the reality is that most hypertensive people have no symptoms at all. Sometimes hypertension causes symptoms such as headache, shortness of breath, dizziness, chest pain, palpitations of the heart and nose bleeds. It can

be dangerous to ignore such symptoms, but neither can they be relied upon to signify hypertension. Hypertension is a serious warning sign that significant lifestyle changes are required. The condition can be a silent killer and it is important for everybody to know their blood pressure reading.

04

HYPERTENSION and life-threatening diseases

It is dangerous to ignore high blood pressure, because this increases the chances of life-threatening complications. The higher the blood pressure, the higher the likelihood of harmful consequences to the heart and blood vessels in major organs such as the brain and kidneys. This is known as cardiovascular risk, and can also be high in people with mild hypertension in combi-

nation with other risk factors e.g., tobacco use, physical inactivity, unhealthy diet, obesity, diabetes, high cholesterol, low socioeconomic status and family history of hypertension (Fig. 9). Low socioeconomic status and poor access to health services and medications also increase the vulnerability of developing major cardiovascular events due to uncontrolled hypertension.



05 | DIAGNOSING hypertension

There are electronic, mercury and aneroid devices that are used to measure blood pressure (14). WHO recommends the use of affordable and reliable electronic devices that have the option to select manual readings (14, 15). Semi-automatic devices enable manual readings to be taken when batteries run down, a not uncommon problem in resource-constrained settings. Given that mercury is toxic, it is recommended that mercury devices be phased out in favour of electronic devices (14). Aneroid devices such as sphygmomanometers should be used only if they are calibrated every

six months and users should be trained and assessed in measuring blood pressure using such devices.

Blood pressure measurements need to be recorded for several days before a diagnosis of hypertension can be made. Blood pressure is recorded twice daily, ideally in the morning and evening. Two consecutive measurements are taken, at least a minute apart and with the person seated. Measurements taken on the first day are discarded and the average value of all the remaining measurements is taken to confirm a diagnosis of hypertension.

Early detection, treatment and self-care of hypertension has significant benefits

If hypertension is detected early it is possible to minimize the risk of heart attack, heart failure, stroke and kidney failure. All adults should check their blood pressure and know their blood pressure levels. Digital blood pressure measurement machines enable this to be done outside clinic settings. If hypertension is detected people should seek the advice of a health worker. For some people, lifestyle changes are not sufficient for controlling blood pressure and prescription medication is needed.

Blood pressure drugs work in several ways, such as removing excess salt and fluid from the body, slowing the heartbeat or relaxing and widening the blood vessels.

Self-monitoring of blood pressure is recommended for the management of hypertension in patients where measurement devices are affordable. As with other noncommunicable diseases, self-care can facilitate early detection of hypertension, adherence to medication and healthy behaviours, better control and awareness of the importance of seeking medical advice when necessary. Self-care is important for all, but it is particularly so for people who have limited access to health services due to geographic, physical or economic reasons.



SECTION 3

How public health stakeholders can tackle hypertension

The prevention and control of hypertension requires political will on the part of governments and policy-makers. Health workers, the academic research community, civil society, the private sector and families and individuals all have a role to play. Only this concerted effort can harness the testing technology and treatments available to prevent and control hypertension and thereby delay or prevent its life-threatening complications.

01

GOVERNMENTS and policy-makers

Public health policy must address hypertension because it is a major cause of disease burden. Interventions must be affordable, sustainable and effective. As such, vertical programmes that focus solely on hypertension are not recommended. Programmes that address total cardiovascular risk need to be an integral part of the national strategy for prevention and control of noncommunicable diseases.

Health systems that have proven to be most effective in improving health and equity organize their services around the principle of universal health coverage. They promote actions at the primary care level that target the entire spectrum of social determinants of health; they balance prevention and health promotion with curative interventions; and they emphasize the first level of care with appropriate coordination mechanisms.

Even in countries where health services are accessible and affordable, governments are finding it increasingly difficult to respond to the ever-growing health needs of their populations and the increasing costs of health

services. Preventing complications of hypertension is a critical element of containing health-care costs. All countries can do more to improve health outcomes of patients with hypertension by strengthening prevention, increasing coverage of health services, and by reducing the suffering associated with high levels of out-of-pocket payment for health services (16-18).

Hypertension can only be effectively addressed in the context of systems strengthening across all components of the health system: governance, financing, information, human resources, service delivery and access to inexpensive good quality generic medicines and basic technologies. Governments must ensure that all people have equitable access to the preventive, curative and rehabilitative health services they need to prevent them developing hypertension and its complications. (17, 18).

There are six important components of any country initiative to address hypertension

- 1 | an integrated primary care programme
- 2 | the cost of implementing the programme
- 3 | basic diagnostics and medicines
- 4 | reduction of risk factors in the population
- 5 | workplace-based wellness programmes
- 6 | monitoring of progress.

