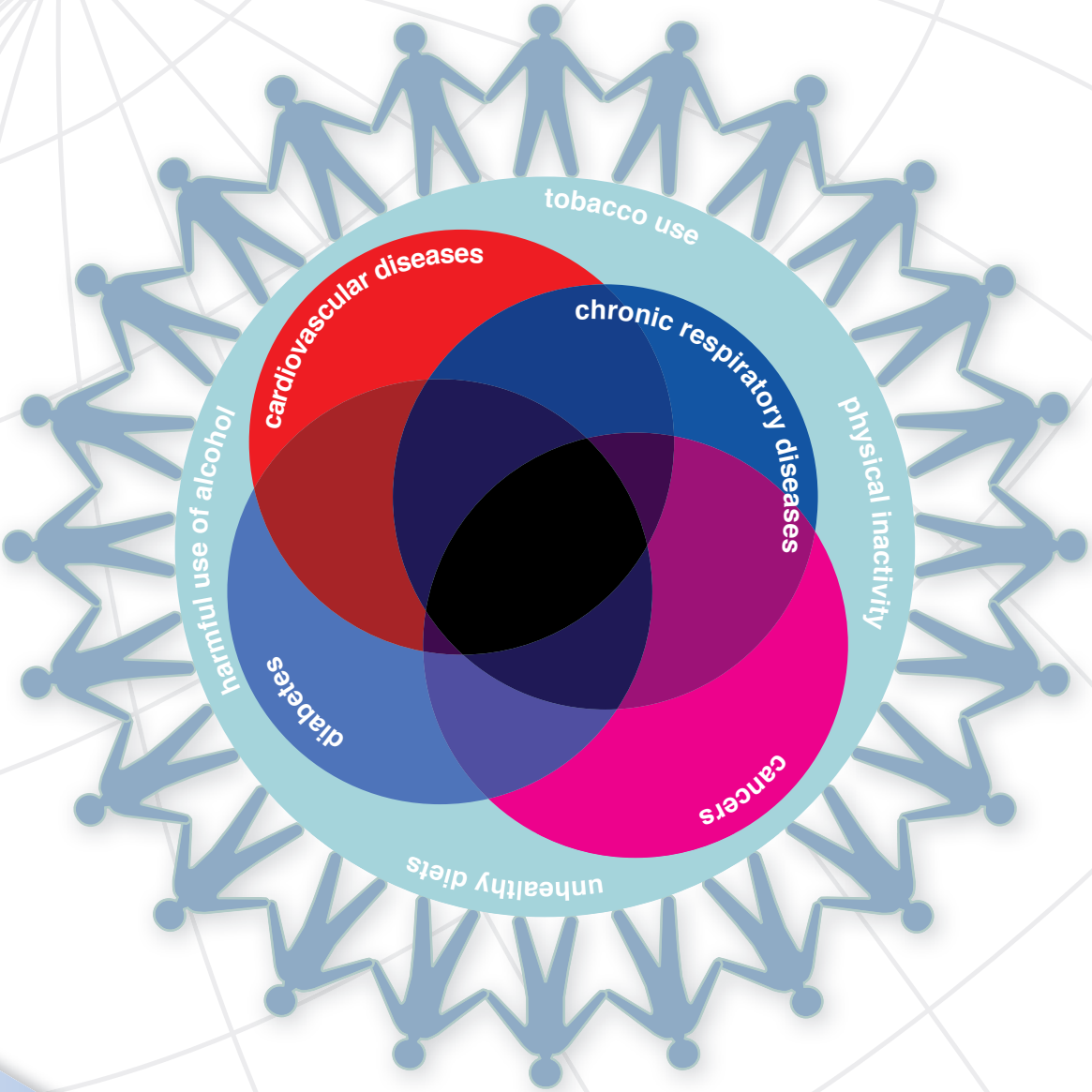
Global status report
on noncommunicable diseases
2010



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Foreword

This report sets out the statistics, evidence and experiences needed to launch a more forceful response to the growing threat posed by noncommunicable diseases. While advice and recommendations are universally relevant, the report gives particular attention to conditions in low- and middle-income countries, which now bear nearly 80% of the burden from diseases like cardiovascular disease, diabetes, cancer and chronic respiratory diseases. The health consequences of the worldwide epidemic of obesity are also addressed.

The report takes an analytical approach, using global, regional and country-specific data to document the magnitude of the problem, project future trends, and assess the factors contributing to these trends. As noted, the epidemic of these diseases is being driven by powerful forces now touching every region of the world: demographic ageing, rapid unplanned urbanization, and the globalization of unhealthy lifestyles. While many chronic conditions develop slowly, changes in lifestyles and behaviours are occurring with a stunning speed and sweep.

The consequences for societies and economies are devastating everywhere, but most especially so in poor, vulnerable and disadvantaged populations. These people get sicker sooner and die earlier than their counterparts in wealthier societies. In large parts of the developing world, noncommunicable diseases are detected late, when patients need extensive and expensive hospital care for severe complications or acute events. Most of this care is covered through out-of-pocket payments, leading to catastrophic medical expenditures. For all these reasons, noncommunicable diseases deliver a two-punch blow to development. They cause billions of dollars in losses of national income, and they push millions of people below the poverty line, each and every year.

On the positive side, much has been learnt about these diseases during the past three decades, especially as their initial burden was greatest in affluent societies with strong research and development capacities. Effective interventions are available, and abundant evidence now demonstrates their clear and measurable impact in a range of resource settings.

In a key achievement, the report sets out a menu of options for addressing these diseases through both population-wide interventions, largely aimed at prevention, and individual interventions, aimed at early detection and treatment that can reduce progression to severe and costly illness and complications. Lifestyle-related behaviours are targeted together with metabolic and physiological risk factors, including high blood pressure, raised serum cholesterol, and impaired glucose metabolism.

To aid priority setting and encourage immediate action, the report puts forward a series of highly cost-effective ‘best buys’, known to be effective, feasible, and affordable in any resource setting. Primary health care is clearly identified as the best framework for implementing recommended interventions on an adequate scale.

Findings in the report reinforce the urgency of certain priorities now recognized by the international community as essential to better health in the 21st century: strong health-care systems, including the information systems needed for reliable surveillance and monitoring, and the full engagement of non-health sectors, industry, civil society, and other partners, especially as the causes of these diseases lie beyond the direct control of public health authorities.

The overarching message is optimistic. Current evidence unequivocally demonstrates that noncommunicable diseases are largely preventable. These diseases can be effectively treated and controlled. We can turn the tide. But we have a long way to go.

The warning remains stark. The epidemic already extends far beyond the capacity of lower-income countries to cope. In the absence of urgent action, the rising financial burden of these diseases will reach levels that are beyond the capacity of even the wealthiest countries in the world to manage.

Dr Margaret Chan

Director-General, World Health Organization

Introduction

Noncommunicable diseases (NCDs) are the leading causes of death globally, killing more people each year than all other causes combined. Contrary to popular opinion, available data demonstrate that nearly 80% of NCD deaths occur in low- and middle-income countries. Despite their rapid growth and inequitable distribution, much of the human and social impact caused each year by NCD-related deaths could be averted through well-understood, cost-effective and feasible interventions.

Of the 57 million deaths that occurred globally in 2008, 36 million – almost two thirds – were due to NCDs, comprising mainly cardiovascular diseases, cancers, diabetes and chronic lung diseases.[1] The combined burden of these diseases is rising fastest among lower-income countries, populations and communities, where they impose large, avoidable costs in human, social and economic terms. About one fourth of global NCD-related deaths take place before the age of 60.

NCDs are caused, to a large extent, by four behavioural risk factors that are pervasive aspects of economic transition, rapid urbanization and 21st-century life: tobacco use, unhealthy diet, insufficient physical activity and the harmful use of alcohol. The greatest effects of these risk factors fall increasingly on low- and middle-income countries, and on poorer people within all countries, mirroring the underlying socioeconomic determinants. Among these populations, a vicious circle may ensue: poverty exposes people to behavioural risk factors for NCDs and, in turn, the resulting NCDs may become an important driver to the downward spiral that leads families towards poverty. As a result, unless the NCD epidemic is aggressively confronted in the most heavily affected countries and communities, the mounting impact of NCDs will continue and the global goal of reducing poverty will be undermined.

A major reduction in the burden of NCDs will come from population-wide interventions, which are cost effective and may even be revenue-generating, as is the case with tobacco and alcohol tax increases, for instance. But effective interventions, such as tobacco control measures and salt reduction, are not implemented on a wide scale because of inadequate political commitment, insufficient engagement of non-health sectors, lack of resources, vested interests of critical constituencies, and limited engagement of key stakeholders. For example, less than 10% of the world's population is fully protected by any of the tobacco demand-reduction measures contained in the *WHO Framework Convention on Tobacco Control*.

Improved health care, early detection and timely treatment is another effective approach for reducing the impact of NCDs. However, appropriate care for people with NCDs is lacking in many settings, and access to essential technologies and medicines is limited, particularly in low- and middle-income countries and populations. Many NCD-related health-care interventions are cost effective, especially compared to costly procedures, that may be necessary when detection and treatment are late and the patient reaches advanced stages of disease. Health systems need to be further strengthened to deliver an effective, realistic and affordable package of interventions and services for people with NCDs.

As the magnitude of the NCD epidemic continues to accelerate, the pressing need for stronger and more focused international and country responses is increasingly recognized by Member States. Much has been learnt about the causes, prevention and treatment of NCDs over the past three decades, as important achievements have been made in reducing mortality in many high-income countries; the evidence base for action is steadily mounting and global attention to the NCD epidemic is intensifying.

[1] The primary focus of this report is on the four groups of diseases covered by the *Global Strategy for the Prevention and Control of Noncommunicable Diseases:* cardiovascular diseases, cancers, diabetes and chronic lung diseases, which are responsible for the majority of deaths caused by NCDs and are largely caused by four shared behavioural risk factors. The broader scope of noncommunicable conditions also includes health problems like gastrointestinal diseases, renal diseases, and neurological and mental health disorders. These conditions account for a substantial portion of the global burden of disease. Although they are not specifically addressed by the content and focus of this report, many of the approaches and opportunities for tackling NCDs described are also directly relevant to these conditions.

The *Global Status Report on Noncommunicable Diseases* is the first detailed description of the global burden of NCDs, their risk factors and determinants; it highlights the immediate opportunities for tackling the epidemic in all settings through a broad focus on NCD surveillance, population-based prevention, strengthening health care and the capacities of countries to respond to the epidemic. The report and its future editions are intended for policy-makers in health and development, health officials, and other key stakeholders, allowing them to share the collective experience and lessons in reducing leading NCD risk factors and improving health care for people who already suffer from these conditions.

The basis of the report is a sound common vision and framework for reversing the epidemic: the *Global Strategy for the Prevention and Control of Noncommunicable Diseases*, which was endorsed by the World Health Assembly in 2000. Intensive action is now needed in each of the strategy's three objectives: mapping the epidemic of NCDs and their causes; reducing the main risk factors through health promotion and primary prevention approaches; and strengthening health care for people already afflicted with NCDs.

The 10 years that followed endorsement of the strategy have witnessed major policy developments and strategic initiatives that further support Member States in tackling the NCD epidemic. The key landmarks are:

- the adoption of the *WHO Framework Convention on Tobacco Control* (FCTC) by the World Health Assembly in 2003 (http://www.who.int/tobacco/framework/final_text/en/);
- the *Global Strategy on Diet, Physical Activity and Health* endorsed by the World Health Assembly in 2004 (http://www.who.int/dietphysicalactivity/strategy/eb11344/strategy_english_web.pdf);
- the *2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases* endorsed by the World Health Assembly in 2008 (http://www.who.int/nmh/publications/9789241597418/en/index.html);
- the *Global Strategy to Reduce the Harmful Use of Alcohol* adopted by the World Health Assembly in 2010 (http://www.who.int/substance_abuse/msbalcstragegy.pdf); and
- the United Nations General Assembly resolution on the prevention and control of noncommunicable diseases adopted in 2010. The resolution calls for a high-level meeting of the General Assembly in September 2011, with the participation of heads of state and government, on the prevention and control of noncommunicable diseases.

The 2008–2013 Action Plan was developed by WHO and Member States to translate the *Global Strategy for the Prevention and Control of Noncommunicable Diseases* into concrete action. The Plan highlighted six key objectives. For each objective, three distinct sets of actions are outlined for implementation by Member States, by WHO and by other international partners. These objectives are:

- to raise the priority accorded to noncommunicable diseases in development work at global and national levels, and to integrate prevention and control of such diseases into policies across government departments;
- to establish and strengthen national policies and plans for the prevention and control of noncommunicable diseases;
- to promote interventions to reduce the main shared modifiable risk factors: tobacco use, unhealthy diets, physical inactivity and harmful use of alcohol;
- to promote research for the prevention and control of noncommunicable diseases;
- to promote partnerships for the prevention and control of noncommunicable diseases; and
- to monitor noncommunicable diseases and their determinants and evaluate progress at the national, regional and global levels.

Despite abundant evidence, some policy-makers still fail to regard NCDs as a global or national health priority. Incomplete understanding and persistent misconceptions continue to impede action. Although the majority of NCD-related deaths, particularly premature deaths, occur in low- and middle-income countries, a perception persists that NCDs afflict mainly the wealthy. Other barriers include the point of view of NCDs as problems solely resulting from harmful individual behaviours and lifestyle choices, often linked to victim 'blaming'. The influence of socioeconomic circumstances on risk and vulnerability to NCDs and the impact of health-damaging policies are

not always fully understood; they are often underestimated by some policy-makers, specially in non-health sectors, who may not fully appreciate the essential influence of public policies related to tobacco, nutrition, physical inactivity and the harmful use of alcohol on reducing behaviours and risk factors that lead to NCDs. Overcoming such misconceptions and viewpoints involves changing the way policy-makers perceive NCDs and their risk factors, and how they then act. Concrete and sustained action is essential to prevent exposure to NCD risk factors, address social determinants of disease and strengthen health systems so that they provide appropriate and timely treatment and care for those with established disease.

The *Global Status Report on Noncommunicable Diseases* provides a baseline for future monitoring of NCD-related trends and for assessing the progress that countries are making to address the epidemic. The report is also the foundation for a call to action, by providing the knowledge base for a global response, recommendations for the way forward, and guidance for country leadership to contain one of the most significant current threats to global health, development and poverty reduction initiatives.

Dr Ala Alwan
Assistant Director-General
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Executive summary

Noncommunicable diseases (NCDs) are the leading global causes of death, causing more deaths than all others causes combined, and they strike hardest at the world's low- and middle-income populations. These diseases have reached epidemic proportions, yet they could be significantly reduced, with millions of lives saved and untold suffering avoided, through reduction of their risk factors, early detection and timely treatments. The *Global Status Report on Noncommunicable Diseases* is the first worldwide report on the state of NCDs and ways to map the epidemic, reduce its major risk factors and strengthen health care for people who already suffer from NCDs.

This report was prepared by the WHO Secretariat under Objective 6 of the 2008–2013 Action Plan for the Global Strategy for the Prevention and Control of NCDs. It focuses on the current global status of NCDs and will be followed by another report to assess progress in 2013. One of the main objectives of this report is to provide a baseline for countries on the current status of NCDs and their risk factors, as well as the current state of progress countries are making to address these diseases in terms of policies and plans, infrastructure, surveillance and population-wide and individual interventions. It also disseminates a shared vision and road map for NCD prevention and control. Target audiences include policy-makers, health officials, nongovernmental organizations, academia, relevant non-health sectors, development agencies and civil society.

Burden

Of the 57 million global deaths in 2008, 36 million, or 63%, were due to NCDs, principally cardiovascular diseases, diabetes, cancers and chronic respiratory diseases. As the impact of NCDs increases, and as populations age, annual NCD deaths are projected to continue to rise worldwide, and the greatest increase is expected to be seen in low- and middle-income regions.

While popular belief presumes that NCDs afflict mostly high-income populations, the evidence tells a very different story. Nearly 80% of NCD deaths occur in low-and middle-income countries and are the most frequent causes of death in most countries, except in Africa. Even in African nations, NCDs are rising rapidly and are projected to exceed communicable, maternal, perinatal, and nutritional diseases as the most common causes of death by 2030.

Mortality and morbidity data reveal the growing and disproportionate impact of the epidemic in lower-resource settings. Over 80% of cardiovascular and diabetes deaths, and almost 90% of deaths from chronic obstructive pulmonary disease, occur in low- and middle-income countries. More than two thirds of all cancer deaths occur in low- and middle-income countries. NCDs also kill at a younger age in low- and middle-income countries, where 29% of NCD deaths occur among people under the age of 60, compared to 13% in high-income countries. The estimated percentage increase in cancer incidence by 2030, compared with 2008, will be greater in low- (82%) and lower-middle-income countries (70%) compared with the upper-middle- (58%) and high-income countries (40%).

A large percentage of NCDs are preventable through the reduction of their four main behavioural risk factors: tobacco use, physical inactivity, harmful use of alcohol and unhealthy diet. The influences of these behavioural risk factors, and other underlying metabolic/physiological causes, on the global NCD epidemic include:

Tobacco: Almost 6 million people die from tobacco use each year, both from direct tobacco use and second-hand smoke. By 2020, this number will increase to 7.5 million, accounting for 10% of all deaths. Smoking is estimated to cause about 71% of lung cancer, 42% of chronic respiratory disease and nearly 10% of cardiovascular disease. The highest incidence of smoking among men is in lower-middle-income countries; for total population, smoking prevalence is highest among upper-middle-income countries.

Insufficient physical activity: Approximately 3.2 million people die each year due to physical inactivity. People who are insufficiently physically active have a 20% to 30% increased risk of all-cause mortality. Regular physical activity reduces the risk of cardiovascular disease including high blood pressure, diabetes,

breast and colon cancer, and depression. Insufficient physical activity is highest in high-income countries, but very high levels are now also seen in some middle-income countries specially among women.

Harmful use of alcohol: Approximately 2.3 million die each year from the harmful use of alcohol, accounting for about 3.8% of all deaths in the world. More than half of these deaths occur from NCDs including cancers, cardiovascular disease and liver cirrhosis. While adult per capita consumption is highest in high-income countries, it is nearly as high in the populous upper-middle-income countries.

Unhealthy diet: Adequate consumption of fruit and vegetables reduces the risk for cardiovascular diseases, stomach cancer and colorectal cancer. Most populations consume much higher levels of salt than recommended by WHO for disease prevention; high salt consumption is an important determinant of high blood pressure and cardiovascular risk. High consumption of saturated fats and trans-fatty acids is linked to heart disease. Unhealthy diet is rising quickly in lower-resource settings. Available data suggest that fat intake has been rising rapidly in lower-middle-income countries since the 1980s.

Raised blood pressure: Raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of all deaths. It is a major risk factor for cardiovascular disease. The prevalence of raised blood pressure is similar across all income groups, though it is generally lowest in high-income populations.

Overweight and obesity: At least 2.8 million people die each year as a result of being overweight or obese. Risks of heart disease, strokes and diabetes increase steadily with increasing body mass index (BMI). Raised BMI also increases the risk of certain cancers. The prevalence of overweight is highest in upper-middle-income countries but very high levels are also reported from some lower-middle income countries. In the WHO European Region, the Eastern Mediterranean Region and the Region of the Americas, over 50% of women were overweight. The highest prevalence of overweight among infants and young children is in upper-middle-income populations, while the fastest rise in overweight is in the lower-middle-income group.

Raised cholesterol: Raised cholesterol is estimated to cause 2.6 million deaths annually; it increases the risks of heart disease and stroke. Raised cholesterol is highest in high-income countries.

Cancer-associated infections: At least 2 million cancer cases per year, 18% of the global cancer burden, are attributable to a few specific chronic infections, and this fraction is substantially larger in low-income countries. The principal infectious agents are human papillomavirus, Hepatitis B virus, Hepatitis C virus and *Helicobacter pylori*. These infections are largely preventable through vaccinations and measures to avoid transmission, or treatable. For example, transmission of Hepatitis C virus has been largely stopped among high-income populations, but not in many low-resource countries.

Impact on development

The NCD epidemic strikes disproportionately among people of lower social positions. NCDs and poverty create a vicious cycle whereby poverty exposes people to behavioural risk factors for NCDs and, in turn, the resulting NCDs may become an important driver to the downward spiral that leads families towards poverty.

The rapidly growing burden of NCDs in low- and middle-income countries is accelerated by the negative effects of globalization, rapid unplanned urbanization and increasingly sedentary lives. People in developing countries are increasingly eating foods with higher levels of total energy and are being targeted by marketing for tobacco, alcohol and junk food, while availability of these products increases. Overwhelmed by the speed of growth, many governments are not keeping pace with ever-expanding needs for policies, legislation, services and infrastructure that could help protect their citizens from NCDs.

People of lower social and economic positions fare far worse. Vulnerable and socially disadvantaged people get sicker and die sooner as a result of NCDs than people of higher social positions; the factors determining social positions are education, occupation, income, gender and ethnicity. There is strong evidence for the correlation between a host of social determinants, especially education, and prevalent levels of NCDs and risk factors.

Since in poorer countries most health-care costs must be paid by patients out-of-pocket, the cost of health care for NCDs create significant strain on household budgets, particularly for lower-income families. Treatment for diabetes, cancer, cardiovascular diseases and chronic respiratory diseases can be protracted and therefore extremely expensive. Such costs can force families into catastrophic spending and impoverishment. Household spending on NCDs, and on the behavioural risk factors that cause them, translates into less money for necessities such as food and shelter, and for the basic requirement for escaping poverty – education. Each year, an estimated 100 million people are pushed into poverty because they have to pay directly for health services.

The costs to health-care systems from NCDs are high and projected to increase. Significant costs to individuals, families, businesses, governments and health systems add up to major macroeconomic impacts. Heart disease, stroke and diabetes cause billions of dollars in losses of national income each year in the world's most populous nations. Economic analysis suggests that each 10% rise in NCDs is associated with 0.5% lower rates of annual economic growth.

The socioeconomic impacts of NCDs are affecting progress towards the UN Millennium Development Goals (MDGs). MDGs that target health and social determinants such as education and poverty are being thwarted by the growing epidemic of NCDs and their risk factors.

Lack of monitoring

Accurate data from countries are vital to reverse the global rise in death and disability from NCDs. But a substantial proportion of countries have little usable mortality data and weak surveillance systems and data on NCDs are often not integrated into national health information systems. Improving country-level surveillance and monitoring must be a top priority in the fight against NCDs. In low-resource settings with limited capacity, viable and sustainable systems can be simple and still produce valuable data.

Three essential components of NCD surveillance constitute a framework that all countries should establish and strengthen. These components are: a) monitoring exposures (risk factors); b) monitoring outcomes (morbidity and disease-specific mortality); and c) health system responses, which also include national capacity to prevent NCDs in terms of policies and plans, infrastructure, human resources and access to essential health care including medicines.

In order to remedy the serious deficiencies in surveillance and monitoring of NCDs, key steps must be taken:

- NCD surveillance systems should be strengthened and integrated into existing national health information systems.
- All three components of the NCD surveillance framework should be established and strengthened. Standardized core indicators for each of the three components should be adopted and used for monitoring.
- Monitoring and surveillance of behavioural and metabolic risk factors in low-resource settings should receive the highest priority. Markers of cancer-associated infections may have to be monitored in some countries. Vital registration and reporting of cause-specific mortality should be strengthened. Reliable recording of adult mortality is a critical requirement for monitoring NCDs in all countries. Monitoring country capacity for health system response to NCDs is necessary.
- A significant acceleration in financial and technical support is necessary for health information system development in low- and middle-income countries.

Strengthening surveillance is a priority at the national and global levels. There is an urgent and pressing need for concerted efforts to improve the coverage and quality of mortality data, to conduct regular risk factor surveys at a national scale with standardized methods, and to regularly assess national capacity to prevent and control NCDs.

Population-wide interventions

Interventions to prevent NCDs on a population-wide basis are not only achievable but also cost-effective. And the income level of a country or population is not a barrier to success. Low-cost solutions can work anywhere to reduce the major risk factors for NCDs.

While many interventions may be cost-effective, some are considered 'best buys' – actions that should be undertaken immediately to produce accelerated results in terms of lives saved, diseases prevented and heavy costs avoided.

Best buys include:

- Protecting people from tobacco smoke and banning smoking in public places;
- Warning about the dangers of tobacco use;
- Enforcing bans on tobacco advertising, promotion and sponsorship;
- Raising taxes on tobacco;
- Restricting access to retailed alcohol;
- Enforcing bans on alcohol advertising;
- Raising taxes on alcohol;
- Reduce salt intake and salt content of food;
- Replacing trans-fat in food with polyunsaturated fat;
- Promoting public awareness about diet and physical activity, including through mass media.

In addition to best buys, there are many other cost-effective and low-cost population-wide interventions that can reduce risk factors for NCDs. These include:

- Nicotine dependence treatment;
- Promoting adequate breastfeeding and complementary feeding;
- Enforcing drink-driving laws;
- Restrictions on marketing of foods and beverages high in salt, fats and sugar, especially to children;
- Food taxes and subsidies to promote healthy diets.

Also, there is strong evidence, though currently a shortage of cost—effectiveness research, for the following interventions:

- Healthy nutrition environments in schools;
- Nutrition information and counselling in health care;
- National physical activity guidelines;
- School-based physical activity programmes for children;
- Workplace programmes for physical activity and healthy diets;
- Community programmes for physical activity and healthy diets;
- Designing the built environment to promote physical activity.

There also are population-wide interventions that focus on cancer prevention. Vaccination against Hepatitis B, a major cause of liver cancer, is a best buy. Vaccination against human papillomavirus (HPV), the main cause of cervical cancer, is also recommended. Protection against environmental or occupational risk factors for cancer, such as aflatoxin, asbestos and contaminants in drinking-water can be included in effective prevention strategies. Screening for breast and cervical cancer, can be effective in reducing the cancer burden.

Individual health-care interventions

In addition to population-wide interventions for NCDs, country health-care systems should undertake interventions for individuals who either already have NCDs or who are at high risk of developing them. Evidence from high-income countries shows that such interventions can be very effective and are also usually cost-effective or low in cost. When combined, population-wide and individual interventions may save millions of lives and considerably reduce human suffering from NCDs.

The long-term nature of many NCDs demands a comprehensive health-system response, which should be the long-term goal for all countries. In recent years, many low- and middle-income

countries have invested, sometimes with the help of donors, in national 'vertical' programmes to address specific communicable disease problems. While this has scaled-up service delivery for those diseases, it also has distracted governments from coordinated efforts to strengthen overall health systems, creating large gaps in health care.

Currently, the main focus of health care for NCDs in many low- and middle-income countries is hospital-centred acute care. NCD patients present at hospitals when cardiovascular disease, cancer, diabetes and chronic respiratory disease have reached the point of acute events or long-term complications. This is a very expensive approach that will not contribute to a significant reduction of the NCD burden. It also denies people the health benefits of taking care of their conditions at an early stage.

Evidence from high-income countries shows that a comprehensive focus on prevention and improved treatment following cardiovascular events has led to dramatic declines in mortality rates. Similarly, progress in cancer treatment combined with early detection and screening interventions have improved survival rates for many cancers in high-income countries. Survival rates in low- and middle-income countries, however, remain very low. A combination of population-wide and individual interventions can reproduce successes in many more countries through cost-effective initiatives that strengthen overall health systems.

A strategic objective in the fight against the NCD epidemic must be to ensure early detection and care using cost-effective and sustainable health-care interventions:

High-risk individuals and those with established cardiovascular disease can be treated with regimens of low-cost generic medicines that significantly reduce the likelihood of death or vascular events. A regimen of aspirin, statin and blood pressure-lowering agents could significantly reduce vascular events in people at high cardiovascular risk and is considered a **best buy**. When coupled with preventive measures such as smoking cessation, therapeutic benefits can be profound. Another **best buy** is administration of aspirin to people who develop a myocardial infarction. In all countries, these **best buys** need to be scaled up and delivered through a primary health-care approach.

Cancer: Cost-effective interventions are available across the four broad approaches to cancer prevention and control: primary prevention, early detection, treatment and palliative care. Early diagnosis based on awareness of early signs and symptoms and, if affordable, population-based screening improve survival, particularly for breast, cervical, colorectal, skin and oral cancers. Some treatment protocols for various forms of cancer use drugs that are available in generic form. In many low- and middle-income countries, access to care, oral morphine and staff trained in palliative care are limited, so most cancer patients die without adequate pain relief. Community- and home-based palliative care can be successful and cost-effective in these countries.

Diabetes: At least three interventions for prevention and management of diabetes are shown to reduce costs while improving health. Blood pressure and glycaemic control, and foot care are feasible and cost-effective interventions for people with diabetes, including in low- and middle-income countries.

Chronic respiratory disease: In many low-income countries, drugs for inhalation use, such as inhaled steroids, are still not financially accessible. Countries could explore procurement of quality-assured inhaled drugs at affordable costs. Lung health programmes developed to address tuberculosis might be integrated with interventions for chronic respiratory diseases.

In order for low- and middle-income country health systems to expand individual health-care interventions, they need to prioritize a set of low-cost treatments that are feasible within their budgets. Many countries could afford a regimen of low-cost individual treatments by addressing inefficiencies in current operations for treating advanced-stage NCDs. Experiences from maternal and child health and infectious disease initiatives show that health priorities can be rearranged and low-cost individual treatments improved with only a modest injection of new resources.

Like population-wide interventions, there also are **best buys*** and other cost-effective approaches in individual health-care interventions.

Among the best buys* and other cost-effective interventions are:

- Counselling and multidrug therapy, including glycaemic control for diabetes for people > 30 years old with a 10-year risk of fatal or nonfatal cardiovascular events*,
- Aspirin therapy for acute myocardial infarction*;
- Screening for cervical cancer, once, at age 40, followed by removal of any discovered cancerous lesion*;
- Early case finding for breast cancer through biennial mammographic screening (50–70 years) and treatment of all stages;
- Early detection of colorectal and oral cancer;
- Treatment of persistent asthma with inhaled corticosteroids and beta-2 agonists.

Financing and strengthening health systems to deliver the cost-effective individual interventions through a primary health-care approach is a pragmatic first step to achieving the long-term vision of universal care coverage.

Improving country capacity

In 2000 and 2010, WHO conducted surveys to assess capacity for NCD prevention and control in Member States. The surveys found that some progress has been made in the past decade. But progress is uneven, with advancements greatest in higher-income countries. More countries are developing strategies, plans and guidelines for combating NCDs and risk factors, and some countries have created essential components of the health infrastructure, as well as advances in funding, policy development and surveillance. Many countries have units within their health systems and some funding to specifically address NCDs.

But in many countries, these advancements are either on paper only – not fully operational – or their capacity is still not at the level to achieve adequate interventions. And many countries still have no funding or programmes at all. However, the fact that some progress has been made in addressing NCDs shows that strengthening is possible.

The delivery of effective NCD interventions is largely determined by the capacity of health-care systems. Gaps in the provision of essential services for NCDs often result in high rates of complications such as heart attacks, strokes, renal disease, blindness, peripheral vascular diseases, amputations, and the late presentation of cancers. This can also mean catastrophic spending on health care and impoverishment for low-income families. Strengthening political commitment and according a higher priority to NCD programmes are key to expanding health system capacity to tackle NCDs.

Improvements in country capacity are particularly needed in the areas of funding, health information, health workforce, basic technologies, essential medicines, and multisectoral partnerships. Approaches to address these gaps are discussed in Chapters 5 and 6. Greater focus is required on expanding the package of essential services delivered in primary health care, particularly the cost-effective NCD health-care interventions mentioned above. Adequate funding for this package of essential services is key to reversing the NCD epidemic.

Supplementing domestic government funding – and in some countries expanding official development assistance (ODA) – through innovative non-state sector financing will help to bridge the existing funding gaps, which constitute the biggest stumbling block to strengthening primary health care and the response to NCDs. *The World Health Report 2010* outlines numerous examples of innovative financing mechanisms that can be considered to complement national health budgets. In this respect, there are examples of countries that have successfully implemented innovative financing through raising tobacco and alcohol taxes and allocating part of the revenue for health promotion or expanding health insurance services at the primary health-care level.

In addition to capacity improvements in health systems, progress must also be made in advancing health policies in relevant non-health sectors.

NCD programmes and policies need to be aligned with strong national plans that strive to achieve people-centred care delivered through strong integrated health systems. Innovative financing and funding plans, support for NCD prevention and control in official development assistance, effective health information systems, improved training and career development for health workers, and effective strategies for obtaining essential medicines and technology are also both urgent and vital.

Priorities for action

While the magnitude of the NCD epidemic has been rising in recent years, so has the knowledge and understanding of its control and prevention. Evidence shows that NCDs are to a great extent preventable. Countries can reverse the advance of these diseases and achieve quick gains if appropriate actions are taken in the three components of national NCD programmes: *surveillance*, *prevention*, and *health care*. Those actions include:

A comprehensive approach: Risk factors for NCDs are spread throughout society, and they often begin early in life and continue throughout adulthood. Evidence from countries where there have been major declines in certain NCDs indicates that both prevention and treatment interventions are necessary. Therefore, reversing the NCD epidemic requires a comprehensive approach that targets a population as a whole and includes both prevention and treatment interventions.

Multisectoral action: Action to prevent and control NCDs requires support and collaboration from government, civil society and the private sector. Therefore, multiple sectors must be brought together for successful action against the NCD epidemic. In this respect, policy-makers must follow successful approaches to engage non-health sectors based on international experience and lessons learnt. Guidelines on promoting intersectoral action are included in Chapter 7 of this report.

Surveillance and monitoring: Measuring key areas of the NCD epidemic is crucial to reversing it. Specific measurable indicators must be adopted and used worldwide. NCD surveillance must be integrated into national health information systems. This is achievable even in the lowest-resourced countries by considering the actions recommended above under "lack of monitoring".

Health systems: Strengthening of country health-care systems to address NCDs must be undertaken through reorienting existing organizational and financial arrangements and through conventional and innovative means of financing. Reforms, based on strengthening the capacity of primary health care, and improvements in health-system performance must be implemented to improve NCD control outcomes.

Best buys: As highlighted above, prevention and control measures with clear evidence of effectiveness and high cost-effectiveness should be adopted and implemented. Population-wide interventions must be complemented by individual health-care interventions. Best buys are described in Chapters 4 and 5.

Sustainable development: The NCD epidemic has a substantial negative impact on human and social development. NCD prevention should therefore be included as a priority in national development initiatives and related investment decisions. Depending on the national situation, strengthening the prevention and control of NCDs should also be considered an integral part of poverty reduction and other development assistance programmes.

Civil society and the private sector: Civil society institutions and groups are uniquely placed to mobilize political and public awareness and support for NCD prevention and control efforts, and to play a key role in supporting NCD programmes. Strong, united advocacy is still required for NCDs to be fully recognized as a key priority of the global development agenda. Businesses can make a decisively important contribution to addressing NCD prevention challenges. Responsible marketing to prevent the promotion of unhealthy diets and other harmful behaviours, and product reformulation to promote access to healthy food options, are examples of approaches and actions that should be implemented by the corporate sector. Governments are responsible for monitoring the required actions.

The NCD epidemic exacts an enormous toll in terms of human suffering and inflicts serious damage to human development in both the social and economic realms. The epidemic already extends far beyond the current capacity of lower-income countries to cope with it, which is why death and disability are rising disproportionately in these countries. This state of affairs cannot continue. There is a pressing need to intervene. Unless serious action is taken, the burden of NCDs will reach levels that are beyond the capacity of all stakeholders to manage.

Chapter 1
Burden: mortality, morbidity and risk factors

This chapter reviews the current burden and trends of NCDs and the risk factors. It also provides the latest estimates on the number, rates and causes of global deaths from NCDs and the prevalence of the most important related risk factors. A description of the methods used to produce these estimates is provided in Annex 1. Data are presented in two ways: according to the six WHO geographical regions[1] and by the four World Bank income groups.[2] A listing of countries according to the WHO regions and World Bank income groups in 2008 is in Annex 2. Maps showing the global distribution of NCD-related mortality and selected risk factors are presented in Annex 3, along with the individual country estimates for NCD mortality and selected risk factors presented in Annex 4.

Mortality

A total of 57 million deaths occurred in the world during 2008; 36 million (63%) were due to NCDs, principally cardiovascular diseases, diabetes, cancer and chronic respiratory diseases (1). Nearly 80% of these NCD deaths (29 million) occurred in low- and middle-income countries. NCDs are the most frequent causes of death in most countries in the Americas, the Eastern Mediterranean, Europe, South-East Asia, and the Western Pacific. In the African Region, there are still more deaths from infectious diseases than NCDs. Even there, however, the prevalence of NCDs is rising rapidly and is projected to cause almost three-quarters as many deaths as communicable, maternal, perinatal, and nutritional diseases by 2020, and to exceed them as the most common causes of death by 2030 (2).

NCD deaths are projected to increase by 15% globally between 2010 and 2020. The greatest increases will be in Africa, the Eastern Mediterranean, and South-East Asia, where they will increase by over 20%

WHO projections show that NCDs will be responsible for a significantly increased total number of deaths in the next decade. NCD deaths are projected to increase by 15% globally between 2010 and 2020 (to 44 million deaths). The greatest increases will be in the WHO regions of Africa, South-East Asia and the Eastern Mediterranean, where they will increase by over 20%. In contrast, in the European Region, WHO estimates there will be no increase. In the African Region, NCDs will cause around 3.9 million deaths by 2020. The regions that are projected to have the greatest total number of NCD deaths in 2020 are South-East Asia (10.4 million deaths) and the Western Pacific (12.3 million deaths) (2).

With the exception of the African Region, NCD mortality exceeds that of communicable, maternal, perinatal and nutritional conditions combined. For men in the European Region, deaths from NCDs are estimated to be 13 times higher than these other causes combined, and for men in the Western Pacific Region they are estimated to be eight times higher (Figure 1).

In 2008, the overall NCD age-standardized death rates in low- and middle-income countries were 756 per 100 000 for males and 565 per 100 000 for females – respectively 65% and 85% higher than for men and women in high-income countries. Age-standardized NCD mortality rates for all ages were highest in the African Region for males (844 per 100 000) and for females (724 per 100 000).

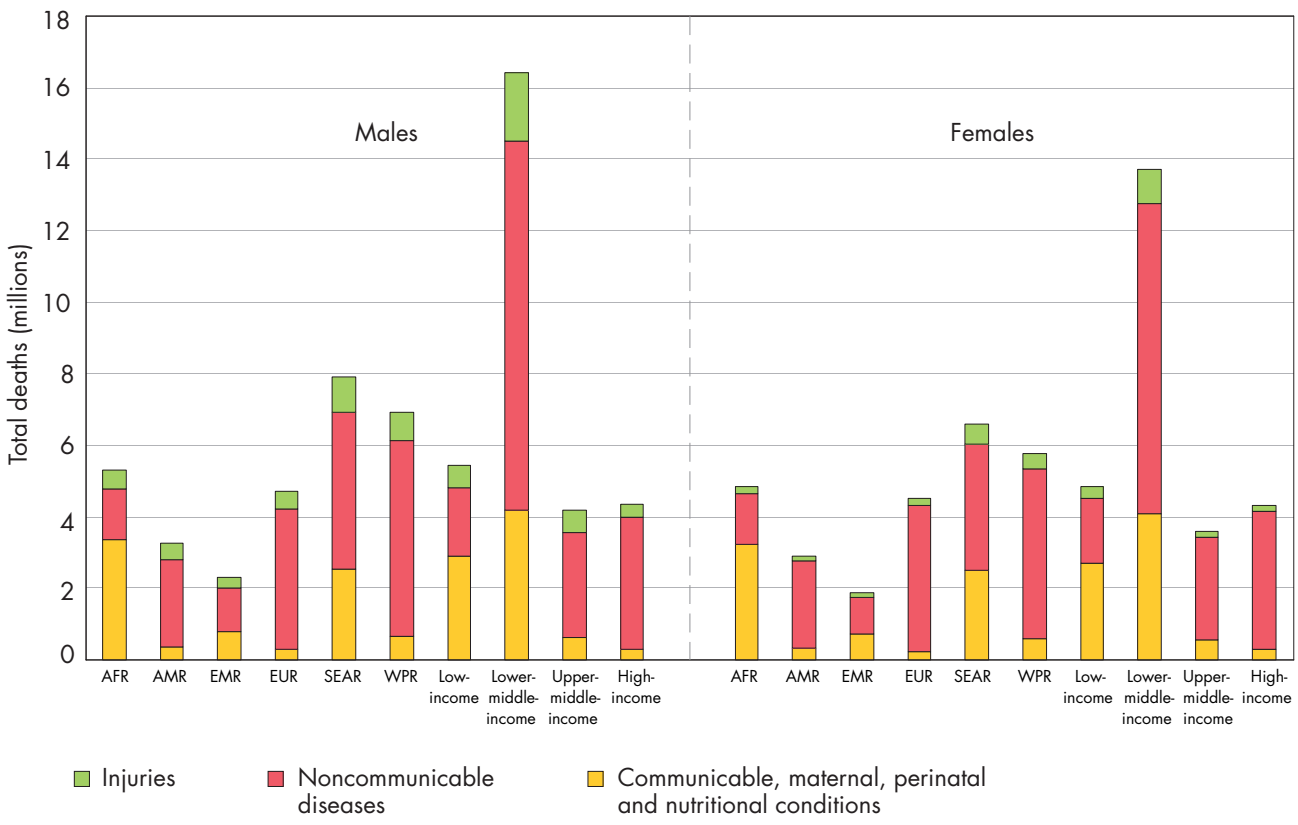
The leading causes of NCD deaths in 2008 were: cardiovascular diseases (17 million deaths, or 48% of NCD deaths); cancers (7.6 million, or 21% of NCD deaths); and respiratory diseases, including asthma and chronic obstructive pulmonary disease (COPD), (4.2 million). Diabetes caused an additional 1.3 million deaths.

Over 80% of cardiovascular and diabetes deaths, and almost 90% of deaths from COPD, occurred in low- and middle-income countries. Behavioural risk factors, including tobacco use, physical inactivity, and unhealthy diet, are responsible for about 80% of coronary heart disease and

[1] The six WHO regions are the African Region, the Region of the Americas, the South-East Asia Region, the European Region, the Eastern Mediterranean Region and the Western Pacific Region.

[2] The World Bank income groups categorize nations according to average gross national income (GNI) per capita into low-income, lower-middle-income, upper-middle-income and high-income countries. Income groups for the year 2008 were used in this report.

Figure 1. Total deaths by broad cause group, by WHO Region, World Bank income group and by sex, 2008



(Note: AFR=African Region, AMR=Region of the Americas, EMR= Eastern Mediterranean Region, EUR= European Region, SEAR=South-East Asia Region, WPR=Western Pacific Region).

cerebrovascular disease (3). These important behavioural risk factors of heart disease and stroke are discussed in detail later in this chapter.

In low- and middle-income countries, 29% of NCD deaths occur among people under the age of 60, compared to 13% in high-income countries

More than two thirds of all cancer deaths occur in low- and middle-income countries. Lung, breast, colorectal, stomach and liver cancers cause the majority of cancer deaths. In high-income countries, the leading causes of cancer deaths are lung cancer among men and breast cancer among women. In low- and middle-income countries cancer levels vary according to the prevailing underlying risks. In sub-Saharan Africa, for example, cervical cancer is the leading cause of cancer death among women. Risk factors for cancer include the four shared behavioural factors (tobacco use, unhealthy diet, insufficient physical activity and the harmful use of alcohol), but infections such as hepatitis B, hepatitis C (liver cancer), human papillomavirus (HPV; cervical cancer) and *Helicobacter pylori* (stomach cancer) also cause up to 18% of cancer burden (4). In addition, cancers are also caused by radiation and a variety of environmental and occupational exposures of varying importance, depending on the specific geographical region and cancer site.

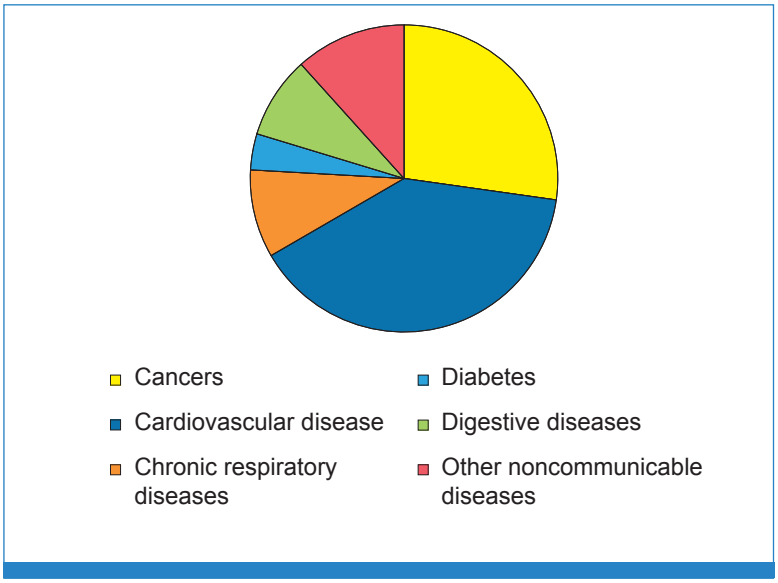
Premature death is a major consideration when evaluating the impact of NCDs on a given population, with approximately 44% of all NCD deaths occurring before the age of 70. In low- and middle-income countries, a higher proportion (48%) of all NCD deaths are estimated to occur in people under the age of 70, compared with high-income countries (26%). The difference is even more marked for NCD deaths in younger age ranges: in low- and middle-income countries, 29% of NCD deaths occur among people under the age of 60, compared to 13% in high-income countries.

Figure 2 shows the proportion of NCD deaths (in 2008) among people under the age of 70, by cause. Cardiovascular diseases were responsible for the largest proportion of NCD deaths under the age of 70 (39%), followed by cancers (27%). Chronic respiratory diseases, digestive diseases

and other NCDs were together responsible for approximately 30% of deaths, and diabetes was responsible for 4% (2).

Population growth and improved longevity are leading to increasing numbers and proportions of older people, with population ageing emerging as a significant trend in many parts of the world. As populations age, annual NCD deaths are projected to rise substantially, to 52 million in 2030. Whereas annual infectious disease deaths are projected to decline by around 7 million over the next 20 years, annual cardiovascular disease mortality is projected to increase by 6 million, and annual cancer deaths by 4 million. In low- and middle-income countries, NCDs will be responsible for three times as many disability-adjusted life years (DALYs)[3] and nearly five times as many deaths as communicable diseases, maternal, perinatal and nutritional conditions combined, by 2030 (2).

Figure 2. Proportion of global NCD deaths under the age of 70, by cause of death, 2008



Morbidity

In addition to information about NCD-related deaths, morbidity data are important for the management of health-care systems and for planning and evaluation of health service delivery. However, reliable data on NCD morbidity are unavailable in many countries. The most comprehensive morbidity data available relate to cancer and are available from population- or hospital-based cancer registries. Such data are important since information on the incidence and types of cancer is required for planning cancer control programmes. Only population-based cancer registries can provide an unbiased description of the cancer profile in a given population. Although disease registries for diabetes, hypertension (raised blood pressure) and renal insufficiency exist in some countries, these are generally only available for well-resourced settings, rather than entire populations. Data on the prevalence of diabetes and raised blood glucose are available from population-based surveys. Raised blood pressure is discussed as a risk factor in the following section.

Cancer

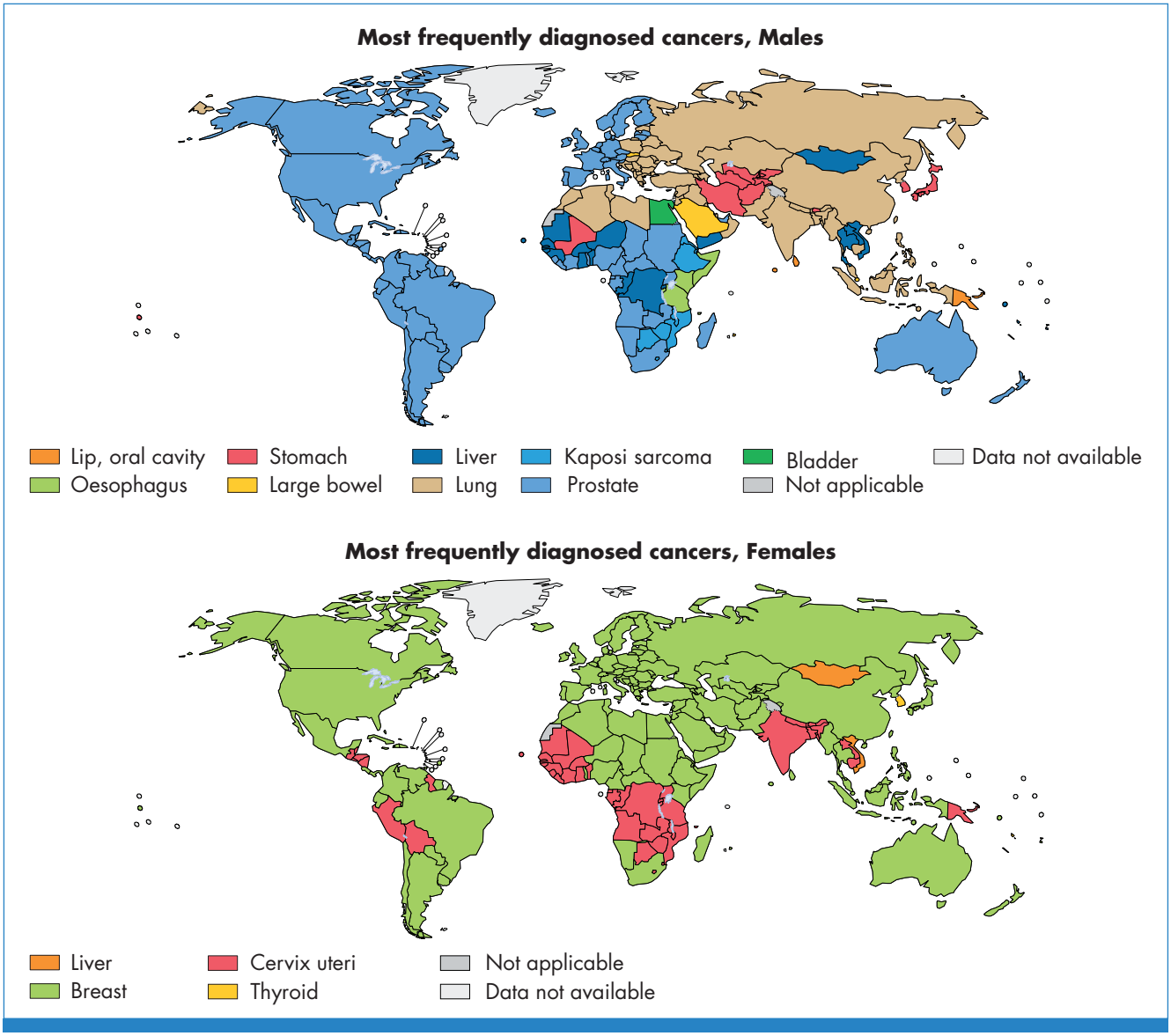
Cancer is predicted to be an increasingly important cause of morbidity and mortality in the next few decades, in all regions of the world. The challenges of tackling cancer are enormous and – when combined with population ageing – increases in cancer prevalence are inevitable, regardless of current or future actions or levels of investment. The forecasted changes in population demographics in the next two decades mean that even if current global cancer rates remain unchanged, the estimated incidence of 12.7 million new cancer cases in 2008 (5) will rise to 21.4 million by 2030, with nearly two thirds of all cancer diagnoses occurring in low- and middle-income countries (6).

Large variations in both cancer frequency and case fatality are observed, even in relation to the major forms of cancer, in different regions of the world. Figure 3 presents the most frequent types of cancer diagnosis (based on age-standardized rates) in each country, for men and women.

The geographical variation in cancer distribution and patterns is mirrored on examination of cancer morbidity and mortality data in relation to the World Bank income groups of countries (Figure 4). Within upper-middle-income and high-income countries, prostate and breast cancers are the

[3] The disability-adjusted life year (DALY) is a measure of overall disease burden, expressed as the number of potential productive years lost due to premature ill-health, disability or early death.

Figure 3. Most frequently diagnosed cancers worldwide, by country and sex, 2008



most commonly diagnosed in males and females respectively, with lung and colorectal cancers representing the next most common types in both sexes. These cancers also represent the most frequent types of cancer-related deaths in these countries although lung cancer is the most common cause of cancer death in both sexes. Within low-income countries, the absolute burden of cancer is much lower, and while lung and breast cancers remain among the most common diagnoses and types of cancer-related deaths, cancers of the cervix, stomach and liver are also among the leading types – all of which are cancers with infection-related etiology.

Middle-income countries are intermediate with respect to their patterns of cancer burden. Within the lower-middle-income countries, the three most common types of cancer are lung, stomach and liver cancers in males, and breast, cervix and lung cancer in females, i.e. a similar pattern to the low-income countries (although liver, colorectal and oesophageal cancers are also of importance). The lower-middle-income group contains some of the most populous countries in the world, including China and India, hence the absolute numbers of cancers and cancer-related deaths are notably high in this group.

Future planning of service provision is an integral part of cancer control programmes. Considering the projected growth in cancer morbidity, important differences can be observed in relation to World Bank income groups. The estimated percentage increase in cancer incidence by 2030 (compared with 2008) will be greater in low- (82%) and lower-middle-income countries (70%) compared with the upper-middle- (58%) and high-income countries (40%). Without any changes in underlying risk

Figure 4. Estimated annual number of new cases and deaths for the 10 most common cancers, by World Bank income groups and by sex, 2008

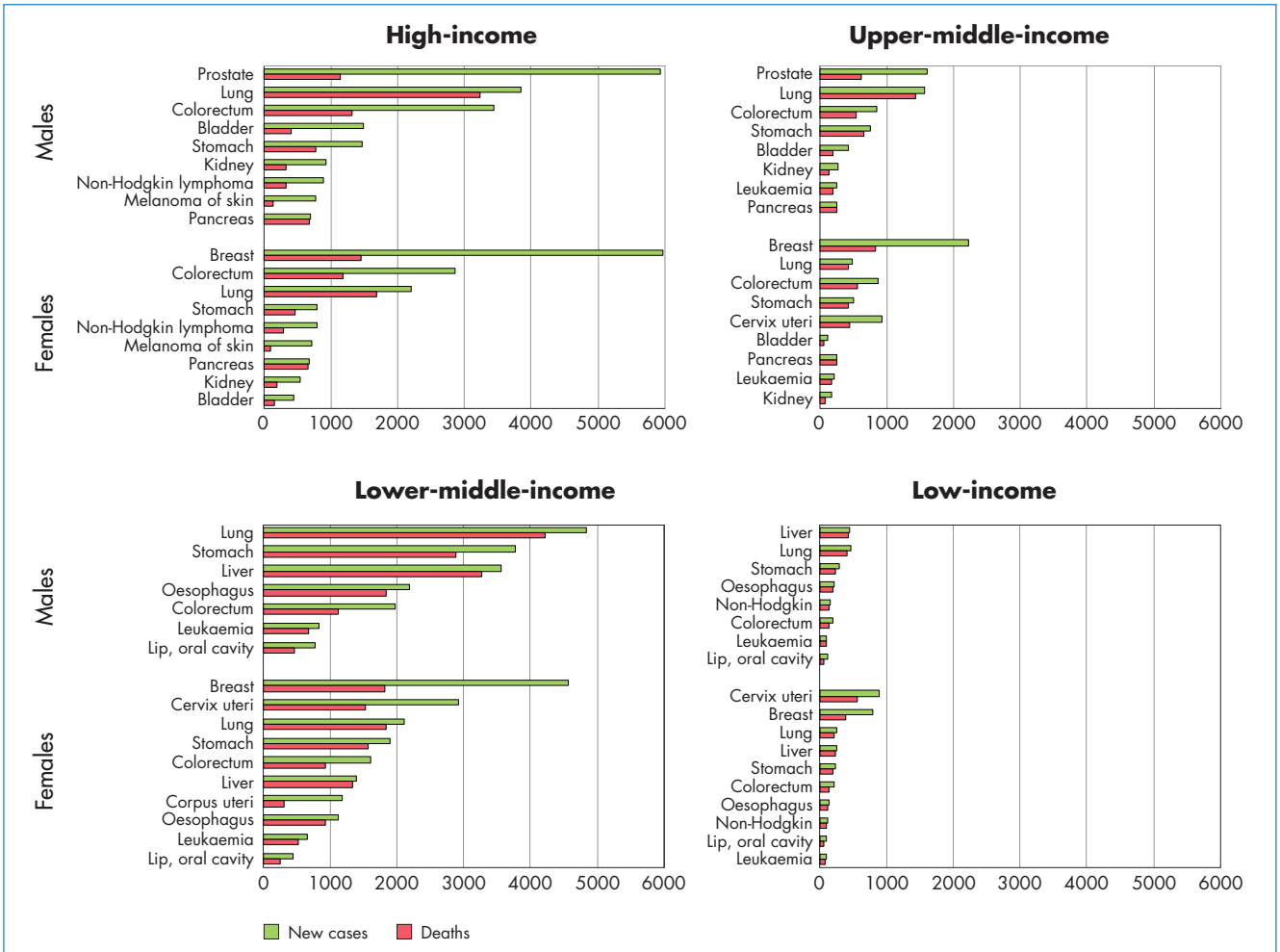


Figure 5. Estimated annual number of new cancer cases 2008 and predicted 2030, by World Bank income groups

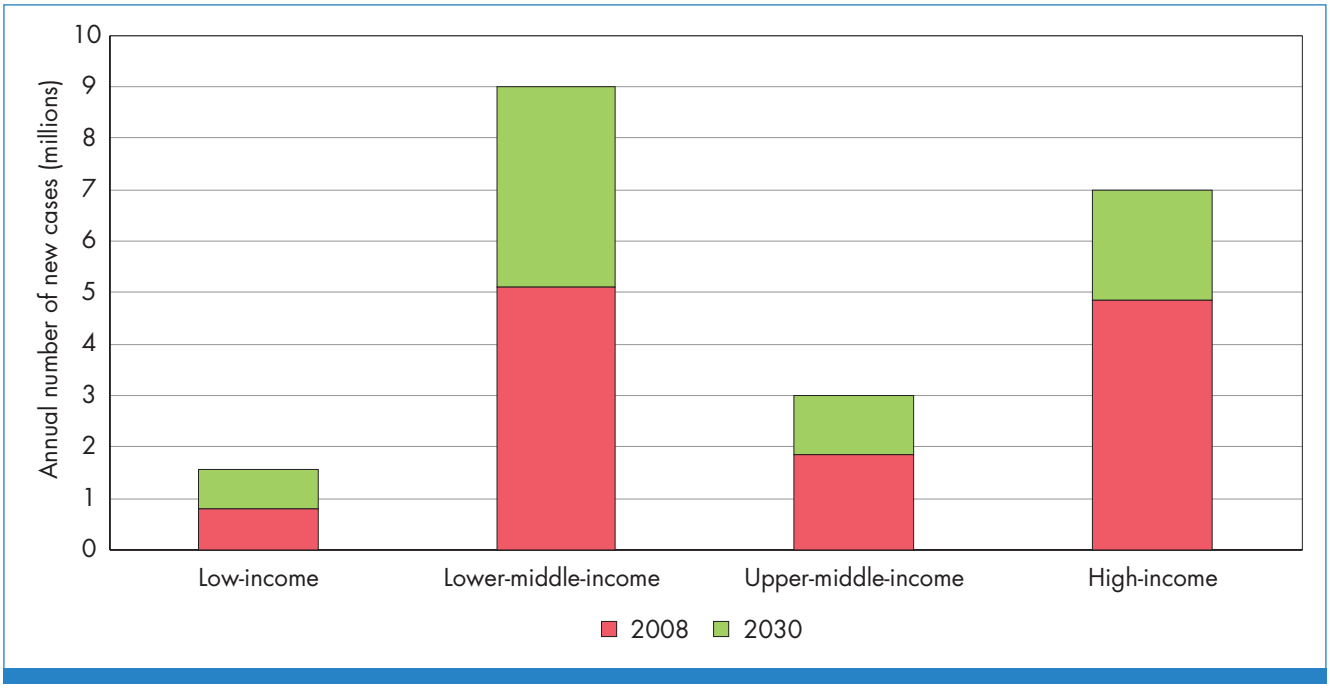
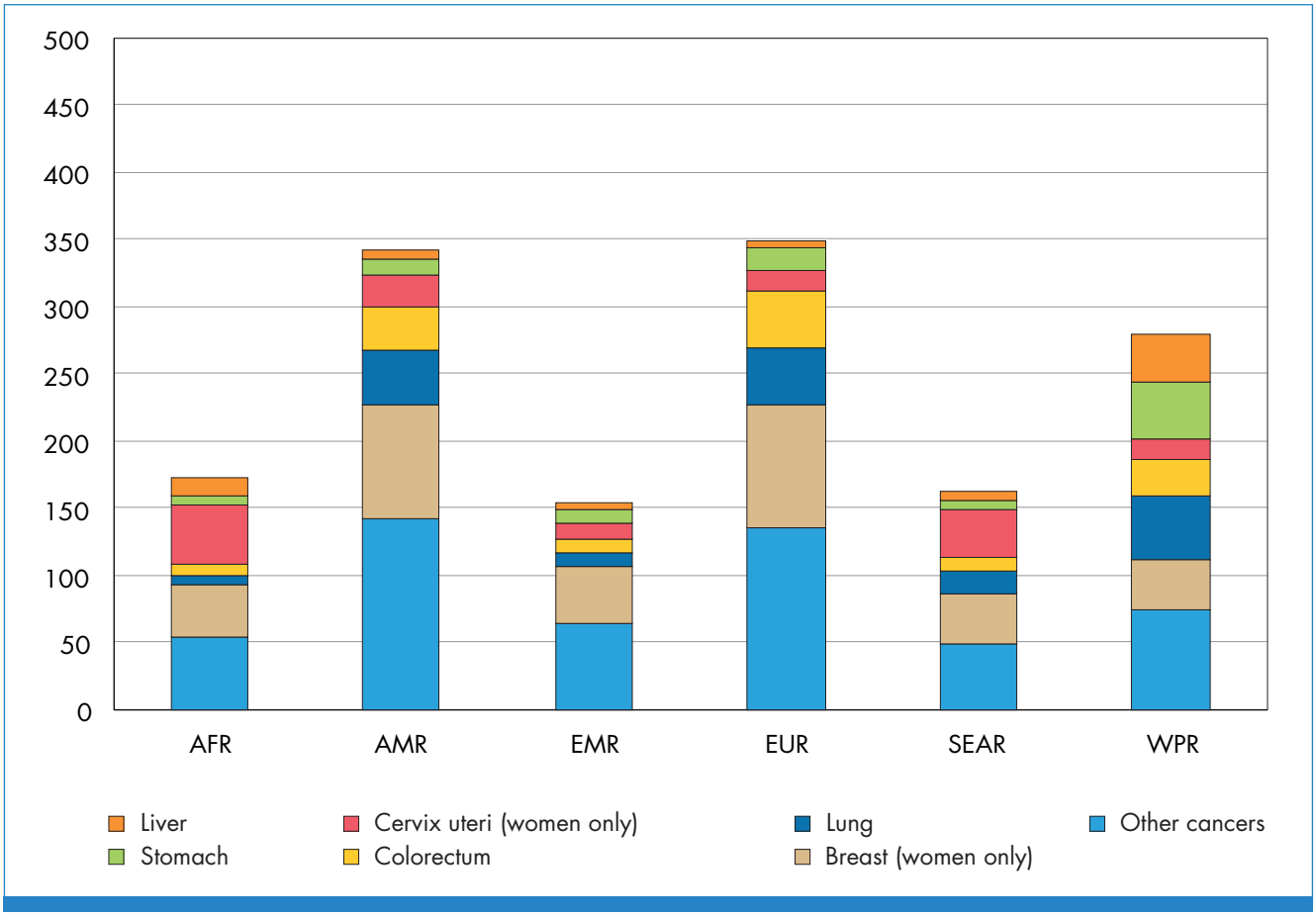


Figure 6. Age-standardized incidence of all cancers (excluding non-melanoma skin cancer), by type, per 100 000 population for both sexes, by WHO Region, 2008



factors (i.e. based only on anticipated demographic changes), between 10 and 11 million cancers will be diagnosed annually in 2030 in the low- and lower-middle-income countries (Figure 5).

The WHO Regions of Europe and the Americas had the highest incidence of all types of cancer combined for both sexes (Figure 6). Countries in the Eastern Mediterranean Region had the lowest incidence rates. Except in the African and South-East Asia Regions, men have higher overall rates for all types of cancer than women.

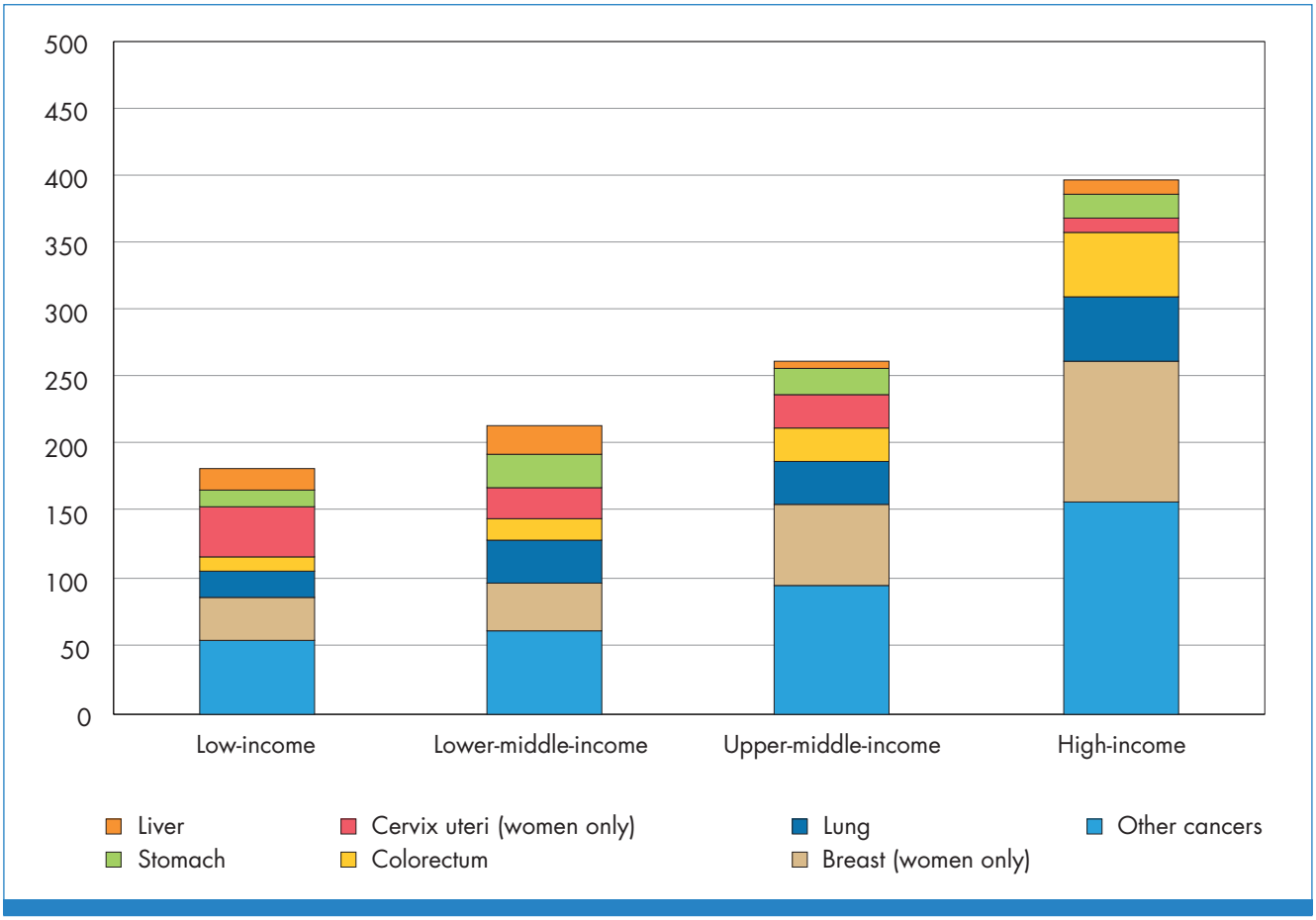
Lung cancer rates among both sexes (combined) were highest in the Western Pacific Region, followed by Europe and the Americas. They were lowest in the African Region.

Women in the African Region had the highest incidence of cancer of the cervix uteri, followed by those in the South-East Asia Region. Women in the Eastern Mediterranean Region had the lowest cervical cancer incidence. For breast cancer, women in the European Region had the highest rates followed by the Region of the Americas. These latter rates were more than double those of the other WHO regions.

Men in the Region of the Americas had the highest rates of prostate cancer, followed by the European Region. The lowest rate of prostate cancer was in the South-East Asia Region.

Among the WHO regions, the countries in the Western Pacific Region had by far the highest incidence of stomach cancer and liver cancer. The lowest incidence of stomach cancer was in the African Region. Men in the Western Pacific Region had five times the rate of liver cancer of men in all other regions, except for the African Region (where it remained more than double the rate). Women in the Western Pacific Region also had a considerably higher liver cancer incidence rate than women in other regions.

Figure 7. Age-standardized incidence rates of all cancer (excluding non-melanoma skin cancer), by type of cancer, per 100 000 population for both sexes, by World Bank income groups, 2008



The European Region had the highest incidence of colorectal cancer followed by the Region of the Americas, while the African Region had the lowest reported incidence.

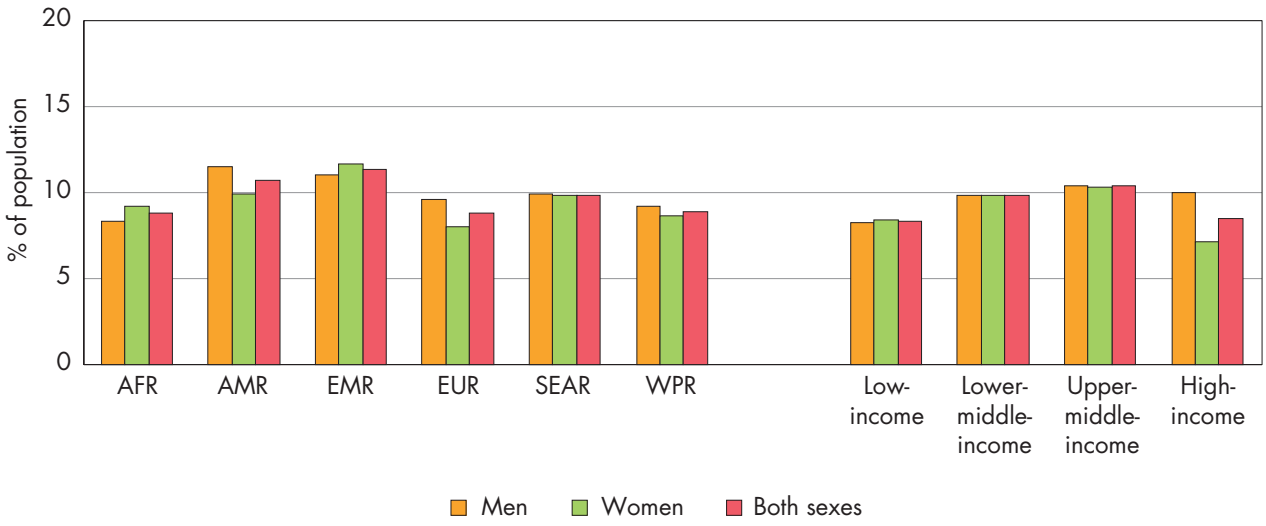
According to the World Bank income groups, the cancer rates for all cancers combined (excluding non-melanoma skin cancers) rose with increasing levels of country income (Figure 7). High-income countries had more than double the rate of all cancers combined of low-income countries. In all countries, other than those in the low-income category, men have considerably higher combined rates of all types of cancer than women. The exception of low-income countries is most likely explained by the high rates of cervical cancer among women in the African Region.

High-income countries had more than double the lung cancer incidence of low-income countries. High-income countries had approximately 10 times the rate of prostate cancer than lower-middle-income countries. For breast cancer, incidence rates rose rapidly in accordance with level of country income, with high-income countries demonstrating more than three times the rate of low-income countries. Similarly, colorectal cancer incidence also rose in parallel with the level of country income. Conversely, high-income countries had considerably lower cervical cancer incidence rates than low- and middle-income countries. Finally, low- and lower-middle income countries also had the highest rates of liver cancer.

Diabetes

Impaired glucose tolerance and impaired fasting glycaemia are risk categories for future development of diabetes and cardiovascular disease (7). In some age groups, people with diabetes have a two-fold increase in the risk of stroke (8). Diabetes is the leading cause of renal failure in many populations in both developed and developing countries. Lower limb amputations are at least 10 times more

Figure 8. Age-standardized prevalence of diabetes by WHO Region and World Bank income group, comparable country estimates, 2008



common in people with diabetes than in non-diabetic individuals in developed countries; more than half of all non-traumatic lower limb amputations are due to diabetes (9). Diabetes is one of the leading causes of visual impairment and blindness in developed countries (10). People with diabetes require at least two to three times the health-care resources compared to people who do not have diabetes, and diabetes care may account for up to 15% of national health care budgets (11). In addition, the risk of tuberculosis is three times higher among people with diabetes (12).

The apparent prevalence of hyperglycaemia depends on the diagnostic criteria used in epidemiological surveys.[4] The global prevalence of diabetes in 2008 was estimated to be 10%. The prevalence of diabetes was highest in the Eastern Mediterranean Region and the Region of the Americas (11% for both sexes) and lowest in the WHO European and Western Pacific Regions (9% for both sexes) (Figure 8). The magnitude of diabetes and other abnormalities of glucose tolerance are considerably higher than the above estimates if the categories of 'impaired fasting' and 'impaired glucose tolerance' are also included.

The estimated prevalence of diabetes was relatively consistent across the income groupings of countries. Low-income countries showed the lowest prevalence (8% for both sexes), and the upper-middle-income countries showed the highest (10% for both sexes).

Risk factors

Most NCDs are strongly associated and causally linked with four behaviours: tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol

As mentioned previously, common, preventable risk factors underlie most NCDs. Most NCDs are strongly associated and causally linked with four particular behaviours: tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol. These behaviours lead to four key metabolic/physiological changes: raised blood pressure, overweight/obesity, hyperglycemia and hyperlipidemia. In terms of attributable deaths, the leading NCD risk factor globally is raised blood pressure (to which 13% of global deaths are attributed), followed by tobacco use (9%), raised blood glucose (6%), physical inactivity (6%), and overweight and obesity (5%) (13).

This chapter discusses these two groupings of behavioural risk factors and consequent metabolic/physiological risk factors, in the order of their relative contribution to total global deaths. At the end of this section, additional modifiable risk factors with potentially substantial impact on the cancer burden are described.

[4] Diabetes is defined as having a fasting plasma glucose value ≥ 7.0 mmol/L (126 mg/dl) or being on medication for raised blood glucose.

Modifiable behavioural risk factors

Tobacco

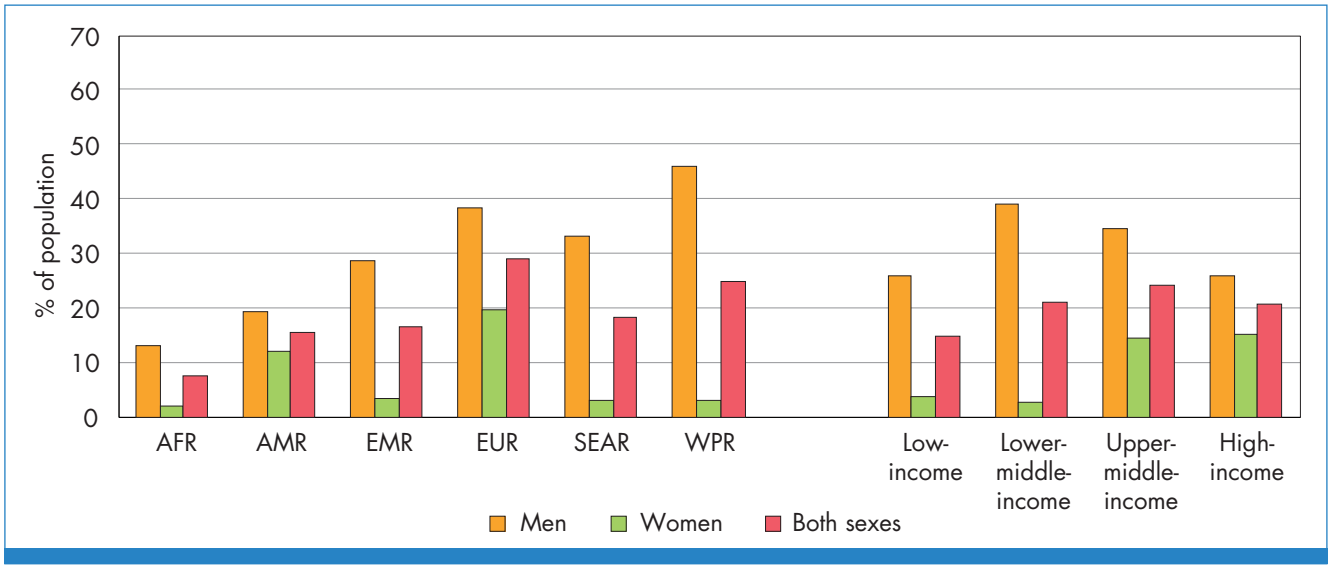
Tobacco use and exposure comes in both smokeless and smoking forms. Smokeless tobacco is consumed in un-burnt forms through chewing or sniffing and contains several carcinogenic, or cancer-causing, compounds. Smokeless tobacco has been associated with oral cancer, hypertension, heart disease and other conditions. Smoking tobacco, by far the most commonly used form globally, contains over 4000 chemicals, of which 50 are known to be carcinogenic.

There are currently about 1 billion smokers in the world. Manufactured cigarettes represent the major form of smoked tobacco. Current smokers are estimated to consume about 6 trillion cigarettes annually (14). In addition to cigarettes, other forms of tobacco are also consumed, particularly in Asia, Africa and the Middle East and to a lesser extent in Europe and the Americas. Data on these additional forms of smoked tobacco are not readily available, but are nonetheless substantial. In India alone, about 700 billion 'bidis' (a type of filter-less hand-rolled cigarette) are consumed annually.

If no serious action is taken, annual tobacco-related deaths are projected to increase to 8 million by 2030, accounting for 10% of all deaths

Risks to health from tobacco use result not only from direct consumption of tobacco but also from exposure to second-hand smoke (15). Almost 6 million people die from tobacco use and exposure each year, accounting for 6% of all female and 12% of all male deaths in the world (13). Of these deaths, just over 600 000 are attributable to second-hand smoke exposure among non-smokers (16) and more than 5 million to direct tobacco use (both smoking and smokeless) (13, 16). By 2020, annual tobacco-related deaths are projected to increase to 7.5 million (17), accounting for 10% of all deaths in that year. Smoking is estimated to cause about 71% of all lung cancer deaths, 42% of chronic respiratory disease and nearly 10% of cardiovascular disease. Smoking is also an important risk factor for communicable diseases such as tuberculosis and lower respiratory infections (18).

Figure 9. Age-standardized prevalence of daily tobacco smoking in adults aged 15+ years, by WHO Region and World Bank income group, comparable country estimates, 2008



The prevalence of daily tobacco smoking varied widely among the six WHO regions in 2008 (Figure 9). The highest overall prevalence for smoking is estimated at nearly 29% in the European Region, while the lowest is the African Region (8%). The highest prevalence of smoking among men was in the Western Pacific Region (46%) and among women in the European Region (20%). In all regions, men smoked more than women, with the largest disparities for daily cigarette smoking being in the Western Pacific Region, where men smoked 15 times more than women, followed by the South-East Asia Region where men smoked 10 times more than women. The smallest disparity between men and women was in the Region of the Americas, where men smoke about 1.5 times more than women.

Among men, the highest prevalence of smoking was in lower-middle-income countries. Smoking then declines as country income rises. Among women, relatively high rates (around 15%) are reported in upper-middle and high-income countries, and about five times lower (between 2% and 4%) in low- and lower-middle-income countries.

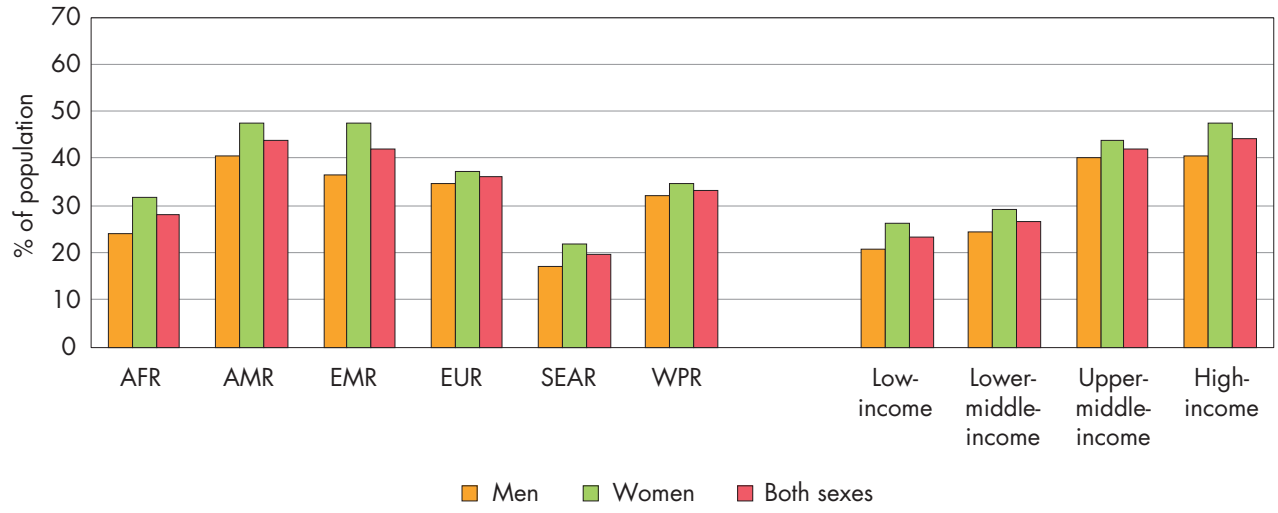
Insufficient physical activity

Approximately 3.2 million deaths each year are attributable to insufficient physical activity

Insufficient physical activity is the fourth leading risk factor for mortality (13). Approximately 3.2 million deaths and 32.1 million DALYs (representing about 2.1% of global DALYs) each year are attributable to insufficient physical activity (13).[5] People who are insufficiently physically active have a 20–30% increased risk of all-cause mortality compared to those who engage in at least 30 minutes of moderate intensity physical activity on most days of the week (19).

Participation in 150 minutes of moderate physical activity each week (or equivalent) is estimated to reduce the risk of ischaemic heart disease by approximately 30%, the risk of diabetes by 27%, and the risk of breast and colon cancer by 21–25% (13, 19). Additionally, physical activity lowers the risk of stroke, hypertension and depression. It is a key determinant of energy expenditure and thus fundamental to energy balance and weight control (19).

Figure 10. Age standardized percentages of insufficient physical activity by WHO Region and World Bank income group, men and women, comparable country estimates, 2008



Globally, 31% of adults aged 15 years or older were insufficiently active (men 28% and women 34%) in 2008. Prevalence of insufficient physical activity was highest in the WHO Region of the Americas and the Eastern Mediterranean Region. In both of these regions, almost 50% of women were insufficiently active, while the prevalence for men was 40% in the Americas and 36% in Eastern Mediterranean. The South-East Asia Region showed the lowest percentages (15% for men and 19% for women).

In all WHO regions, men were more active than women, with the biggest difference in prevalence between the two sexes in the Eastern Mediterranean Region. This was also the case in nearly every individual country (Figure 10).

The prevalence of insufficient physical activity rose according to the level of country income. High-income countries had more than double the prevalence compared to low-income countries

[5] Insufficient physical activity is defined as less than five times 30 minutes of moderate activity per week, or less than three times 20 minutes of vigorous activity per week, or equivalent.

for both men and women, with 41% of men and 48% of women being insufficiently physically active in high-income countries as compared to 18% of men and 21% of women in low-income countries. Nearly every second woman in high-income countries was insufficiently physically active (Figure 10). These data may be explained by increased work and transport-related physical activity for both men and women in the low -and lower-middle-income countries. The increased automation of work and other aspects of life in higher-income countries is a likely determinant of insufficient physical activity.

Harmful use of alcohol

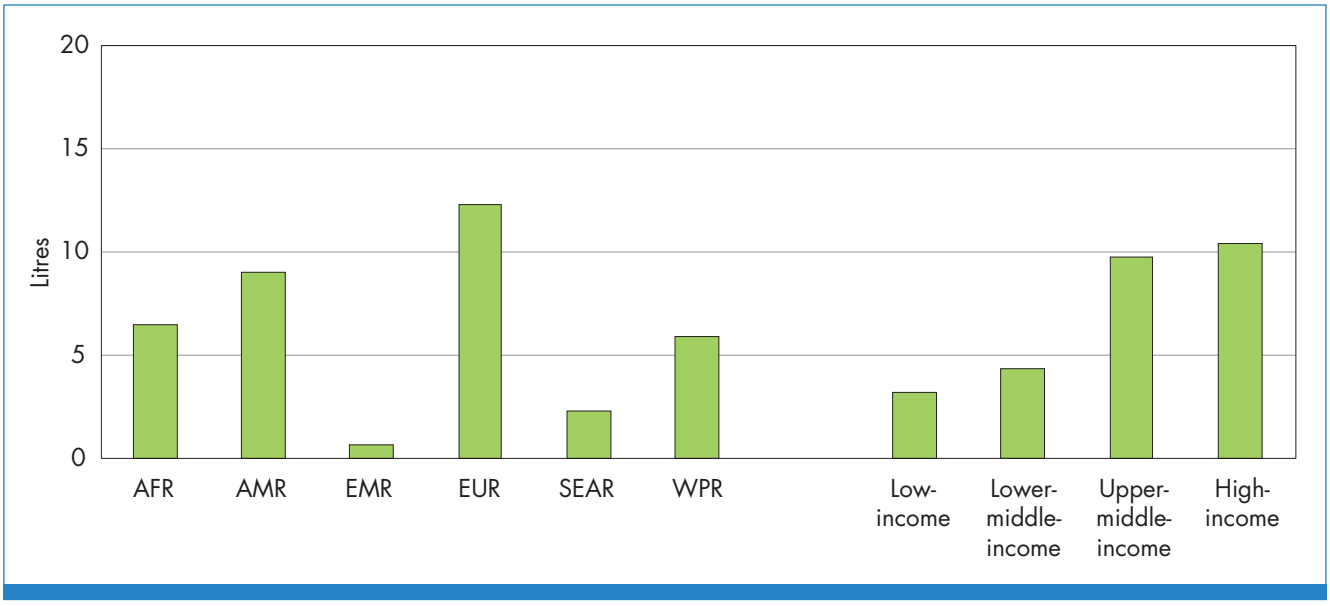
The harmful use of alcohol is a major risk factor for premature deaths and disabilities in the world (13). Hazardous and harmful drinking was responsible for 2.3 million deaths worldwide in 2004 (2). That amounts to 3.8% of all deaths in the world. More than half of these deaths occurred as a result of NCDs, including cancers, cardiovascular disease and liver cirrhosis. An estimated 4.5% of the global burden of disease – as measured in DALYs – is caused by harmful use of alcohol. Cancers, cardiovascular disease and liver cirrhosis are responsible for a quarter of this burden.