1 | The features of an integrated primary care programme

Integrated programmes must be established at the primary care level for control of hypertension. In most countries this is the weakest level of the health system. Very effective treatment is available to control hypertension to prevent complications. Treatment should be targeted particularly at people at medium or high risk of developing heart attack, stroke or kidney damage. For this to happen, patients presenting with hypertension should have a cardiovascular risk assessment, including tests for diabetes mellitus and other risk factors. Hypertension and diabetes are closely linked, and one cannot be properly managed without attention to the other. The objective of an integrated programme is to reduce total cardiovascular risk to prevent heart attack, stroke, kidney failure and other complications of diabetes and hypertension. Adopting this comprehensive approach ensures that drug treatment is provided to those at medium and high risk. It also prevents unnecessary drug treatment of people with borderline hypertension and low cardiovascular risk. Inappropriate drug treatment exposes people to unwarranted harmful effects and increases the cost of health care; both need to be avoided. Further, there are inexpensive, very effective medicines available for control of hypertension which have a very good safety margin. They should be used whenever possible. WHO protocols are available to provide the required guidance.

WHO tools such as the WHO/International Society of Hypertension (ISH) risk prediction charts (Fig. 10) (18) are designed to aid risk assessment. WHO/ISH charts are available for all World Health Organization subregions. Evidence-based guidance is also available on management of patients with hypertension through integrated programmes even in resource-constrained settings (19-22). WHO tools also provide evidence-based guidance on the appropriate use of medicines, so that unnecessary costs related to drug therapy can be avoided to ensure sustainability of programmes. At least 30 low- and middle-income countries are now using these tools to address hypertension in an affordable and sustainable manner.

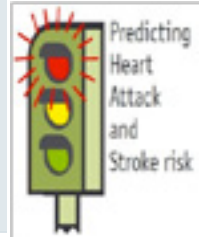
Although cost-effective interventions are available for addressing hypertension, there are major gaps in application, particularly in resource-constrained settings. It is essential to quickly identify ways to address these gaps including through operational research; the enormous benefits of blood pressure control for public health make a compelling case for action. (23).

FIGURE 10

WORLD HEALTH ORGANIZATION AND INTERNATIONAL SOCIETY OF HYPERTENSION RISK PREDICTION CHART

10-year risk of a fatal or non-fatal cardiovascular event by gender, age, smoking status, systolic blood pressure, blood cholesterol, and presence or absence of diabetes. Different charts are available for all World Health Organization subregions.

Source:
*Prevention of cardiovascular disease:
 Guidelines for assessment and management
 of cardiovascular risk.*
 Geneva, World Health Organization, 2012

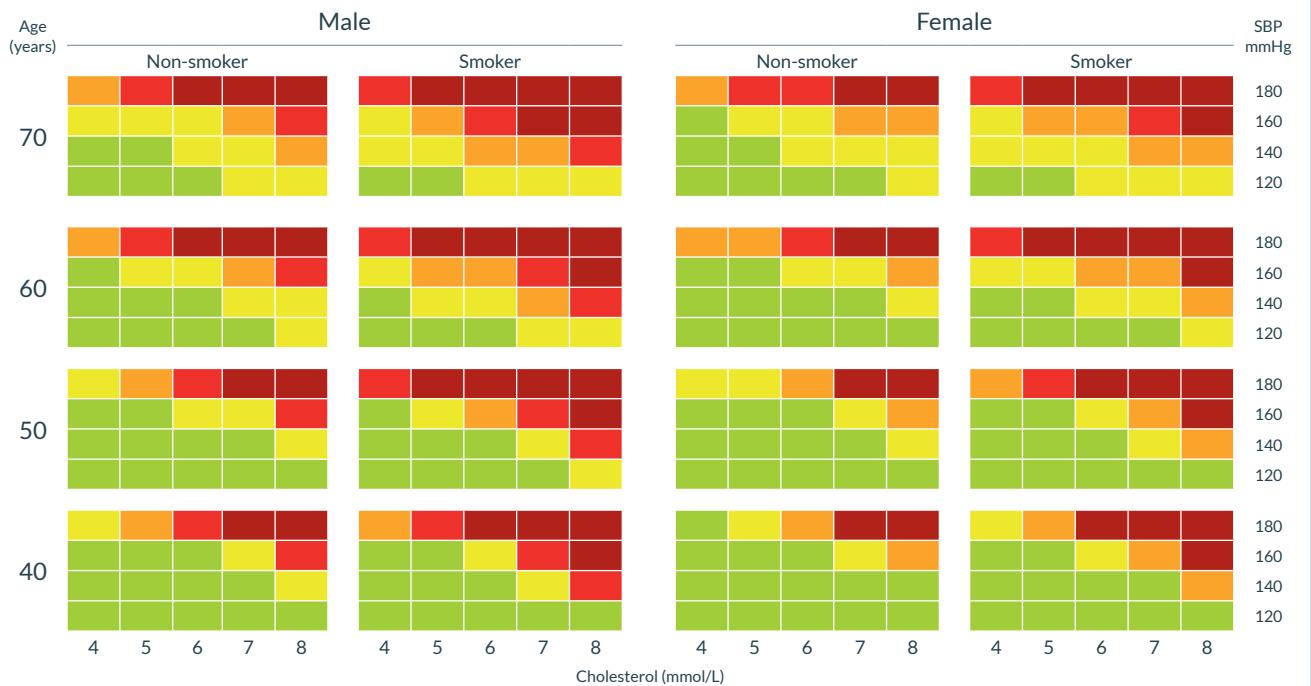


Risk Level ■ <10% ■ 10% to <20% ■ 20% to <30% ■ 30% to <40% ■ >40%

AFR D People with Diabetes Mellitus



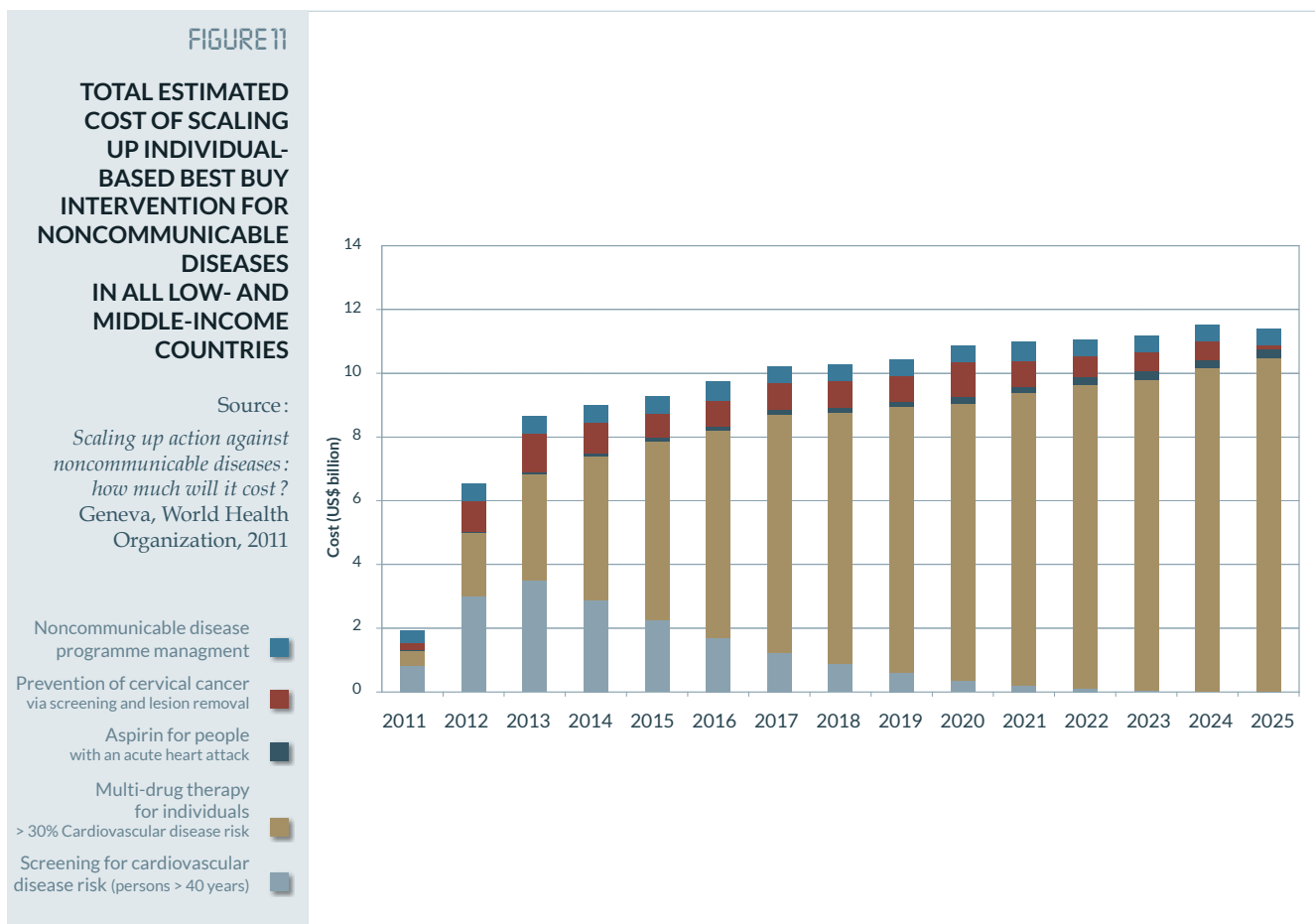
AFR D People without Diabetes Mellitus



2 | The cost of implementing an integrated primary care programme

The cumulative cost of implementing an integrated primary care programme to prevent heart attack, stroke and kidney failure, using blood pressure as an entry point, is shown in Fig. 11. Estimated costs cover primary care outpatient visits for consultation, counselling,

diagnostics and medicines. The cumulative cost of scaling up very cost-effective interventions that address cardiovascular disease and cervical cancer in all low- and middle-income countries is estimated to be US\$ 9.4 billion a year (21).