There is a direct relationship between higher levels of alcohol consumption and rising risk of some cancers, liver diseases and cardiovascular diseases. The relationship between alcohol consumption and ischaemic heart and cerebrovascular diseases is complex. It depends on both the amount and the pattern of alcohol consumption.

Some epidemiological data, generated mainly in high-income countries, suggest that low-risk patterns of alcohol consumption may have a beneficial effect on selected disease outcomes and in some segments of populations (20–23), but these effects tend to disappear if the patterns of drinking are characterized by heavy episodic drinking (24, 25).

Although alcohol consumption is deeply embedded in the cultures of many societies, an estimated 45% of the global adult population has never consumed alcoholic beverages in their lives. An estimated 55% of women never consumed alcohol (26).

Figure 11. Total adult (15+ years of age) per capita consumption of pure alcohol (litres) for both sexes, by WHO Region and World Bank income group, projected estimates, 2008



There is a high level of variation in alcohol consumption around the world (Figure 11). On average, global adult per capita consumption was estimated at 6.0 litres of pure alcohol in 2008. Adult per capita consumption was highest in the European Region (12.2 litres) and lowest in the Eastern Mediterranean Region (0.6 litres).

In general, abstention rates are lower and per capita consumption is higher in the countries with higher income. The adult per capita consumption in upper-middle- and high-income countries (around 10 litres) was more than double the level of low- and lower-middle-income countries (around 3 to 4 litres).

Unhealthy diet

Aligning varying sources and types of data to generate overall estimations of unhealthy diet prevalence is not possible. For that reason, estimates of specific elements of unhealthy diets are presented separately in this section. The World Cancer Research Fund has estimated that 27–39% of the main cancers can be prevented by improving diet, physical activity and body composition (27).

Approximately 16 million (1.0%) DALYs and 1.7 million (2.8%) of deaths worldwide are attributable to low fruit and vegetable consumption (13, 28). Adequate consumption of fruit and vegetables reduces the risk for cardiovascular diseases, stomach cancer and colorectal cancer (29, 30). There is convincing evidence that the consumption of high levels of high-energy foods, such as processed foods that are high in fats and sugars, promotes obesity compared to low-energy foods such as fruits and vegetables (28).

The amount of dietary salt consumed is an important determinant of blood pressure levels and overall cardiovascular risk (31).

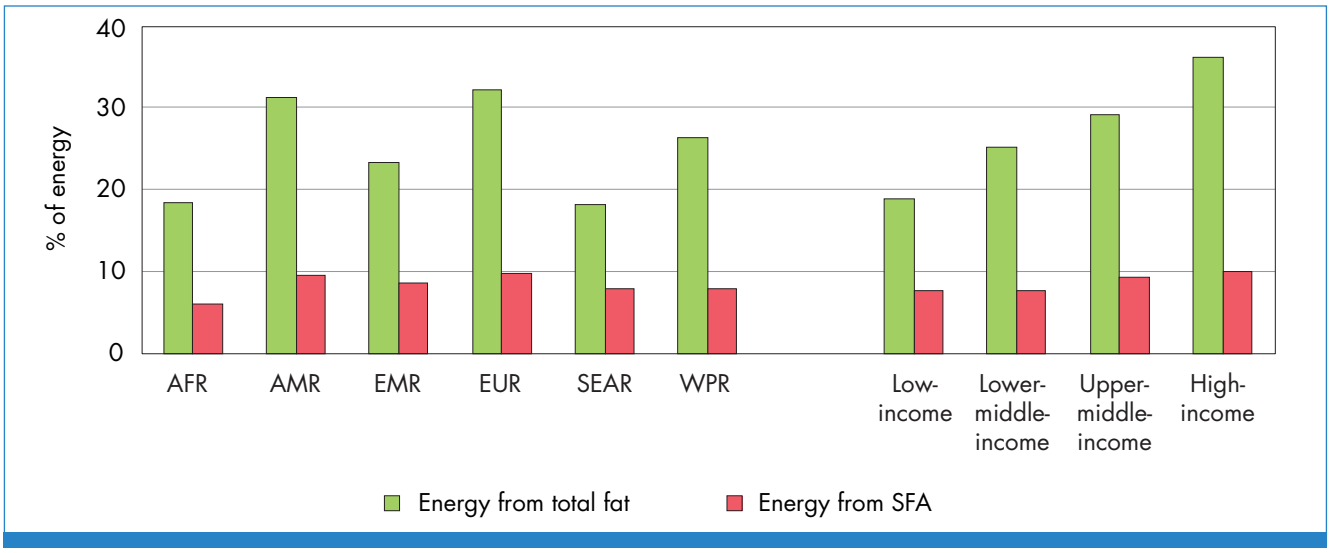
A population salt intake of less than 5 grams per person per day is recommended by WHO for the prevention of cardiovascular disease (32). However, data from various countries indicate that most populations are consuming much more salt than this (33).

It is estimated that decreasing dietary salt intake from the current global levels of 9–12 grams per day – to the recommended level of 5 grams per day – would have a major impact on reducing blood pressure and cardiovascular disease (34).

There is convincing evidence that saturated fat and trans-fat increase the risk of coronary heart disease and that replacement with monosaturated and polyunsaturated fat reduces the risk (35). There is also evidence that the risk of type 2 diabetes is directly associated with consumption of saturated fat and trans-fat and inversely associated with polyunsaturated fat from vegetable sources (36, 37).

In the absence of comparable data on individual dietary intakes around the world, the availability of food for human consumption derived from national *Food balance sheets* (38) has been used. However, these may not accurately reflect actual consumption and should be treated as indicative only.

Figure 12. Availability of total fat and saturated fatty acids (SFA) (as % dietary energy supply) for 2005–7, by WHO Region and World Bank income group[6]



[6] Source: Food and Agriculture Organization (FAO) *Food Balance Sheets*.

There were large variations across regions of the world in the amount of total fats available for human consumption (Figure 12). The lowest quantities available were recorded in the South-East Asia Region, and the highest availability in the European Region. For saturated fatty acids (SFA), the lowest rates were in the African Region, and the highest was in the European Region and the Region of the Americas, with very high values observed in some of the Pacific Islands. Energy from SFA usually accounts for a third of the energy from total fat, with the notable exception of the South-East Asia Region, where SFAs account for over 40% of total fat intake.

The availability of total fat increases with country income level, while the availability of saturated fats clusters around the value of 8% in low- and lower-middle-income countries and 10% in upper-middle-income and in high-income countries.

Figure 13. Percent of available energy from fat (1961–2007), by World Bank income group, 2008[7]

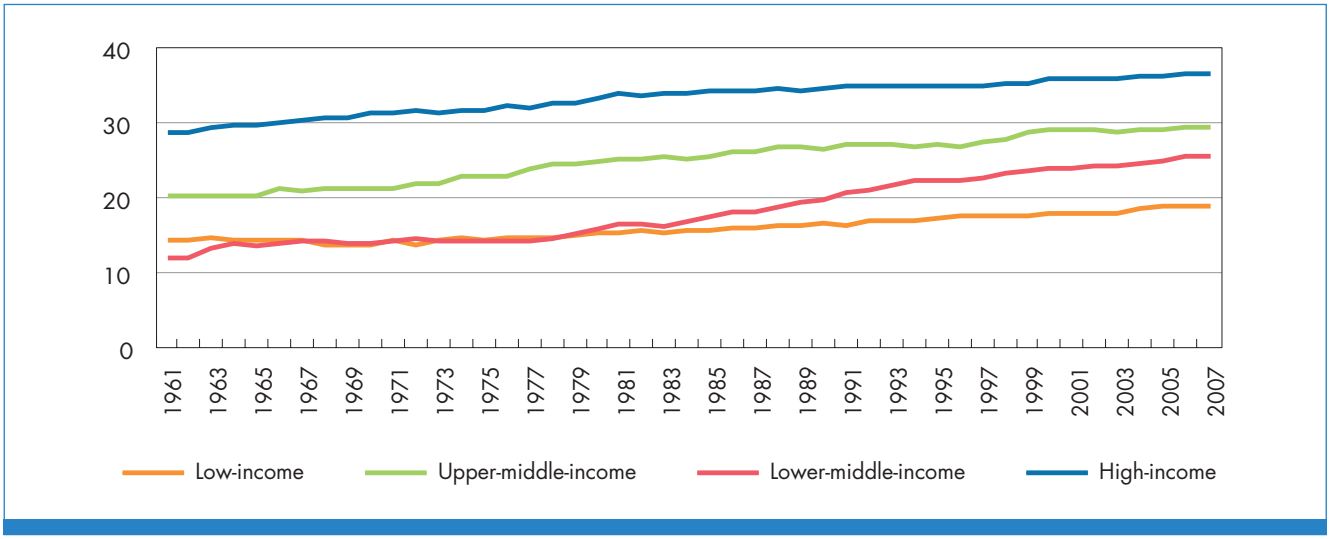


Figure 13 shows the trend in the availability of fat in the last four decades by World Bank income groups. Increase has been steady and particularly rapid since the 1980s in lower-middle-income countries.

In relation to cancer, dietary contaminants – as well as dietary constituents – are a significant problem in some regions. One example is widespread naturally-occurring aflatoxins, which contaminate cereals and nuts and cause liver cancer when eaten (39). Aflatoxin was estimated to have a causative role in 5–28% of all hepatocellular cancers (40). The association of nasopharyngeal cancer with consumption of Chinese-style salted-fish is another example (41).

Metabolic/physiological risk factors

Raised blood pressure

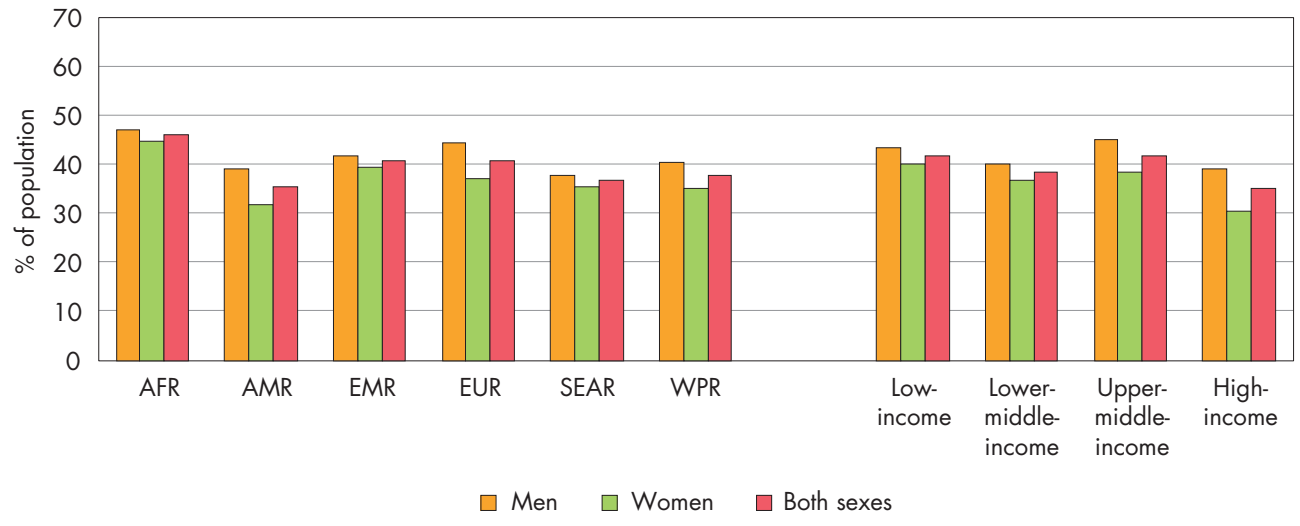
Worldwide, raised blood pressure[8] is estimated to cause 7.5 million deaths, about 12.8% of the total of all annual deaths (13). This accounts for 57 million DALYs or 3.7% of total DALYs. Raised blood pressure is a major risk factor for coronary heart disease and ischaemic as well as haemorrhagic stroke (27). Blood pressure levels have been shown to be positively and progressively related to the risk for stroke and coronary heart disease (42). In some age groups, the risk of cardiovascular disease doubles for each incremental increase of 20/10 mmHg of blood pressure, starting as low as

[7] Source: Food and Agriculture Organization of the United Nations (FAO) *Food balance sheets*.

[8] Raised blood pressure is defined as systolic blood pressure of ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg, or using medication to lower blood pressure.

115/75 mmHg (43). In addition to coronary heart diseases and stroke, complications of raised blood pressure include heart failure, peripheral vascular disease, renal impairment, retinal haemorrhage and visual impairment (44). Treating systolic blood pressure and diastolic blood pressure so they are below 140/90 mmHg is associated with a reduction in cardiovascular complications (33).

Figure 14. Age-standardized prevalence of raised blood pressure in adults aged 25+ years by WHO Region and World Bank income group, comparable estimates, 2008



Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008 (Figure 14). The proportion of the world's population with high blood pressure, or uncontrolled hypertension, fell modestly between 1980 and 2008. However, because of population growth and ageing, the number of people with hypertension rose from 600 million in 1980 to nearly 1 billion in 2008 (45).

The prevalence of raised blood pressure was highest in the African Region, where it was 46% for both sexes combined. The lowest prevalence of raised blood pressure was in the WHO Region of the Americas, with 35% for both sexes. Men in this region had a slightly higher prevalence than women (39% and 32% respectively). In all WHO regions, men have slightly higher prevalence of raised blood pressure than women, but this difference was only statistically significant in the Region of the Americas and the European Region.

Across the income groups of countries, the prevalence of raised blood pressure was consistently high, with low-, lower-middle- and upper-middle-income countries all having rates of around 40% for both sexes. The prevalence in high-income countries was lower, at 35% for both sexes.

Overweight and obesity

Worldwide, 2.8 million people die each year as a result of being overweight[9] (including obesity[10]) and an estimated 35.8 million (2.3%) of global DALYs are caused by overweight or obesity (13). Overweight and obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. Risks of coronary heart disease, ischaemic stroke and type 2 diabetes mellitus increase steadily with increasing body mass index (BMI), a measure of weight relative to height

[9] Overweight is defined as BMI ≥ 25 kg/m^2.

[10] Obesity is defined as body mass index BMI ≥30 kg/m^2.

(46). Raised BMI also increases the risk of cancer of the breast, colon/rectum, endometrium, kidney, oesophagus (adenocarcinoma) and pancreas (27, 46). Mortality rates increase with increasing degrees of overweight, as measured by BMI. To achieve optimal health, the median BMI for adult populations should be in the range of 21 to 23 kg/m^2, while the goal for individuals should be to maintain a BMI in the range 18.5 to 24.9 kg/m^2. There is increased risk of co-morbidities for BMIs in the range of 25.0 to 29.9 kg/m^2, and moderate to severe risk of co-morbidities for a BMI greater than 30 kg/m^2 (47).

Figure 15. Age-standardized prevalence of overweight in adults aged 20+ years by WHO Region and World Bank income group, comparable country estimates, 2008

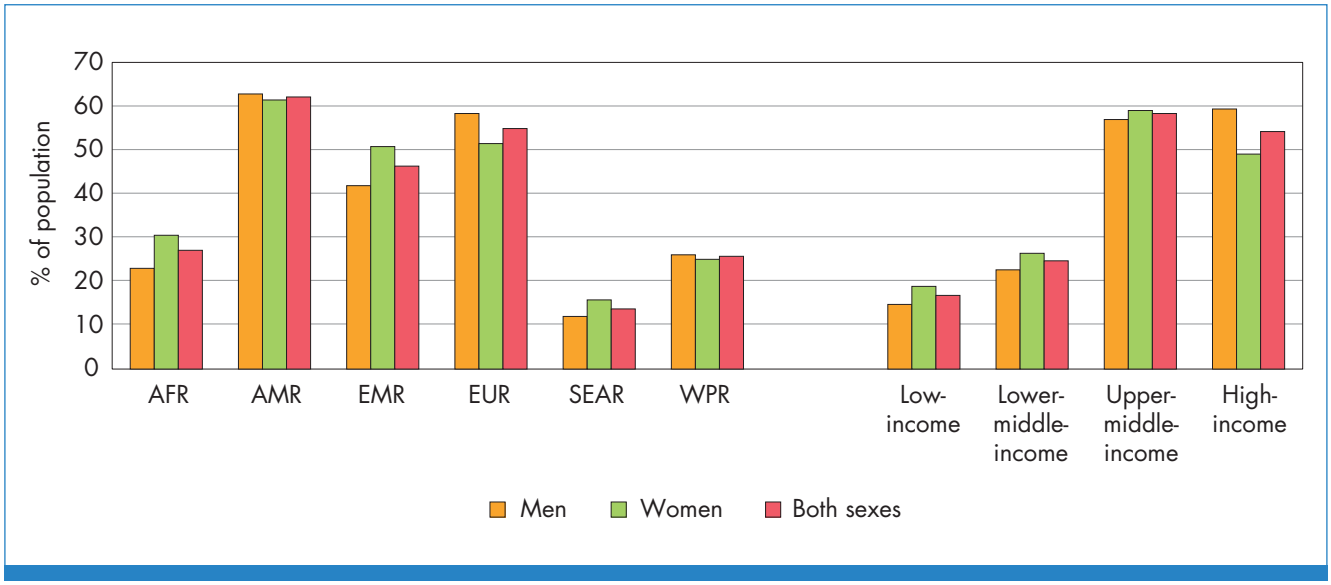
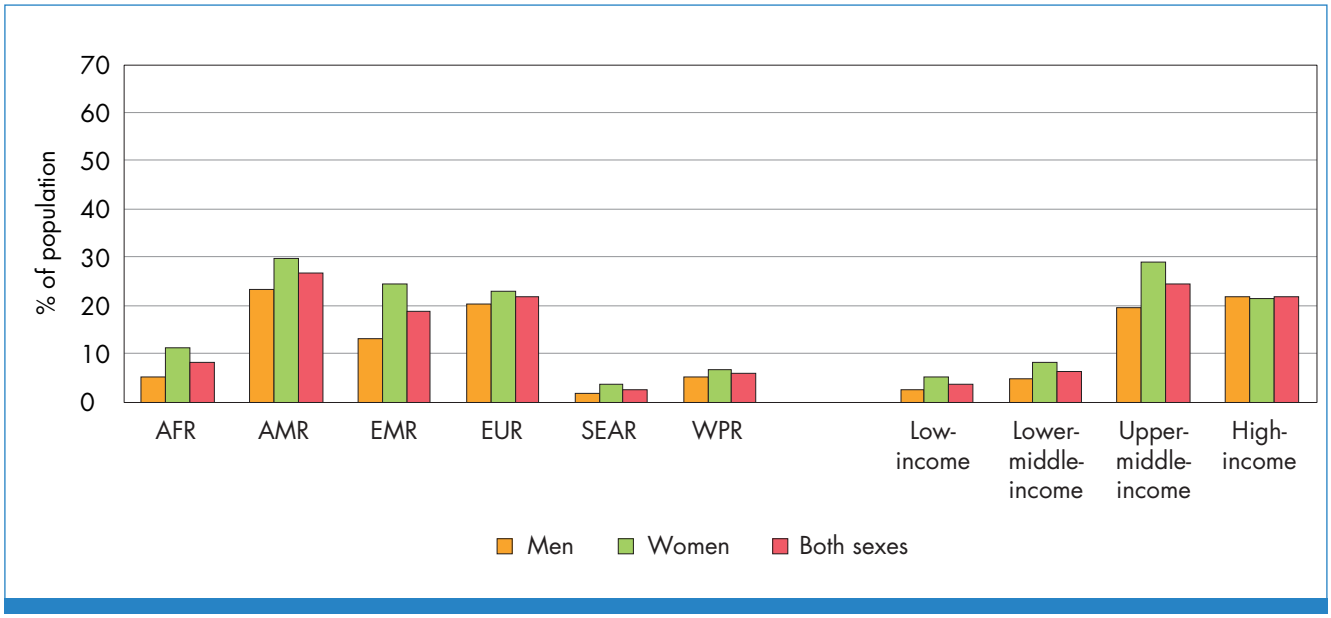


Figure 16. Age-standardized prevalence of obesity in adults aged 20+ years of age by WHO Region and World Bank income group, comparable country estimates, 2008



In 2008, 35% of adults aged 20 years and older were overweight (BMI ≥ 25 kg/m^2) (34% men and 35% of women). The worldwide prevalence of obesity has nearly doubled between 1980 and 2008. In 2008, 10% of men and 14% of women in the world were obese (BMI ≥30 kg/m^2), compared with

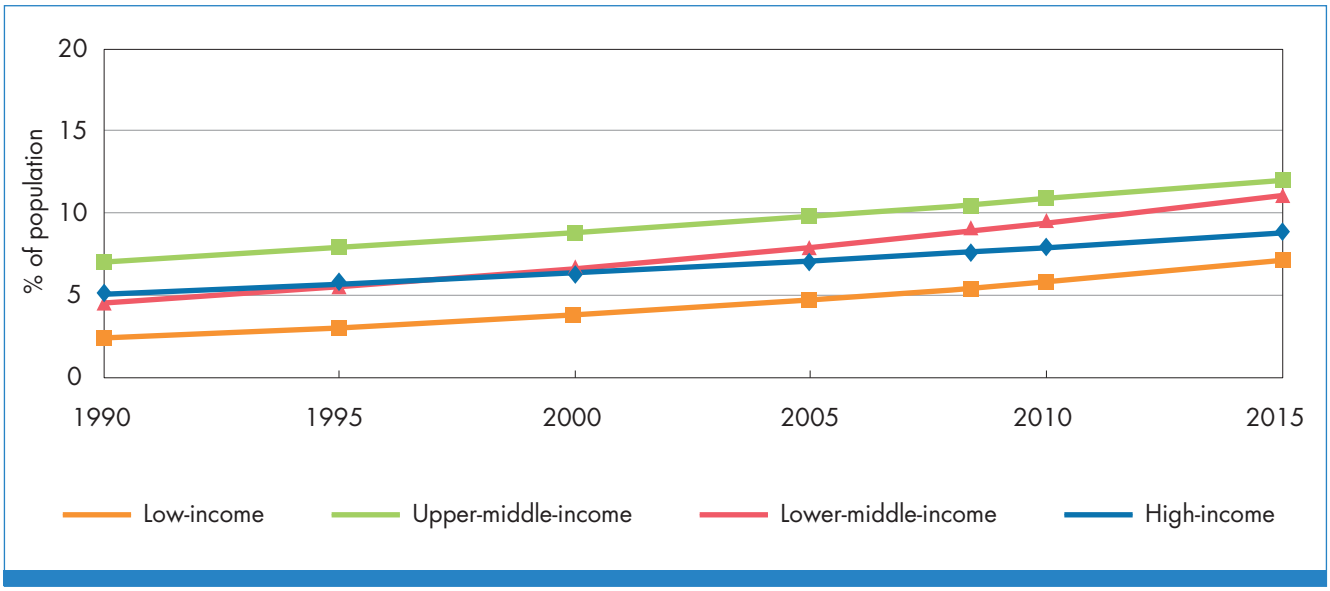
5% for men and 8% for women in 1980. An estimated 205 million men and 297 million women over the age of 20 were obese in 2008 – a total of more than half a billion adults worldwide (48).

The prevalence of overweight and obesity were highest in the WHO Region of the Americas (62% for overweight in both sexes, and 26% for obesity) and lowest in the WHO Region for South-East Asia (14% overweight in both sexes and 3% for obesity) (Figures 15 and 16). In the WHO European Region, the Eastern Mediterranean and the Region for the Americas, over 50% of women were overweight. For all three regions, roughly half of overweight women are obese (23% of women in Europe, 24% in the Eastern Mediterranean, 29% in the Americas). In all WHO regions, women were more likely to be obese than men. In the African, South-East Asian and Eastern Mediterranean Regions, women had roughly double the obesity prevalence of men.

The prevalence of raised BMI increases with income level of countries, up to upper-middle-income levels. The prevalence of overweight in high-income and upper-middle-income countries was more than double that of low- and lower-middle-income countries. For obesity, the difference more than triples from 7% obesity in both sexes in lower-middle-income countries to 24% in upper-middle-income countries. Women's obesity was significantly higher than men's, with the exception of high-income countries where it was of similar prevalence. In low- and lower-middle-income countries, obesity among women was approximately double that among men.

The prevalence of obesity varies across socioeconomic groups within individual countries. In high-income countries, an inverse relationship has been identified between socioeconomic status and obesity in women for several decades (49). More recent research conducted in the European Union (50), and specifically in the Netherlands (51), Spain (52), Sweden (53) and the United Kingdom (54), have shown an inverse relationship between education and either BMI or obesity among both men and women. In medium- and low-income countries a positive relationship between socioeconomic status and obesity in men, women and children has instead been observed.

Figure 17. Infant and young child overweight trends from 1990 to 2015, by World Bank income group



The fastest rise in overweight among infants and young children is in lower-middle-income countries

Estimates for overweight among infants and young children globally for 2008 indicate that there were 40 million (or 6%) preschool children with a weight-for-height above more than two standard deviations of the WHO child growth standards median.

The highest prevalence of overweight among infants and young children was found in the upper-middle-income group, while the fastest rise in overweight was in the lower-middle-income group (Figure 17). Low-income countries had the lowest rate but overweight rose over time among all country income groups. Rising income is associated with rising rates of overweight among infants and young children. In high-income countries, such as the United Kingdom and the United States, lower socioeconomic status is associated with a higher prevalence of obesity (55, 56).

Raised cholesterol

Raised cholesterol levels[11] increase the risks of heart disease and stroke (57). Globally, a third of ischaemic heart disease is attributable to high cholesterol. Overall, raised cholesterol is estimated to cause 2.6 million deaths (4.5% of total) and 29.7 million DALYs, or 2.0% of total DALYs (13). Raised total cholesterol is a major cause of disease burden in both the developed and developing world as a risk factor for ischaemic heart disease and stroke (36). For example, a 10% reduction in serum cholesterol in men aged 40 has been reported to result in a 50% reduction in heart disease within five years; the same serum cholesterol reduction for men aged 70 years can result in an average 20% reduction in heart disease occurrence in the next five years (58).

Figure 18. Age-standardized prevalence of raised total cholesterol by WHO Region and World Bank income group, comparable country estimates, 2008

In 2008, the global prevalence of raised total cholesterol among adults was 39% (37% for males and 40% for females). Globally, mean total cholesterol changed little between 1980 and 2008, falling by less than 0.1 mmol/L per decade in men and women (59). The prevalence of elevated total cholesterol was highest in the WHO European Region (54% for both sexes), followed by the WHO Region of the Americas (48% for both sexes). The WHO African Region and the WHO South-East Asia Region showed the lowest percentages (23% and 30% respectively).

The prevalence of raised total cholesterol increased noticeably according to the income level of the country (Figure 18). In low-income countries, around a quarter of adults had raised total cholesterol, in lower-middle-income countries this rose to around a third of the population for both sexes. In high-income countries, over 50% of adults had raised total cholesterol; more than double the level of the low-income countries.

Additional modifiable risk factors for cancer

The shared NCD risk factors mentioned above are highly relevant to the prevention of cancer of the lung and a number of other cancer sites (tobacco smoking), and both breast and colorectal cancer (unhealthy diet, overweight and physical inactivity).

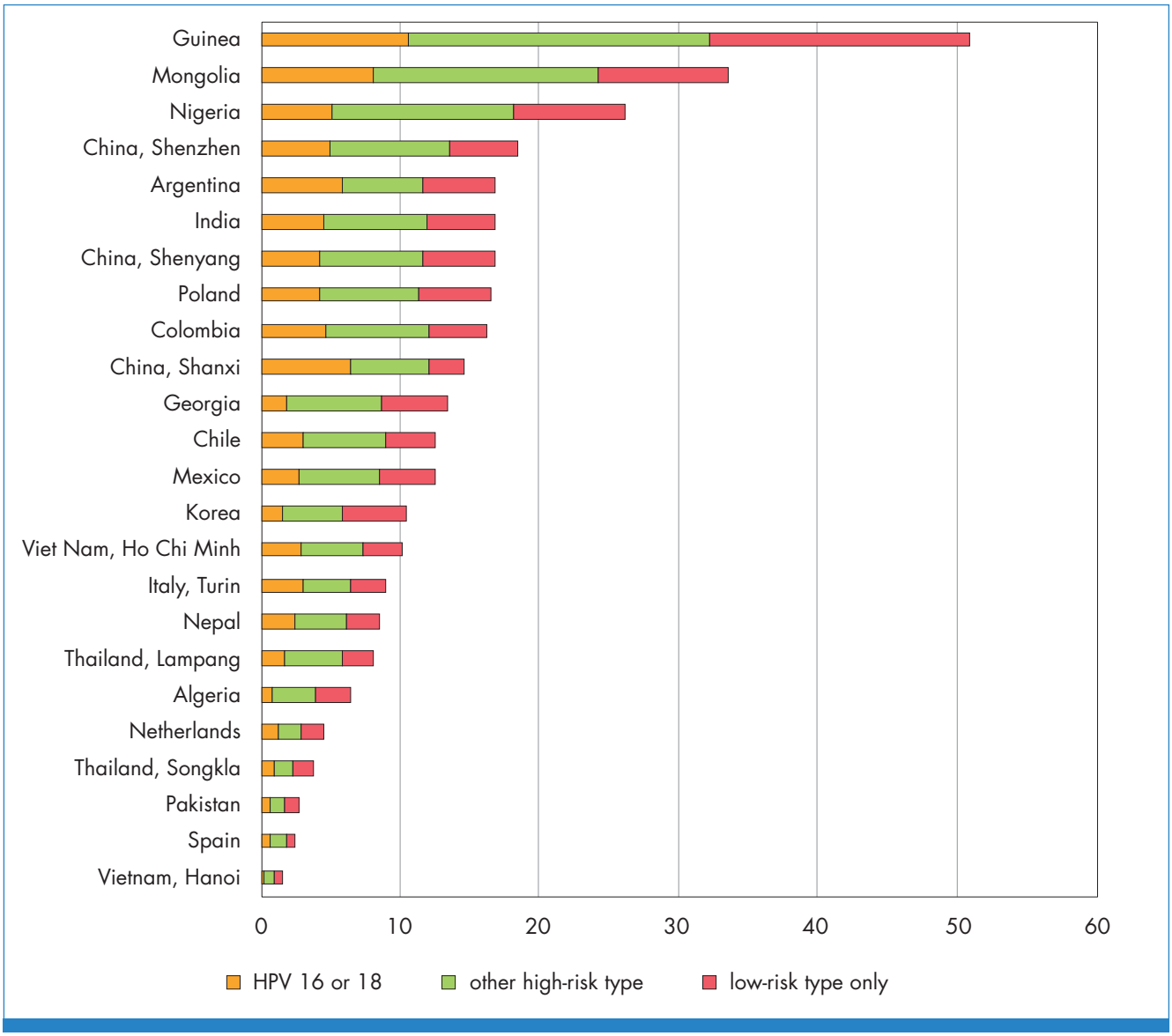
Among the four cancer sites that show more elevated incidence and mortality in low- and lower-middle rather than high-income countries (cervix, liver, stomach and oesophagus), all except cancer of the oesophagus are predominantly caused by chronic infections (60). Conservative estimates have

[11] Raised cholesterol was defined, in these estimates, as 5.0 mmol/L or 190 mg/dl or higher.

shown that about 2 million cancer cases per year (18% of the global cancer burden) are attributable to a few specific chronic infections (4). This fraction is substantially larger in low-income countries (26%) than in high-income countries (8%), making the prevention or eradication of these infections a priority to overcome inequalities in cancer incidence between poor and rich populations. The principal infectious agents, each responsible for approximately 5% of cancers worldwide, are HPV (100% of cancer of the cervix, the majority of cancers of anogenital tract in each sex, and between 20% and 60% of cancer of the oro-pharynx depending upon the population); Hepatitis B virus (HBV) and Hepatitis C virus (HCV) (responsible for 50% and 85% of primary liver cancers in high- and low-income countries, respectively); and *Helicobacter pylori* (that causes at least 80% of noncardia carcinomas of the stomach) (4, 61-63).

The prevalence of cervical infection with high-risk HPV types, for instance, varies substantially in different populations in a way that closely resembles the geographical distribution of corresponding cancer incidence. The prevalence of cervical HPV infection in women, for instance, varies by over tenfold according to International Agency for Research on Cancer (IARC) population-based HPV surveys: from less than 3% to more than 25% in some settings (64) (Figure 19). An even more extreme variation is seen for HCV infection. The transmission of HCV has been largely stopped in high-income countries, where major epidemics had taken place in the last decades (e.g. Italy and Japan) but not in many low-resource countries (e.g., Egypt, Mongolia and Pakistan), where it is still mainly sustained by unsafe transfusions and use or sharing of contaminated needles.

Figure 19. Prevalence of cervical HPV in sexually active women, 15-59 years, (1995-2009)



A wide range of environmental causes of cancer, encompassing environmental contaminants or pollutants, occupationally-related exposures and radiation, together make a significant contribution to cancer burden (65) and are often modifiable at low cost.

Notable examples of environmental causes of cancer are asbestos, benzene, indoor and outdoor air pollution and contaminants such as arsenic. Ionizing radiation increases the risk for several cancer types (66, 67). Diagnostic X-rays were estimated to contribute between 0.5—3% to the overall cancer burden in high-income countries (68). Risk related to radon is high in miners, and residential radon has been estimated to cause 2% of cancer deaths in Europe (69). Protection against solar radiation and UV tanning devices are effective cancer prevention strategies in populations of people with light-coloured skin.

Approximately 50 occupational agents and work-related exposure circumstances are carcinogenic to humans (65). In the United Kingdom, for example, an overall 5% of cancers were estimated to be attributable to occupation (70), but this is likely to be higher in countries with less stringent standards of worker protection, less attention to industrial hygiene or with child labour.

Conclusion

NCDs are the leading causes of death globally. They are strongly influenced by four main behavioural risk factors: tobacco use, insufficient physical activity, harmful use of alcohol, and unhealthy diet, which lead to: elevated blood pressure, raised blood glucose and cholesterol levels, and excess body weight.

Age-specific death rates due to NCDs are generally higher in countries with low-income levels. Almost half of deaths caused by NCDs in low- and middle-income countries occur under the age of 70, and almost 30% below the age of 60, with potentially serious consequences for productivity and socioeconomic development.

Cancer is a particularly complex disease with a distribution of cancer sites that varies geographically in relation to the prevalence and level of different risk factors. A number of additional etiological agents are important and more common in low-income countries, particularly certain chronic infections, together with environmental and occupational exposures.

The prevalence of risk factors varies between the country income groups, with the patterns of variation differing between the various risk factors and among men and women. High-, middle- and low-income countries face differing risk profiles.

Raised blood pressure has a notably higher prevalence in low-income countries.

Some key risk factors are high or becoming more prevalent in middle-income countries. These include tobacco use among men, where the highest prevalence is among the lower-middle-income countries of the Western Pacific Region and European Region. The prevalence of both overweight and obesity among adults is highest in upper-middle-income countries. While physical inactivity is highest in high-income countries, in middle-income countries the rates of inactivity are rising among women and have already reached high-income country levels among men.

Several risk factors have the highest prevalence in high-income countries. These include: adult per capita alcohol consumption; physical inactivity among women; total fat consumption and raised total cholesterol.

The number of deaths from NCDs is projected to increase substantially in the coming decades. There are, however, a number of reasons for some cautious optimism. Countries of Western Europe, North America and some parts of Latin America are making significant progress in reducing cardiovascular disease deaths. In general, smoking prevalence and blood pressure in these countries are declining. Further progress in reducing tobacco use, salt and fat intake, and harmful use of alcohol, as well as increasing physical activity, can greatly reduce or attenuate the occurrence of NCDs.

Key Messages

- Noncommunicable diseases are the biggest global killers today.
- Sixty-three percent of all deaths in 2008 – 36 million people – were caused by NCDs.
- Nearly 80% of these deaths occurred in low- and middle-income countries, where the highest proportion of deaths under the age of 70 from NCDs occur.
- The prevalence of NCDs, and the resulting number of related deaths, are expected to increase substantially in the future, particularly in low- and middle-income countries, due to population growth and ageing, in conjunction with economic transition and resulting changes in behavioural, occupational and environmental risk factors.
- NCDs already disproportionately affect low- and middle-income countries. Current projections indicate that by 2020 the largest increases in NCD mortality will occur in Africa and other low- and middle-income countries.

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Chapter 2
NCDs and development

Noncommunicable diseases have potentially serious socioeconomic consequences, through increasing individual and household impoverishment and hindering social and economic development. This chapter examines the relationship between NCDs and socioeconomic conditions. It demonstrates that the distribution and impact of NCDs and their risk factors is highly inequitable and imposes a disproportionately large burden on low- and middle-income countries. Poverty is closely linked with NCDs, and the rapid rise in the magnitude of these health problems is therefore predicted to impede poverty reduction initiatives in low-income countries and communities. Finally, the chapter argues that scaling up global efforts to prevent and control NCDs will help accelerate the achievement of the United Nations Millennium Development Goals (MDGs).

Poverty is closely linked with NCDs, and the rapid rise in NCDs is predicted to impede poverty reduction initiatives in low-income countries

Once thought of as diseases of the rich, NCDs are now the leading causes of death in low- and middle-income countries. As mentioned previously, nearly 30% of NCD-related deaths in low-income countries occur under the age of 60, whereas in high-income countries the proportion is only 13%. Without targeted and sustained interventions, these health inequities are likely to widen, causing even greater individual, social and economic consequences. NCDs are fundamentally a development and socioeconomic issue, striking both rich and poor people, but inflicting more ill-health and other consequences on the poor in all countries.

Equity, social determinants and NCDs

Structural determinants and the conditions of daily life constitute the social determinants of health and are crucial to explaining and addressing health inequities. As with other priority health issues, prevailing social and economic conditions influence people's exposure and vulnerability to NCDs, as well as related health-care outcomes and consequences (1).

The rapidly growing burden of NCDs in developing countries is not only accelerated by population ageing; it is also driven by the negative effects of globalization, for example, unfair trade and irresponsible marketing, rapid and unplanned urbanization and increasingly sedentary lives. People in developing countries eat foods with higher levels of total energy. Increasing NCD levels are being influenced by many factors including tobacco use and availability, cost and marketing of foods high in salt, fat and sugar. A considerable proportion of global marketing targets children and adolescents as well as women in developing countries to promote tobacco smoking and consumption of 'junk' food and alcohol. Rapid, unplanned urbanization also changes people's way of living through more exposure to the shared risk factors. NCDs are exacerbated in urban areas by changes in diet and physical activity, exposure to air pollutants (including tobacco smoke) and harmful use of alcohol. Overwhelmed by the speed of growth, many governments are not keeping pace with ever-expanding needs for infrastructure and services and people are less likely to be protected by interventions like smoke-free laws, regulations to phase out trans-fats, protections against harmful use of alcohol, and urban planning to promote physical activity.

As a consequence, vulnerable and socially disadvantaged people get sicker and die sooner than people of higher social positions; the factors determining social positions include education, occupation, income, gender and ethnicity (2).

Vulnerable and socially disadvantaged people get sicker and die sooner than people of higher social positions

There is strong evidence on the links between poverty and lower life expectancy, and on the associations between a host of social determinants, especially education, and prevalent levels of NCDs: people of lower social and economic positions fare far worse in countries at all levels of development.

In Singapore, for example, the prevalence of physical inactivity, daily smoking and regular alcohol consumption was found to be consistently highest among men and women with the least education (3). In the United States, an additional four years of schooling was associated with a decreased risk of heart disease and diabetes (4). In Australia, blue-collar workers have significantly higher levels of cancer and in Spain, female blue-collar workers had a higher incidence of metabolic

syndrome compared to other female white-collar personnel (5, 6). Diabetes is more prevalent among immigrants in Australia and the Netherlands (7, 8), while immigrants in Canada also have higher mortality rates of ischaemic heart disease (9). In Finland, consumption of saturated fat increased with decreasing individual income (10).

Similarly, in low- and middle-income countries, an increasing number of studies show associations between NCDs and certain social determinants, particularly education and income levels.

In China, lower education levels and urban residency are strongly associated with an increased risk of diabetes (11). The findings of a recent study in India also revealed that tobacco use, hypertension and physical inactivity were significantly more prevalent in lower education groups (12). In Viet Nam, cardiovascular mortality rates decreased among educated people compared to those without formal education, as is the case with harmful use of alcohol in Nepal (13, 14). In South Africa, higher mortality from NCDs was found among the urban poor (15). Poor people are more likely to smoke in Bangladesh and India (16, 17). People in poor communities in South Africa are at greater risk of being exposed to a number of NCD risk factors, including second-hand smoke, excessive alcohol use and indoor air pollution, as well as suffering from asthma (18). In Brazil, obesity is higher among women with lower level of income (19).

Evidence now shows that the poor may begin life with increased vulnerability to NCDs and are then exposed to additional risks throughout life. Under-nutrition in utero and low birth weight, particularly prevalent among low-income populations, increases the subsequent risk of cardiovascular disease and diabetes. There is evidence that childhood socioeconomic status is associated with type 2 diabetes and obesity in later life (20). As a consequence, the poor are more likely to die prematurely from NCDs. The WHO Commission on Social Determinants of Health made an aspirational call for closing the health gap in a generation (2). To ensure that the call is fulfilled, focused research, coherent policies and multisectoral partnerships for action are required to expand the evidence base and implement interventions that show evidence of effectiveness in combating NCDs and their risk factors.

Economic impact of NCDs on households

In addition to the close links between poverty and NCD risk, the economic consequences of NCDs are also of critical importance. In a World Bank qualitative survey of 60 000 poor women and men in 60 countries, sickness and injury was the most frequent trigger for downward mobility (21).

At the household level, unhealthy behaviours, poor physical status, and the high cost of NCD-related health care, lead to loss of household income. People often become trapped in a dangerous cycle where poverty and NCDs continually reinforce one another.