A WHO costing tool to estimate the cost of establishing such a programme in any country (21) takes into account:

- the need to gradually increase coverage of the whole population in an affordable manner to advance the universal health coverage agenda;
- availability of basic technologies to manage people with hypertension;
- the availability and appropriate use of essential medicines to prevent complications in people with moderate to high cardiovascular risk;
- the links between different levels of the health system so that people can be managed appropriately based on their level of risk.

3 | Basic diagnostics and medicines

The basic diagnostic technologies required for addressing hypertension include accurate blood pressure measurement devices, weighing scales, urine albumin strips, fasting blood sugar tests and blood cholesterol tests.

Not all patients diagnosed with hypertension require medication, but those at medium to high risk will need one or more of eight essential medicines to lower their cardiovascular risk (a thiazide diuretic, an angiotensin converting enzyme inhibitor, a long-acting calcium channel blocker, a beta blocker, metformin, insulin, a statin and aspirin).

The cost of implementing such a programme is low, at less than US\$ 1 per head in low-income countries, less than US\$ 1.50 per head in lower middle-income countries and US\$ 2.50 in upper middle-income countries. Expressed as a proportion of current health spending, the cost of implementing such a package amounts to 4% in low-income countries, 2% in lower middle-income countries and less than 1% in upper middle-income countries (22).

4 | Reduction of risk factors in the population

The likelihood of cardiovascular disease increases continuously as the level of a risk factor such as blood pressure increases, without any natural threshold limit. Most cardiovascular disease in the population occurs in people with an average risk level, because they constitute the largest proportion of the population. Although a very high risk factor level increases the chances of developing cardiovascular disease in an individual, the number of cases from this risk group is relatively low because of the relatively low proportion of people in this population segment. The population-based approach is thus based on the observation that effective reduction of cardiovascular disease rates in the population usually calls for community-wide changes in unhealthy behaviors or reduction in mean risk factor levels. Hence, these interventions predominantly in-

volve general changes in behaviour. In the population-based approach, interventions target the population, community, worksites and schools, aiming at modifying social and environmental determinants.

Therefore, in addition to strengthening health systems, a cost-effective programme must include population-wide approaches to shift the blood pressure distribution of the whole population to a healthy pattern. Population-wide approaches to reduce high blood pressure are similar to those that address other major non-communicable diseases. They require public policies to reduce the exposure of the whole population to risk factors such as an unhealthy diet, physical inactivity, harmful use of alcohol and tobacco use (24-27) with a special focus on children, adolescents and youth.



| TABLE 02 THE FOLLOWING EVIDENCE-BASED POLICY INTERVENTIONS ARE VERY COST EFFECTIVE | |
|--|---|
| TOBACCO USE | <ul style="list-style-type: none"> • Excise tax increases • Smoke-free indoor workplaces and public places • Health information and warnings about tobacco • Bans on advertising and promotion |
| HARMFUL ALCOHOL USE | <ul style="list-style-type: none"> • Excise tax increases on alcoholic beverages • Comprehensive restrictions and bans on alcohol marketing • Restrictions on the availability of retailed alcohol |
| UNHEALTHY DIET AND PHYSICAL INACTIVITY | <ul style="list-style-type: none"> • Salt reduction through mass-media campaigns and reduced salt content in processed foods • Replacement of trans-fats with polyunsaturated fats • Public awareness programme about diet and physical activity |

SALT REDUCTION

Dietary salt intake is a contributing factor for hypertension.

In most countries average per-person salt intake is too high and is between 9 grams (g) and 12 g/day (28). Scientific studies have consistently demonstrated that a modest reduction in salt intake lowers blood pressure in people with hypertension and people with normal blood pressure, in all age groups, and in all ethnic groups, although there are variations in the magnitude of reduction. Several studies have shown that a reduction in salt intake is one of the most cost-effective interventions to reduce heart disease and stroke worldwide at the population level.

WHO recommends that adults should consume less than 2000 milligrams of sodium, or 5 g of salt per day (27, 29). Sodium content is high in processed foods, such as bread (approximately 250 mg/100 g), processed meats like bacon (approximately 1500 mg/100 g), snack foods such as pretzels, cheese puffs and popcorn (approximately 1500 mg/100 g), as well as in condiments such as soy sauce (approximately 7000 mg/100 g), and bouillon or stock cubes (approximately 20 000 mg/100 g).

Potassium-rich food helps to reduce blood pressure (30). WHO recommends that adults should consume at least 3,510 mg of potassium /day. Potassium-rich foods include: beans and peas (approximately 1,300 mg of potassium per 100 g), nuts (approximately 600 mg/100 g), vegetables such as spinach, cabbage and parsley (approximately 550 mg/100 g) and fruit such as bananas, papayas and dates (approximately 300 mg/100 g). Processing reduces the amount of potassium in many food products.

Reducing population salt intake requires action at all levels, including the government, the food industry, nongovernmental organizations, health professionals and the public. A modest reduction in salt intake can be achieved by voluntary reduction or by regulating the salt content of prepackaged foods and condiments. The food industry can make a major contribution to population health if a gradual and sustained decrease is achieved in the amount of salt that is added to prepackaged foods. In addition, sustained mass-media campaigns are required to encourage reduction in salt consumption in households and communities.

Several countries have successfully carried out salt reduction programmes as a result of which salt intake has fallen. For example, Finland initiated a systematic approach to reduce salt intake in the late 1970s through mass-media campaigns, cooperation with the food industry, and implementation of salt labeling legislation. The reduction in salt intake was accompanied by a decline in both systolic and diastolic blood pressure of 10 mm Hg or more. A reduction in salt intake contributed to the reduction of mortality from heart disease and stroke in Finland during this period. The United Kingdom of Great Britain and Northern Ireland, the United States of America and several other high-income countries have also successfully developed programmes of voluntary salt reduction in collaboration with the food industry. More recently, several developing countries have also launched national salt reduction initiatives.

5 | Workplace wellness programmes and high blood pressure control

WHO considers workplace health programmes to be one of the most cost-effective ways to prevent and control noncommunicable diseases including hypertension (31).

The United Nations high-level meeting on noncommunicable disease prevention and control in 2011 called on the private sector to “promote and create an enabling environment for healthy behaviours among workers, including by establishing tobacco-free workplaces, and safe and healthy working environments through occupational safety and health mea-

asures, including, where appropriate, through good corporate practices, workplace wellness programmes and health insurance plans.”

Workplace wellness programmes should focus on promoting worker health through the reduction of individual risk-related behaviours, e.g. tobacco use, unhealthy diet, harmful use of alcohol, physical inactivity and other health risk behaviours. They have the potential to reach a significant proportion of employed adults for early detection of hypertension and other illnesses.

6 | Monitoring of progress

Please see section 4: Monitoring the impact of action to tackle hypertension (p.34).

02 HEALTH workers

Skilled and trained health workers at all levels of care are essential for the success of hypertension control programmes. Health workers can raise the awareness of hypertension in different population groups. Activities can range from blood pressure measurement campaigns to health education programmes in the workplace to information dialogue with policy makers on how living conditions and unhealthy behavior influence blood pressure levels.

Training of health workers should be institutionalized within medical, nursing and allied health worker curricula. The majority of cases of hypertension can be managed effectively at the primary health care level. Primary health-care physicians as well as trained non-

physician health workers can play a very important role in detection and management of hypertension. WHO has developed guidelines and several tools to assist health workers in managing hypertension cost effectively in primary care. More information on how health workers should manage people with high blood pressure is available online, including how to measure blood pressure, which blood pressure devices to use, how to counsel on lifestyle change and when to prescribe medicines (14-16, 19-21).

<http://www.who.int/nmh/publications/phc2012/en/index.html>

03

CIVIL society

Civil society institutions, in particular non-governmental organizations (NGOs), academia and professional associations, have a major part to play in addressing hypertension and in the overall prevention and control of noncommunicable diseases at both country and global levels.

Civil society institutions have several roles that they are uniquely placed to fulfil. They help strengthen capacity to address prevention of noncommunicable diseases at the national level. They are well-placed to garner political support and mobilize society for wide support of activities to address hypertension and other noncommunicable diseases. In some countries, civil society institutions are significant providers of prevention and health-care services and often fill gaps in services and training provided to the public and private sectors.

Civil society action is particularly important in addressing the common risk factors of tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol where complex commercial, trade, political and social factors are at play. Partnerships between NGOs and academia can bring together the expertise and resources needed to build both workforce capacity and the skills of individuals, families and communities. The International Society of Hypertension, World Hypertension League, World Heart Federation and the World Stroke Association have a long history of collaboration with WHO and working specifically in the area of hypertension and cardiovascular disease (32-35).

04

PRIVATE sector

The private sector - excluding the tobacco industry - can make a significant contribution to hypertension control in several ways.

In addition to contributing to worksite wellness programmes, it can actively participate in the implementation of the set of recommendations on the marketing of foods and non-alcoholic beverages to children which was endorsed by the Sixty-third World Health Assembly in May 2010 (36). Evidence shows that exposure to advertising influences children's food preferences, purchase requests and consumption patterns. Advertising and other forms of food marketing to children are widespread across the world. Most of this marketing is for foods with a high content of salt, fat and sugar. At country level the recommendations require

the collaboration of the private sector to put in place the means necessary to reduce the impact of cross-border marketing of foods high in saturated fats, trans-fatty acids, sugar, or salt.

In addition, the private sector has potential to contribute to prevention and control of hypertension and other noncommunicable diseases through the development of cutting-edge health technologies and applications, and manufacturing affordable health commodities.

Other ways in which the private sector can contribute to prevention and control of hypertension are outlined in the draft Global Noncommunicable Diseases Action Plan 2013-2020 (9).

05

FAMILIES and individuals

While some people develop hypertension as they get older, this is not a sign of healthy ageing. All adults should know their blood pressure level and should also find out if a close relative had or has hypertension as this could place them at increased risk.