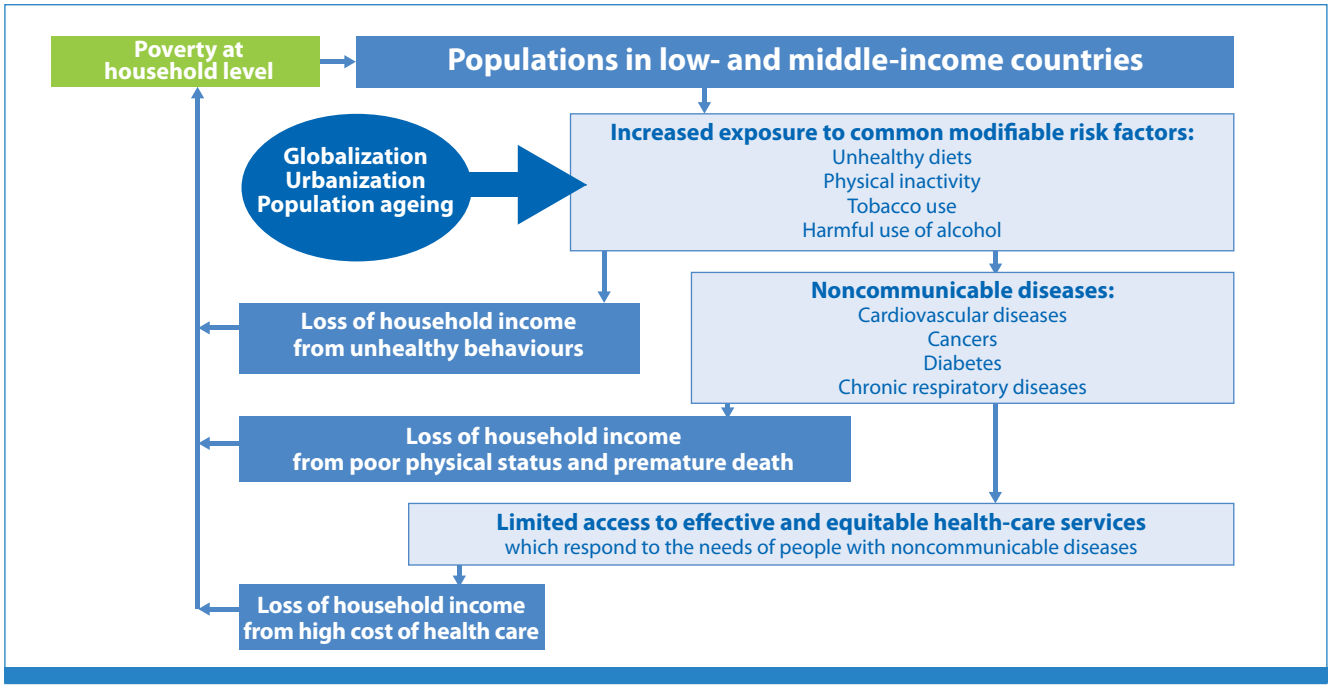
While measuring the economic impacts of NCDs remains a relatively complex and under-developed discipline, they invariably affect low- and middle-income countries and households more severely because they have the least financial cushion to withstand the economic consequences of NCDs.

About 150 million people each year suffer financial catastrophe and around 100 million are pushed under the poverty line because of payments for health care. More than 90% of these people live in low-income countries

The World Health Report 2010 (22) states that each year, 100 million people are pushed into poverty because they have to pay directly for health services; in some countries, this may represent 5% of the population forced into poverty each year. Financial hardship is not restricted to low- and middle-income countries: almost 4 million people in six OECD countries (Greece, Hungary, Mexico, Poland, Portugal and the Republic of Korea) reported forms of financial hardship caused by paying for health care. The report indicates that direct out-of-pocket payments still represent more than 50% of total health expenditures in a large number of low- and middle-income countries.

In low-resource settings, treatment for cardiovascular disease, cancer, diabetes or chronic lung disease can quickly drain household resources, driving families into impoverishment. NCDs exacerbate social inequity because most payments for health care in low- and middle-income countries are private and out-of-pocket; such costs weigh more heavily on those least able to afford them, increasing the risk of impoverishment.

Figure 1. Poverty contributes to NCDs and NCDs contribute to poverty



If those who become sick or die are the main income earners, NCDs can force a drastic cut in spending on food and education, the liquidation of family assets and a loss of care and investment in children. Where males are the primary income earners, widowhood or the burden of caring for a permanently disabled partner are routes to poverty. The high rate of disability due to NCDs is a particular burden on women and children. This may result in children losing opportunities for schooling, women losing the main sustenance for their families, and families losing their stability.

In some countries, the lowest income households have the highest levels of NCD risk factors, with negative consequences on household income. Data from Nepal indicate that the poor spent 10% of their income on cigarettes (23). In India, the risk of distress borrowing and distress selling of assets was notably higher for hospitalized patients who are smokers (24). Alcohol is often a significant part of family expenditure: Romanians spent an average of 11% of family income on alcohol in 1991 and Zimbabwean households averaged 7% (25). However, national averages conceal the impact on families of drinkers: families with frequent-drinking husbands in New Delhi spent 24% of family income on alcohol, compared to 2% in other families (25). Surveys among the urban poor in Sri Lanka found that 30% of families used alcohol and spent more than 30% of their income on it (25).

NCDs and their risk factors often prevent people from working or seeking employment, thus robbing families of income. A recent analysis by the World Economic Forum estimated that countries such as Brazil, China, India and the Russian Federation currently lose more than 20 million productive life years annually to NCDs (26). On average, 10 days are lost per employee per year due to NCDs and injuries in the Russian Federation (27). Annual income loss from NCDs, arising from days spent ill and in care-giving efforts, amounted to US$ 23 billion (0.7% GDP) in India in 2004. In the Province of Taiwan, China, the probability of being in the labour force was reduced by 27% by cardiovascular disease and 19% by diabetes (28). Studies in China showed that tobacco use increased the odds of sick leave by between 32% and 56% (29, 30).

Financial catastrophe due to health problems can occur in countries of all levels of development. Yet the problem is most severe in low- and middle-income countries (31, 32).

Studies from India show that the contribution to poverty of high out-of-pocket expenditure for health care and NCDs is significant (33, 34). An estimated 1.4 million to 2 million Indians experienced catastrophic spending in 2004 and 600 000 to 800 000 people were impoverished by the costs of caring for cardiovascular disease and cancer (34). The findings of another study also reveal that one of every four families living in the world's poorest countries borrows money or sells assets to pay for health care (35).

The chronic nature of NCDs, and the projected increase in prevalence, means that the economic impact may grow cumulatively over many years. Using cross-sectional panel data from the Russian Federation Living Standards Measurement Study (1997–2004), NCDs were found to be associated with higher levels of long-term household health-care expenditure in the Russian Federation, especially in poorer households (36).

The costs of NCD treatments place a considerable burden on household income. A review of medicine prices in two multi-country studies showed that in the public sector, it cost on average from two to eight days' wages to purchase one month's supply of at least one cardiovascular medicine (37) and one day's wage to purchase one month's supply of at least one anti-diabetic medicine (38). One month of combination treatment for coronary heart disease costs 18.4 days' wages in Malawi, 6.1 days' wages in Nepal, 5.4 in Pakistan and 5.1 in Brazil. The cost of one month of combination treatment for asthma ranged from 1.3 days' wages in Bangladesh to 9.2 days' wages in Malawi (39). In India, paying for diabetes care can cost low-income households about one third of their incomes (40). In the United Republic of Tanzania, household costs for diabetes treatment were found to be 25% of the minimum wage (41).

Economic impact of NCDs on health systems and national incomes

National health-care budgets are being increasingly allocated to treatment of cardiovascular disease, cancer, diabetes and chronic respiratory disease. Costs for treating diabetes ranged from 1.8% of gross domestic product in Venezuela to 5.9% in Barbados (42). For the Latin America and Caribbean region, diabetes health-care costs were estimated at US$ 65 billion annually, or between 2% and 4% of gross domestic product (GDP) (43) and 8% to 15.0% of national health-care budgets (44).

Oman is a high-income country and its per capita expenditure on health is lower than that of neighbouring Gulf states; but the sustainability of its health-care services has become a concern due to a 64% increase in health-care expenditure from 1995 to 2005. Treatment of cardiovascular disease alone will account for 21% of the total health-care expenditure in Oman in 2025 (45).

At the national level, threats and impacts of NCDs also include large-scale loss of productivity as a result of absenteeism and inability to work, and ultimately a decrease in national income. In 2010, the World Economic Forum placed NCDs among the most important and severe threats to economic development, alongside the current financial crisis, natural disasters and pandemic influenza (46).

Estimated losses in national income from heart disease, stroke and diabetes in 2005 were US$ 18 billion in China, US$ 11 billion in the Russian Federation, US$ 9 billion in India and US$ 3 billion in Brazil (47). One macroeconomic analysis demonstrated that each 10% rise in NCDs is associated with 0.5% lower rate of annual economic growth (48). According to this estimate, the expected 50% rise in NCDs predicted in Latin America by 2030 would correspond to about a 2.5% loss in economic growth rates. An Institute of Medicine study in the United States in 2010 found that NCDs cost developing countries between 0.02% and 6.77% of GDP (49). This economic burden is greater than that caused by malaria in the 1960s or AIDS in the 1990s, both of which were considered major economic threats.

From 2005 to 2015, China and India are projected to lose International $ (I$)[12] 558 billion (0.93% of the GDP) and I$ 237 billion (1.5% of the GDP) respectively as a result of heart disease, strokes and diabetes. Significant losses are also estimated for other countries (48–50).

By 2025, the total direct and indirect costs from overweight and obesity alone among Chinese adults are projected to exceed 9% of China's gross national product (51).

[12] An international dollar is a hypothetical currency that is used as a means of translating and comparing costs from one country to another using a common reference point, the US dollar. An international dollar has the same purchasing power as the US dollar has in the United States.

Impact on Millennium Development Goals

Despite considerable progress, the health- and development-related MDGs are falling short of targets set in many countries. We now know that managing NCDs is of central importance to progress towards these goals.

Preventing NCDs is important for eliminating poverty and hunger because these diseases have a negative impact on productivity and family income and also because a substantial proportion of household income is spent on health care in low-income countries. NCDs' negative impact on national economies also means fewer jobs and therefore fewer people escaping poverty. It is also important for achieving MDG 2 (universal primary education), since costs for NCD health care, medicines, tobacco and alcohol consumption displace household resources that otherwise might be available for education. This problem is particularly acute in very poor families, which have the most to gain from education of their children.

There are also strong links with MDGs 4 and 5 (maternal and child health): the rising prevalence of high blood pressure and gestational diabetes is increasing the adverse outcomes of pregnancy and maternal health (52). Mothers who smoke are likely to breastfeed for shorter periods of time and have lower quantities of milk and milk that is less nutritious (53). Exposure to second-hand tobacco smoke increases the risks of childhood respiratory infections, sudden infant death and asthma (54).

The increasing NCD burden also threatens the possibility to effectively control tuberculosis. In an analysis of the 22 countries with a high burden of tuberculosis, which account for 80% of the global burden, HIV infection was estimated to be associated with 16% of adult tuberculosis cases, diabetes was associated with 10%, smoking with 21% and harmful alcohol use 13% (55). Smoking is already implicated in over 50% of tuberculosis deaths in India (56).

MDG Target 8e aspires to provide access to affordable essential drugs in developing countries. However, international efforts to provide access to essential drugs are limited largely to AIDS, tuberculosis and malaria (57). In a time when most ill-health and deaths are caused by NCDs, it is irrational that major development goals should be assessed in terms of communicable diseases alone.

Conclusions

The NCD epidemic exacts a massive socioeconomic toll throughout the world. It is rising rapidly in lower-income countries and among the poor in middle- and high-income countries. Each year, NCDs are estimated to cause more than 9 million deaths before the age of 60 years with concomitant negative impacts on productivity and development. The increasing burden of NCDs also imposes severe economic consequences that range from impoverishment of families to high health system costs and the weakening of country economies. The NCD epidemic is thwarting poverty reduction efforts and robbing societies of funds that could otherwise be devoted to social and economic development.

If common development goals are to be achieved, they must do more than raise incomes and consumption; they must free as many people as possible from disease and disability, and reduce the widening gap between the haves and have nots.

Key messages

- The NCD epidemic has a serious negative impact on human development in human, social and economic realms. NCDs reduce productivity and contribute to poverty.
- NCDs create a significant burden on health systems and a growing economic burden on country economies.
- NCDs impede progress towards the MDGs; they must be tackled if the global development agenda is to be realized

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Chapter 3

Monitoring NCDs and their risk factors: a framework for surveillance

Noncommunicable disease surveillance is the ongoing systematic collection and analysis of data to provide appropriate information regarding a country's NCD disease burden, the population groups at risk, estimates of NCD mortality, morbidity, risk factors and determinants, coupled with the ability to track health outcomes and risk factor trends over time. Surveillance is critical to providing the information needed for policy and programme development and appropriate legislation for NCD prevention and control, and to support the monitoring and evaluation of the progress made in implementing policies and programmes.

Accurate data from countries are vital to reversing the global rise in death and disability from NCDs. Currently, many countries have little usable mortality data and weak NCD surveillance (1). Data on NCDs are often not integrated into national health information systems. Improving country-level surveillance and monitoring must be a top priority in the fight against NCDs.

Accurate data from countries are vital to reverse the global rise in death and disability from NCDs

The 2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases (2) recommends critical actions for Member States to strengthen surveillance and standardize data collection on NCD risk factors, disease incidence and cause-specific mortality. The plan also calls on Member States to contribute, on a routine basis, data and information on trends related to NCDs and their risk factors stratified by age, sex and socioeconomic group, and to provide information on progress made in implementation of national strategies and plans.

NCD surveillance systems need to be integrated into existing national health information systems. This is all the more important where resources are limited. Table 1 provides a framework for a national NCD surveillance scheme. Three major components of NCD surveillance are: a) monitoring exposures (risk factors); b) monitoring outcomes (morbidity and disease-specific mortality); and c) assessing health system capacity and response, which also includes national capacity to prevent NCDs (in terms of policies and plans, infrastructure, human resources and access to essential health care including medicines). Monitoring NCDs in relation to this framework is discussed further in this chapter. A list of core indicators for consideration to be used with the framework above is provided in Annex 5.

The three major components of NCD surveillance are: a) monitoring exposures (risk factors); b) monitoring outcomes; and c) assessing health system capacity and response

Table 1. Framework for national NCD surveillance

Exposures	
	Behavioural risk factors: *tobacco use, physical inactivity, the harmful use of alcohol* and *unhealthy diet.*
	Physiological and metabolic risk factors: *raised blood pressure, overweight/obesity, raised blood glucose,* and *raised cholesterol.*
	Social determinants: *educational level, household income,* and *access to health care.*
Outcomes	
	Mortality: *NCD-specific mortality.*
	Morbidity: *Cancer incidence and type (as core).*
Health system capacity and response	
	Interventions and health system capacity: *infrastructure, policies and plans, access to key health-care interventions and treatments,* and *partnerships.*

Source: (3)

Monitoring exposures: risk factor surveillance

Monitoring of risk factors at the population level (or in a subset of the population) has been the mainstay of national NCD surveillance in most countries. Taking an incremental approach, the first phase of surveillance in many low- and middle-income countries should be based on their priority information needs for policy and programme development, implementation and evaluation. Surveillance activities in low-resource settings should place the highest priority on national needs and the Global Strategy Action Plan's emphasis on population exposures to risk factors.

Data on behavioural and metabolic risk factors are typically obtained from national health interview or health examination surveys, either addressing a specific topic (e.g. tobacco) or multiple factors. Data on social determinants, which can then be used to further understand risk factor patterns, are also typically obtained from these sources.

In this context, the WHO STEPS approach (4) to NCD risk factor surveillance is a good example of an integrated and phased approach that has been used and tested by many countries. It allows countries to develop a comprehensive risk profile of their national populations. Information on sociodemographic factors and behavioural risk factors is collected through self-reporting. Physical measurements of height and weight for body mass index (BMI), waist circumference and blood pressure are made, and biochemical measurements are obtained for fasting blood glucose and total cholesterol levels.

The principles of STEPS risk factor surveillance are repeated in cross-sectional, population-based household surveys. STEPS promotes the concept that surveillance systems require standardized data collection but with sufficient flexibility to be appropriate in a variety of country situations and settings.

A good example of a topic-specific risk factor survey is the Global Adult Tobacco Survey (GATS) (5), which captures additional information on knowledge, attitudes and perceptions surrounding the health effects of tobacco use and exposure, advertising, promoting and economics of tobacco use, as well as information on cessation activities.

Any survey that includes the collection of blood samples can also be used to monitor trends in the prevalence of cancer-associated infections, notably HBV, HCV, and HIV.

In many countries, key surveillance activities related to exposures, such as surveys, only take place as one-time events that may be conducted by different agencies or external experts, and without adequate coordination with the national health information system. If this is the case, surveillance does not become institutionalized as a vital public health function and builds little or no sustained country capacity. A significant acceleration in financial and technical support is necessary for health information system development in low- and middle-income countries if global health priorities and goals are to be achieved.

Monitoring outcomes: mortality and morbidity

An accurate measure of adult mortality is one of the most informative ways to measure the extent of the NCD epidemic and to plan and target effective programmes for NCD control. All-cause and cause-specific death rates, particularly premature deaths before age 60 or 70, are key NCD indicators. High-quality mortality data can only be generated by long-term investment in civil registration systems (6).

Registering every death is a key first step. Accurate reporting of the cause of death on the death certificate is a challenge, even in high-income countries. Death registration by cause is neither accurate nor complete in a large proportion of countries. From a global perspective, there has been only limited improvement in the registration of births and deaths over the past 50 years (7). Ascertaining all deaths and their cause on a country level is a critical requirement. Only about two thirds of countries have vital registration systems that capture the total number of deaths reasonably well (6). Although total all-cause mortality may be reported, significant accuracy problems exist in many countries with cause-specific certification and coding. National initiatives to strengthen vital registration systems, and cause-specific mortality statistics, are a key priority.

In the meantime, where cause-specific mortality data are not available or inadequate from a coverage and/or quality perspective, countries should establish interim measures such as verbal autopsy for cause of death, pending improvements in their vital registration systems (8).

As mentioned in Chapter 1, reliable data on NCD morbidity are scarce in many countries. Accurate information on morbidity is important for policy and programme development. This is particularly the case for cancer where data on the incidence and type of cancer are essential for planning cancer control programmes. The diversity of cancer types in different countries highlights the need for cancer control activities to fully consider cancer patterns and available resources, given that different cancers may be variably amenable to primary prevention, early detection, screening and treatment. In lower-resource settings, hospital-based registries can be an important step towards the establishment of population-based cancer registries (PBCR), but it is only the latter that provide an unbiased description of the cancer patterns and trends in defined catchment populations. A PBCR is therefore a core component of the national cancer control strategy and programme (9). PBCRs collect and classify information on all new cases of cancer in a defined population, providing incidence and survival statistics for the purposes of assessing and controlling the impact of cancer in the community (10, 11). Despite their overwhelming need, there remains a notable lack of high-quality PBCRs in Africa, Asia and Latin America, with approximately 1%, 4% and 6% of the populations of these respective regions being monitored (12).

Monitoring health system response and country capacity

Assessing individual country capacity and health-system responses to address NCD prevention and control in a comprehensive manner, and measuring their progress over time, are major components of the reporting requirements stated in Objective 6 of the Global Strategy Action Plan. To monitor country capacity to respond to NCDs, WHO has conducted periodic assessments of the major components of national capacity in all Member States. This was carried out in 2000–2001, following the endorsement of the *Global Strategy for the Prevention and Control of Noncommunicable Diseases* (13), and again in 2009–2010. A further assessment is planned for 2013.

The capacity assessments examined the public health infrastructure available to deal with NCDs; the status of NCD-relevant policies, strategies, action plans and programmes; the existence of health information systems, surveillance activities and surveys; access to essential health-care services including early detection, treatment and care for NCDs; and the existence of partnerships and collaborations related to NCD prevention and control.

A number of countries also monitor activities in tackling risk factors such as tobacco, harmful alcohol use and obesity. WHO supports this process, for example by conducting regular reviews of tobacco demand reduction policy measures (14), and the status of policies and programmes to address harmful use of alcohol (15).

Opportunities for enhancement

The dearth of reliable information and capacity, which includes important gaps in surveillance data, is a major challenge to NCD prevention and control in many countries. Tracking NCDs and their risk factors and determinants is one of the three key components of the *Global Strategy for the Prevention and Control of Noncommunicable Diseases*. Strengthening surveillance is a priority for every country. There is an urgent and pressing need for concerted efforts to improve the coverage and quality of mortality data, to conduct regular risk factors surveys at a national scale with standardized methods, and to regularly assess national capacity to prevent and control NCDs.

This chapter outlines a framework for monitoring of NCDs and reviewing the mortality burden, as well as the capacity of countries to respond to them. While technical, human, and fiscal resource constraints are major impediments in some countries, with judicious use of scarce resources and capacity building, the surveillance framework can be implemented in all countries. Such a framework is essential for policy development and assessment and for monitoring of trends in population behaviours and disease. The adoption and use of a standardized core set of indicators is of crucial importance for national and global monitoring of NCD trends.

Numerous recommendations have been made to improve country capacity for the development and maintenance of health information systems, and many are clearly applicable to NCDs. A permanent infrastructure for surveillance activities is required. Data collection can be organized in several ways, but an institution or a network with the relevant expertise is needed to guarantee the sustainability and quality of surveillance over time. However, knowing what to do is not the only obstacle; lack of experience in establishing health information systems, and obtaining the necessary resources, also remain key challenges.

Key messages

- Current capacities for NCD surveillance are inadequate in many countries and urgently require strengthening.
- High quality NCD risk factor surveillance is possible even in low-resource countries and settings.
- A surveillance framework that monitors exposures (risk factors and determinants), outcomes (morbidity and mortality) and health-system responses (interventions and capacity) is essential. A common set of core indicators is needed for each component of the framework.
- Cancer morbidity data are essential for planning and monitoring cancer control initiatives. Population-based cancer registries play a central role in cancer control programmes because they provide the means to plan, monitor and evaluate the impact of specific interventions in targeted populations.
- Sustainable NCD surveillance systems need to be integrated into national health information systems and supported with adequate resources.

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Chapter 4

Reducing risks and preventing disease: population-wide interventions

The global epidemic of NCDs can be reversed through modest investments in interventions. Some effective approaches are so low in cost that country income levels need not be a major barrier to successful prevention. What is needed are high levels of commitment, good planning, community mobilization and intense focus on a small range of critical actions. With these, quick gains will be achieved in reducing the major behavioural risk factors: tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity, together with key risk factors for cancer, notably some chronic infections.

This chapter demonstrates that best practices exist in many countries with different income levels. It reviews affordable actions that are evidence-based and can be taken immediately to save lives and prevent disease. Further actions that can achieve even greater successes are also detailed.

This chapter introduces the concepts of 'best buys' and 'good buys', based on cost-effectiveness and other information. A **best buy** is an intervention that is not only highly cost-effective but also cheap, feasible and culturally acceptable to implement. **Good buys** are other interventions that may cost more or generate less health gain but still provide good value for money. A highly cost-effective intervention is one that, on average, provides an extra year of healthy life (equivalent to averting one DALY) for less than the average annual income per person. For example, in Eastern Europe, any intervention that produces a healthy year of life for less than US$ 9972 (the average GDP per capita) is deemed to be highly cost-effective; an intervention that does so for less than three times GDP per capita is still considered reasonable value for money or quite cost-effective. These threshold values are based on a recommendation by the WHO Commission on Macroeconomics and Health (2001) and the work of the WHO cost-effectiveness CHOICE project.

Reducing tobacco use

Tobacco is the most widely available harmful product on the market. To reduce its harms, WHO sponsored the negotiations of the WHO Framework Convention on Tobacco Control (WHO FCTC), its first legally-binding international treaty. The treaty sets a framework for guidelines and protocols to reduce tobacco consumption and tobacco supply through evidence-based interventions (1).

The WHO FCTC includes measures on prices and taxes, exposure to tobacco smoke, the contents of tobacco products, product disclosures, packaging and labelling, education, communication, training and public awareness, tobacco advertising, promotion and sponsorship and reducing tobacco dependence. It also includes sales to and by minors, measures to reduce illicit trade, and support for economically viable alternative activities. It addresses liability, protecting public health policies from the tobacco industry, protecting the environment, national coordinating mechanisms, international cooperation, reporting and exchange of information and institutional arrangements (2).

There is robust evidence that tobacco control is cost-effective compared to other health interventions

There is robust evidence that tobacco control is cost-effective compared to other health interventions. The evidence base on what works to reduce harm from tobacco provided the foundation for the WHO FCTC (3). The 1998 book *Curbing the Epidemic* (4), a landmark World Bank publication, addressed the economic costs of tobacco and estimated the overall impact of tobacco control interventions.

Key cost-effective interventions include tobacco tax increases, timely dissemination of information about the health risks of smoking, restrictions on smoking in public places and workplaces, and comprehensive bans on advertising, promotion and sponsorship (5). These are each considered **best buys** in reducing tobacco use and preventing NCDs. All of these interventions reduce social acceptance of tobacco use, thereby increasing demand for cessation therapies. In this context, it is a **good buy** to provide smokers in particular, and tobacco users in general, with treatment for tobacco dependence.

Increases in taxes on and prices of tobacco products are by far the **best buys** in tobacco control because they can significantly reduce tobacco use through lower initiation and increased cessation, especially among young people and the poor (6). Increases in tobacco excise taxes increase prices and reduce the prevalence of adult tobacco use. The effectiveness of tax and price policies in tobacco control has been recently documented in detail (7).

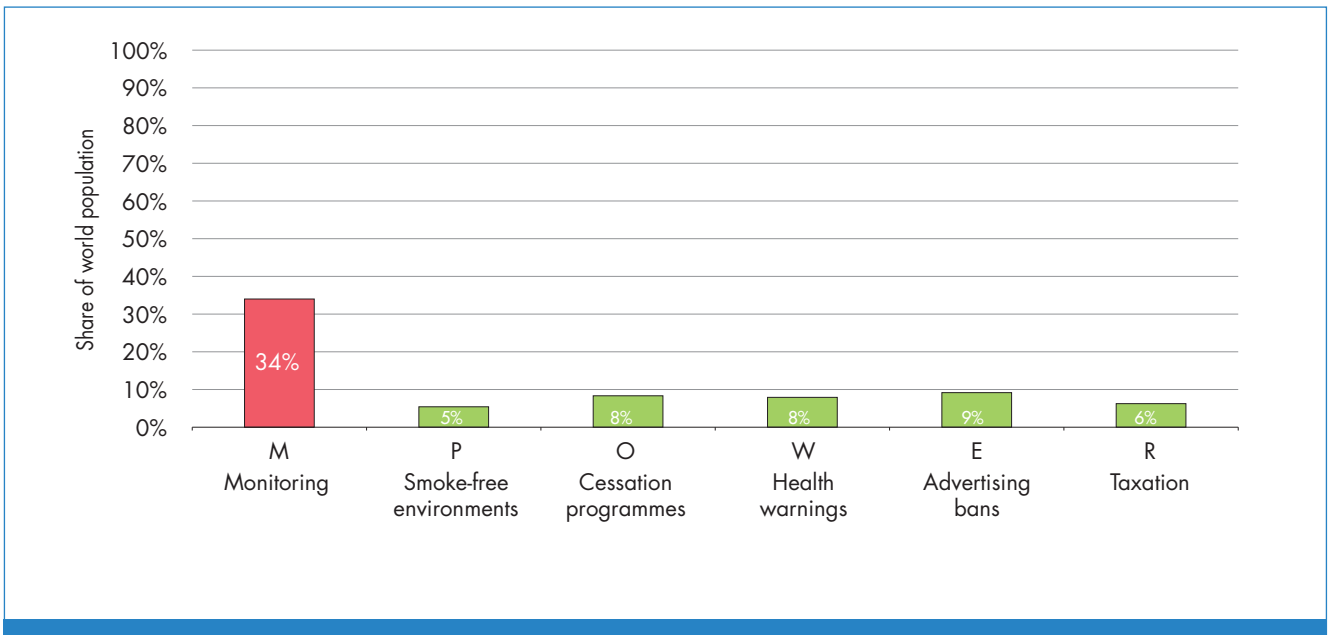
Smoke-free work and public places reduce second-hand smoke (8) and effectively help smokers cut down or quit, while reducing smoking initiation. Smoke-free policies reduce the opportunities to sustain nicotine addiction in individuals at early stages of dependence, youth in particular (9). Furthermore, smoke-free laws enjoy popular support and high levels of compliance when properly implemented, providing an additional message that smoking is not socially acceptable. For all these reasons, protection from second-hand tobacco smoke is a **best buy**.

Providing information to adults about tobacco-dependence and health impacts of tobacco can reduce consumption and is another **best buy**. Regular and creative mass media campaigns and graphic health warnings on tobacco packages have been shown to reduce demand (10, 11). Country-based experience suggests that despite tobacco companies' opposition and the resource constraints faced by health authorities, implementation of health warnings is generally powerful and successful (12). A comprehensive set of tobacco advertising, promotion and sponsorship bans is a **best buy** and can reduce tobacco consumption by up to 6.3%. However, limited advertising bans have little or no effect (13).

Cost-effective tobacco cessation assistance is a **good buy**. Treatment should be available at public health (including toll free 'quitlines' and awareness-raising campaigns) and primary care services. The most effective treatment modality is a combination of behavioural and pharmacological therapies (14).

Evidence shows that tobacco control interventions are affordable in all countries. One study (15) modelled price increases, workplace bans, health warnings and bans on advertising for 23 countries. This showed that 5.5 million deaths could be averted at a cost of less than US$ 0.40 per person per year in low- and lower-middle-income countries, and US$ 0.5–1.00 in upper-middle-income countries. Yet, less than 10% of the world's population in 2008 was fully covered by any of the tobacco control demand reduction measures in the WHO FCTC (16).

Figure 1. Share of the world population covered by selected tobacco control policies, 2008



Factors that hinder implementation of cost-effective measures can include the lack of resources and political will and competing priorities. To increase adoption and implementation of tobacco interventions, key approaches are needed:

Cooperation: Virtually all countries that have implemented successful tobacco control programmes – countries from all regions and income levels – have engaged diverse sectors such as finance, trade, customs, agriculture, industry affairs, labour, environment and education.

Comprehensiveness: Programmes should focus on multiple interventions (17), including preventing initiation, promoting cessation, reducing exposure to second-hand smoke, regulating tobacco products and eliminating disparities among population subgroups (18).

Capacity: A national plan of action and a national commission or steering committee is needed, along with high-level partnerships; human and financial resources; and the technical, managerial, and political processes necessary to implement policies.

Surveillance and monitoring: Comprehensive surveillance and monitoring of tobacco use and harms can provide decision-makers and civil society with a true picture of the tobacco epidemic (19). Monitoring the activities of the tobacco industry is also an essential component of tobacco control programmes (20).

Declines in tobacco use prevalence are apparent in high-income countries that conduct regular population-based surveys of tobacco use (e.g. Australia, Canada, Finland, the Netherlands and the United Kingdom). There are some low- and middle-income countries that also have a documented decline. Examples include Mexico, Uruguay and Turkey (21).

Box 1. Cost-effective policies: increasing taxes and prices on tobacco products

A number of low- and middle-income countries (e.g. Bangladesh, Egypt, Pakistan, Turkey and the Ukraine) have recently increased taxes on tobacco products, generating substantial revenues and saving lives. Between 2009 and 2010, Turkey became one of the 17 smoke-free countries in the world. It increased tobacco taxes by 77%, which led to a 62% price increase on cigarettes. Turkey also adopted and implemented comprehensive tobacco control measures, including pictorial health warnings on tobacco packaging, a comprehensive ban on tobacco advertising, promotion and sponsorship in all media, as well as a comprehensive smoke-free law for all public and work places. Egypt increased taxes by 87% for cigarettes and 100% for loose tobacco. This will lead to an estimated increase of 44% in average retail prices and a 21% reduction in cigarette consumption. The Ukraine elevated taxes by 127% on filtered cigarettes, leading to a 73% increase in retail prices between February 2009 and May 2010.

In conclusion, tobacco control programmes are an integral part of the public health agenda, with proven cost-effectiveness. **Best buys** in tobacco control include tax and price interventions; providing information about the dangers of using tobacco products (with packaging health warnings being a simple and cost-effective intervention); promoting smoke-free environments; and banning advertising, promotion and sponsorship. A **good buy** in tobacco control is treating tobacco dependence. Multisectoral action is essential, and a national coordination mechanism and the integration of tobacco control programmes in country health-care systems are key. Tobacco control interventions should be integrated into development programmes and related investment initiatives. The WHO FCTC provides a blueprint for international cooperation.

Promoting physical activity

Promoting physical activity and healthy diet through the media is a cost-effective and highly feasible intervention

There is a direct relationship between physical activity and risk reduction for coronary heart disease, stroke, and diabetes. There is a dose–response relationship for cardiovascular disease (CVD) and diabetes with risk reductions routinely occurring at levels of 150 minutes of activity per week. Evidence also shows that participation in 30 to 60 minutes of physical activity per day significantly reduces risk of breast and colon cancer (22, 23).

There are a number of interventions to promote physical activity that constitute a **good buy**. Promoting physical activity (in combination with a healthy diet) through the media has been

estimated to be a cost-effective, low-cost and highly feasible option. The cost-effectiveness of other potential strategies is being assessed.

The *Global Strategy on Diet, Physical Activity and Health* endorsed by the World Health Assembly in 2004, and the *Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases 2008–2013* (24, 25) urge Member States to implement the outlined programmes and actions to increase levels of physical activity among their populations.

Children and young people between 5 and 17 years of age should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity every day. Adults over 18, including those 65 and older, should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week, or at least 75 minutes of vigorous-intensity aerobic physical activity, or an equivalent combination of the two. Adults aged 65 and above with poor mobility should perform physical activity to enhance balance and prevent falls on three or more days per week. When older adults cannot do the recommended amount of physical activity due to health conditions, they should be as physically active as their abilities and conditions allow (23).

National policies to ensure that walking, cycling, sports and other recreational activities are accessible and safe are required to promote physical activity. National physical activity guidelines are required in order to implement and guide national policies and programmes. Many types of public policies across sectors – which may include transport, education, sport and urban design – can encourage physical activity and reach large portions of the population (26).

The physical environment plays an important role in physical activity, ensuring that walking, cycling and other forms of activity are accessible and safe for all. The physical environment can also promote active and safe methods of travelling to and from schools and workplaces; provide adequate sports, recreation and leisure facilities; and ensure adequate safe spaces for active play, especially for children.

Raising levels of physical activity requires countries to develop and implement a combination of policies aimed at informing, motivating and supporting individuals and communities to be active (26). Multi-targeted approaches to encourage walking and cycling to school, and create healthier commuting and leisure activities, showed moderate effectiveness.

Schools: School-based physical activity interventions show consistent improvements in knowledge, attitudes, behaviour and, when tested, physical and clinical outcomes. Schools should include a physical activity component taught by trained teachers in a supportive environment, and also include parental involvement. Benefits include mental health and behavioural improvements, and the physical activity habits developed appear to carry on into later years. However, there is a scarcity of cost-effectiveness research in this area.

Workplaces: Multi-component programmes promoting physical activity in the workplace are shown to be effective when they:

- Provide space for fitness and signs to encourage the use of stairs;
- Involve workers in programme planning and implementation;
- Involve families through self-learning programmes, newsletters, festivals, etc.;
- Provide individual behaviour change strategies and self-monitoring.

Community level: The most effective physical activity interventions at the community level include: community development campaigns with multisectoral cooperation that focus on a common goal, such as reduction in CVD risk, as well as group-based physical activity programmes or classes for homogenous groups.

Community interventions that provide advice on lifestyle modifications of moderate physical activity and diet advice have been shown to prevent diabetes in people who have impaired glucose tolerance. The effect of participation in physical activity and improving diets is about equal to that of drug therapy (27).

In conclusion, interventions to increase physical activity at the population level are effective and must be integrated into strategies to prevent and control NCDs. Mass media interventions can be considered a **best buy** for physical activity promotion (28). Multiple intervention strategies including physical activity have been shown to have favourable cost-effectiveness profiles, and there is an emerging body of evidence which show promise of cost-effectiveness for physical activity interventions alone, however these have not yet been assessed for their global applicability.

Reducing harmful alcohol use

In relation to harmful use of alcohol, effective prevention strategies for certain cancers, liver cirrhosis and CVD should target both the levels and patterns of alcohol consumption. Established evidence for the effectiveness and cost-effectiveness of interventions to reduce the harmful use of alcohol (29-33) including examples from countries such as Brazil, China, Mexico, the Russian Federation and Viet Nam, supports implementation of the following effective measures:

Cost-effective measures for reducing harmful alcohol use include increasing alcoholic beverage taxes, regulating the availability of alcoholic beverages, restricting marketing of alcoholic beverages and drink-driving countermeasures

- Increasing excise taxes on alcoholic beverages;
- Regulating availability of alcoholic beverages, including minimum legal purchase age, restrictions on outlet density and on time of sale, and, where appropriate, governmental monopoly of retail sales;
- Restricting exposure to marketing of alcoholic beverages through effective marketing regulations or comprehensive advertising bans;
- Drink-driving countermeasures including random breath testing, sobriety check points and blood alcohol concentration (BAC) limits for drivers at 0.5 g/l, with reduced limits or zero tolerance for young drivers;
- Treatment of alcohol use disorders and brief interventions for hazardous and harmful drinking.

Available evidence does not support isolated classroom-based education, public education and mass media campaigns, or consumer warning labels and messages. However, educational and information campaigns in support of the effective measures listed above can increase their acceptance in populations.

The cost-effectiveness of these policy measures may depend on their degree of acceptance in the population and their level of enforcement, in addition to the extent of harmful alcohol use in the society. In countries with low prevalence of drinking or with high proportion of consumed alcohol produced informally or illegally and, therefore, not covered by taxation, the cost-effectiveness of raising taxes on alcohol is far less favourable.

In May 2010, the Sixty-third World Health Assembly adopted resolution WHA63.13, which endorsed the *WHO Global Strategy to Reduce the Harmful Use of Alcohol* (34), and urged Member States to adopt and implement it. The strategy represents a global policy framework for reducing harmful use of alcohol. It advances guiding principles for development and implementation of alcohol policies and interventions at all levels, sets priorities for global action and urges a set of policy options for implementation at the national level. The strategy recommends 10 target areas for action in countries: leadership awareness and commitment; health services participation through counselling and treatment; community involvement in identifying needs and solutions; drink-driving control policies and countermeasures; reducing the availability of alcohol; regulating the marketing of alcoholic beverages; pricing policies; reducing the negative consequences of drinking and alcohol intoxication; reducing the public health impact of illicit and informally produced alcohol; and monitoring and surveillance.

In conclusion, the current available scientific evidence supports prioritization of multiple cost-effective policy actions (32), three of which are **best buys**: increasing alcohol beverage excise taxes, restricting access to retailed alcohol beverages and comprehensive advertising, promotion and sponsorship bans (Table 1).

Promoting healthy diets

Unhealthy diets increase the risk of NCDs including CVD, some cancers and diabetes. An optimal diet (24) includes:

- Achieving a balance between energy intake from food and energy expenditure from physical activity to maintain a healthy weight;
- Limiting energy intake from total fats (not to exceed 30% of total energy intake), and shifting fat consumption away from saturated fats to unsaturated fats, and towards elimination of trans-fatty acids;
- Limiting intake of free sugars;
- Limiting sodium consumption from all sources and ensuring that salt is iodized;
- Increasing the consumption of fruits, legumes, whole grains and nuts.

There is evidence to suggest that multiple intervention strategies have the potential to achieve larger health gains than individual interventions, and often with greater cost-effectiveness (35). However, some interventions stand out as best buys in the prevention of NCDs. Enough evidence exists to make salt reduction strategies a **best buy** in the prevention of NCDs (36, 37). As mentioned, excessive salt intake is linked with raised blood pressure, which is a major cause of mortality (22, 38). In Europe and North America, approximately 75% of salt intake is from sodium added in manufactured foods and meals. In some African and Asian countries, most sodium consumption comes from salt added at home in cooking and at the table or through the use of sauces, such as soy sauce (39). It has been estimated that if salt consumption is reduced to the recommended level (40–42), up to 2.5 million deaths could be prevented each year (43). Of the countries with salt reduction initiatives, five – Finland, France, Ireland, Japan and the United Kingdom – have demonstrated some positive, measurable results (44).

Box 2. Cost-effective policy: United Kingdom salt reduction programme

The United Kingdom salt reduction programme, begun in 2003, has involved working with industry to reduce levels of salt in food, raise consumer awareness and improve food labelling. Average intake was 9.5g/day in 2000–2001, considerably above the recommended national level of no more than 6g/day for adults.

Voluntary salt reduction targets were set, and industry made public commitments to work to reduce the amount of salt in food products. Public awareness campaigns about health issues, recommended salt intakes and consumer advice took place between 2004 and 2010.

Levels of salt in foods have been reduced in some products by up to 55%, with significant reductions in those food categories contributing most salt to the diet. Consumer awareness of the 6g/day message increased tenfold, and the number of people who say they make a special effort to reduce their intake has doubled. By 2008, average intake declined by 0.9g to 8.6g/day, which is estimated to prevent more than 6000 premature deaths and save £1.5 billion every year in health care and other costs, dramatically more than the cost of running the salt reduction programme.

Industrially produced trans-fatty acids negatively affect blood lipids and fatty acid metabolism, endothelial function and inflammation, thus increasing the risk of type 2 diabetes and CVD (45). The Disease Control Priorities (DCP) project report indicates that substituting 2% energy from trans-fat with polyunsaturated fat will lead to a reduction of CVD risk ranging between 7–8% and 25–40%, and that these calculations do not consider the additional effects on type 2 diabetes (46). In order to achieve the reduction of industrially produced trans-fatty acids, government approaches have included mandatory regulation of food standards, nutritional recommendations, raising awareness about adverse effects of trans-fatty acids through nutrition and health claims, voluntary or mandatory labelling of trans-fatty acid content of foods, and voluntary reformulation by industry (47, 48). Bans are the most effective action. In 2003, Denmark introduced mandatory compositional restrictions of trans-fatty acids in fats and oils to less than 2% of total fatty acids. A 2006 survey indicated

that industrially produced trans-fatty acids in Denmark have been virtually eliminated from the food supply and that both the population average and the high-risk groups consume less than 1 g of industrially produced trans-fatty acids per day. Although more economic evidence is needed, the conservative assumptions used by the DCP project (46) indicate the high likelihood of this intervention being very cost–effective, cheap and feasible to implement, and therefore a **best buy**.

Sound communication and information strategies are **best buys** for healthy diet promotion campaigns. Food-based dietary guidelines should be developed and properly disseminated to consumers. However, this is not yet being done at a national scale in most countries (49). Adequate nutritional information through product labelling is also necessary to help consumers make the right food choices. Nutrition labels have been shown to encourage more healthy diets, among people who read the labels (50).

There is evidence linking nutrition during pregnancy and early life to the predisposition to NCDs later in life. Individuals who were breastfed experienced lower mean blood pressure and total cholesterol, higher performance in intelligence tests, and lower risk of overweight/obesity and type 2 diabetes (51). Children should be exclusively breastfed until six months and breastfeeding should continue until two years and beyond (52). Improvement of infant and young child feeding requires a combination of legislation, such as maternity protection at work; actions in the health system and improving health worker skills; and support for improving family and community practices through community channels, such as breastfeeding support groups (53).

There are, however, additional effective interventions that should be considered in a comprehensive strategy to promote healthy diets.

The replacement of saturated with unsaturated fat in the diet would lead to a decrease in LDL cholesterol concentration and the total/HDL cholesterol ratio and to a decreased risk of CVD (54). The DCP project report indicates that replacing part of the saturated fat with polyunsaturated fat could avert one DALY at a cost of US$ 1865 in South Asia and US$ 4012 in the Middle East and North Africa (46).

Lifestyle interventions addressing diet and physical activity are considered a first-line intervention for the prevention of type 2 diabetes (55). A combination of increase in dietary fibre (≥15 g/1000 kcal), reducing total fat (< 30% of energy consumed) and saturated fat (< 10% of energy consumed), combined with moderate physical activity (≥30 min/day) and weight reduction (5%) can reduce the risk of progression to type 2 diabetes in adults with impaired glucose regulation (also known as pre-diabetes) by around 50% (56).