The odds of developing high blood pressure and its adverse consequences can be minimized by:

| Healthy diet

- promoting a healthy lifestyle with emphasis on proper nutrition for infants and young people
- reducing salt intake to less than 5 g of salt per day
- eating five servings of fruit and vegetables a day
- reducing saturated and total fat intake.

| Alcohol

- avoiding harmful use of alcohol.

| Physical activity

- regular physical activity, and promotion of physical activity for children and young people. WHO recommends physical activity for at least 30 minutes a day five times a week.
- maintaining a normal body weight.

| Tobacco

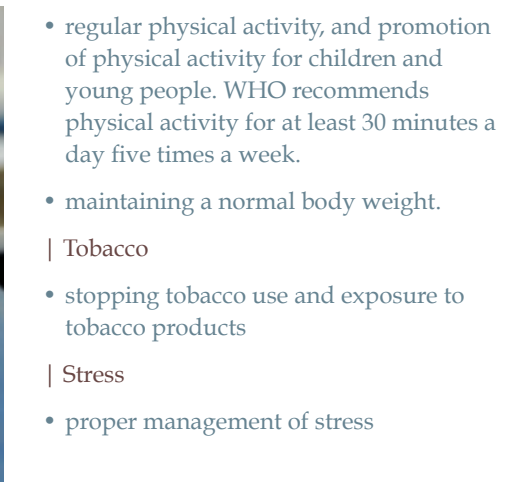
- stopping tobacco use and exposure to tobacco products

| Stress

- proper management of stress

Individuals who already have hypertension can actively participate in managing their condition by:

- adopting the healthy behaviours listed above
- monitoring blood pressure at home if feasible
- checking blood sugar, blood cholesterol and urine albumin
- knowing how to assess cardiovascular risk using a risk assessment tool
- following medical advice
- regularly taking any prescribed medications for lowering blood pressure.



06

WORLD HEALTH ORGANIZATION Our role

WHO's mandated role in global health addresses the right to health, social justice and equity for all. Since 2000, WHO has played a critical leadership role in efforts to address noncommunicable diseases including hypertension through a public health approach (7, 9, 10). As the world's leading public health agency, it tracks the global burden, articulates evidence-based policy, sets norms and standards and provides technical support to countries to address health and disease. WHO is providing support to countries to develop their health financing systems to move towards and to sustain universal health coverage (17, 18). It has developed evidence-based guidance and implementation tools to assist countries to address hyper-

tension through a combination of interventions focused on individuals (14, 16, 17-22) and the whole population (24-30). At present WHO, in consultation with Member States and other partners, is coordinating the development of a global action plan for the prevention and control of noncommunicable diseases (9) and a global monitoring framework. Together, they will provide a roadmap to operationalize the commitments of the UN Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases and to continue the work of the Global Strategy for prevention and control of noncommunicable diseases including hypertension (9).



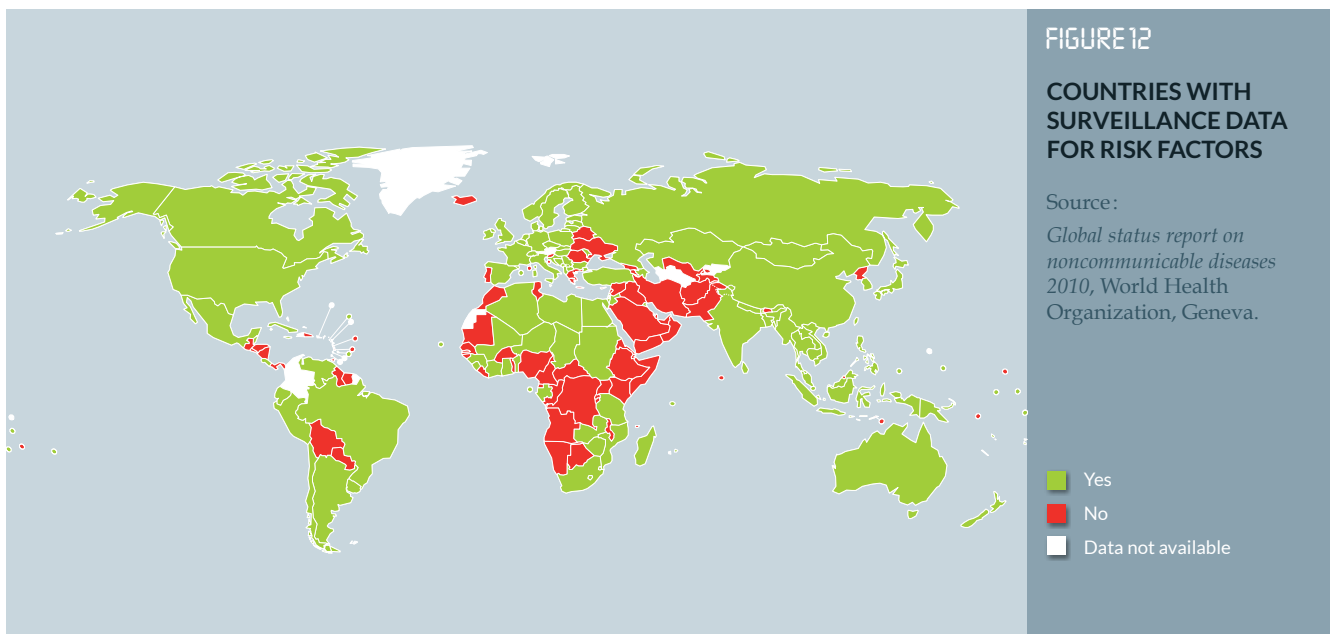


SECTION 4

Monitoring the impact of action to tackle hypertension

National surveillance health information systems must be strengthened to monitor the impact of action to prevent and control hypertension and other risk factors of noncommunicable diseases.

Noncommunicable disease surveillance is the ongoing systematic collection and analysis of data to provide information regarding a country's noncommunicable disease burden. Monitoring systems must collect reliable information on risk factors and their determinants, noncommunicable disease mortality and illness. This data is critical for policy and programme development. However, some countries still lack surveillance data for hypertension and other risk factors (Fig. 12).



The importance of surveillance and monitoring was recognized in the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. It called upon WHO to develop a global monitoring framework, including indicators and targets that could be applied across different regional and country settings before the end of 2012. WHO concluded the work on the comprehensive global monitoring framework, including indicators, and a set of voluntary global targets for the prevention and control of noncommunicable diseases in November 2012 at a formal consultation attended by representatives from 119 Member States and stakeholder organizations. The consultation resulted in a global monitoring framework comprising 24 indicators and nine voluntary global targets for the prevention and control of noncommunicable diseases (table 3). The WHO Director-General will submit the global monitoring framework to the Sixty-sixth World Health Assembly in May 2013 for its consideration and adoption.

A combination of interventions targeted at the whole population and specifically at high risk groups is needed to achieve

these ambitious global targets. Strengthening population wide approaches to reduce exposure to risk factors will reduce the prevalence of hypertension (target 6). Strengthening health systems to deliver integrated programmes, particularly at primary care level, will facilitate treatment of people at high risk of complications and reduce preventable mortality (targets 1, 8 and 9). For example, target 8 is to cover at least 50% of people at moderate to high risk of developing heart attack and stroke with drug therapy and counselling (including blood sugar control). This requires the availability of basic technologies and generic essential medicines for this purpose in primary care facilities.

The core list includes:

- Technologies - blood pressure measurement device, weighing scale, blood sugar measurement device and urine strips for albumin assay
- Medicines - a thiazide diuretic, an angiotensin converting enzyme inhibitor, a long-acting calcium channel blocker, a beta blocker, metformin, insulin, a statin and aspirin.



Countries should be supported to set baselines and national targets. If this is done all countries can make a meaningful contribution to the nine global voluntary targets (9). These include targets directly related to control of hypertension and its consequences.

In order to monitor progress, and to achieve the global targets, the capacity of countries to collect, analyze and communicate data must be strengthened, particularly in low- and middle-income countries.

TABLE 03 SET OF VOLUNTARY GLOBAL TARGETS TO BE ACHIEVED BY 2025 (9)

| MORTALITY AND MORBIDITY | |
|--|---|
| Premature mortality from noncommunicable diseases | |
| <i>(1) A 25% relative reduction in overall mortality from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases</i> | |
| RISK FACTORS | |
| Behavioural risk factors | |
| Harmful use of alcohol | <i>(2) At least a 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context</i> |
| Physical inactivity | <i>(3) A 10% relative reduction in prevalence of insufficient physical activity</i> |
| Salt/sodium intake | <i>(4) A 30% relative reduction in mean population intake of salt/sodium intake</i> |
| Tobacco use | <i>(5) A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years</i> |
| Biological risk factors | |
| Raised blood pressure | <i>(6) A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure according to national circumstances</i> |
| Diabetes and obesity | <i>(7) Halt the rise in diabetes and obesity</i> |
| NATIONAL SYSTEMS RESPONSE | |
| Drug therapy to prevent heart attacks and strokes | |
| <i>(8) At least 50% of eligible people receive drug therapy and counselling (including blood sugar control) to prevent heart attacks and strokes</i> | |
| Essential noncommunicable disease medicines and basic technologies to treat major noncommunicable diseases | |
| <i>(9) An 80% availability of the affordable basic technologies and essential medicines, including generic drugs, required to treat major noncommunicable diseases in both public and private facilities</i> | |