The reduction in marketing of foods and non-alcoholic beverages high in salt, fats and sugar to children is also a cost-effective action to reduce NCDs (57). The marketing of such food to children is very potent, because children engage with and enjoy these advertisements and other promotions (58, 59). Strong evidence links television advertising to children's food knowledge, preferences, purchase requests and consumption patterns. Television advertising is associated with increased consumption of snacks and drinks high in sugar, consumption of nutrient-poor foods and increased calorific intake (60, 61). A recent review shows that since 2003, 20 countries have developed or are developing policies that include statutory mandates, official guidelines or approved forms of self-regulation (62). The United Kingdom evaluated the impact of restrictions on children's exposure to advertising (63), and found that children aged 4–15 years saw 32% less overall food advertising after restrictions were instituted. World Health Assembly Resolution WHA 63.14 urges Member States to take necessary measures to implement the WHO recommendations on marketing of foods and non-alcoholic beverages to children (64).

Several countries have explored fiscal measures such as increased taxation on foods that should be consumed in lower quantities and decreased taxation, price subsidies or production incentives for foods that are encouraged. A longitudinal study of food prices and consumption in China found that increases in the prices of unhealthy foods were associated with decreased consumption of those foods (65). In the United States, programmes to reduce the price of healthy foods led to a 78% increase in their consumption (66). Modelling studies suggest that a combination of tax reduction on healthy foods and tax increases on unhealthy foods may result in a stimulation of the consumption of healthy food, particularly for lower-income populations (67).

A combination of national and local level actions is clearly beneficial to the implementation of food and nutrition policies. At the community level, programmes can effectively combine healthy food consumption with physical activity, which has been shown to control the rate of increase of childhood obesity in France and Sweden. Such multi-level actions are needed to raise political support for policy changes regarding diet and exercise.

In conclusion, while a combination of actions addressing food supply and information to the public is required to improve diet quality and reduce NCD risk, some actions stand out as being highly cost-effective and affordable even in low-income contexts. These include the reduction of salt through mass media campaigns and reformulation of manufactured food, the replacement of trans-fat with polyunsaturated fat possibly through regulatory measures, initiatives to promote consumers'awareness about healthy diet including information at the point of choice.

Specific strategies to prevent cancer

Many of the above interventions for reducing tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets also reduce the risk of certain cancers. Comprehensive cancer control encompasses primary prevention, early detection/screening, treatment and palliative care. Screening is discussed in this chapter while early detection is dealt with in Chapter 5. There is evidence that population-based interventions are superior to individual-based approaches in terms of coverage, equity, quality control, and cost-effectiveness (68, 69)

Cancer-specific strategies include specific interventions aimed at avoidance or control of cancer-associated infections. Chronic Hepatitis B virus (HBV) infection is a major cause of liver cancer. HBV is highly infectious through contact with blood or other body fluids of an infected person. The development of chronic HBV infection is inversely related to age of infection. Therefore, WHO recommends universal infant immunization including a birth dose by incorporating hepatitis B vaccination in national infant immunization programmes, the most cost-effective strategy for preventing chronic HBV infection and primary liver cancer. Hepatitis B vaccine immunization is a **best buy** (70).

Human papillomavirus (HPV) infection is the main cause of cervical cancer. Currently available HPV vaccines can prevent up to 70% of incident cervical cancer. It is recommended to include HPV immunization into comprehensive cervical cancer prevention and control programmes where appropriate (i.e. in countries where cervical cancer represents a priority) and feasible (71). Major challenges for the introduction of HPV vaccination are the high cost of the vaccine and the recommendation to target adolescent girls, for whom no efficient vaccination platform is in place. Fortunately, the cost of the vaccine for the public sector is declining. It has been estimated that, with a good coverage of adolescent girls (70% at least) and at I$ 10 per vaccinated girl (approximately I$ 2.00 per dose, plus wastage, administration and programme support), HPV vaccination would be cost-effective in the 72 poorest countries – a cost of per DALY averted of less than I$ 200 in most of these countries. A separate analysis for low- resource settings similarly found that HPV vaccination would be just as (highly) cost-effective as alternative screening and treatment strategies assuming that vaccine prices will fall to US$ 2 or less (72). Both analyses also demonstrated that combining vaccination of adolescent girls and screening of adult women can reduce cervical cancer faster than programmes resorting to only one strategy.

Protection against environmental or occupational risk factors for cancer includes very effective prevention strategies, as low-cost interventions are often available. Although not always resulting in large numbers of prevented cases, such interventions often result in reduction of local occurrences of avoidable lethal cancers. Examples include: reduced exposure to solar radiation in susceptible populations; better food storage in countries with high humidity, to reduce aflatoxin-related hepatocellular cancers; bans on the use of asbestos to reduce mesothelioma and lung cancer; higher awareness and more strict regulation for occupational hygiene and worker protection; reduced indoor air pollution from cooking or heating from combustion of solid fuels; reduced contamination of drinking-water and soil by better regulations for the protection of the public and the environment.

In addition to primary prevention, secondary prevention can also be cost-effective. Population-based cancer screening is effective in reducing the cancer burden. It consists of the application of validated tests, examinations and other procedures that can be applied rapidly to the general population.

Over 50 years of experience in cancer screening in high-resource countries has demonstrated that population-based organized screening programmes can reduce cancer mortality in a cost-effective way (68, 69). Essential elements for successful organized screening are an informed decision to initiate screening for priority cancers in the context of a national cancer control programme, and the political will to proceed, with support and funding from the ministry of health, on the basis of an adequate health- care infrastructure. The target population for screening must be defined and informed, including a list of priority cancers, and a means to identify the target population and to invite them for screening. An active call and recall system of the target population is necessary to achieve a high coverage. Whereas in high-resource countries such systems are generally based on population lists and written invitations, elevated participation rates can be obtained in low-resource countries by mobilizing communities and community health workers (73, 74).

Breast cancer is generally diagnosed at an advanced stage. While there is evidence from high-income countries that screening with mammography will reduce mortality from breast cancer, it is essential to ensure that the required capacity, funding and infrastructure for treatment exist before initiating such programmes. Available economic evidence indicates that treatment of early-stage breast cancer is a highly cost-effective and affordable option. A comprehensive mammographic screening and treatment programme is also cost-effective but is much less affordable in low-resource settings with low incidence. (68).

Cervical cancer is the second most important cancer in women, and the first in many low-income countries. In too many countries, cervical cancer is generally diagnosed in an advanced stage. There is evidence that organized cytology screening has reduced cervical cancer mortality in many high-income countries (69). Screening of cervical cancer using HPV testing and, to a lesser extent, visual inspection with acetic acid, have been successfully implemented and evaluated in low-income settings and may be a first priority for cancer prevention and control in these countries (72). New, low-cost HPV screening tests, combined with HPV vaccination, have the potential for a major improvement in cervical cancer control worldwide, although the high vaccine price makes this option a less affordable option at the present time (75). Colorectal cancer is the most frequent cancer in non-smokers worldwide. Different screening options (i.e. search for occult fecal blood, sigmoidoscopy, and colonoscopy) have been validated and included in organized screening programmes in high-income countries. Colorectal screening programmes have not yet been implemented in low-resource countries, due to the relatively lower incidence of the disease and the high cost and complications assessing pre-cancerous lesions (76). Prostate cancer is the second most frequent cancer in men worldwide. However more studies are needed to establish the merit of population screening with regard to reduction of prostate cancer-specific mortality and quality of life improvement (77).

Promising methods of early detection and screening are also available for cancers of the skin and oral cancers (78).

Increasing impact

There are concrete indications of progress over the past decade in the development of effective interventions, programmes and policies for the prevention and control of NCDs, including best practices for low-, middle- and high-income countries. The rise of NCDs and related deaths can be reversed, and gains can be achieved rapidly, if appropriate action is taken.

Notable interventions where impact is evident include tobacco tax increases and restrictions on smoking in public places and workplaces; alcohol tax increases and restriction of sales; mandatory and voluntary salt reduction; and improved access to places for physical activity such as walking.

Wide implementation of the best buys should be considered (Table 1). The intervention strategies shown in the second column have been demonstrated to be highly cost-effective in high-, middle- and low-income resource settings.

Table 1. Interventions to tackle non-communicable disease risk factors: identifying 'best buys'

Risk factor **(DALYs, in millions; % global burden)**[a]	**Interventions / actions** (* **core set of 'best buys'**, Others are 'good buys')	**Avoidable burden** *(DALYs averted, millions)*	**Cost-effectiveness** [b] *(US$ per DALY prevented)* *[Very = < GDP per person;* *Quite = < 3xGDP per person* *Less = >3xGDP per person]*	**Implementation cost** *(US$ per capita)* *[Very low = < US$0.50* *Quite low = < US$ 1* *Higher = > US$ 1]*	**Feasibility** *(health system constraints)*
Tobacco use (> 50m DALYs; 3.7% global burden)	**Protect people from tobacco smoke *** **Warn about the dangers of tobacco *** **Enforce bans on tobacco advertising *** **Raise taxes on tobacco ***	Combined effect: 25-30 m DALYs averted (> 50% tobacco burden)	Very cost-effective	Very low cost	Highly feasible; strong framework (FCTC)
	Offer counselling to smokers		Quite cost-effective	Quite low cost	Feasible (primary care)
Harmful use of alcohol (> 50m DALYs; 4.5% global burden)	**Restrict access to retailed alcohol *** **Enforce bans on alcohol advertising *** **Raise taxes on alcohol ***	Combined effect: 5-10 m DALYs averted (10-20% alcohol burden)	Very cost-effective	Very low cost	Highly feasible
	Enforce drink-driving laws (breath-testing) Offer brief advice for hazardous drinking		Quite cost-effective	Quite low cost	Intersectoral action Feasible (primary care)
Unhealthy diet (15-30m DALYs; 1-2% global burden)[c]	**Reduce salt intake *** **Replace trans-fat with polyunsaturated fat *** **Promote public awareness about diet * +**	Effect of salt reduction: 5 m DALYs averted Other interventions: Not yet assessed globally	Very cost-effective	Very low cost	Highly feasible
	Restrict marketing of food and beverages to children Replace saturated fat with unsaturated fat Manage food taxes and subsidies		Very cost-effective (more studies needed)	Very low cost	Highly feasible
	Offer counselling in primary care		Quite cost-effective	Higher cost	Feasible (primary care)
	Provide health education in worksites Promote healthy eating in schools		Less cost-effective	Quite low cost	Highly feasible
Physical inactivity (> 30m DALYs; 2.1% global burden)	**Promote physical activity (mass media) * +**	Not yet assessed globally	Very cost-effective	Very low cost	Highly feasible
	Promote physical activity (communities) Support active transport strategies		Not assessed globally	Not assessed globally	Intersectoral action
	Offer counselling in primary care		Quite cost-effective	Higher cost	Feasible (primary care)
	Promote physical activity in worksites Promote physical activity in schools		Less cost-effective		Highly feasible
Infection	Prevent liver cancer via hepatitis B vaccination *	Not yet assessed globally	Very cost-effective	Very low cost	Feasible (primary care)

[a] *DALYs (or disability-adjusted life years) are widely used as a measure of premature mortality and ill-health - one DALY can be thought of as one lost year of healthy life.*

[b] *Main data sources for globally applicable cost-effectiveness estimates are the Disease Control Priorities project (www.DCP2.org) and the WHO-CHOICE project (www.who.int/choice)*

[c] *This estimate is based on the combined burden of low fruit and vegetable intake, high cholesterol, overweight and obesity, high blood glucose, high blood pressure - all diet related - and low physical activity. (m=millions)*

+ Considered a best buy when the two interventions are implemented together.

Key messages

- The majority of noncommunicable diseases can be averted through interventions and policies that reduce major risk factors.
- Many preventive measures are cost-effective, including for low-income countries.
- Some preventive actions can have a quick impact on the burden of disease at the population level.
- Interventions that combine a range of evidence-based approaches have better results.
- Comprehensive prevention strategies must emphasize the need for sustained interventions over time.

The majority of noncommunicable diseases can be averted through interventions and policies that reduce major risk factors

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Chapter 5
Improving health care: individual interventions

In addressing noncommunicable diseases, the population-wide approach to prevention described in the previous chapter has great potential to decrease disease burden, but it does not provide an adequate response to the need to strengthen health care for people with NCDs. The disease burden can be reduced considerably in the short- to medium-term if the population-wide approach is complemented by health-care interventions for individuals who either already have NCDs or those who are at high risk (1–5).

As the *Global Strategy for the Prevention and Control of Noncommunicable Diseases* indicates, NCDs can best be addressed by a combination of primary prevention interventions targeting whole populations, by measures that target high-risk individuals and by improved access to essential health-care interventions for people with NCDs (2).

This chapter examines key issues related to the provision of health care and improved access to essential interventions, particularly in low- and middle-income countries. Health systems in many low- and middle-income countries are historically shaped around acute care and are inadequate when dealing with NCDs, which require chronic care (6). The long-term nature of many NCDs demands a comprehensive health system response that brings together a trained workforce with appropriate skills, affordable technologies, reliable supplies of medicines, referral systems and empowerment of people for self-care, all, over a sustained period of time. Currently, many low- and middle-income countries have health systems that do not meet the requirements for chronic care. In recent years, many of them have invested in vertical national programmes to address HIV/AIDS, tuberculosis and malaria. Positive as well as negative effects of these initiatives on health systems have been identified (7). While positive effects include rapid scale-up in service delivery for HIV/AIDS, tuberculosis and malaria, greater stakeholder participation, and channelling of funds to nongovernmental stakeholders, negative effects might include distortion of national priorities, distraction of governments from coordinated efforts to strengthen health systems, and re-verticalization of planning, management and monitoring and evaluation systems (7). Lessons learnt and capacities that have been developed through such initiatives need to be harnessed and synergized through better integration of communicable and NCD initiatives. In order to address the current gaps in programmes and services, within a coordinated process of overall health-system strengthening, national health programmes should be based on sound situation analyses and a clear understanding of national health priorities. Such approaches are particularly important in countries with a double burden of disease. The capacity of health systems to address the NCD challenge is also discussed in Chapter 6.

Currently, many low- and middle-income countries have health systems that do not meet the requirements for chronic care

Evidence from high-income countries

Over the past two decades, cardiovascular diseases (CVD) mortality rates have declined substantially in high income countries (8–12). There is clear evidence that population-wide primary prevention and individual health-care interventions have both contributed to these declining mortality trends (11, 12). For example, during the 10-year period covered by the Multinational Monitoring of Trends and Determinants of Cardiovascular Disease (MONICA) project coordinated by the WHO, mortality from coronary heart disease and stroke declined dramatically in many of the 38 MONICA populations (11). The decline in mortality has been attributed to reduced incidence rates and/or improved survival after cardiovascular events due to prevention and treatment interventions. Across all populations with declining coronary heart disease mortality, reduced cardiovascular risk contributed to 75% and 66% of the change in men and women respectively, the remainder being attributed to provision of health care resulting in improved survival in the first four weeks after the event. For stroke, about 33% of the changes in populations with declining mortality were attributed to reduced incidence and 66% to improved survival. These WHO MONICA data strongly support the view that population-wide primary prevention and individual health-care approaches go hand-in-hand to reduce the population burden of cardiovascular disease (11).

Cardiovascular mortality rates have declined substantially in high-income countries. The decline is due to both prevention and treatment interventions

There has been a dramatic decline in coronary heart disease mortality in the United Kingdom between 1981 and 2000 (12). Some 42% of this decrease has been attributed to treatment (including 11% to secondary prevention, 13% to heart failure treatment, 8% to initial treatment of acute myocardial infarction, and 3% to hypertension treatment). About 58% of the decline has been attributed to population-wide risk factor reductions (12).

With respect to cancer treatment, improvements in the outcome of a number of cancers have occurred in high-income countries (13). Progress in cancer treatment, often combined with early detection, greater access to care and screening interventions, have made it possible for a substantial proportion of patients with various cancer types (including breast, cervical, prostate and childhood cancers) to achieve significant long-term survival. Survival rates in low- and middle-income countries, however, are significantly lower (14), due both to more advanced disease at presentation and less-effective therapy, the quality of which is often correlated with the socioeconomic status of the country.

As the Global Strategy emphasizes, in all populations there will always be some people with medium- to high-risk for NCDs, so individual health-care interventions are needed for early detection, prevention and management (2). If individual health-care interventions are not accessible, those people will present at health-care institutions with acute events (e.g. acute myocardial infarction, stroke) or long-term complications (e.g. congestive cardiac failure due to hypertension and coronary artery disease and cardiovascular, renal, eye or neurological complications due to diabetes) (4, 5).

Provision of health care for NCDs in low- and middle-income countries

NCD levels in low- and middle-income countries are on the rise. If rising trends are to be halted and reversed, current approaches to addressing NCDs need to be changed. At present, the main focus of health care for NCDs in many low-and middle-income countries is hospital-centred. In the case of CVD, a large proportion of people with high cardiovascular risk remain undiagnosed (5, 15) and even those diagnosed have insufficient access to treatment at the primary health-care level (16). Similarly, the majority of people with diabetes have no access to essential health care unless primary health-care facilities are equipped to provide it; secondary and tertiary care facilities can only accommodate a small proportion of the diabetic population, and referral to such facilities is usually limited to patients with complications or those who require special management and care.

When an NCD diagnosis is made, it is often at a late stage of disease, when people become symptomatic and are admitted to hospitals with acute events or long-term complications and disabilities (17–19). When the stage of the disease is advanced, expensive high-technology interventions are required for treatment. Examples of such costly health-care interventions include coronary artery bypass surgery and other types of vascular surgery for unstable angina and cerebrovascular disease, laser surgery for diabetes retinopathy, renal dialysis and transplantation for end-stage renal disease and radiotherapy for advanced cancer.

In many countries, cancer patients have limited or no access to care due to delayed diagnosis, lack of trained oncologists and specialized nursing staff, as well as lack of diagnostic facilities such as pathology services, specialist equipment and drugs (13, 14, 19). Surgery remains the primary and often only treatment modality in low- and middle-income countries where there are insufficient radiation therapy facilities and intermittent availability of chemotherapy agents that, in any event, are often unaffordable. Over 60% of the world's radiotherapy facilities are serving only the 15% of the global population living in the affluent countries. Radiotherapy facilities in developing countries, with 85% of the global population, comprise less than half of the minimum requirements, with 36 countries lacking radiotherapy services entirely (20).

A particular concern in low- and middle-income countries is access to palliative care. The availability of oral morphine and staff trained in palliative care are limited in many low- and middle-income countries, even though these services can be made available at very low cost, so that most cancer patients die without adequate pain relief or psychosocial support (21).

Affordable tools (e.g. clinical measurements, simple laboratory investigations and cardiovascular risk assessment charts) are available for early detection of people with major NCDs and those at high risk (4, 5). Since most major NCDs are asymptomatic in early stages, such tools need to be proactively utilized to avoid delay in diagnosis. In settings where population-wide screening is not

affordable, targeted screening of people in specific situations (e.g. adults over a certain age threshold screened in primary care facilities, work sites and community settings) can be a useful approach used for early detection and diagnosis.

Effective individual health-care interventions for major NCDs

As mentioned above, treating patients in the later stages of NCDs is technology-intensive and expensive. Substantial additional public funding will be required if access is to be extended to high technology interventions (22). Currently, high-cost interventions result in high out-of-pocket spending and catastrophic expenditures for patients (23), which drive families into poverty. Therefore, a key strategic objective in the context of limited resources and the gaps in health systems is to improve access to cost-effective and sustainable health-care interventions that reduce the health and socioeconomic burden of NCDs.

Effective individual health-care interventions fall into three categories (4, 5, 24, 25). One pertains to acute events and should ideally be delivered in special units dealing with coronary care, stroke care or intensive care. A second category of health service interventions deals with complications and advanced stages of disease. They both require health workers with specific skills, high technology equipment, costly treatment and tertiary hospital infrastructure. By contrast, the third category of interventions can be applied at the first level of contact with the health system ; in primary care. These primary health-care interventions are essential for proactive early detection and providing the essential standards of care for the four major groups of NCDs, thereby reducing the demand for the first two categories of interventions (25). Improved access to highly cost-effective interventions at the primary health-care level will have the greatest potential for reversing the progression of the disease, preventing complications, and reducing hospitalizations, health-care costs and out-of-pocket expenditures.

Cardiovascular disease

For primary prevention of coronary heart disease and stroke, individual health-care interventions can be targeted to those at high total cardiovascular risk or those with single risk factor levels above traditional thresholds, such as hypertension and hypercholesterolemia (4). The former approach is more cost effective than the latter and has the potential to substantially reduce cardiovascular events (1, 4, 24, 25). Furthermore, application of this approach is also feasible in primary care in low-resource settings, including by non-physician health workers (25, 26). It has been estimated that a regimen of aspirin, statin and blood pressure-lowering agents may significantly reduce the risk of death from CVD in people at high cardiovascular risk (people with a 10-year cardiovascular risk equal to or above 15%, and those who have suffered a previous cardiovascular event) (27). Providing such a regimen to those eligible between 40–79 years of age has been estimated to avert about one fifth of cardiovascular deaths in the next 10 years, with 56% of deaths averted in people younger than 70 years (27). With effective management, the average yearly cost per head of implementing such a regimen has been estimated to range from US$ 0·43 to US$ 0·90 in low-income countries and from US$ 0·54 to US$ 2·93 in middle-income countries (27).

For secondary prevention of cardiovascular disease (prevention of recurrences and complications in those with established disease), aspirin, beta-blockers, angiotensin-converting enzyme inhibitors and lipid-lowering therapies lower the risk of recurrent cardiovascular events, including in those with diabetes (4, 28). The benefits of these interventions are largely independent, so that when used together with smoking cessation, about three quarters of recurrent vascular events may be prevented (28). Currently there are major gaps in the implementation of secondary prevention interventions that can even be delivered in primary care settings (29).

Aspirin, atenolol and streptokinase are medicines that significantly reduce the relative risk of dying from acute myocardial infarction (24, 30, 31). The incremental cost is less than US$ 25 per DALY averted worldwide for aspirin plus atenolol interventions (24). Similarly prophylaxis for rheumatic fever using benzathine penicillin injections to prevent recurrences and rheumatic valve disease is a cost-saving intervention that can be delivered in primary care settings (25, 32).

Cancer

As highlighted in Chapter 4, comprehensive cancer control encompasses primary prevention, early detection/screening, treatment and palliative care (33). Cost-effective interventions are available across the four broad approaches to cancer prevention and control (24, 25, 33–38). Prevention interventions for cancer are discussed under population-wide interventions. Early detection and screening for cancer have also been covered in Chapter 4 and provide an important complement to primary prevention. Population-based screening for common cancers is also discussed in Chapter 4.

Early diagnosis is essential to reducing cancer morbidity and mortality since cancer stage at diagnosis is the most important determinant of treatment options and patient survival. Early detection is based upon awareness of early signs and symptoms. In a population where the majority of the cancers are diagnosed in late stages, the establishment of an early diagnosis programme is an effective strategy to reduce the proportion of advanced stages and improve survival rates for selected cancers that may be amenable to effective treatment with limited resources (e.g. cervical, breast, oral or skin cancers) (25, 33–38).

The main goals of a cancer diagnosis and treatment programme are to cure or considerably prolong the life of patients and to ensure the best possible quality of life to cancer survivors. The most effective and efficient treatment programmes are those that: a) are provided in a sustained and equitable way; b) are linked to early detection; and c) adhere to evidence-based standards of care and a multidisciplinary approach. Such programmes also ensure adequate therapy for cancer types that, although not amenable to early detection, have high potential for being cured (such as metastatic seminoma and acute lymphatic leukaemia in children), or have a good chance of prolonging survival in a significant way (such as breast cancer and advanced lymphomas).

The first critical step in the management of cancer is to establish the diagnosis based on pathological examination. A range of tests is necessary to determine the spread of the tumour. Staging often requires substantial resources that can be prohibitive in low-resource settings. Because of late diagnosis, however, a consequence of poor access to care, most patients have advanced disease in such settings (14).

Once the diagnosis and degree of spread of the tumour have been established, to the extent possible, a decision must be made regarding the most effective cancer treatment in the given socioeconomic setting. This requires a careful selection of one or more of the major treatment modalities – surgery, radiotherapy and systemic therapy – a selection that should be based on evidence of the best existing treatment given the resources available. Surgery alone, and sometimes radiation alone, is only likely to be highly successful when the tumour is localized and small in size. Chemotherapy alone can be effective for a small number of cancers, such as haematological neoplasms (leukaemias and lymphomas), which can generally be considered to be widespread from the outset. Combined modality therapy requires close collaboration among the entire cancer care team.

Palliative care is essential and effective for adequate symptom control and management of pain in cancer patients, in particular but not exclusively for those in the terminal stage. Patients living with and dying from cancer have the fundamental right to do so with dignity and comfort, irrespective of their disease or where they live. Unfortunately, access to care, oral morphine and staff trained in palliative care is limited in many low- and middle-income countries, so that most cancer patients die without adequate pain relief.

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Pain management must include adequate access to appropriate pain medication. Experience from developing countries confirms that oral morphine is an effective and safe method of managing cancer pain in low- and middle-income countries (21). A recent Cochrane review confirmed that oral morphine is an effective analgesic for moderate to severe cancer pain (39).

WHO has spearheaded the application of pain relief and palliative care in many low- and middle-income countries by providing an analgesic ladder for relief of cancer pain and guidance for the implementation of effective palliative care for cancer (40). Of the several models for palliative care in low- and middle-income countries, those that have been successful rely on community-based programmes and home-based care (40).

Diabetes

There are several interventions for prevention and management of diabetes that have a strong evidence base (Table 1). At least three reduce costs while improving health (24, 25, 41). These are blood pressure control (when blood pressure is above 130/80 mmHg), glycaemic control (in people with HbA1c >9%) and foot care for people with a high risk of ulcers. Blood pressure control in people with diabetes has been demonstrated to be highly effective in reducing the risk of cardiovascular complications as well as retinopathy and nephropathy. In resource-poor settings, it is estimated that blood pressure control is one of the most feasible and cost-effective interventions in people with diabetes.

Table 1. Individual interventions in diabetes with evidence of efficacy (24)

Interventions with evidence of efficacy	Benefit
Lifestyle interventions for preventing type 2 diabetes in people at high risk	Reduction of 35–58% in incidence
Metformin for preventing type 2 diabetes for people at high risk	Reduction of 25–31% in incidence
Glycaemic control in people with HbA1c greater than 9%	Reduction of 30% in microvascular disease per 1 percent drop in HbA1c
Blood pressure control in people whose pressure is higher than 130/80mmHg	Reduction of 35% in macrovascular and microvascular disease per 10 mmHg drop in blood pressure
Annual eye examinations	Reduction of 60 to 70% in serious vision loss
Foot care in people with high risk of ulcers	Reduction of 50 to 60% in serious foot disease
Angiotensin converting enzyme inhibitor use in all people with diabetes	Reduction of 42% in nephropathy; 22% drop in cardiovascular disease

Chronic respiratory disease

The major chronic respiratory diseases are asthma and chronic obstructive pulmonary disease. Standard treatment consists of inhaled salbutamol for intermittent asthma and inhaled salbutamol and corticosteroids for persistent asthma (24, 25). In addition to inhaled salbutamol, inhaled corticosteroids and ipratropium bromide are recommended for moderate to severe chronic obstructive pulmonary disease (24). Due to cost considerations, it may not be feasible to make inhaled ipratropium bromide available in low-resource settings.

In many low-income countries, drugs for inhalation use, such as inhaled steroids, are still not accessible. The International Union against Tuberculosis and Lung Disease has recently developed a drug procurement mechanism called the Asthma Drug Facility (42), for inhaled medications for asthma patients. Countries can explore procurement of quality-assured inhaled drugs at affordable costs from the Asthma Drug Facility in order to improve access to inhaled steroids and salbutamol.

In countries with non-negligible TB prevalence, many patients seek care for respiratory symptoms related to post-TB chronic lung disorder. WHO has developed, in the framework of the Stop TB Strategy, the Practical Approach to Lung Health (43) that aims to improve respiratory care in primary health-care settings. This approach could be usefully linked to the integrated implementation of the package of essential NCD interventions in primary care settings (25).

Self-care programmes

Self-care programmes are seen as a vital form of prevention in those at high risk and in improving outcomes in people with NCDs. They have also been shown to reduce demand on health services and thereby cut costs of care (44). Self-care is defined by WHO as including "activities that individuals,

families, and communities undertake with the intention of enhancing health, preventing disease, limiting illness and restoring health".

Techniques and approaches used in self-care programmes include the "patient as the expert" approach, nurse-led programmes, home self-monitoring techniques and programmes using new information technologies, such as mobile phones, computer networks, web-based tools and telemedicine. In general, self-care programmes aim to increase the interest and involvement of people in their own care, and by doing so, empower them to manage their condition. They use educational or self-management interventions to improve patients' management of their conditions. These interventions are designed to impart knowledge and skills to enable patients to participate in decision-making, to monitor and control the disease and to change behaviour. Published literature demonstrates that patient education for self-care can provide benefits in terms of knowledge, self-efficacy and health status (45). Although the amount of scientific enquiry into the direct associations between increased health literacy and improved health outcomes on NCD-related health outcomes is scant, the impact of health education, an important component of self-care, is known (46), particularly in smoking cessation interventions directed towards individual smokers through individual and group counselling and mass education (47, 48). The effectiveness of individual patient education in the management of diabetes has also been reported to be positive (49) but it is not yet supported by quality evidence (50).

Effective delivery of individual health-care interventions

As explained above, complications that require costly high technology interventions occur in advanced stages of NCDs. Therefore, to improve efficiency, health-system policies should prioritize interventions that are essential for preventing the progression of NCDs (25). For example, by prioritizing access to interventions for assessment and management of high cardiovascular risk, health-care costs related to heart attacks, strokes and revascularization procedures can be reduced (25, 51). Similarly, early diagnosis and treatment of diabetes can prevent diabetic nephropathy and the need for costly renal dialysis (24, 25). Not only do such policies reduce public sector spending on high technology care, they also protect people from catastrophic expenditure.

Gaps exist in all building blocks of health systems: governance; policies and plans; health care delivery; health information systems; health workforce; and access to essential technologies and medicines. Countries will need to address these gaps

The delivery of effective NCD interventions is determined by the capacity of health-care systems. As mentioned before, health systems in many countries are weak in providing the required standards of health care for people with NCDs and there are major gaps in capacity. The gaps exist in all building blocks of health systems: governance; policies and plans; health-care delivery; health information systems; health workforce; and access to essential technologies and medicines. Countries will need to address these gaps in their quest to strengthen health systems and improve NCD health care. A more detailed review of the current situation approaches to address the key gaps is included in Chapter 6.

Effective delivery of individual health-care interventions also depends on accuracy of diagnosis, population coverage, population eligibility, patient adherence to treatment and professional practice (52). In order to maximize effectiveness, barriers to implementation of cost-effective interventions need to be identified and overcome, particularly in primary care. Further, the development of partnerships among health-care providers, patients, families and communities as well as collaboration between public and private health-care sectors, are also likely to be important in enhancing continuity of care required for ensuring effectiveness of individual interventions (53).

Several studies (6, 54, 55) have documented the common inefficiencies and inadequacies in the performance of health systems, which also influence delivery of NCD interventions. First, there is often excessive and inappropriate use of technologies, medicines and costly invasive procedures. Second, there is lack of focus on efficiency. Third, there is failure to operate at the appropriate scale, e.g. underutilization of primary-care facilities and maintaining hospitals with low occupancy rates. Finally, there is a failure to remunerate staff adequately to encourage good performance and offer them incentives to work in rural locations and in primary care.

There are lessons to be learnt from the experience of maternal and child health and communicable disease initiatives on effective approaches to address health system constraints (6). Experience from these initiatives demonstrates that if there is political commitment and favourable public policy, structural constraints can be relaxed through a modest injection of resources. Constraints that

have been shown to be amenable to infusion of new funds include staff, infrastructure, equipment, medicines and supplies and strengthening of planning and budgeting systems. An integrated human resources strategy and decentralization of managerial authority to local levels are also important. Such an integrated human resources strategy needs to look at training and skills requirement, working conditions, performance monitoring and supervision and the development of a coherent career structure.

Strategic choices for improving access to individual health-care interventions

Robust evidence exists for the efficacy of a wide range of health service interventions in reducing morbidity and mortality in people with major NCDs. Most of the interventions referred to in the previous sections of this chapter are cost effective for wide application across the different levels of health systems in developed countries. For low- and middle-income countries, however, the options are more limited due to constraints in resources and weak health system capacity (25). Competing health priorities further complicate prioritization of health service interventions in low- and middle-income country contexts. Given these constraints, and the urgent need to contain the rising epidemic of NCDs, low- and middle-income countries need to prioritize investment of available resources in individual health-care interventions that will provide a good return (**best buys**); very cost-effective individual interventions that are feasible for implementation on a wide scale can also have a high impact.

As mentioned in Chapter 4, an intervention is defined as 'very cost-effective' if it is capable of generating an extra year of healthy life or averting a DALY for less than the average annual income per person in the resource setting where it will be applied. Interventions that produce a healthy life year for more than that but still less than three times average per capita income can still be considered 'cost-effective' (56). To be considered a **best buy**, an intervention also needs to be financially affordable (e.g. costing no more than one US dollar per capita population each year in lower-income countries) and pragmatic and feasible to implement in close to client, non-specialized health-care settings.

As listed in Table 2, among the cost-effective interventions that target people with disease and at high risk, there are several **best buys** (very cost-effective, high impact, affordable and feasible interventions) for low- and middle-income countries. For example, counselling and multidrug therapy (including glycaemic control for diabetes) for people with a 10-year risk of fatal or non-fatal cardiovascular events ≥ 30%, and aspirin treatment for acute myocardial infarction together, have the potential to reduce the cardiovascular disease burden by 37%, and comprise a combined a **best buy**. Similarly, early detection and treatment of lesions of early stage cervical cancer are a **best buy** that will reduce the cancer burden by 5%.

Table 2. Health care interventions to tackle noncommunicable diseases: identifying 'best buys'

Disease (% global burden; DALYs [a])	**Interventions / actions** (* core set of 'best buys')	**Avoidable burden** *(DALYs averted, millions)*	**Cost–effectiveness** [b] *(US$ per DALY prevented) [Very = < GDP per person; Quite = < 3* GDP per person Less = >3* GDP per person]*	**Implementation cost** *(US$ per capita) [Very low = < US$ 0.50; Quite low = < US$ 1 Higher = > US$ 1]*	**Feasibility** *(health system constraints)*
Cardiovascular disease (CVD) and diabetes (170 m DALYs; 11.3% global burden)	**Counselling and multidrug therapy (including glycaemic control for diabetes mellitus) for people (≥30 years), with 10-year risk of fatal or nonfatal cardiovascular events ≥ 30% * [c]**	60 m DALYs averted *(35% CVD burden)*	Very cost-effective	Quite low cost	Feasible (primary care)
	Aspirin therapy for acute myocardial infarction *	4 m DALYs averted *(2% CVD burden)*	Very cost-effective	Quite low cost	
	Counselling and multidrug therapy (including. glyceamic control for diabetes mellitus) for people (≥ 30 years), with a 10-year risk of fatal and nonfatal cardiovascular events ≥ 20%	70 m DALYs averted *(40% CVD burden)*	Quite cost-effective	Higher cost	
Cancer (78 m DALYs; 5.1% global burden)	**Cervical cancer screening (VIA), and treatment of pre-cancerous lesions to prevent cervical cancer***	5 m DALYs averted *(6% cancer burden)*	Very cost-effective	Very low cost	Feasible (primary care) Treatment may require referral
	Breast cancer – treatment of stage I	3 m DALYs averted *(4% cancer burden)*	Quite cost-effective	Higher cost	Not feasible in primary care
	Breast cancer – early case-finding through biennial mammographic screening (50–70 years) and treatment of all stages	15 m DALYs averted *(19% cancer burden)*	Quite cost-effective	Higher cost	
	Colorectal cancer-screening at age 50 and treatment	7 m DALYs averted *(9% cancer burden)*	Quite cost-effective	Quite low cost	
	Oral cancer – early detection and treatment	Not established globally	Not assessed globally	Not assessed	
Respiratory disease (60 m DALYs; 3.9% global burden)	Treatment of persistent asthma with inhaled corticosteroids and beta-2 agonists	Not established globally *(expected to be small)*	Quite cost-effective	Very low cost	Feasible (primary care)

[a] DALYs (or disability-adjusted life years) are widely used as a measure of premature mortality and ill-health - one DALY can be thought of as one lost year of healthy life.
[b] See Annex for sources of evidence
[c] Includes prevention of recurrent vascular events in people with established coronary heart disease and cerebrovascular disease.

Prioritizing and financing the core set of **best buys** may be a pragmatic first step to achieving the long-term vision of universal coverage (25, 57). Countries will need to make their own choices regarding other essential health-care interventions to address major NCDs. While a comprehensive set of cost-effective interventions could be implemented in a high-income country (58), what is feasible in low- and middle-income countries will depend on the level of health-care spending, competing health priorities and the capacity of the health system.

In order to make progress, two key issues require consideration at the country level: a) identifying constraints for delivering NCD interventions and options available to deal with them; b) determining the total costs of expanding coverage of **best buys** and other essential NCD interventions and sustaining them. An in-depth understanding of the type, severity and range of constraints will be invaluable for countries in making these strategic choices.

Key messages

- A range of cost-effective interventions is essential to proactively detect and effectively treat individuals with noncommunicable diseases, and protect those who are at high risk of developing them.
- When cost-effective health-care interventions are complemented with population-wide prevention strategies, a significant impact can be made on the global NCD epidemic.
- To improve efficiency, health-system policies should prioritize interventions that are essential for preventing the progression of NCDs. Limited resources and weak health systems in low- and middle-income countries, demand prioritization of a package of essential NCD interventions including **best buys** (high impact, very cost-effective, affordable and feasible interventions).
- Financing and strengthening health systems to deliver the **best buys** through a primary health-care approach is a pragmatic first step to achieve the long-term vision of universal coverage.

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Chapter 6
Tackling NCDs: the capacity of countries to respond

In the past decade, countries have expanded their capacities to respond to the epidemic of noncommunicable diseases. Real progress, though uneven, has been made. Many countries have developed NCD strategies, plans and guidelines, although a substantial proportion of them are not yet operational. Some countries have created components of the health infrastructure that is essential to containing the spread of NCDs, but have not effectively funded or implemented them. However, the existence of initiatives to combat the NCD epidemic in a growing number of countries provides a strong foundation to extend progress in the coming years through increasingly robust efforts.

This chapter presents an assessment of the capacity of Member States to prevent and control NCDs based on surveys completed by WHO in 2000 and 2010. It reviews some specific gaps and challenges in the response of health systems in Member States and concludes with recommendations on actions to respond to the challenges and build country capacity.

In 2000, WHO conducted a global survey to assess national capacity for NCD prevention and control. About 88% of Member States (167 countries) completed the survey. The results showed that a key gap in taking action on NCDs was the lack of capacity of health systems (1).

In 2009 and 2010, WHO conducted a further assessment of national capacity to undertake NCD prevention and control. All WHO Member States were invited to take part and the full list of Member States that completed the survey is available on the Global Status Report website.[13]

An electronic questionnaire covering health system infrastructure; funding; policies, plans and strategies; surveillance; primary health care; and partnerships and multilateral collaboration was sent to NCD focal points, or designated colleagues within the ministry of health or a national institute/agency. The questionnaire was distributed in 2009 with a deadline for responses of March 2010. The final completion rate was 95% (184 countries). The questionnaire was designed to reflect both the recommendations of *The World Health Report 2008* on primary health care (2), which set out reforms for universal coverage, service delivery, public policy and leadership, and the six WHO building blocks for health system strengthening: governance, health financing, health workforce, information systems, medical products and technology, and service delivery (3).

A similar approach was used in the 2000 survey, when only 167 Member States responded. Although all 184 responses were included in the 2010 analysis, only the 157 that completed both the 2000 and 2010 surveys were used when assessing progress made between 2000 and 2010. In the following sections of this chapter, general descriptions of survey results refer to 2010 data unless specifically stated otherwise.

Health system infrastructure

In 2010, most countries reported that they had a ministry of health unit, branch or department with responsibility for NCDs (Table 1:[14] Percentage of countries with NCD units within the ministry of health and supporting units). In 2000, only 61% of countries reported having such units.

This trend suggests that in most countries, ministries of health recognize that NCDs pose a significant public health problem and require specific attention, although there is no accurate information on the level of political commitment to address NCDs or the capacity of such units to implement prevention and control initiatives.

[13] http://www.who.int/chp/ncd_global_status_report/en/

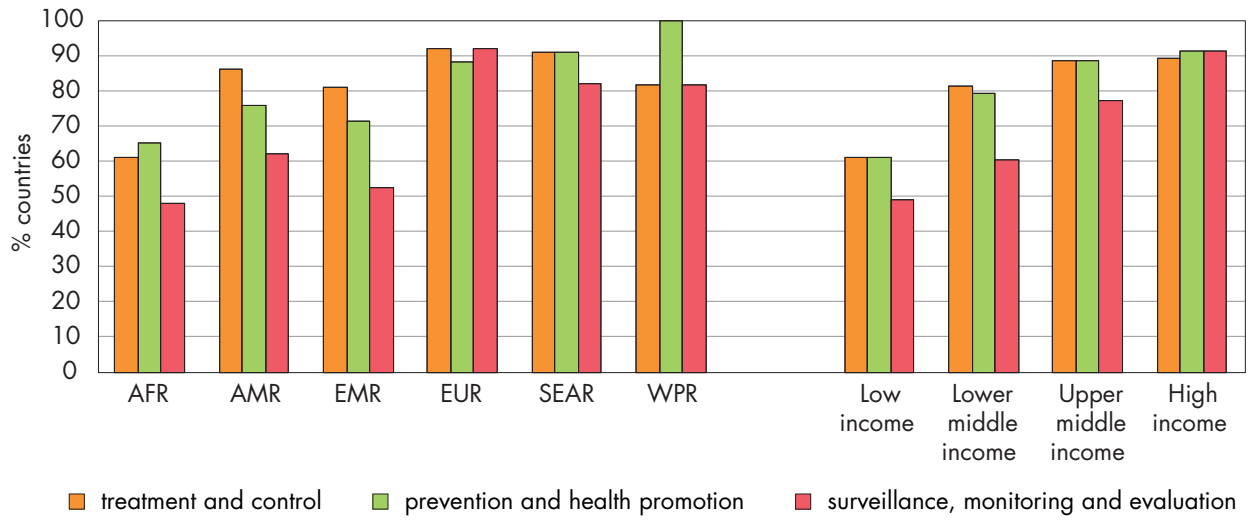
[14] Table 1 is available as a web-based annex at: http://www.who.int/chp/ncd_global_status_report/en/

The majority of countries also had at least one national agency or institute that helps prevent and/or control NCDs. These agencies and institutes may conduct a wide range of functions, including scientific research, policy research, coordination and development of policy, NCD and risk factor surveillance, information management, development of treatment guidelines, as well as training and health promotion.

Funding

Almost 90% of countries reported that some funding was available for NCD prevention and control. Funding was greatest in the WHO Western Pacific Region, the South-East Asia Region, and European Region (Figure 1). Not surprisingly, funding was also more likely to exist in higher-income countries.

Figure 1. Proportion of countries with funding for NCD activities, by function, WHO Region and World Bank income group, 2010



When assessed according to funding targets, 80% of countries had funding for NCD treatment, and the same percentage report funding for NCD prevention and health promotion. In most cases, the major source of funding was the national government (85%), but health insurance, earmarked taxes and international donors are also important sources of NCD funding (Table 2:[15] Major funding sources for NCDs). International donors were reported as a source of some funding for NCD activities in low- and lower-middle-income countries, despite the generally limited funding provided to this area of work by international development agencies.

Twenty countries had no NCD funding stream, and there was a lower level of funding in low-income countries: one third of low-income countries have no funding at all for NCD prevention and control. This is a particular problem in the African Region.

Proportionately fewer low-income countries receive funding from government sources. Around 65% of low-income countries receive government revenues for NCDs compared to about 90% of middle- and high-income countries; 12% of low-income-countries receive funds from health insurance compared to 40–50% of other countries; and 7% of low-income countries receive earmarked taxes compared to about 20–25% for other countries. Also, a smaller percentage of low-income countries receive donations compared to lower-middle income countries (59% compared with 83%).

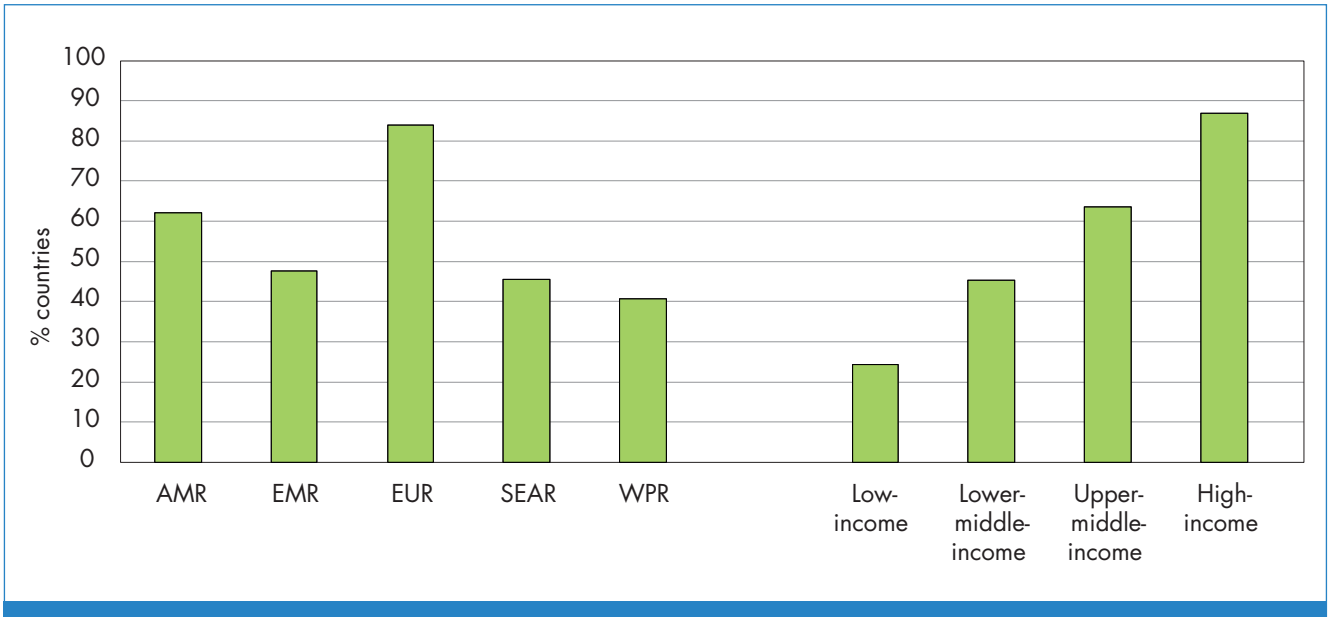
[15] Table 2 is available as a web-based annex at: http://www.who.int/chp/ncd_global_status_report/en/

High-income countries were nearly four times more likely to have NCD services and treatments covered by health insurance than low-income countries

Among all countries there is little earmarking of tobacco and alcohol taxes for NCD programmes. Only 20% of countries reported that they use earmarked taxes to fund NCD prevention and control, and this was lower in low- and lower-middle-income countries. Tobacco taxes are widely collected across all regions and all national income groups and provide a potential opportunity for earmarking for health budgets in general, or specifically for NCD prevention and control.

Many countries also provide health insurance, either social or private, to cover NCD-related services and treatment (Figure 2). The proportion of countries with such insurance schemes rose with increasing national income level: high-income countries were nearly four times as likely to have NCD services and treatments covered by health insurance than low-income countries. Countries with inadequate health insurance coverage are unlikely to provide universal access to individual health-care interventions for NCDs. Consequently, high out-of-pocket expenditures are incurred for routine services, with a greater likelihood of catastrophic spending by individuals and families in the event of life-threatening NCDs.

Figure 2. Proportion of countries where NCD-related services and treatments are generally covered by health insurance, by WHO Region and World Bank income group, 2010



Policies, plans and strategies

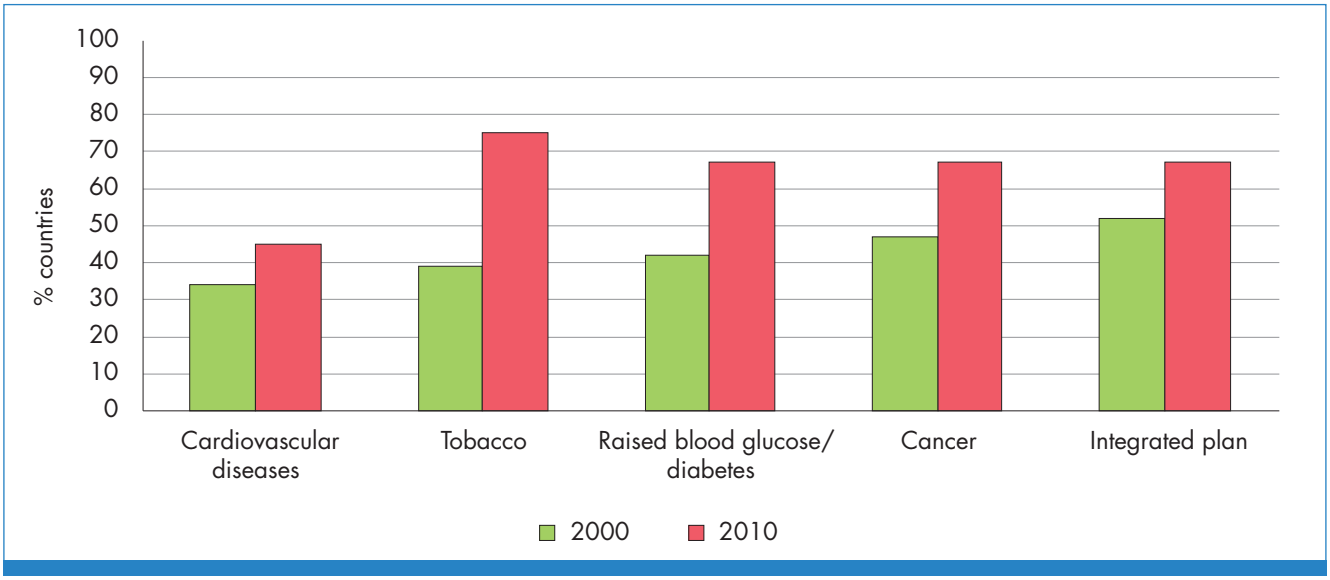
Globally, the number of NCD policies, plans and strategies has increased substantially. About 92% of countries have developed at least one policy, plan or strategy to address NCDs and/or their risk factors. Moreover, the percentage of countries with policies, plans and/or strategies has risen significantly since 2000 (Figure 3). Taking integrated[16] NCD plans as an example, from 2000 to 2010 the percentage of countries rose from 52% to 67%.

The widespread presence of a policy, plan or strategy is a positive finding since they are the cornerstones of NCD prevention and control. They show that countries have national frameworks to guide the development and implementation of interventions – and suggest there is widespread recognition of the need to deal with NCDs.

Despite this positive trend, there are significant variations between diseases and risk factors. Figure 4 shows that fewest plans for tackling NCDs had been developed for chronic respiratory disease. For risk factors, tobacco control policies and plans are available in more than 80% of countries, for

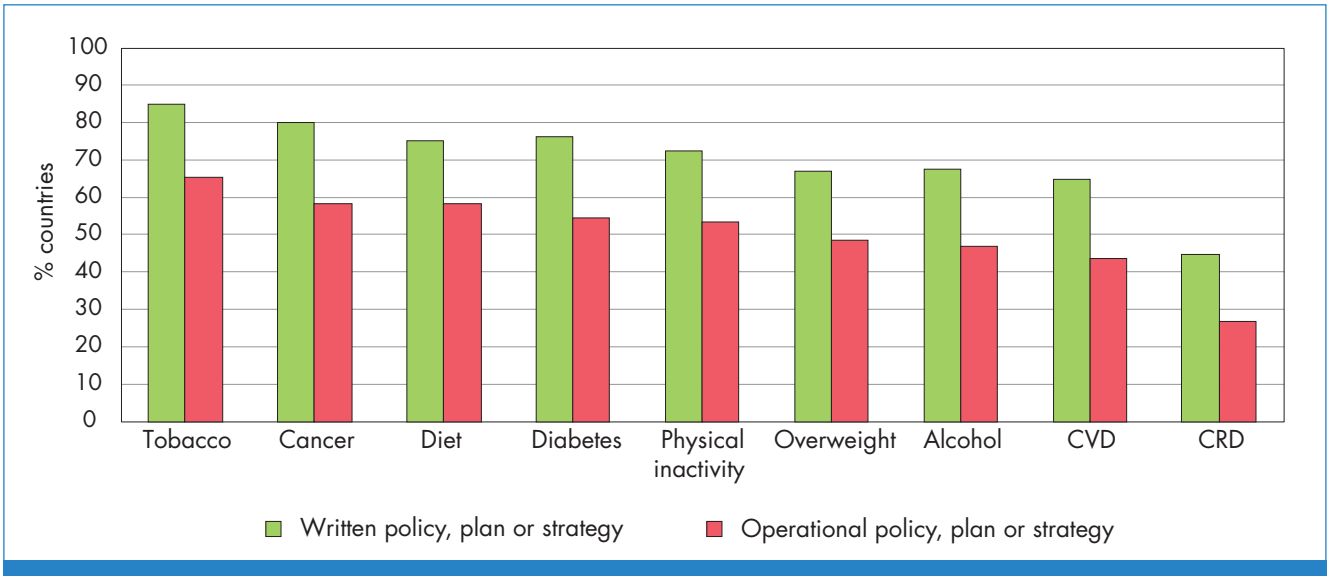
[16] 'Integrated' in this context refers to policies/plans/strategies that focus on more than one of the major chronic diseases and/or more than one of the key risk factors for NCDs.

Figure 3. Percentage of countries with specific policies, plans or strategies, 2000–2010



addressing diet and physical inactivity in around 75%, and the fewest plans have been developed for tackling harmful alcohol consumption. Although the priorities for establishing policies and plans should be based on the burden of diseases and prevalence of the risk factor as well as the availability of cost-effective interventions, the pattern in Figure 4 indicates that this is not always the case.

Figure 4. Percentage of countries with policies, plans or strategies, either integrated or disease/risk-factor specific, according to different diseases and risk factors, 2010



It is important to note that having a policy, plan or strategy on paper does not necessarily mean that it is implemented or funded. As seen in Figure 4, a considerable proportion of policies and plans were not described by respondents as being operational. In addition, on average, countries reported that only 50% of NCDs policies, plans and strategies were being adequately funded.

Finally, many countries did not have measurable outcome targets in their policies, plans and strategies, nor did they include monitoring or evaluation components. Overall, while policies, plans and strategies exist, many are not implemented or are of insufficient quality.

Surveillance

Surveillance for NCDs should cover monitoring of risk factors, health outcomes (mortality and morbidity) and system capacity. Based on the survey, more than 80% of countries reported NCD mortality as part of their national health information systems. A similar percentage reported that morbidity related to NCDs is included, but only 21% of countries reported that such data were population-based. Although the data reported suggest improvements over the past decade, they do not provide information on completeness and quality of mortality data, since fewer countries currently report reliable cause-specific mortality data on regular basis to WHO. Regardless of the completeness and reliability of data, 16% of countries still have no mortality or morbidity surveillance at all. Significantly, far fewer countries reported that they had population-based mortality data for NCDs.

Written reporting on NCD mortality in national health information systems is another specific challenge: only 61% of countries said they had produced a report on these data in the last three years (2007 or later). Overall, the gaps were much greater in lower-income countries (Figure 5:[17] Prevalence of WHO Member States with NCD-related mortality data included in their national health information system, by income group). High-income countries were 16 times more likely to have population-based NCD mortality data in their national health information system than low-income countries. The same pattern was observed for population-based morbidity monitoring, with high-income countries three times more likely to have morbidity data in their reporting system.

Significant progress has been made over the past 10 years on risk factor surveillance, including surrounding population-based data and in lower-income countries. Tobacco use surveillance in Member States has increased from 61% to 92%; physical inactivity from 38% to 73%; blood glucose from 53% to 76%, diet from 59 to78%; blood pressure from 49% to 81%, and overweight/obesity from 62% to 80%. Analysis suggested that lower-income countries are catching up with higher income groups in risk factor surveillance – and in some cases surpassing high-income countries. Nevertheless, despite this progress, data on NCD risk factors are still less likely to be included in a country's national health information system than mortality and morbidity data.

Because of the constraints on surveillance, as described in Chapter 3, many countries have not implemented standardized data collection, essential to tracking NCDs and their risk factors over time. Implementing the framework on national surveillance systems presented in Chapter 3 and adopting a set of core indicators under each of its three core components provides a way forward for many countries to strengthen monitoring of trends and assessing the progress they are making to address the NCD epidemic.

The availability of NCD treatments in low-income countries is one quarter that of high-income countries. Even in hospital settings in low-income countries, there is limited availability of basic technologies required for NCD care

Primary health care

About 80% of countries report having primary prevention, health promotion, risk factor detection, and risk factor and disease management built into their health-care systems (Figures 6 and 7). However, less than 60% of countries have systems to support self-help and self-care, and less than 50% have home-based care services. An even greater challenge is the very low percentage of countries with government-approved, evidence-based national guidelines, protocols or standards for managing NCDs: just over half (53%) of countries have such guidelines, and only 17% of countries are implementing them.

The availability of NCD treatments in low-income countries is one quarter that of high-income countries. Even in hospital settings in low-income countries, there is limited availability of basic technologies required for NCD care and rehabilitation. Results of the survey show the poor availability of basic technologies and treatment, particularly for cancer and diabetes in primary care in many low-income and lower-middle-income countries, but basic services were not available in about 10% of high-income countries either. This underscores the need to continue to advocate for universal coverage for the management and health care of people with NCDs. As can be seen

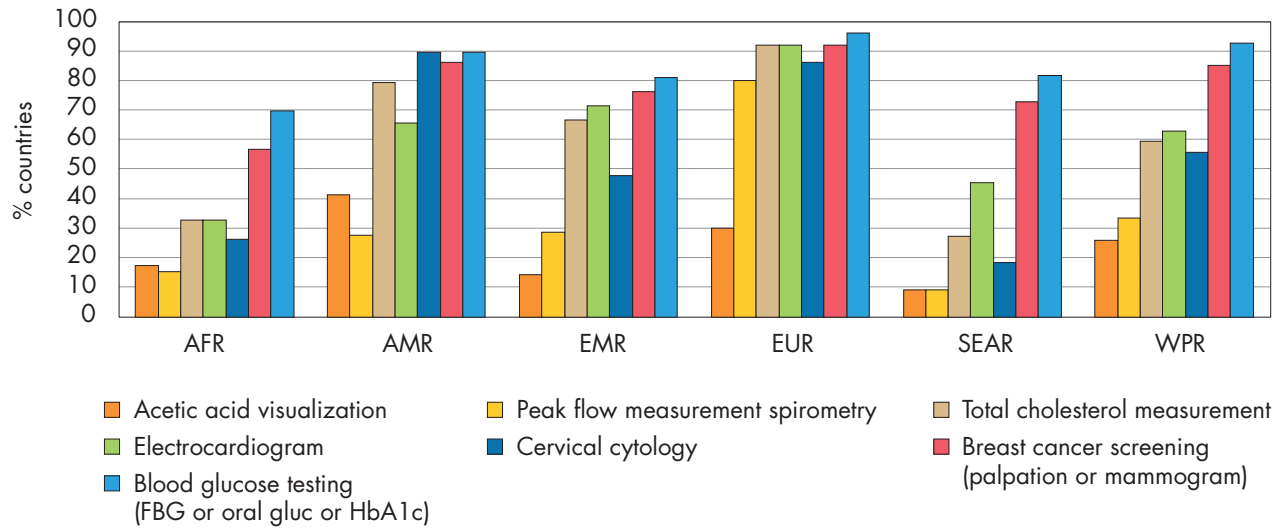
[17] Figure 5 is available as a web-based annex at: http://www.who.int/chp/ncd_global_status_report/en/

in Figure 7, there is no access to basic management of end-stage renal disease, chemotherapy and radiotherapy for cancer and photocoagulation services to prevent blindness in the public health systems of nearly two thirds of countries in some regions. Although universal coverage should be the long-term objective, a short- and medium-term measure in many low- and middle-income countries could be to expand the package of interventions available at the primary health-care level to include the essential package of interventions for the management of cardiovascular diseases, diabetes, cancer and chronic lung disease.

The above also highlights the importance of preventing diabetic and cardiovascular complications through early diagnosis and effective treatment in countries where the facilities and experienced human resources for managing these complications are not widely available.

Figure 6. Availability of laboratory tests and basic technologies in primary care

6a) By WHO Regions, 2010



6b) By World Bank income group, 2010

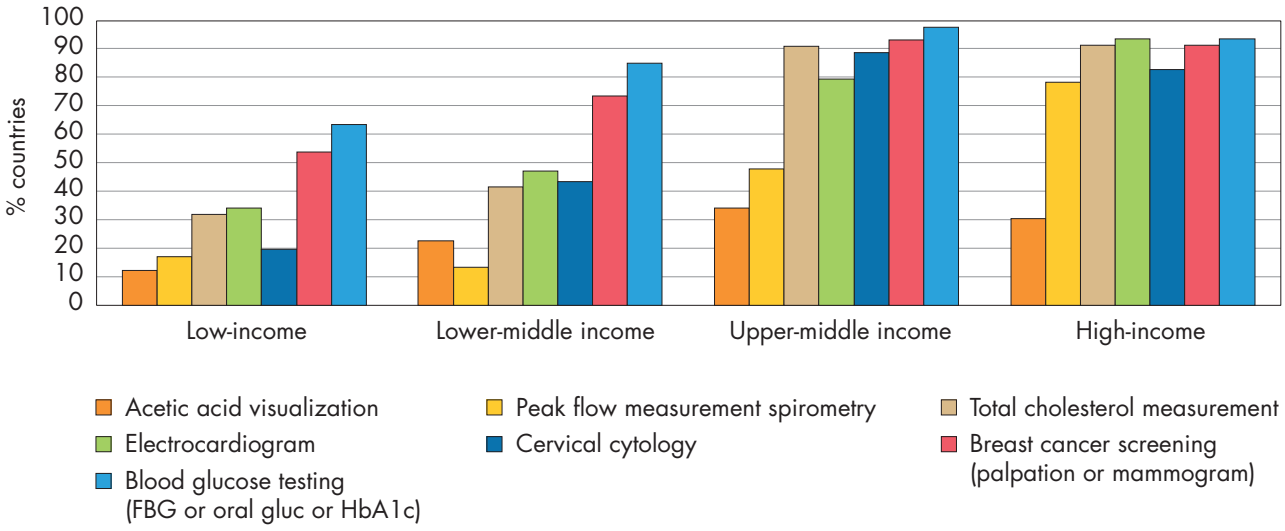
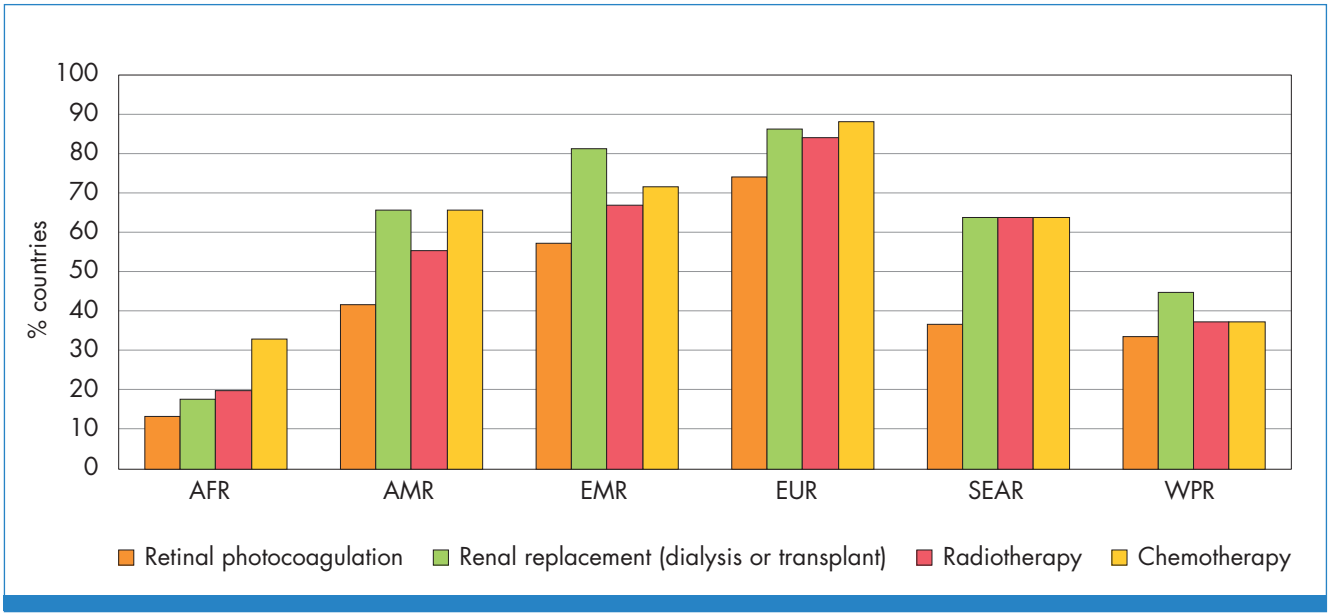
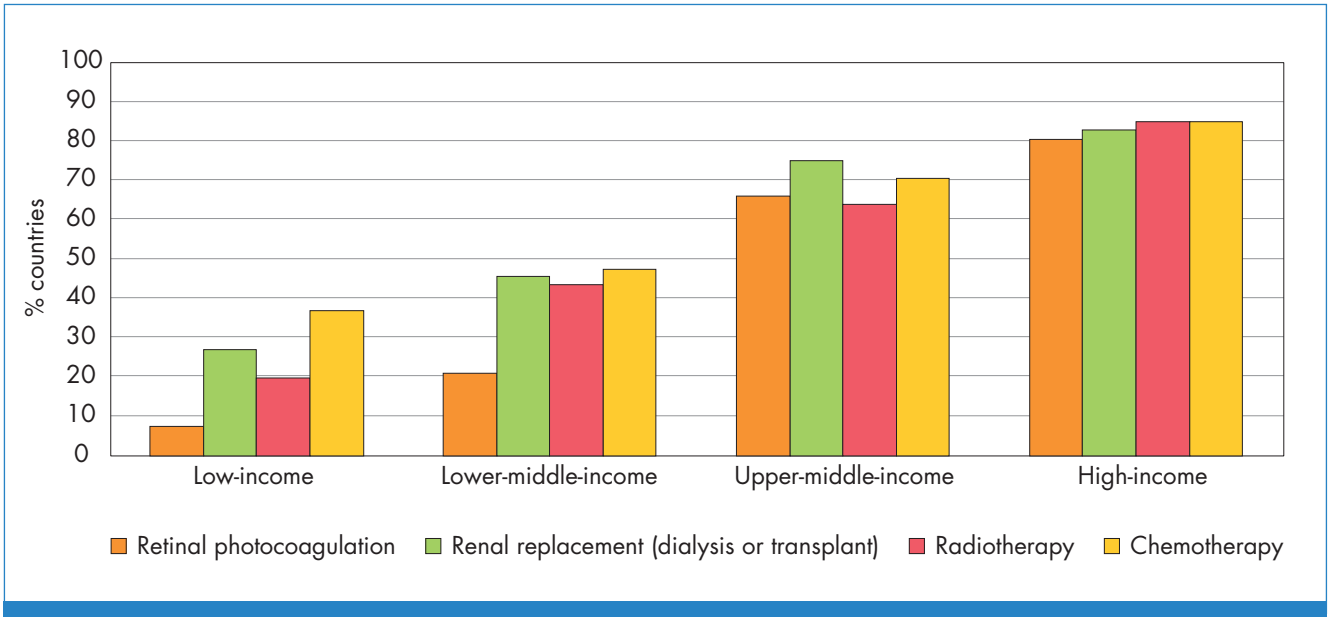


Figure 7. Availability of selected procedures to treat NCDs in public health systems

7a) By WHO Regions, 2010



7b) By World Bank income group, 2010



The survey provided information on the availability of basic medicines required for treatment of NCDs. Essential medicines for the management of diabetes and cardiovascular diseases were reported as available in primary care in more than three quarters of countries; however, these results were based on responses to a questionnaire which are inconsistent with available evidence that shows a much lower availability of essential medicines for NCD (4, 5). Yet this questionnaire survey revealed particularly striking findings of low availability of statins, oral morphine and steroid inhalers in primary care in low- and lower-middle-income countries and lack of nicotine replacement therapy in nearly 20% of the primary care facilities in high-income countries.

Partnerships and multisectoral collaboration

Partnerships, inside and outside of health systems, play a key role in the success of NCD prevention and control. Such partnerships include collaboration among health-care teams, patients, families,

communities and other relevant partners. Nearly 90% of countries reported the existence of partnerships or collaborations for implementing key NCD activities. Tobacco use and diabetes (84% and 81% respectively) were the areas most often covered by such partnerships.

Some of the mechanisms in operation for multisectoral collaboration were inter-departmental committees, ministerial committees, task forces, academia and nongovernmental/civil society bodies. However, the study was not able to determine the effectiveness and impact of partnerships on accelerating progress towards NCD prevention.

Limitations of the 2010 survey

Inevitably, the most recent survey has some limitations. The information was provided by the NCD focal points in each country and may be subject to responder bias. For example, studies in selected low-income countries have revealed major gaps and considerably lower levels of availability for essential medicines than were reported in this study (4, 5). In these studies, up to two thirds of generic medicines were not freely available in the public sector and almost 50% were not available in the private sector. It was helpful, however, that two regions added a validation step where responses were checked by senior health officials. In addition, independent validation was completed for a number of specific survey responses. Where discrepancies were found, clarification was requested from the country.

A second limitation is that a global survey cannot possibly take into account the specific situation and variation in every country. This may be particularly true for countries with a federated system or a highly decentralized NCD system. A further limitation is that although the questionnaire and instructions were translated from English into a number of the WHO official languages (e.g. French, Russian and Spanish), there may have been language constraints regarding interpretation of the questionnaire.

A final limitation was that neither the 2000 nor 2010 surveys provided significant information on the engagement of non-health sectors, which are so crucial in the response to NCDs. This is an area for future WHO activity.

Meeting the challenges: actions to expand country capacity and address health systems gaps

The delivery of effective NCD interventions is largely determined by the capacity of health-care systems. Available data, including the surveys conducted by WHO in 2000 and 2010, reveal major gaps in health-system capacity in many low- and middle-income countries. Low- and middle-income countries were much less likely to provide adequate health care for people with NCDs within their primary health-care systems.

The gaps in the provision of essential services for NCDs often result in complications such as heart attacks, strokes, renal disease, blindness, and peripheral vascular diseases and the late presentation of cancers. This can also mean catastrophic spending on health care for low-income families and consequent poverty.

Health systems that deliver care for NCDs

In any health system, good health services are those that deliver effective, safe, high quality, personal and non-personal care to those who need it, when needed, with minimum waste. Prevention, treatment or rehabilitation services can be delivered in the home, the community, the workplace or in health facilities. The section below explores crucial health system components (or building blocks) in more detail.

Governance: policies and plans

The widespread presence of NCD policies or plans at the country level shows that health ministries are increasingly recognizing the importance of addressing NCDs. However, the 2010 survey showed that a substantial proportion of policies and plans are not operational. A recent review of national health strategies and plans revealed that NCDs are not included as priorities in a large number of plans. Effective implementation of the policies and plans has to be intensified. To this end, in addition to increasing funding and personnel, measures must be undertaken (6) to ensure that:

- National policies and plans are developed based on accurate situation analysis and priority-setting, with specific and measurable outcome indicators.
- A strategy is in place for translating these policies into implications for financing, human resources, pharmaceuticals, technology, infrastructure and service delivery, along with relevant plans and monitoring and evaluation targets.
- Coalitions and alliances are built in multiple sectors through shared vision, pooled resources and greater harmonization of action among key stakeholders.
- Best practices in policy and plan development, and implementation, become better understood, documented and disseminated.

Financing and funding

Limited funding for essential NCD interventions, and the health sector in general, is at the root of many country capacity challenges. Health financing is key to improving health and reducing health inequities. *The World Health Report 2010* on health system financing (7) recommends several critical actions to improve support for interventions:

- Increasing efficiency of revenue collection and give priority to NCD prevention and control, when allocating government budgets.
- Improving access to social health insurance and include NCD prevention and control in health insurance.
- Introducing innovative financing for NCD prevention and control, such as increased tobacco and alcohol taxes, or levies on air travel tickets or foreign exchange transactions.
- Including NCD prevention and control as a priority for official development assistance, particularly to lower-income countries.

Health information systems

The gaps in national health information systems, the scarcity of standardized data on NCDs and their determinants, as well as the absence of global and national monitoring schemes, are key issues that require urgent attention. Chapter 3 addresses these gaps and provides a framework for national NCD surveillance schemes that can be feasibly implemented in all countries and a set of core indicators to monitor trends at global and national levels.

Health workforce

A sufficient, well-distributed, adequately trained, organized and motivated health workforce is at the heart of an effective response to NCDs. Health workers, particularly those in remote and rural areas, must have appropriate skills and competencies through pre-service education and in-service training. They must also have access to infrastructure and essential tools, as well as improvements in working conditions such as financial incentives, career development opportunities, and easy access to information technology. Moreover, NCD prevention and control also require collaboration and coordination across sectors. To these ends, health workforce policies and plans need to be developed and be firmly integrated with wider national health strategies. Strong leadership is essential to influencing others within the workforce and creating an environment in which effective policies can be developed and implemented. Lastly, investment needs to be made in information technology to

improve patient data and record management and communication between health workers, as well as between workers and their service recipients. Recommendations on health workforce development have been set out by WHO and in reviews on prevention and management of chronic diseases (7–15). In short, the key recommendations are:

- Establishing strong leadership nationwide and integrating NCD in all phases of health workforce development and management, and health workforce policies in national health strategies.
- Reviewing pre-service educational curricula to ensure that knowledge and skills required for essential NCD health care are included.
- Strengthening training and continuing education programmes provided to health workers, particularly in remote and rural areas.
- Establishing multi-disciplinary teams to implement continuing and coordinated care for NCD prevention and control.
- Creating positive work environments, for example, ensuring availability of essential supplies, referral services and supportive management.

Essential medicines and technology

Appropriate use of essential medicines and technologies can significantly reduce morbidity and mortality from NCDs (16, 17). However, in many low- and middle-income countries, access is limited and prices are high (4, 5). Many measures have been identified to facilitate access to quality medicines and technologies in low-resource settings (6, 7, 17).

Policy options to improve the quality and availability of medicine and technology (18) include:

- Rational selection of a limited range of essential medicines and technologies.
- Development, promotion and dissemination of independent, evidence-based clinical guidelines.
- Prioritization on the basis of proper health technology assessment, which includes clinical effectiveness, as well as economical, social and ethical impacts of the use of the medicines and medical devices.
- Monitoring of quality and safety of medicines and medical devices for NCDs require functional national regulatory authorities that are adequately resourced and staffed to inspect facilities and products and to enforce the regulations.
- Promotion of quality use of medicines and medical devices by health professionals and consumers. This can be done through a dedicated national body to monitor and promote quality medicine and technology use; national essential technologies and medicines lists; drugs and therapeutic committees in all major hospitals and districts; and, financial (reimbursement or pricing) incentives.

Policy options to promote affordable prices of medicines (7, 18, 19) include:

- Generic policies and social marketing of generic essential medicines through the private sector.
- National clinical guidelines that recommend essential medicines for which generic products are available.
- Improved public procurement; separating the prescribing and dispensing; controlling the wholesale and retail mark-ups through regressive mark-up schemes.
- Exempting essential medicines from import tax and value-added tax and using the flexibilities of international trade agreements to introduce generics while a patent is in force.

Medicines and technology will always account for a substantial proportion of direct costs of NCD programmes. Thus, increasing public funding for essential NCD medicines and technology remains critically important for countries and global partners. To avoid catastrophic spending by patients, the expansion of drugs and technology benefits as part of health insurance schemes are necessary.

Indicators for reporting progress

Determining progress in building capacity requires development of a uniform set of country capacity indicators for NCD prevention and control that can be measured in the future. The framework for NCD surveillance presented in Chapter 3 can be used to assess the progress in scaling up capacity to address NCDs. A core set of indicators, available in Annex 5, can be used for this purpose.

Key messages

- Country capacity for the prevention and control of NCDs have seen significant improvements in the past decade.
- While many countries have components of the necessary health infrastructure in place, they are often not adequately funded or operational.
- Strengthening political commitment and according a higher priority to NCD programmes are key to expanding health system capacity to tackle NCDs.
- NCD programmes and policies need to be aligned with strong national plans that strive to achieve people-centred care, delivered through strong integrated health systems.
- Guidance on effective policies and strategies to address health systems gaps now exists and needs to be used.
- Growing country capacity for combating the NCD epidemic indicates that there is a significant opportunity for progress over the coming years.

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Chapter 7
The way forward: taking action based on evidence and lessons learnt

Through the *Global Strategy for the Prevention and Control of Noncommunicable Diseases* and its 2008–2013 Action Plan, Member States signalled the pressing need for countries and the international community to take concrete and sustained action to reverse the NCD epidemic. Both the Global Strategy and the Action Plan were developed through the active engagement of Member States, and vigorously discussed and endorsed by them during the 53rd and 61st World Health Assemblies respectively.

Current evidence unequivocally demonstrates that NCDs are largely preventable. Countries can reverse the advance of these diseases and achieve quick gains if appropriate action is taken

Cardiovascular diseases, cancers, diabetes and chronic respiratory diseases are the biggest threats to health globally, with similar burden as infectious diseases; their impact undermines social and economic development at the community, national and global levels. While the magnitude of these health challenges has been progressively rising across the globe during the last three decades, so have substantial improvements in knowledge and understanding about their prevention and control. As highlighted in previous chapters, current evidence unequivocally demonstrates that these diseases are largely preventable. Countries can reverse the advance of these diseases and achieve quick gains if appropriate action is taken. This chapter reviews the lessons learnt over the past few decades and summarizes priority areas for action at the national and global levels.

Lessons learnt

Review of international experience and examination of the existing knowledge and evidence base provide important lessons and critical messages to policy-makers to guide policy development and programmatic decision-making on NCDs.

The following lesson summaries are based on a review that was first completed in 2000 in preparation for the development of the Global Strategy (1, 2), and that was subsequently updated following a global consultation organized by WHO in 2010.

A comprehensive approach to prevention

- In any population, the majority of people have a moderate level of exposure to NCD risk factors and a minority has a high level of exposure. An exposure in this context is either an external risk factor, such as tobacco use, or a physiological condition, such as raised blood pressure. When observed as a whole, the larger, moderate risk group contributes more to the total burden of NCDs than the minority group with higher risk. Comprehensive NCD prevention strategies must take this into account, and blend together two types of approaches: public health interventions aimed at reducing population-level risk factor levels, and medical interventions targeted specifically at high-risk individuals.
- Both population-wide primary prevention approaches and individual health-care strategies are needed to reduce NCDs and their impact. In countries that have achieved major declines in cardiovascular deaths, for example, declines are attributed to reduced NCD incidence rates combined with improved survival after cardiovascular events, due to dual prevention and treatment initiatives.
- Risk factors can be encountered at all ages, and risk-associated behaviours may be adopted early in life. As a result, comprehensive, long-term strategies for control of NCDs must take a life-course approach to prevention of risk factor exposure, commencing in early life and continuing with interventions for adults and the elderly.

Surveillance and monitoring

- Monitoring and evaluation of NCDs is essential to policy and programme development.

Three key areas require monitoring: exposures (risk factors and determinants), outcomes (morbidity and cause-specific mortality), and assessment of health system capacity and response. Measurable core indicators for each have to be adopted and used to monitor trends and progress.

- For a surveillance system to be effective it should be integrated into the national health information system, and supported by long-term funding.
- High-quality risk factor surveillance is possible even in resource-limited settings and countries. Risk factor surveillance is a priority within a more comprehensive NCD surveillance framework, as it provides both the impetus for current action and predicts future burden trends.

Multisectoral action

- Experience has shown that community-based NCD programmes both inform and support national action towards appropriate policy formulation, as well as legislative and institutional changes. Effective community-based NCD interventions require a number of combined elements at the national level: meaningful community participation and engagement, supportive policy prioritization and setting, multisectoral collaboration and active partnerships among national authorities, nongovernmental organizations, academia and the private sector.
- Decisions made outside the health sector often have a major bearing on factors that influence NCD-related risk. More prevention gains may be achieved by influencing public policies in domains such as trade, food and pharmaceutical production, agriculture, urban development, pricing, advertising, information and communication technology and taxation policies, than by changes that are restricted to health policy and health care alone.

Health systems

- The long-term needs of people with NCDs can only be addressed by reorienting existing organizational and financial arrangements surrounding health care. Initiatives aimed at improving health systems performance and reform should additionally include specific NCD-related endpoints in universal coverage goals.
- Broad-based initiatives to achieve equity in financing are vital protections against the risk of catastrophic health expenditures, including NCD-related health-care costs. Financial risk and inequity can be minimized through both conventional and innovative financing mechanisms.

Innovative financing refers to a range of non-traditional mechanisms to raise additional funds for development and aid through 'innovative' projects such as micro-contributions, taxes, public–private partnerships and market-based financial transactions. Supplementing traditional public sector funding and, in some countries, development assistance with innovative and/or non-state sector financing can potentially bridge considerable funding gaps, which constitute the biggest stumbling block to strengthening NCD interventions in primary health care. There are examples of countries that have successfully used revenues from raised taxation on tobacco and alcohol to finance health promotion and promote coverage in primary health care. As mentioned above, *The World Health Report 2010 - Health systems financing: the path to universal coverage* provides numerous examples of innovative financing systems that can be considered to complement national health budgets.

Following the 2009 recommendations of the High-Level Task Force on Innovative Financing, one of the new concepts to assess and develop was a global levy on tobacco products. A Solidarity Tobacco Levy is being considered as a possibility for raising funds that could support NCD prevention and control in low-income countries.

The way forward

The *2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases* provides a roadmap for addressing NCDs at the country and global levels by: a) strengthening surveillance; b) taking action to reduce risk factors with emphasis on interventions that are affordable and known to work; and c) addressing gaps in health systems and improving access to essential health care for people with NCDs.

Nearly 80% of NCD-related deaths occur in low- and middle-income countries, and the burden of premature deaths is also much greater in these countries. The epidemic has a dramatic impact on human development in both social and economic realms. The negative implications for national productivity are increasingly recognized, and NCDs are a significant burden on health systems because of increasing demands and escalating health-care costs. Unless concerted action is taken, the rising financial burden of NCDs will reach unmanageable levels.

Much of the NCD burden can be averted through primary prevention and the complementary identification of early stage disease, combined with effective treatment of existing conditions.

All countries need to reconsider their health and development strategies and plans, in order to scale up and mobilize additional responses to address NCDs.

Surveillance and monitoring of NCDs and their determinants

Surveillance is critical to generating the information needed for NCD-related policy and programme development, to support monitoring and evaluation of their implementation progress, and for appropriate legislation for NCD prevention and control.

The major challenge remains that many countries have a lack of usable mortality data, and have weak NCD surveillance systems that are frequently not integrated into national health information systems.

Chapter 3 highlights the need for a surveillance framework in all countries that monitors exposures (risks and determinants), outcomes (morbidity and mortality) and health-system responses (interventions and capacity). A core set of measurable and standardized indicators is needed for each component of the framework. NCD surveillance should be strengthened according to this framework, and integrated into national health information systems in all countries.

Reducing risk factors and preventing NCDs

NCDs can be averted and their outcomes improved through proven population-based interventions. Priority should be given to the implementation of practical and affordable **best buy** interventions, such as tobacco and alcohol taxation; smoke-free public spaces and workplaces; comprehensive bans on tobacco advertising, promotion and sponsorship; salt reduction measures; HBV vaccination; and low-cost multiple drug management of people at high risk.

Other affordable interventions that should be considered include: policy interventions to promote healthy diets, such as bans on trans-fat; measures to reduce marketing of foods and non-alcoholic beverages to children; taxes on foods high in sugar, salt and fat; subsidies to promote fruit and vegetable consumption; and interventions to increase physical activity at the population level. For cancer control, health interventions that should be considered include the reduction of exposure to identified environmental and occupational carcinogens.

As mentioned before, the active engagement of non-health sectors is a prerequisite for implementing effective NCD preventive interventions. The principle of 'health in all policies' has been the focus of public health advocacy that dates back to when safe drinking-water, sanitation, and decent housing were key result areas for health promotion and disease control. The same principle now applies to NCDs in that many of the social determinants of NCDs lie outside the scope of the health sector. Specific policies associated with globalization, as adopted by non-health sectors for example, are fuelling the rise in NCDs and their adverse impact on economic development. Health policy-makers recognize the critical need for engaging all parts of government but they often struggle to achieve effective multisectoral action. Understanding how to promote engagement of non-health sectors is therefore critical to NCD prevention.

Review of international experience shows many examples of successful multisectoral action. To ensure that policies and decisions taken by non-health sectors contribute to reduction of NCDs and other health risks, effective mechanisms for engaging non-health sectors should be established and

strengthened. Based on lessons learnt, WHO has developed guidance on promoting multisectoral action that policy-makers may wish to consider (Annex 6).

The industrial and other private sectors have a major opportunity and responsibility in facing up to the NCD epidemic. They must recognize how much is at stake in both human and economic terms if the global rise in NCDs is allowed to continue.

Strengthening health care for people with NCDs

A major challenge in many countries is to promote access to essential standards of health care for people living with NCDs. Essential interventions, particularly the 'best buys' mentioned in chapter 5 need to be integrated into primary health care. Effectively managing specific NCDs requires well-functioning and equitable health systems that are capable of providing long-term care that is person-centred, community-based and sustainable. Challenges exist for all six of the WHO building blocks of effective health systems: governance, finance, health workforce, health information, medical products and technologies, and health service delivery. While universal coverage of primary health-care services is a shared overall objective, the following approaches can be specifically considered by health policy-makers in relation to NCDs:

- Ensure that national health strategies and plans are based on accurate situation analysis and include NCD prevention and control as part of the national health priorities.
- Strengthen political commitment to NCD prevention at all levels of government.
- Integrate the delivery of basic health care for NCD prevention and management into primary health care systems.
- Expand the package of essential NCD-related interventions available at the primary health-care level by including a prioritized and realistic set of high-impact interventions to detect and treat common conditions. Specific "best buys" and other cost-effective interventions are discussed in Chapters 4 and 5.
- Address health system gaps, such as by strengthening surveillance systems (Chapter 3), strengthening the capacity of the health workforce (Chapter 6), and improving access to essential medicines and technology (Chapter 6).
- Remove financial barriers to essential health-care interventions, such as user fees, and reduce out-of-pocket payments. Consider financing mechanisms including the use of tobacco or alcohol taxation to increase revenues for primary health care.