REFERENCES

1. *Causes of Death 2008 [online database]. Geneva, World Health Organization* (http://www.who.int/healthinfo/global_burden_disease/cod_2008_sources_methods.pdf)
2. Lim SS, Vos T, Flaxman AD, Danaei G, et al *A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010.* *Lancet.* 2012; 380 (9859): 2224-60
3. *World Health Organization. Global status report on noncommunicable diseases 2010.* Geneva, World Health Organization, 2011.
4. *World Health Organization. Global Health Observatory Data Repository [online database].* Geneva, World Health Organization, 2008 (<http://apps.who.int/gho/data/view.main>) Accessed 11th February 2013.
5. *World Health Organization. Global health risks: Mortality and burden of disease attributable to selected major risks.* Geneva, World Health Organization, 2009.
6. *Department of Economic and Social Affairs, Population Division. World population prospects: The 2010 revision, CD-ROM edition.* New York, United Nations, 2011.
7. *World Health Organization. Global strategy for prevention and control of noncommunicable diseases.* Geneva, World Health Organization. (http://www.who.int/nmh/publications/wha_resolution53_14/en/).
8. *Political Declaration of the High-Level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases.* United Nations General Assembly, 2011
9. *Draft action plan for the prevention and control of noncommunicable diseases 2013-2020.* World Health Organization. (http://www.who.int/nmh/events/2013/consultation_201303015/en/)
10. *Global atlas on cardiovascular disease prevention and control.* Geneva, World Health Organization, 2011.
11. *World Health Organization. Impact of out-of-pocket payments for treatment of non-communicable diseases in developing countries: A review of literature WHO Discussion Paper 02/2011.* Geneva, World Health Organization.
12. *World Health Organization and World Economic Forum. From Burden to "Best Buys": Reducing the Economic Impact of Non-Communicable Diseases in Low- and Middle-Income Countries.* Geneva, World Health Organization and World Economic Forum, 2011 (http://www.who.int/nmh/publications/best_buys_summary).
13. *The Global Economic Burden of Non-communicable Diseases.* World Economic Forum and the Harvard School of Public Health, 2011.
14. *World Health Organization. Affordable Technology: Blood Pressure Measuring Devices for Low Resource Settings.* Geneva, World Health Organization 2003.
15. Parati G., et al. A new solar-powered blood pressure measuring device for low-resource settings. *Hypertension*, 2010, 56; 1047-1053.
16. Ooms G, Brolan C, Eggermont N, et al Universal health coverage anchored in the right to health *Bull World Health Organ* d 2013; 91 (1): 2-2A. doi: 10.2471/BLT.12.115808.
17. *World health report 2010. Health Systems financing: the path to universal coverage.* Geneva, World Health Organization, 2010.

18. *World health report 2008. Primary health care - now more than ever.* Geneva, World Health Organization, 2008.
19. *World Health Organization. Prevention of cardiovascular disease: Guidelines for assessment and management of cardiovascular risk.* Geneva, World Health Organization, 2007.
20. *World Health Organization. Package of essential noncommunicable disease interventions for primary health care in low-resource settings.* Geneva, World Health Organization, 2010.
21. *World Health Organization. Prevention and control of noncommunicable diseases: Guidelines for primary health care in low resource settings.* Geneva, World Health Organization, 2012.
22. *Scaling up action against noncommunicable diseases: How much will it cost?* Geneva, World Health Organization, 2011
23. *A prioritized research agenda for prevention and control of noncommunicable diseases.* Geneva, World Health Organization, 2011.
24. *World Health Organization. WHO Framework convention on tobacco control.* Geneva, World Health Organization, 2003 (<http://whqlibdoc.who.int/publications/2003/9241591013.pdf>).
25. *World Health Assembly. Global strategy on diet, physical activity and health.* Geneva, World Health Organization, 2004 (WHA 57.17) (<http://www.who.int/dietphysicalactivity/en/>).
26. *Global Strategy for infant and young child feeding.* Geneva, World Health Organization, 2003 (<http://www.who.int/nutrition/publications/infantfeeding/9241562218/en/index.html>).
27. *World Health Assembly. Global Strategy to reduce the harmful use of alcohol.* Geneva, World Health Organization, 2010 (WHA 63.13) (http://apps.who.int/gb/ebwha/pdf_files/WHA63/A63_R13-en.pdf).
28. *Reducing salt intake in populations - Report of a WHO Forum and Technical Meeting.* Geneva, World Health Organization, 2007.
29. *World Health Organization Guideline: Sodium intake for adults and children.* Geneva, World Health Organization, 2012.
30. *World Health Organization Guideline: Potassium intake for adults and children.* Geneva, World Health Organization, 2012.
31. *Healthy workplaces: a WHO global model for action.* Geneva, World Health Organization, 2010.
32. *World Hypertension League* (<http://www.worldhypertensionleague.org>). Accessed 11 February 2013.
33. *International Society of Hypertension* (<http://www.ish-world.com>). Accessed 11 February 2013.
34. *World Heart Federation* (<http://www.world-heart-federation.org>). Accessed 11 February 2013.
35. *World Stroke Organization* (<http://www.world-stroke.org/>). Accessed 11 February 2013.
36. *Set of recommendations on the marketing of foods and non-alcoholic beverages to children.* Geneva, World Health Organization, 2010.

A global brief on HYPERTENSION

Silent killer, global public health crisis



World Health
Organization