Prevention and implementation research

This report stresses that enough is known about NCDs to establish effective and high-impact national programmes to address them. However, while it is sufficient to establish a causal relationship between NCDs and risk factors in order to initiate prevention strategies, knowledge of specific NCD etiological mechanisms is of potential value in refining these strategies. Research findings in pathways of disease development will help to refine prevention strategies and provide fresh ideas and initiatives with respect to prevention.

Objective 4 of the Action Plan calls for a coordinated agenda for NCD research to strengthen the evidence base for cost-effective NCD prevention and control. Based on a series of papers commissioned by WHO, and three global consultations conducted between 2008 and 2010, key research priority areas have been identified in four broad domains: a) research to monitor NCDs and their impact on health and socioeconomic development; b) multisectoral and multidisciplinary research to understand and influence the social determinants of NCDs; c) translational and health system research to a wider implementation of proven cost-effective interventions; and d) research to enable affordability of high-cost but effective technologies in the context of various resource settings. These research priorities are discussed in depth in another publication: *A prioritized research agenda for the prevention and control of noncommunicable diseases* (3).

Integrating NCD prevention in national programmes for sustainable development

The NCD epidemic has a substantial negative impact on human development. As the Global Strategy states, the growing challenge of NCDs represents one of the greatest challenges to global development in the 21st century. NCDs kill more poor people than rich; they reduce productivity and contribute to poverty; they also create a significant burden on health systems because of increasing demands and escalating health-care costs. Unless serious action is taken, the rising financial burden of NCDs will reach levels that are beyond the capacity of even high-income countries to manage.

There is also evidence to indicate that NCDs may impede progress towards the UN Millennium Development Goals. NCD prevention should therefore be included as a priority in national development initiatives and related investment decisions. Depending on the national situation, strengthening the prevention and management of NCDs should also be considered an integral part of poverty reduction and other development assistance programmes.

Technical support to low-income countries to address NCDs is not given priority by international development agencies and it currently constitutes a negligible proportion of official development assistance. This gap has to be adddressed. As the United Nations Secretary-General said during the World Economic Forum in January 2011, the United Nations High-Level Meeting on NCDs in September 2011 is a chance to broker an international commitment that puts NCDs high in the development agenda, where they belong.

The civil society sector

Reversing the epidemic of NCDs is not only a key responsibility of all of government. It also requires engagement from civil society and the business sector.

Civil society institutions are uniquely placed to mobilize political awareness and support for NCD prevention and control. They play a key role in advocating for NCDs to be a part of the global development agenda.

Civil society institutions and nongovernmental organizations contribute to capacity-building. They are also significant providers of prevention and treatment services for cardiovascular disease, cancer, diabetes and respiratory diseases, often filling gaps between services provided by the private and government sectors.

At a global level, nongovernmental organizations have grouped together to collectively support and influence global tobacco control efforts and, more recently, wider NCD prevention control, providing a strong platform for advocacy and action.

The role and capacity of civil society should be support and strengthened at the national and international levels.

The private sector can make a decisively important contribution to addressing NCD prevention challenges

The corporate sector

With the exception of the tobacco industry, the private sector can make a decisively important contribution to addressing NCD prevention challenges. Companies should work closely with governments to promote healthy lifestyles and implement action to promote healthy diet by: reformulation to reduce salt, trans-fat and sugar in their products; ensuring responsible marketing; and helping to make NCD essential medicines more affordable and accessible. Such actions need to be monitored.

Companies should also adopt and strengthen programmes to improve the health and well-being of their employees through workplace health promotion and specific NCD prevention schemes. Virtually all industries can help to reduce pollution and promote healthy lifestyles.

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Annex 1

Methods used for country estimates in Chapter 1 and Annex 4

The mortality and risk factor data presented in Chapter 1 and Annex 4 were estimated by WHO using standard methods to maximize cross-country comparability. They are not necessarily the official statistics of Member States.

Mortality

Age- and sex-specific all-cause mortality rates were estimated for the year 2008 for the 193 WHO Member States from revised life tables, published in World health statistics 2011 (1). Total deaths by age and sex were estimated for each country by applying these death rates to the estimated resident populations prepared by the United Nations Population Division in its 2008 revision (2).

To calculate causes of death for countries with complete or incomplete death registration data, vital registration data were used to estimate deaths by cause. Death registration data from 1980 up to 2008 (if available) were used to project recent trends for specific causes, and these trend estimates were used to estimate the cause distribution for 2008. Adjustments for deaths due to HIV, drug use disorders, war and natural disasters were based on other sources of information using similar data sources and methods as previous estimates (3).

For countries without any nationally representative data, cause-specific estimates of deaths for children under age 5 were estimated as described by Black et al. (4). For ages five years and over, previous estimated distributions of deaths by cause (3) were projected forward from 2004 to 2008, excluding human immunodeficiency virus (HIV), war and natural disasters. Detailed proportional cause distributions within the three broad groups were based on death registration data from within each region. Further information on these methods is available from WHO (3). Specific causes were further adjusted on the basis of epidemiological evidence from registries, verbal autopsy studies, disease surveillance systems and analyses from WHO technical programmes. Cause-specific estimates for HIV, tuberculosis and malaria deaths for 2008 were derived from previously published WHO estimates (5–7). Country-specific estimates of maternal mortality and cause-specific maternal mortality were based on the recent estimates for 2008 together with an analysis of regional cause patterns (8, 9). Cause-specific estimates for cancers were derived from GLOBOCAN 2008 (10).

Risk factors and morbidity

Estimates for risk factors and diabetes morbidity were produced for the standard year 2008 for all the indicators reported here. The crude adjusted estimates in Annex 4 are based on aggregated data provided by countries to WHO, and obtained through a review of published and unpublished literature. The inclusion criteria for estimation analysis included data that had come from a random sample of the general population, with clearly indicated survey methods (including sample sizes) and risk factor definitions. Adjustments were made for the following factors so that the same indicator could be reported for a standard year (in this case 2008) in all countries: standard risk factor definition; standard set of age groups for reporting; standard reporting year, and representativeness of population. Using regression modelling techniques, crude adjusted rates for each indicator were produced. To further enable comparison among countries, age-standardized comparable estimates were produced. This was done by adjusting the crude estimates to an artificial population structure that closely reflects the age and sex structure of most low- and middle-income countries. This corrects for the differences in age/sex structure between countries. Uncertainty in estimates was analysed by taking into account sampling error and uncertainty due to statistical modelling. The estimates included in the WHO Regional groupings and World Bank income groups are the age-standardized comparable estimates. Further detailed information on the methods and data sources used to produce these estimates is available from WHO.

The annual number of new cases of cancer for 2008 were obtained from GLOBOCAN 2008, an online analysis tool and database of incidence and mortality estimates in 2008 for the major types of cancer in each country worldwide (11), compiled by the International Agency for Research on Cancer (IARC). Predictions for 2030 were based on applying the estimated age-specific rates in 2008 to national projected populations for 2030 (2). As well as by country, the number of new cases in GLOBOCAN are presented according to the four World Bank income groups. Age standardization is necessary when comparing several populations given possible differences in the underlying age structure between populations, as well as the powerful influence of age on the risk of disease. Age-standardised rates are based on weighted means of the age-specific rates, with the weights taken from a standard population, here based on the WHO standard population (12).

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Annex 2

List of Countries by WHO Regions

Africa	The Americas	Eastern Mediterranean
Algeria	Antigua and Barbuda	Afghanistan
Angola	Argentina	Bahrain
Benin	Bahamas	Djibouti
Botswana	Barbados	Egypt
Burkina Faso	Belize	Iran (Islamic Republic of)
Burundi	Bolivia (Plurinational State of)	Iraq
Cameroon	Brazil	Jordan
Cape Verde	Canada	Kuwait
Central African Republic	Chile	Lebanon
Chad	Colombia	Libyan Arab Jamahiriya
Comoros	Costa Rica	Morocco
Congo	Cuba	Oman
Côte d'Ivoire	Dominica	Pakistan
Democratic Republic of the Congo	Dominican Republic	Qatar
Equatorial Guinea	Ecuador	Saudi Arabia
Eritrea	El Salvador	Somalia
Ethiopia	Grenada	Sudan
Gabon	Guatemala	Syrian Arab Republic
Gambia	Guyana	Tunisia
Ghana	Haiti	United Arab Emirates
Guinea	Honduras	Yemen
Guinea-Bissau	Jamaica	
Kenya	Mexico	
Lesotho	Nicaragua	
Liberia	Panama	
Madagascar	Paraguay	
Malawi	Peru	
Mali	Saint Kitts and Nevis	
Mauritania	Saint Lucia	
Mauritius	Saint Vincent and the Grenadines	
Mozambique	Suriname	
Namibia	Trinidad and Tobago	
Niger	United States of America	
Nigeria	Uruguay	
Rwanda	Venezuela (Bolivarian Republic of)	
Sao Tome and Principe		
Senegal		
Seychelles		
Sierra Leone		
South Africa		
Swaziland		
Togo		
Uganda		
United Republic of Tanzania		
Zambia		
Zimbabwe		

	Europe	South East Asia	Western Pacific
	Albania	Bangladesh	Australia
	Andorra	Bhutan	Brunei Darussalam
	Armenia	Democratic People's Republic of Korea	Cambodia
	Austria	India	China
	Azerbaijan	Indonesia	Cook Islands
	Belarus	Maldives	Fiji
	Belgium	Myanmar	Japan
	Bosnia and Herzegovina	Nepal	Kiribati
	Bulgaria	Sri Lanka	Lao People's Democratic Republic
	Croatia	Thailand	Malaysia
	Cyprus	Timor-Leste	Marshall Islands
	Czech Republic		Micronesia (Federated States of)
	Denmark		Mongolia
	Estonia		Nauru
	Finland		New Zealand
	France		Niue
	Georgia		Palau
	Germany		Papua New Guinea
	Greece		Philippines
	Hungary		Republic of Korea
	Iceland		Samoa
	Ireland		Singapore
	Israel		Solomon Islands
	Italy		Tonga
	Kazakhstan		Tuvalu
	Kyrgyzstan		Vanuatu
	Latvia		Viet Nam
	Lithuania		
	Luxembourg		
	Malta		
	Monaco		
	Montenegro		
	Netherlands		
	Norway		
	Poland		
	Portugal		
	Republic of Moldova		
	Romania		
	Russian Federation		
	San Marino		
	Serbia		
	Slovakia		
	Slovenia		
	Spain		
	Sweden		
	Switzerland		
	Tajikistan		
	The former Yugoslav Republic of Macedonia		
	Turkey		
	Turkmenistan		
	Ukraine		
	United Kingdom		
	Uzbekistan		

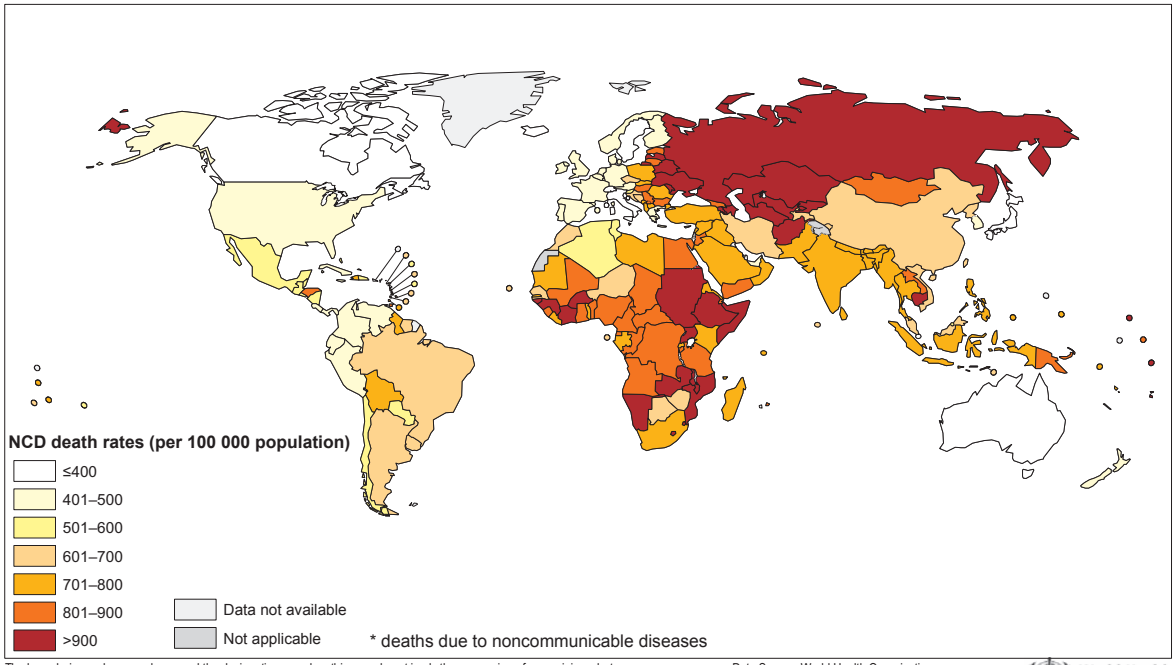
List of countries by 2008 World Bank income groups

High-income	Upper-middle income	Lower-middle income	Low-income
Andorra	Algeria	Albania	Afghanistan
Antigua and Barbuda	Argentina	Angola	Bangladesh
Australia	Belarus	Armenia	Benin
Austria	Bosnia and Herzegovina	Azerbaijan	Burkina Faso
Bahamas	Botswana	Belize	Burundi
Bahrain	Brazil	Bhutan	Cambodia
Barbados	Bulgaria	Bolivia (Plurinational State of)	Central African Republic
Belgium	Chile	Cameroon	Chad
Brunei Darussalam	Colombia	Cape Verde	Comoros
Canada	Cook Islands	China	Democratic People's Republic of Korea
Croatia	Costa Rica	Congo	Democratic Republic of the Congo
Cyprus	Cuba	Côte d'Ivoire	Eritrea
Czech Republic	Dominica	Djibouti	Ethiopia
Denmark	Dominican Republic	Ecuador	Gambia
Equatorial Guinea	Fiji	Egypt	Ghana
Estonia	Gabon	El Salvador	Guinea
Finland	Grenada	Georgia	Guinea-Bissau
France	Jamaica	Guatemala	Haiti
Germany	Kazakhstan	Guyana	Kenya
Greece	Latvia	Honduras	Kyrgyzstan
Hungary	Lebanon	India	Lao People's Democratic Republic
Iceland	Libyan Arab Jamahiriya	Indonesia	Liberia
Ireland	Lithuania	Iran (Islamic Republic of)	Madagascar
Israel	Malaysia	Iraq	Malawi
Italy	Mauritius	Jordan	Mali
Japan	Mexico	Kiribati	Mauritania
Kuwait	Montenegro	Lesotho	Mozambique
Luxembourg	Namibia	Maldives	Myanmar
Malta	Nauru	Marshall Islands	Nepal
Monaco	Niue	Micronesia (Federated States of)	Niger
Netherlands	Palau	Mongolia	Rwanda
New Zealand	Panama	Morocco	Senegal
Norway	Peru	Nicaragua	Sierra Leone
Oman	Poland	Nigeria	Somalia
Portugal	Romania	Pakistan	Tajikistan
Qatar	Russian Federation	Papua New Guinea	Togo
Republic of Korea	Saint Kitts and Nevis	Paraguay	Uganda
San Marino	Saint Lucia	Philippines	United Republic of Tanzania
Saudi Arabia	Saint Vincent and the Grenadines	Republic of Moldova	Uzbekistan
Singapore	Serbia	Samoa	Viet Nam
Slovakia	Seychelles	Sao Tome and Principe	Yemen
Slovenia	South Africa	Solomon Islands	Zambia
Spain	Suriname	Sri Lanka	Zimbabwe
Sweden	The former Yugoslav Republic of Macedonia	Sudan	
Switzerland	Turkey	Swaziland	
Trinidad and Tobago	Uruguay	Syrian Arab Republic	
United Arab Emirates	Venezuela (Bolivarian Republic of)	Thailand	
United Kingdom		Timor-Leste	
United States of America		Tonga	
		Tunisia	
		Turkmenistan	
		Tuvalu	
		Ukraine	
		Vanuatu	

Annex 3

Maps showing the global distribution of estimated NCD-related mortality and selected risk factors

Total NCD death rates*, age standardized
Males, 2008



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Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

World Health Organization

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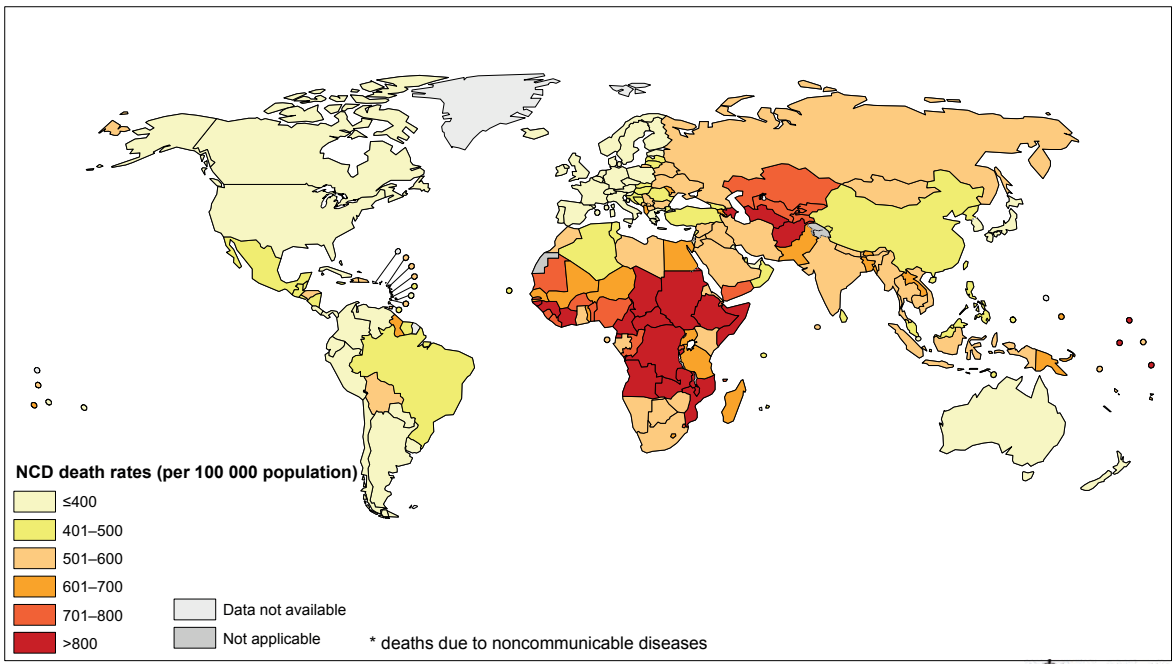
Total NCD death rates*, age standardized
Females, 2008



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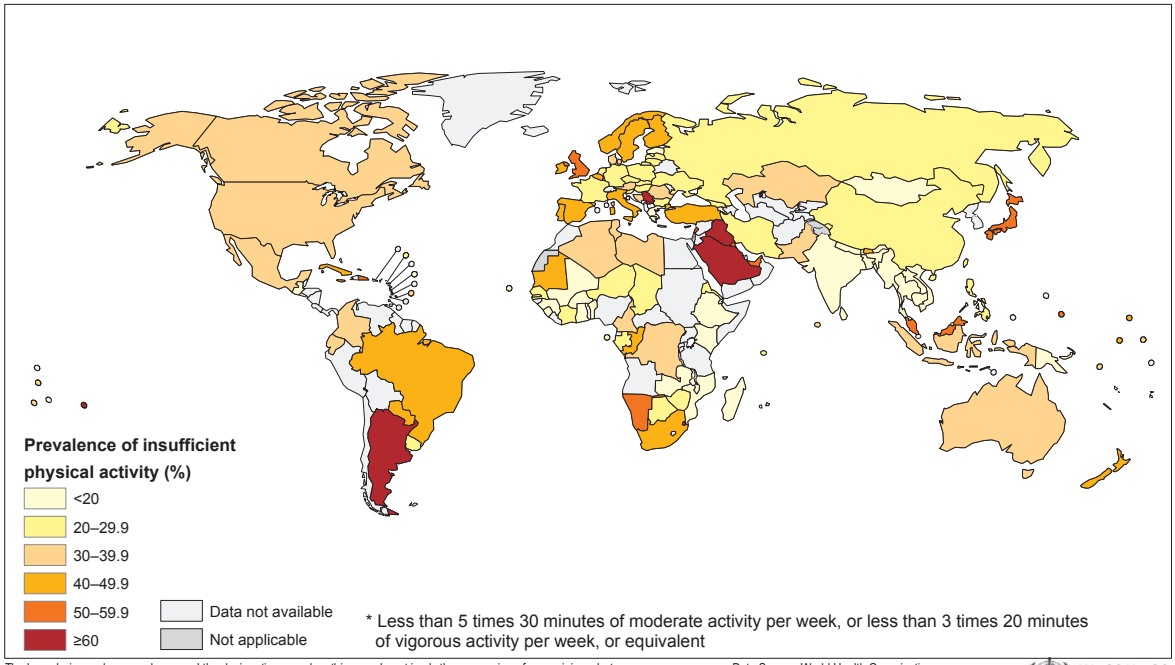
Prevalence of insufficient physical activity*, ages 15+, age standardized
Males, 2008



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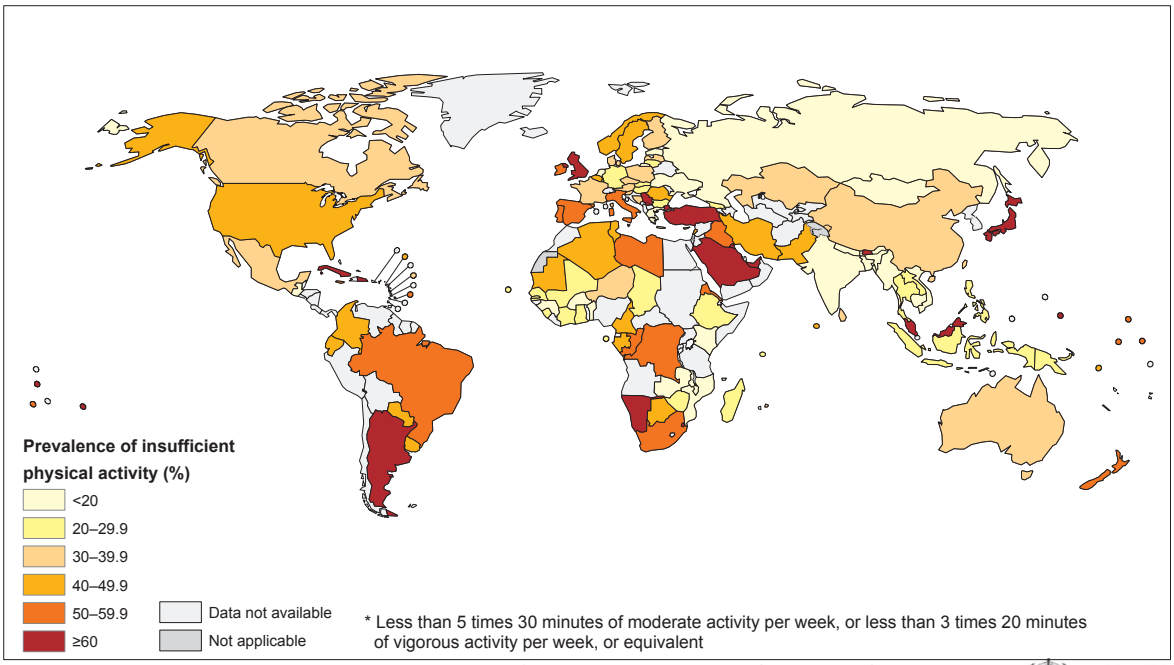
Prevalence of insufficient physical activity*, ages 15+, age standardized
Females, 2008



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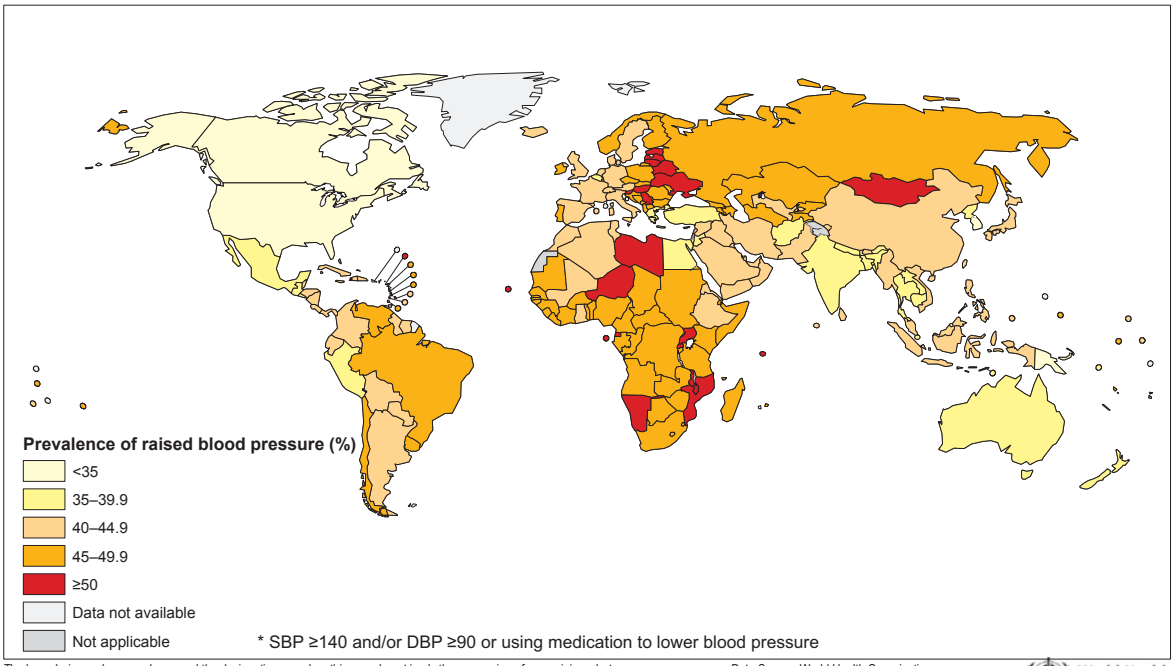
Prevalence of raised blood pressure*, ages 25+, age standardized
Males, 2008



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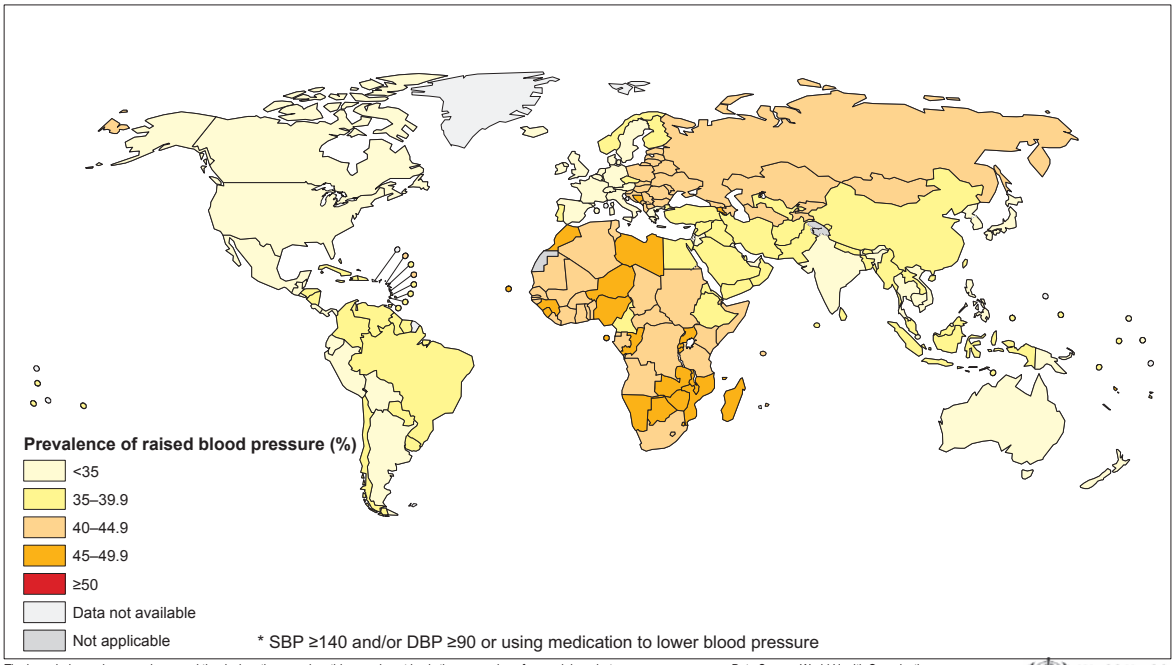
Prevalence of raised blood pressure*, ages 25+, age standardized
Females, 2008



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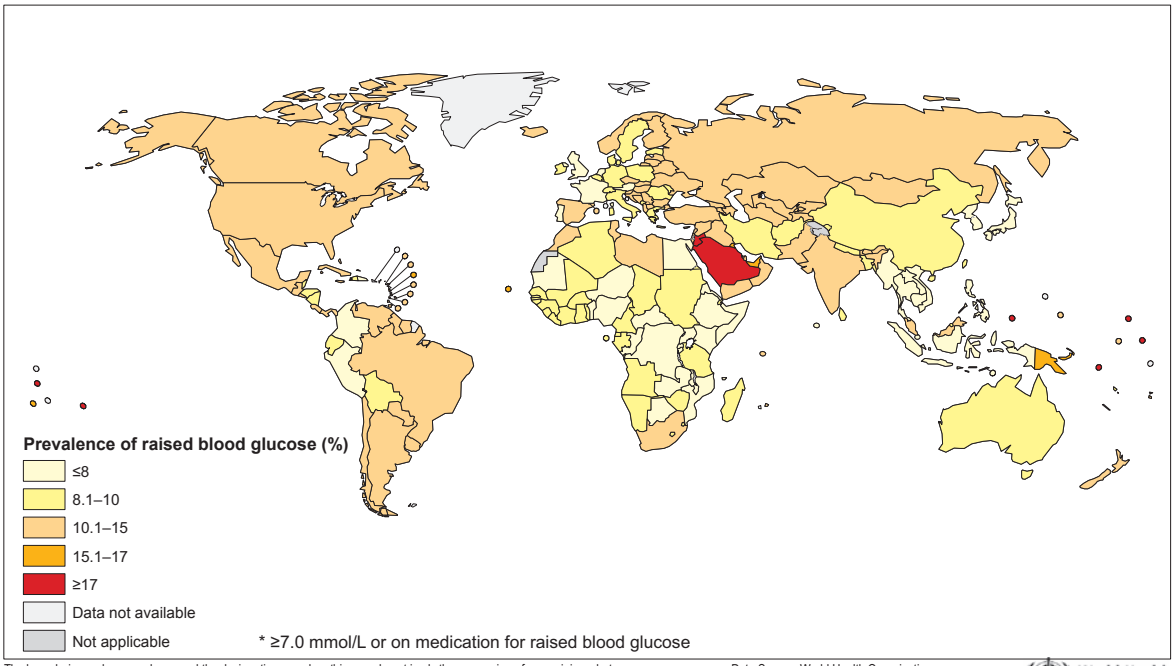
Prevalence of raised blood glucose*, ages 25+, age standardized
Males, 2008



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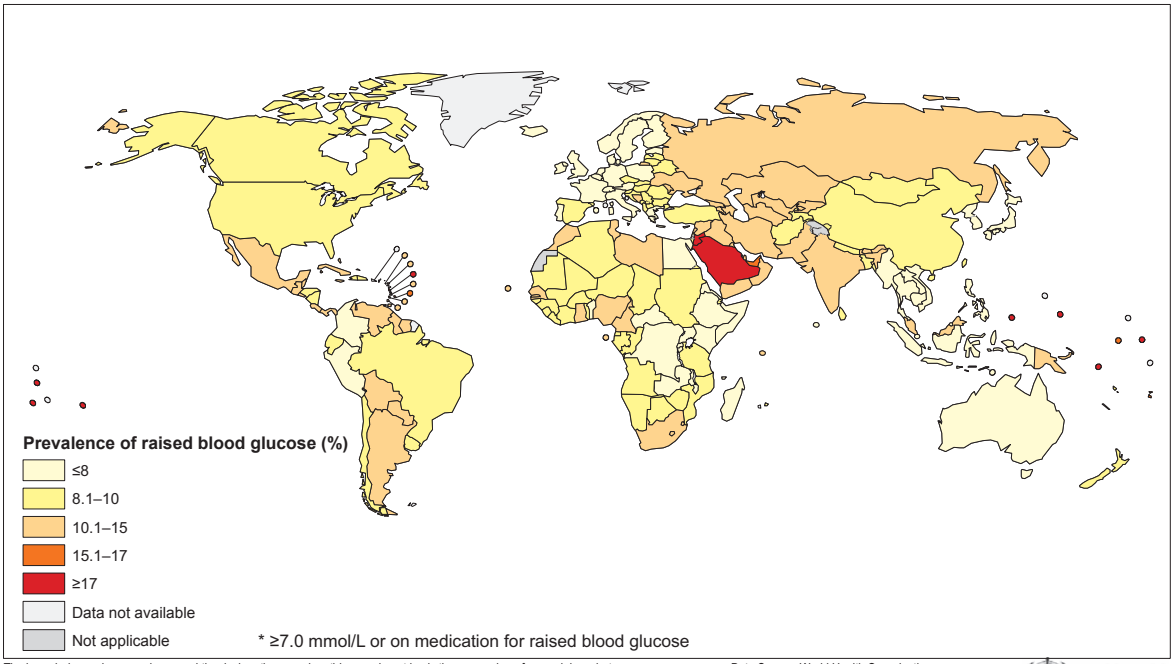
Prevalence of raised blood glucose*, ages 25+, age standardized
Females, 2008



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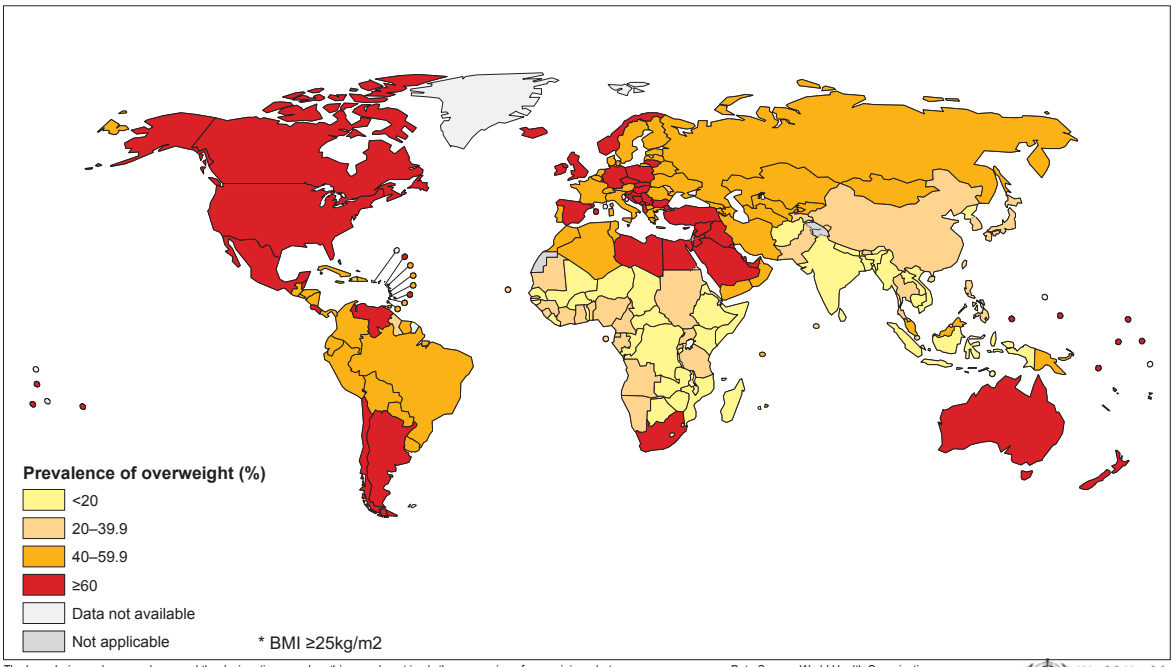
Prevalence of overweight*, ages 20+, age standardized
Males, 2008



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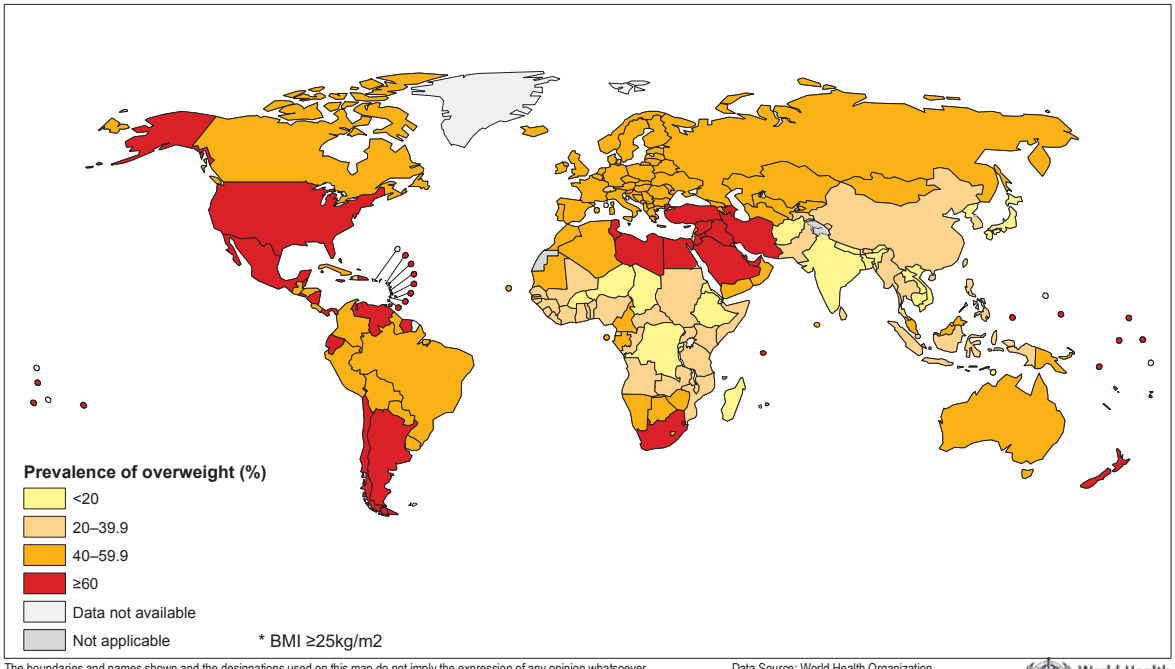
Prevalence of overweight*, ages 20+, age standardized
Females, 2008



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Annex 4

Country estimates of NCD mortality and selected risk factors, 2008

NCD MORTALITY

2008 COMPARABLE ESTIMATES OF NCD MORTALITY (total NCD Deaths in 000s; % of NCD Deaths occuring under the age of 70; and age-standardized death rate for NCDs per 100 000)

Note: Countries with figures not in bold have a high degree of uncertainty because they are not based on any national NCD mortality data. The estimates for these countries are based on a combination of country life tables, cause of death models, regional cause of death patterns, and WHO and UNAIDS programme estimates for some major causes of death (not including NCDs).

Country name	Region	Total NCD deaths ('000s)		NCD deaths under age 70 (percent of all NCD deaths)		Age-standardized death	
		Males	Females	Males	Females	All NCDs	Cancers
Afghanistan	EMR	75.8	50.8	81.0	72.2	1285.0	108.4
Albania	EUR	**11.2**	**13.7**	**37.6**	**22.3**	**755.0**	**171.6**
Algeria	AFR	53.5	55.5	52.4	44.1	556.0	97.7
Andorra	EUR	0.3	0.3	27.6	13.9	414.2	143.8
Angola	AFR	29.1	31.1	71.4	66.7	892.3	88.2
Antigua and Barbuda	AMR	**0.2**	**0.2**	**47.5**	**45.3**	**544.1**	**123.0**
Argentina	AMR	**128.7**	**130.0**	**41.9**	**25.4**	**612.7**	**167.7**
Armenia	EUR	**18.6**	**19.2**	**35.6**	**21.7**	**1156.1**	**231.5**
Australia	WPR	**63.4**	**63.2**	**28.8**	**18.6**	**364.8**	**140.8**
Austria	EUR	**30.9**	**36.7**	**33.2**	**15.6**	**437.2**	**153.5**
Azerbaijan	EUR	**30.3**	**36.0**	**51.9**	**34.4**	**998.7**	**154.9**
Bahamas	AMR	**0.7**	**0.6**	**60.3**	**47.5**	**530.1**	**130.5**
Bahrain	EMR	**1.1**	**0.7**	**62.4**	**49.7**	**641.9**	**98.4**
Bangladesh	SEAR	313.3	285.5	60.7	60.4	747.7	104.7
Barbados	AMR	**0.8**	**0.8**	**40.5**	**31.2**	**633.2**	**193.9**
Belarus	EUR	**55.8**	**58.5**	**51.8**	**23.1**	**1066.5**	**206.4**
Belgium	EUR	**42.3**	**42.8**	**30.2**	**17.1**	**439.1**	**163.3**
Belize	AMR	**0.4**	**0.4**	**52.0**	**46.8**	**507.4**	**110.9**
Benin	AFR	15.8	16.1	69.2	56.8	885.5	84.4
Bhutan	SEAR	1.7	1.4	55.9	51.1	793.2	131.2
Bolivia (Plurinational State of)	AMR	19.0	18.2	52.2	42.9	710.8	77.4
Bosnia and Herzegovina	EUR	**15.9**	**17.6**	**42.1**	**21.8**	**644.8**	**145.7**
Botswana	AFR	2.9	3.2	63.8	57.5	676.4	68.6
Brazil	AMR	**474.0**	**419.9**	**52.3**	**42.2**	**614.0**	**136.3**
Brunei Darussalam	WPR	**0.5**	**0.5**	**59.1**	**46.4**	**534.3**	**97.0**
Bulgaria	EUR	**53.2**	**50.6**	**40.0**	**21.0**	**849.2**	**179.1**
Burkina Faso	AFR	23.6	19.6	79.8	66.8	956.2	100.0
Burundi	AFR	12.2	17.2	65.7	61.2	837.3	105.3
Cambodia	WPR	31.1	25.5	77.1	56.6	957.9	144.9
Cameroon	AFR	39.7	46.1	63.1	62.6	881.9	83.7
Canada	AMR	**103.1**	**105.1**	**32.7**	**22.1**	**386.5**	**142.2**
Cape Verde	AFR	0.7	0.8	55.9	42.3	650.0	91.4
Central African Republic	AFR	9.0	10.9	61.5	59.8	881.5	83.1
Chad	AFR	18.7	21.3	68.2	63.9	894.2	81.5
Chile	AMR	**41.7**	**37.6**	**40.2**	**30.2**	**500.6**	**143.9**
China	WPR	**4323.3**	**3675.5**	**43.9**	**32.0**	**665.2**	**182.3**
Colombia	AMR	**66.3**	**68.2**	**49.4**	**43.3**	**437.6**	**112.9**
Comoros	AFR	1.1	1.3	65.1	60.9	798.4	87.9
Congo	AFR	7.8	7.1	59.8	51.4	891.5	82.6
Cook Islands	WPR	**0.0**	**0.0**	**61.0**	**52.5**	**592.0**	**58.6**
Costa Rica	AMR	**8.2**	**7.6**	**41.0**	**34.2**	**431.0**	**120.1**
Côte d'Ivoire	AFR	56.4	44.8	68.1	66.6	1013.4	80.4
Croatia	EUR	**23.6**	**25.2**	**38.3**	**17.3**	**696.6**	**225.0**
Cuba	AMR	**39.1**	**35.1**	**36.8**	**31.6**	**492.6**	**160.3**
Cyprus	EUR	**2.6**	**2.5**	**29.7**	**18.4**	**416.6**	**100.7**
Czech Republic	EUR	**45.4**	**47.3**	**43.2**	**21.5**	**603.7**	**202.4**
Democratic People's Republic of Korea	SEAR	61.5	71.4	64.0	38.0	652.2	122.8

rate per 100,000 (Males)		Age-standardized death rate per 100,000 (Females)				Latest Year of Data
Chronic respiratory diseases	Cardiovascular diseases and diabetes	All NCDs	Cancers	Chronic respiratory diseases	Cardiovascular diseases and diabetes	
88.5	765.2	952.7	96.8	54.7	578.2	no data
29.0	**468.6**	**623.2**	**126.3**	**17.6**	**417.2**	2004
74.7	278.6	472.4	79.2	38.9	275.0	no data
46.2	145.9	226.2	70.0	15.2	86.7	no data
133.2	476.7	800.6	83.4	75.1	488.5	no data
19.3	**301.4**	**510.9**	**134.3**	**14.3**	**283.1**	2008
73.0	**263.0**	**365.5**	**107.0**	**41.0**	**152.8**	2008
76.7	**709.3**	**693.0**	**130.6**	**53.7**	**387.8**	2008
25.6	**136.3**	**246.3**	**92.9**	**15.5**	**88.6**	2006
22.0	**188.2**	**273.3**	**94.8**	**9.4**	**124.1**	2008
40.1	**655.3**	**846.9**	**120.9**	**30.8**	**582.9**	2007
27.5	**274.4**	**372.6**	**94.9**	**12.4**	**205.6**	2005
60.9	**357.0**	**551.8**	**85.2**	**36.4**	**311.3**	2008
91.5	446.9	648.1	106.7	73.1	387.5	no data
34.6	**293.2**	**363.1**	**100.4**	**10.1**	**173.9**	2006
58.2	**701.0**	**517.7**	**87.5**	**10.5**	**370.6**	2007
42.6	**161.3**	**266.4**	**93.2**	**16.9**	**102.0**	2005
42.4	**248.9**	**455.4**	**90.9**	**14.4**	**262.8**	2008
130.7	472.4	731.3	94.7	65.3	437.1	no data
92.8	465.0	654.6	118.4	71.8	381.3	no data
69.0	316.6	563.0	93.4	44.1	264.0	no data
20.8	**425.1**	**491.2**	**73.3**	**12.7**	**372.7**	1999
100.8	361.0	545.9	54.1	50.9	330.8	no data
53.6	**304.2**	**428.1**	**94.7**	**32.4**	**226.4**	2008
69.0	**292.7**	**488.7**	**98.1**	**44.0**	**275.4**	2008
26.3	**566.6**	**513.9**	**100.6**	**10.8**	**367.7**	2008
141.3	499.8	712.8	100.9	61.4	425.7	no data
119.9	437.5	828.1	108.8	75.7	488.5	no data
129.0	480.4	592.2	90.0	60.4	338.7	no data
131.3	472.1	861.3	76.7	85.3	523.0	no data
26.9	**151.6**	**265.0**	**106.6**	**16.0**	**90.1**	2004
92.2	341.1	455.1	91.5	36.0	260.3	no data
131.6	476.1	846.8	75.6	82.2	519.5	no data
133.9	483.5	843.3	83.7	80.0	517.1	no data
39.0	**196.3**	**313.1**	**98.4**	**20.6**	**117.4**	2007
118.4	**311.5**	**495.2**	**105.0**	**88.7**	**259.6**	2007
43.0	**205.9**	**351.3**	**92.1**	**29.9**	**166.7**	2007
116.0	433.3	767.7	93.2	71.5	467.8	no data
133.3	482.0	714.7	76.2	63.6	443.9	no data
61.3	**350.7**	**326.3**	**57.4**	**26.3**	**180.0**	2001
33.5	**181.4**	**333.3**	**92.9**	**22.0**	**137.4**	2008
154.5	547.6	859.1	78.7	83.9	524.4	no data
25.6	**352.3**	**408.7**	**115.0**	**8.4**	**239.7**	2008
23.2	**236.0**	**382.1**	**114.5**	**17.9**	**194.1**	2008
25.8	**224.5**	**282.0**	**65.3**	**14.5**	**149.7**	2008
21.4	**315.1**	**366.2**	**116.3**	**9.1**	**203.1**	2008
78.7	345.5	467.1	97.6	47.5	261.6	no data

NCD MORTALITY

2008 COMPARABLE ESTIMATES OF NCD MORTALITY (total NCD Deaths in 000s; % of NCD Deaths occuring under the age of 70; and age-standardized death rate for NCDs per 100 000)

Note: Countries with figures not in bold have a high degree of uncertainty because they are not based on any national NCD mortality data. The estimates for these countries are based on a combination of country life tables, cause of death models, regional cause of death patterns, and WHO and UNAIDS programme estimates for some major causes of death (not including NCDs).

Country name	Region	Total NCD deaths ('000s)		NCD deaths under age 70 (percent of all NCD deaths)		Age-standardized death	
		Males	Females	Males	Females	All NCDs	Cancers
Democratic Republic of the Congo	AFR	101.5	115.1	68.1	61.8	865.7	89.2
Denmark	EUR	**23.6**	**24.5**	**34.6**	**22.3**	**493.8**	**177.1**
Djibouti	EMR	1.6	1.6	67.7	62.8	878.1	95.1
Dominica	AMR	**0.2**	**0.2**	**42.0**	**30.6**	**681.9**	**190.9**
Dominican Republic	AMR	**21.7**	**22.4**	**40.8**	**37.4**	**545.6**	**108.9**
Ecuador	AMR	**23.9**	**21.1**	**47.4**	**43.4**	**434.0**	**122.4**
Egypt	EMR	**198.9**	**172.2**	**61.8**	**48.8**	**829.7**	**107.3**
El Salvador	AMR	**13.5**	**15.0**	**46.4**	**36.6**	**539.3**	**78.5**
Equatorial Guinea	AFR	1.3	1.4	66.5	63.2	889.7	85.0
Eritrea	AFR	5.6	6.3	70.0	57.7	759.3	92.2
Estonia	EUR	**7.2**	**7.8**	**44.9**	**20.0**	**823.9**	**219.9**
Ethiopia	AFR	161.4	176.9	66.5	65.0	922.7	97.5
Fiji	WPR	**2.4**	**1.8**	**71.5**	**61.1**	**928.4**	**106.2**
Finland	EUR	**20.4**	**22.0**	**36.6**	**16.9**	**452.4**	**126.7**
France	EUR	**233.4**	**221.0**	**32.3**	**17.0**	**419.0**	**183.4**
Gabon	AFR	3.0	2.6	54.2	43.6	734.8	78.5
Gambia	AFR	2.5	2.7	73.9	71.3	779.6	112.3
Georgia	EUR	**23.0**	**22.0**	**47.4**	**26.0**	**858.4**	**116.3**
Germany	EUR	**351.6**	**409.0**	**33.7**	**16.0**	**459.8**	**155.7**
Ghana	AFR	49.8	36.4	68.8	58.5	816.9	89.9
Greece	EUR	**47.3**	**41.3**	**28.4**	**15.8**	**444.5**	**164.5**
Grenada	AMR	**0.3**	**0.3**	**58.5**	**38.2**	**722.1**	**214.6**
Guatemala	AMR	**19.6**	**18.6**	**58.3**	**54.0**	**503.0**	**110.3**
Guinea	AFR	23.0	21.2	74.2	65.9	1035.5	98.1
Guinea-Bissau	AFR	3.5	3.8	67.5	63.8	944.6	90.4
Guyana	AMR	**2.3**	**2.0**	**60.1**	**54.8**	**735.0**	**85.1**
Haiti	AMR	20.0	17.5	54.5	49.1	796.9	119.0
Honduras	AMR	16.6	14.4	47.2	37.2	811.6	137.4
Hungary	EUR	**59.8**	**58.7**	**48.1**	**25.7**	**844.6**	**254.8**
Iceland	EUR	**0.9**	**0.8**	**24.8**	**18.3**	**364.3**	**131.1**
India	SEAR	**2967.6**	**2273.8**	**61.8**	**55.0**	**781.7**	**78.8**
Indonesia	SEAR	582.3	481.7	57.6	47.0	757.0	135.9
Iran (Islamic Republic of)	EMR	**163.5**	**118.2**	**40.7**	**39.3**	**661.2**	**112.7**
Iraq	EMR	45.5	48.8	66.8	44.1	779.5	120.6
Ireland	EUR	**12.3**	**12.3**	**33.5**	**22.5**	**435.7**	**153.4**
Israel	EUR	**15.6**	**16.6**	**32.2**	**20.6**	**376.5**	**131.5**
Italy	EUR	**256.1**	**280.8**	**23.8**	**13.0**	**399.8**	**158.0**
Jamaica	AMR	6.3	8.0	37.9	29.0	497.7	125.8
Japan	WPR	**473.2**	**435.5**	**29.3**	**15.7**	**336.7**	**150.5**
Jordan	EMR	**12.9**	**9.2**	**56.0**	**47.7**	**817.8**	**109.8**
Kazakhstan	EUR	**67.5**	**72.7**	**67.6**	**38.4**	**1270.0**	**199.2**
Kenya	AFR	56.5	46.6	58.7	51.5	779.6	118.8
Kiribati	WPR	**0.3**	**0.2**	**77.7**	**66.5**	**832.4**	**39.0**
Kuwait	EMR	**2.3**	**1.6**	**68.5**	**58.4**	**395.0**	**61.9**
Kyrgyzstan	EUR	**17.3**	**17.7**	**58.8**	**36.3**	**1088.4**	**128.8**
Lao People's Democratic Republic	WPR	12.1	11.7	60.3	53.0	849.4	145.4
Latvia	EUR	**13.1**	**14.8**	**48.7**	**21.8**	**921.2**	**233.6**
Lebanon	EMR	12.5	9.1	45.0	38.7	717.4	151.2
Lesotho	AFR	4.8	4.5	57.5	47.9	953.5	79.2
Liberia	AFR	5.8	6.5	62.2	56.9	790.5	91.6
Libyan Arab Jamahiriya	EMR	13.5	9.6	59.5	45.4	743.5	114.3
Lithuania	EUR	**18.2**	**19.0**	**48.5**	**23.2**	**875.5**	**219.9**

rate per 100,000 (Males)		Age-standardized death rate per 100,000 (Females)				Latest Year of Data
Chronic respiratory diseases	Cardiovascular diseases and diabetes	All NCDs	Cancers	Chronic respiratory diseases	Cardiovascular diseases and diabetes	
126.6	461.8	806.1	86.2	74.0	492.2	no data
33.7	**179.6**	**338.3**	**133.5**	**27.5**	**107.4**	**2006**
56.4	525.6	748.9	80.4	43.8	452.8	no data
53.7	**314.8**	**518.7**	**116.4**	**24.1**	**300.8**	2008
36.0	**312.3**	**530.5**	**96.4**	**36.0**	**328.7**	2004
23.4	**190.3**	**335.7**	**116.4**	**14.1**	**143.4**	2008
33.2	**427.3**	**660.0**	**76.1**	**24.3**	**384.0**	2008
29.0	**201.0**	**449.4**	**113.2**	**27.0**	**203.6**	2008
132.3	476.4	810.0	80.6	77.1	491.5	no data
109.9	402.7	599.8	80.0	52.2	363.1	no data
27.8	**469.4**	**391.0**	**103.1**	**5.7**	**233.4**	2008
135.3	486.1	875.8	87.4	85.3	530.3	no data
91.1	**579.9**	**590.9**	**121.6**	**44.2**	**328.2**	2000
19.9	**210.5**	**264.8**	**85.3**	**7.0**	**106.3**	2008
18.8	**128.3**	**224.8**	**93.7**	**7.4**	**69.2**	2008
108.9	396.3	561.2	71.9	48.4	343.5	no data
110.0	400.6	720.1	87.0	65.9	433.3	no data
14.7	**650.0**	**490.8**	**77.8**	**8.4**	**376.4**	2001
24.2	**206.6**	**290.3**	**99.1**	**10.9**	**133.7**	2006
126.5	426.6	595.3	99.0	54.5	343.5	no data
26.7	**215.0**	**289.4**	**87.3**	**16.4**	**158.0**	2008
28.9	**345.7**	**441.6**	**111.3**	**9.4**	**253.3**	2008
23.3	**188.6**	**420.9**	**118.6**	**17.6**	**189.9**	2008
153.9	543.6	841.8	106.3	79.1	494.9	no data
139.8	502.4	874.0	97.8	83.0	523.3	no data
26.9	**475.2**	**602.4**	**80.4**	**14.4**	**427.8**	2006
44.8	428.3	593.8	87.0	22.4	394.5	no data
47.1	410.3	594.8	131.2	29.6	342.3	no data
43.4	**415.8**	**457.2**	**133.7**	**17.1**	**241.4**	2008
18.7	**156.4**	**257.1**	**105.0**	**16.4**	**86.0**	2008
178.4	**386.3**	**571.0**	**71.8**	**125.5**	**283.0**	2003
102.3	400.2	537.9	108.9	52.4	300.3	no data
41.8	**420.8**	**506.7**	**69.8**	**28.8**	**348.0**	2006
50.6	470.7	592.9	81.7	33.0	376.1	no data
33.7	**179.4**	**296.3**	**118.9**	**21.0**	**103.6**	2008
24.8	**138.9**	**267.9**	**101.4**	**15.2**	**93.8**	2008
24.6	**156.3**	**244.9**	**90.7**	**9.4**	**102.0**	2007
51.4	245.8	479.3	120.4	42.2	248.7	no data
22.5	**118.1**	**178.1**	**76.6**	**8.0**	**65.0**	2008
45.7	**550.4**	**568.4**	**89.2**	**17.5**	**379.8**	2008
68.3	**858.9**	**772.4**	**123.2**	**22.3**	**545.9**	2008
109.2	401.1	575.0	113.0	44.8	326.4	no data
61.8	**425.9**	**548.3**	**64.2**	**19.1**	**223.8**	2002
7.8	**281.8**	**393.6**	**69.6**	**12.1**	**263.4**	2008
101.4	**696.6**	**757.5**	**104.5**	**48.9**	**515.6**	2008
122.8	467.9	689.0	111.1	103.4	392.8	no data
21.1	**566.8**	**458.9**	**107.9**	**4.0**	**295.0**	2008
43.9	404.4	465.0	113.2	22.8	262.7	no data
144.4	513.1	628.8	59.3	57.7	393.4	no data
113.8	419.8	747.3	94.7	65.9	454.2	no data
41.1	458.8	525.9	79.6	25.7	330.1	no data
32.1	**503.2**	**438.0**	**110.1**	**5.9**	**263.7**	2008

NCD MORTALITY

2008 COMPARABLE ESTIMATES OF NCD MORTALITY (total NCD Deaths in 000s; % of NCD Deaths occuring under the age of 70; and age-standardized death rate for NCDs per 100 000)

Note: Countries with figures not in bold have a high degree of uncertainty because they are not based on any national NCD mortality data. The estimates for these countries are based on a combination of country life tables, cause of death models, regional cause of death patterns, and WHO and UNAIDS programme estimates for some major causes of death (not including NCDs).

Country name	Region	Total NCD deaths ('000s)		NCD deaths under age 70 (percent of all NCD deaths)		Age-standardized death	
		Males	Females	Males	Females	All NCDs	Cancers
Luxembourg	EUR	**1.5**	**1.6**	**35.4**	**20.3**	**435.2**	**156.1**
Madagascar	AFR	30.3	27.8	56.9	54.9	750.7	141.9
Malawi	AFR	39.7	28.1	73.5	61.4	1208.2	83.5
Malaysia	WPR	**50.4**	**39.1**	**58.4**	**46.0**	**605.7**	**118.8**
Maldives	SEAR	**0.5**	**0.4**	**44.7**	**43.0**	**612.7**	**295.6**
Mali	AFR	18.2	15.7	72.2	66.6	814.4	105.9
Malta	EUR	**1.4**	**1.5**	**33.0**	**19.4**	**441.0**	**136.5**
Marshall Islands	WPR	0.3	0.3	80.3	70.6	1280.1	100.7
Mauritania	AFR	4.7	5.3	74.3	66.9	787.6	102.7
Mauritius	AFR	**4.2**	**3.6**	**61.1**	**41.2**	**816.0**	**103.1**
Mexico	AMR	**227.1**	**210.7**	**50.0**	**40.2**	**542.6**	**87.3**
Micronesia (Federated States of)	WPR	0.2	0.2	55.8	51.2	753.7	79.3
Monaco	EUR	0.1	0.1	31.7	15.8	399.9	165.6
Mongolia	WPR	6.1	4.8	69.2	54.7	867.7	259.5
Montenegro	EUR	**2.8**	**2.9**	**41.1**	**24.5**	**711.8**	**165.7**
Morocco	EMR	66.2	59.0	48.5	39.8	665.2	90.5
Mozambique	AFR	48.6	47.8	69.5	61.6	1029.5	90.9
Myanmar	SEAR	125.8	116.6	51.8	43.2	737.4	123.5
Namibia	AFR	5.4	3.3	71.2	55.2	1073.2	63.9
Nauru	WPR	**0.0**	**0.0**	**72.5**	**69.9**	**1367.4**	**114.7**
Nepal	SEAR	48.8	42.8	60.0	53.6	705.5	113.9
Netherlands	EUR	**57.3**	**61.5**	**31.8**	**21.1**	**424.9**	**173.5**
New Zealand	WPR	**13.1**	**12.8**	**29.9**	**22.1**	**410.7**	**149.1**
Nicaragua	AMR	**9.2**	**8.0**	**59.2**	**52.9**	**558.8**	**90.6**
Niger	AFR	14.2	14.8	71.4	64.8	648.5	74.5
Nigeria	AFR	254.6	285.2	64.0	62.0	818.2	89.4
Niue	WPR	**0.0**	**0.0**	**64.0**	**36.6**	**790.3**	**79.7**
Norway	EUR	**17.0**	**18.7**	**28.0**	**16.8**	**405.0**	**150.6**
Oman	EMR	5.0	2.7	67.0	50.1	757.8	81.1
Pakistan	EMR	379.8	301.2	55.0	56.0	746.9	94.6
Palau	WPR	0.0	0.0	64.2	66.8	777.3	91.4
Panama	AMR	**6.1**	**5.0**	**45.6**	**41.5**	**433.5**	**111.5**
Papua New Guinea	WPR	11.1	9.1	72.2	69.0	836.9	151.8
Paraguay	AMR	**10.5**	**9.2**	**49.9**	**43.9**	**517.0**	**133.3**
Peru	AMR	**41.4**	**41.2**	**44.7**	**43.8**	**407.6**	**109.5**
Philippines	WPR	**175.7**	**133.9**	**67.6**	**55.0**	**711.6**	**98.6**
Poland	EUR	**176.3**	**164.5**	**46.4**	**23.7**	**713.6**	**229.2**
Portugal	EUR	**45.4**	**43.4**	**31.0**	**16.6**	**483.4**	**182.1**
Qatar	EMR	**0.9**	**0.4**	**74.9**	**53.1**	**367.5**	**101.1**
Republic of Korea	WPR	**112.3**	**96.7**	**45.1**	**23.5**	**465.0**	**190.5**
Republic of Moldova	EUR	**19.0**	**20.3**	**54.2**	**33.8**	**1005.9**	**171.0**
Romania	EUR	**117.3**	**109.2**	**42.7**	**24.4**	**788.7**	**188.9**
Russian Federation	EUR	**827.9**	**890.4**	**55.0**	**25.4**	**1108.6**	**193.7**
Rwanda	AFR	12.4	15.8	64.6	56.2	781.2	109.8
Saint Kitts and Nevis	AMR	**0.2**	**0.2**	**40.7**	**22.8**	**620.9**	**160.5**
Saint Lucia	AMR	**0.4**	**0.4**	**43.6**	**38.0**	**596.9**	**155.3**
Saint Vincent and the Grenadines	AMR	**0.3**	**0.3**	**46.3**	**35.4**	**648.9**	**134.6**
Samoa	WPR	0.4	0.4	55.6	43.7	772.1	68.5
San Marino	EUR	**0.1**	**0.2**	**20.5**	**11.5**	**308.5**	**162.5**
Sao Tome and Principe	AFR	0.2	0.3	42.8	37.9	649.2	174.6
Saudi Arabia	EMR	46.0	26.6	63.3	51.4	753.1	79.2
Senegal	AFR	13.9	14.7	70.3	68.0	698.4	105.2
Serbia	EUR	**59.1**	**58.6**	**37.2**	**21.7**	**804.2**	**211.2**

rate per 100,000 (Males)			Age-standardized death rate per 100,000 (Females)				Latest Year of Data
	Chronic respiratory diseases	Cardiovascular diseases and diabetes	All NCDs	Cancers	Chronic respiratory diseases	Cardiovascular diseases and diabetes	
	27.4	**183.9**	**268.7**	**93.5**	**13.3**	**115.5**	2007
	99.5	367.0	647.5	96.0	55.8	384.4	no data
	144.7	674.1	811.5	105.5	57.7	500.0	no data
	74.7	**318.7**	**436.5**	**89.9**	**42.1**	**236.5**	2006
	53.1	**184.3**	**570.7**	**234.6**	**34.2**	**220.7**	2008
	117.1	418.8	684.3	123.6	54.7	393.1	no data
	31.6	**202.0**	**303.1**	**92.2**	**9.4**	**148.2**	2008
	135.1	818.5	1316.0	129.0	107.1	831.4	no data
	113.1	407.1	734.2	100.1	64.7	436.7	no data
	53.8	**545.0**	**497.6**	**75.4**	**26.2**	**344.9**	2008
	44.5	**257.8**	**411.7**	**74.9**	**27.1**	**216.8**	2008
	80.2	459.4	622.8	90.1	50.8	363.1	no data
	21.2	138.6	211.2	78.1	9.7	75.8	no data
	33.6	456.4	569.0	166.4	22.7	303.6	no data
	35.5	**461.1**	**529.0**	**91.9**	**24.5**	**378.8**	2008
	45.8	391.8	523.6	74.5	29.8	319.0	no data
	154.4	548.7	801.1	95.0	74.7	478.0	no data
	89.1	411.5	570.5	114.9	60.1	326.8	no data
	111.0	632.5	556.6	49.6	34.7	361.0	no data
	86.3	**922.3**	**845.5**	**190.6**	**72.3**	**473.0**	1996
	86.4	400.2	536.3	118.9	54.9	301.3	no data
	31.2	**151.0**	**290.5**	**120.1**	**16.6**	**93.3**	2008
	30.1	**171.2**	**285.1**	**110.8**	**20.5**	**106.1**	2007
	37.9	**248.0**	**423.6**	**101.5**	**23.8**	**221.2**	2006
	94.7	350.7	669.1	88.9	56.4	412.0	no data
	119.0	435.9	792.6	98.8	71.6	475.7	no data
	81.1	**486.3**	**314.6**	**80.5**	**24.2**	**160.4**	2000
	30.7	**158.4**	**270.6**	**107.8**	**19.5**	**90.6**	2008
	31.5	545.7	494.2	71.8	19.1	333.3	no data
	89.2	454.6	637.8	94.2	71.2	387.6	no data
	78.7	469.6	413.7	105.3	27.9	214.8	no data
	29.2	**201.9**	**323.9**	**97.6**	**20.6**	**144.9**	2008
	99.9	459.8	664.7	106.9	74.1	395.4	no data
	24.2	**269.3**	**395.3**	**98.1**	**10.1**	**227.9**	2008
	32.7	**148.2**	**338.8**	**118.9**	**20.3**	**120.8**	2007
	80.7	**394.8**	**482.8**	**74.6**	**32.5**	**295.3**	2003
	28.9	**366.4**	**377.8**	**120.9**	**8.4**	**204.5**	2008
	34.8	**184.5**	**276.4**	**89.3**	**15.1**	**125.3**	2008
	26.2	**179.8**	**433.7**	**84.3**	**30.6**	**239.3**	2008
	36.1	**167.9**	**246.8**	**77.1**	**12.1**	**115.2**	2006
	54.9	**614.0**	**671.6**	**98.4**	**18.9**	**445.4**	2008
	30.1	**476.9**	**483.0**	**100.1**	**10.2**	**322.5**	2008
	40.9	**771.7**	**561.8**	**89.5**	**8.8**	**414.3**	2006
	110.4	404.5	706.2	114.8	59.8	410.2	no data
	16.8	**307.0**	**552.5**	**123.2**	**10.2**	**331.3**	2008
	46.9	**311.9**	**405.2**	**83.9**	**16.7**	**245.8**	2005
	30.5	**354.7**	**508.6**	**100.3**	**10.5**	**323.6**	2008
	83.3	477.4	583.2	40.2	50.2	373.6	no data
	3.0	**135.7**	**247.7**	**69.7**	**3.3**	**168.9**	2004
	85.0	301.7	553.4	131.3	47.2	312.5	no data
	31.0	540.6	510.0	66.2	20.3	347.6	no data
	97.7	357.1	660.1	101.3	56.5	387.7	no data
	36.6	**463.5**	**577.7**	**129.1**	**15.6**	**380.8**	2008

NCD MORTALITY

2008 COMPARABLE ESTIMATES OF NCD MORTALITY (total NCD Deaths in 000s; % of NCD Deaths occuring under the age of 70; and age-standardized death rate for NCDs per 100 000)

Note: Countries with figures not in bold have a high degree of uncertainty because they are not based on any national NCD mortality data. The estimates for these countries are based on a combination of country life tables, cause of death models, regional cause of death patterns, and WHO and UNAIDS programme estimates for some major causes of death (not including NCDs).

Country name	Region	Total NCD deaths ('000s)		NCD deaths under age 70 (percent of all NCD deaths)		Age-standardized death	
		Males	Females	Males	Females	All NCDs	Cancers
Seychelles	AFR	**0.3**	**0.2**	**58.0**	**43.1**	**773.6**	**226.6**
Sierra Leone	AFR	7.2	7.6	80.0	81.5	808.0	101.1
Singapore	WPR	**10.1**	**7.8**	**46.0**	**34.9**	**372.1**	**141.6**
Slovakia	EUR	**24.2**	**23.5**	**46.7**	**23.7**	**767.9**	**218.9**
Slovenia	EUR	**7.6**	**8.2**	**39.9**	**18.1**	**517.3**	**207.3**
Solomon Islands	WPR	0.8	0.6	61.1	58.1	709.7	85.9
Somalia	EMR	18.4	19.3	70.7	65.8	996.6	105.3
South Africa	AFR	**92.4**	**98.1**	**69.0**	**53.7**	**733.7**	**207.2**
Spain	EUR	**176.2**	**167.3**	**27.6**	**13.4**	**429.0**	**168.2**
Sri Lanka	SEAR	**66.8**	**51.1**	**46.9**	**32.8**	**746.2**	**90.0**
Sudan	EMR	89.0	95.1	61.5	58.7	920.3	78.8
Suriname	AMR	**1.3**	**1.1**	**52.5**	**45.2**	**696.4**	**107.1**
Swaziland	AFR	2.5	2.4	69.0	65.0	1038.1	92.5
Sweden	EUR	**38.5**	**41.9**	**24.5**	**15.4**	**389.7**	**127.7**
Switzerland	EUR	**26.3**	**29.4**	**26.9**	**15.0**	**362.2**	**136.8**
Syrian Arab Republic	EMR	33.7	26.1	59.1	49.2	730.4	65.7
Tajikistan	EUR	**10.1**	**14.8**	**48.5**	**40.5**	**678.1**	**83.6**
Thailand	SEAR	**227.1**	**191.3**	**51.7**	**42.2**	**791.7**	**114.6**
The former Yugoslav Republic of Macedonia	EUR	**9.1**	**9.7**	**41.2**	**24.8**	**755.8**	**165.1**
Timor-Leste	SEAR	1.4	1.0	64.5	55.4	651.2	122.2
Togo	AFR	10.3	11.4	59.6	54.1	754.6	86.4
Tonga	WPR	**0.2**	**0.3**	**45.9**	**53.0**	**649.3**	**67.4**
Trinidad and Tobago	AMR	**4.1**	**3.7**	**54.2**	**44.9**	**895.6**	**157.5**
Tunisia	EMR	20.5	18.1	40.2	31.5	505.4	122.6
Turkey	EUR	**177.1**	**136.7**	**51.3**	**39.7**	**707.6**	**158.0**
Turkmenistan	EUR	**16.1**	**15.7**	**68.0**	**48.4**	**1181.7**	**120.6**
Tuvalu	WPR	**0.0**	**0.0**	**63.1**	**56.3**	**992.3**	**106.9**
Uganda	AFR	64.1	42.3	69.6	53.1	1094.7	126.5
Ukraine	EUR	**310.9**	**338.0**	**52.0**	**24.4**	**1121.9**	**159.3**
United Arab Emirates	EMR	3.2	1.4	74.5	58.5	448.0	63.4
United Kingdom	EUR	**244.3**	**274.1**	**29.4**	**18.1**	**440.6**	**154.8**
United Republic of Tanzania	AFR	75.7	58.8	64.0	49.2	874.0	79.0
United States of America	AMR	**1055.0**	**1150.5**	**36.5**	**23.6**	**458.2**	**141.4**
Uruguay	AMR	**14.4**	**14.6**	**36.2**	**21.4**	**650.5**	**217.0**
Uzbekistan	EUR	**68.2**	**72.1**	**54.0**	**39.1**	**937.8**	**76.6**
Vanuatu	WPR	0.5	0.3	60.3	62.2	767.8	94.7
Venezuela (Bolivarian Republic of)	AMR	**45.7**	**42.4**	**53.0**	**44.5**	**468.7**	**102.5**
Viet Nam	WPR	**208.0**	**222.0**	**42.7**	**32.4**	**687.2**	**137.3**
Yemen	EMR	36.2	31.4	67.8	59.4	886.8	87.1
Zambia	AFR	28.2	24.3	70.3	63.1	1075.2	105.3
Zimbabwe	AFR	19.0	19.1	45.9	43.0	697.8	111.7

rate per 100,000 (Males)		Age-standardized death rate per 100,000 (Females)				Latest Year of Data
Chronic respiratory diseases	Cardiovascular diseases and diabetes	All NCDs	Cancers	Chronic respiratory diseases	Cardiovascular diseases and diabetes	
53.2	**322.7**	**416.9**	**95.7**	**20.6**	**229.6**	2008
117.1	421.0	769.9	100.8	69.5	458.6	no data
22.6	**171.2**	**238.8**	**90.9**	**7.2**	**108.9**	2008
22.3	**430.8**	**425.2**	**110.3**	**7.6**	**259.4**	2008
22.1	**209.9**	**287.2**	**112.7**	**7.1**	**127.8**	2008
74.5	425.0	524.3	85.9	41.4	303.7	no data
88.4	570.7	932.9	97.1	57.8	573.4	no data
86.6	**327.9**	**555.2**	**123.9**	**44.5**	**315.2**	2007
43.7	**139.7**	**235.1**	**78.2**	**16.0**	**86.3**	2008
101.5	**384.9**	**460.9**	**77.8**	**57.5**	**240.8**	2003
84.6	549.5	859.8	67.6	55.0	545.6	no data
28.3	**426.2**	**450.1**	**80.8**	**13.6**	**275.6**	2005
158.9	558.2	729.8	70.9	71.3	441.9	no data
17.3	**179.2**	**266.5**	**100.6**	**12.5**	**102.8**	2008
18.5	**143.0**	**233.6**	**87.8**	**7.9**	**85.7**	2007
46.5	471.7	503.5	47.2	28.8	326.1	no data
32.9	**483.3**	**759.0**	**81.4**	**42.8**	**562.4**	2005
114.4	**343.0**	**540.6**	**95.9**	**29.7**	**280.0**	2006
30.9	**500.7**	**578.9**	**96.2**	**21.1**	**429.3**	2003
78.1	358.7	474.9	95.6	49.7	275.8	no data
109.4	402.4	676.5	90.8	59.7	404.5	no data
68.8	**395.9**	**672.6**	**93.9**	**53.2**	**395.0**	1998
37.1	**545.3**	**505.7**	**89.2**	**12.2**	**316.4**	2006
30.1	267.8	404.2	71.7	21.5	245.4	no data
94.7	**402.5**	**474.8**	**78.0**	**37.6**	**321.5**	2008
49.3	**880.8**	**872.8**	**92.1**	**32.0**	**667.7**	1998
98.4	**605.8**	**991.9**	**153.8**	**77.3**	**568.0**	2000
159.3	561.6	684.9	140.3	53.4	383.7	no data
43.3	**772.1**	**582.5**	**79.2**	**8.4**	**440.9**	2008
11.6	308.9	340.0	64.4	23.1	203.9	no data
38.7	**165.7**	**309.3**	**114.5**	**26.5**	**101.7**	2008
130.5	472.7	614.3	73.6	52.1	381.9	no data
38.0	**190.5**	**325.7**	**103.7**	**27.8**	**122.0**	2007
59.5	**264.1**	**377.5**	**118.3**	**20.3**	**160.6**	2004
33.1	**718.4**	**733.9**	**66.5**	**22.4**	**563.7**	2005
79.5	462.4	576.8	94.3	44.8	333.4	no data
25.0	**265.7**	**370.8**	**92.1**	**19.7**	**207.2**	2007
76.6	**381.5**	**508.2**	**94.3**	**45.5**	**298.2**	2008
62.8	541.8	721.3	80.6	42.5	445.7	no data
159.4	562.8	808.2	108.3	74.6	472.5	no data
96.2	357.3	533.4	115.1	41.2	291.0	no data

TOBACCO
2008 COMPARABLE ESTIMATES OF PREVALENCE OF CURRENT DAILY TOBACCO SMOKING AND CURRENT DAILY CIGARETTE SMOKING

Note: – indicates sample sizes were not available
… indicates no data were available

Country name	Region	Current Daily Tobacco Smoking						Current Daily Tobacco Smoking				
		Crude adjusted estimates						Age-standardized adjusted estimates				
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes
Afghanistan	EMR	…	…	…	…	…	…	…	…	…	…	…
Albania	EUR	37.7	28.3-47.1	2.5	0.0-7.6	19.6	14.3-24.9	39.1	29.9-48.2	2.6	0.0-6.0	20.8
Algeria	AFR	24.8	20.5-29.0	0.2	0.0-0.5	12.5	10.3-14.7	24.2	20.0-28.5	0.2	0.0-0.6	12.2
Andorra	EUR	29.9	20.0-39.7	20.1	9.5-30.7	24.9	17.6-32.2	30.5	20.6-40.4	24.8	14.1-35.5	27.6
Angola	AFR	…	…	…	…	…	…	…	…	…	…	…
Antigua and Barbuda	AMR	…	…	…	…	…	…	…	…	…	…	…
Argentina	AMR	26.4	–	21.0	–	23.6	–	26.6	–	21.8	–	24.2
Armenia	EUR	53.8	41.3-66.3	1.9	0.6-3.2	25.2	19.5-30.9	55.1	42.6-67.6	1.9	0.6-3.2	28.5
Australia	WPR	18.3	17.6-19.0	15.4	14.8-16.0	16.8	16.3-17.3	18.8	18.2-19.8	16.1	15.4-16.6	17.5
Austria	EUR	40.6	38.5-42.7	39.2	37.2-41.1	39.8	38.4-41.2	42.1	40.0-44.2	43.6	41.6-45.5	42.8
Azerbaijan	EUR	…	…	0.4	0.0-3.5	…	…	…	…	0.4	0.0-2.4	…
Bahamas	AMR	…	…	…	…	…	…	…	…	…	…	…
Bahrain	EMR	31.4	28.3-34.5	6.2	4.6-7.8	21.2	19.2-23.2	30.2	27.2-33.3	7.4	5.7-9.1	18.8
Bangladesh	SEAR	40.0	30.7-49.2	2.1	0.3-3.9	21.2	16.4-26.0	42.4	33.2-51.7	2.8	1.0-4.6	22.6
Barbados	AMR	9.1	6.8-11.5	0.9	0.2-1.6	4.9	3.7-6.1	9.4	7.0-11.8	1.0	0.3-1.7	5.2
Belarus	EUR	58.7	55.3-62.1	13.6	11.6-15.5	34.2	32.3-36.1	58.6	55.2-62.0	16.8	14.6-18.9	37.7
Belgium	EUR	21.2	18.8-23.6	18.5	12.6-24.4	19.8	17.8-21.9	22.4	19.9-24.9	20.1	18.2-22.0	21.2
Belize	AMR	7.2	0.9-13.6	0.4	0.0-1.2	3.9	0.7-7.1	7.7	1.4-14.1	0.5	0.0-1.3	4.1
Benin	AFR	11.7	6.7-16.8	0.7	0.0-1.8	6.2	3.6-8.8	12.4	7.3-17.5	1.0	0.0-2.1	6.7
Bhutan	SEAR	…	…	…	…	…	…	…	…	…	…	…
Bolivia (Plurinational State of)	AMR	33.4	30.5-36.3	26.6	25.9-27.2	29.9	28.4-31.4	30.5	27.7-33.3	26.7	26.1-27.4	28.6
Bosnia and Herzegovina	EUR	42.8	36.7-48.9	29.5	24.3-34.7	35.8	30.2-41.5	43.5	37.3-49.7	31.7	26.1-37.3	37.6
Botswana	AFR	19.5	17.3-21.7	0.8	0.5-1.1	10.1	9.0-11.2	17.5	15.4-19.6	1.0	0.6-1.4	9.3
Brazil	AMR	17.3	16.8-17.8	11.0	10.7-11.3	14.1	13.8-14.4	16.5	16.0-17.0	10.6	10.3-10.9	13.6
Brunei Darussalam	WPR	…	…	…	…	…	…	…	…	…	…	…
Bulgaria	EUR	41.9	–	27.2	–	34.3	–	42.3	–	32.1	–	37.2
Burkina Faso	AFR	13.3	11.5-15.0	5.8	4.6-7.0	9.5	8.1-10.9	16.4	14.6-18.2	8.3	6.9-9.7	12.4
Burundi	AFR	…	…	…	…	…	…	…	…	…	…	…
Cambodia	WPR	45.6	43.4-47.8	3.7	3.1-4.3	23.7	22.6-24.8	48.3	46.1-50.6	4.2	3.5-4.9	26.3
Cameroon	AFR	10.5	9.5-11.5	1.1	0.8-1.4	5.8	5.3-6.3	11.7	10.7-12.8	1.2	0.9-1.4	6.4
Canada	AMR	15.4	14.0-16.8	11.6	10.5-12.6	13.5	12.6-14.3	15.5	14.8-16.2	11.7	11.1-12.3	13.6
Cape Verde	AFR	9.9	–	2.3	–	5.9	–	10.9	–	2.8	–	6.9
Central African Republic	AFR	…	…	…	…	…	…	…	…	…	…	…
Chad	AFR	20.1	17.6-22.6	2.1	1.1-3.0	11.0	9.7-12.3	20.5	18.0-23.0	2.0	1.1-3.0	11.3
Chile	AMR	38.4	36.6-40.2	32.7	31.1-34.3	35.5	34.3-36.7	38.1	36.3-39.8	33.3	31.7-34.9	35.7
China	WPR	49.3	48.7-50.0	2.1	1.9-2.3	26.3	26.0-26.6	48.8	48.2-49.5	2.1	1.9-2.2	25.4
Colombia	AMR	…	…	…	…	…	…	…	…	…	…	…
Comoros	AFR	15.6	6.7-24.5	6.8	0.0-18.1	11.2	4.0-18.4	20.1	11.1-29.1	8.9	0.0-20.2	14.5
Congo	AFR	7.1	2.7-11.5	0.4	0.0-1.4	3.7	1.4-6.0	7.2	2.8-11.7	0.5	0.0-1.5	3.9
Cook Islands	WPR	38.9	21.3-56.4	29.7	10.1-49.4	34.4	21.3-47.5	37.4	19.9-55.0	28.5	8.8-48.1	32.9
Costa Rica	AMR	9.5	7.6-11.3	2.4	1.7-3.2	6.0	4.7-7.3	9.3	7.4-11.2	2.4	1.6-3.2	5.9
Côte d'Ivoire	AFR	14.3	12.8-15.9	2.7	2.1-3.3	8.7	7.8-9.6	15.0	13.4-16.6	3.2	2.5-3.9	9.1
Croatia	EUR	31.7	30.0-33.4	22.3	21.3-23.3	26.7	25.4-28.1	33.1	31.3-34.9	25.6	24.5-26.7	29.4
Cuba	AMR	43.5	–	27.5	–	35.5	–	41.7	–	25.9	–	33.8
Cyprus	EUR	…	…	…	…	…	…	…	…	…	…	…
Czech Republic	EUR	27.3	–	19.6	–	23.4	–	27.9	–	21.6	–	24.7
Democratic People's Republic of Korea	SEAR	56.9	33.6-80.3	…	…	…	…	55.9	32.6-79.3	…	…	…
Democratic Republic of the Congo	AFR	8.3	3.5-13.1	0.9	0.0-2.3	4.5	2.0-7.0	8.5	3.7-13.3	1.5	0.0-2.9	5.0
Denmark	EUR	26.9	25.0-28.8	22.4	20.7-24.1	24.6	22.8-26.5	26.6	24.7-28.5	22.3	20.5-24.1	24.4
Djibouti	EMR	…	…	…	…	…	…	…	…	…	…	…
Dominica	AMR	7.0	4.7-9.3	2.9	1.5-4.2	4.9	3.6-6.2	7.1	4.8-9.4	2.8	1.5-4.2	5.0
Dominican Republic	AMR	13.6	9.7-17.5	10.2	7.3-13.1	11.9	9.5-14.3	15.1	11.2-19.1	11.5	8.5-14.4	13.3
Ecuador	AMR	5.7	4.4-6.9	1.3	0.8-1.9	3.5	2.6-4.4	6.1	4.7-7.5	1.5	1.0-2.0	3.8

		Current Daily Cigarette Smoking						Current Daily Cigarette Smoking						Latest Year of National Data
		Crude adjusted estimates						Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	15.9-25.7	37.7	28.3-47.1	2.5	0.0-7.6	19.6	14.3-24.9	39.1	29.9-48.2	2.6	0.0-6.0	20.8	15.9-25.7	2002
	10.1-14.3	22.3	18.0-26.5	0.1	0.0-0.5	11.2	9.1-13.3	21.1	16.9-25.3	0.1	0.0-0.5	10.6	8.5-12.7	no national data
	20.3-34.9	29.9	20.0-39.7	20.1	9.5-30.7	24.9	17.6-32.2	30.5	20.6-40.4	24.8	14.1-35.5	27.6	20.3-34.9	1997
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	–	25.4	–	17.9	–	21.6	–	25.6	–	18.8	–	22.2	–	2005
	22.2-34.8	53.8	41.3-66.3	1.9	0.6-3.2	25.2	19.5-30.9	55.1	42.6-67.6	1.9	0.6-3.2	28.5	22.2-34.8	2005
	17.0-18.0	18.8	17.8-19.4	15.4	15.3-16.5	17.1	16.3-17.3	18.6	18.2-19.8	15.9	15.4-16.6	17.3	16.8-17.8	2007
	41.4-44.2	40.6	38.5-42.7	39.2	37.2-41.1	39.8	38.4-41.2	42.1	40.0-44.2	43.6	41.6-45.5	42.8	41.4-44.2	2004
	...	...	...	0.4	0.0-3.5	...	...	...	...	0.4	0.0-2.4	...	...	2001
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	17.0-20.6	23.3	20.5-26.1	4.8	3.4-6.2	15.9	14.1-17.7	22.5	19.7-25.2	6.2	4.6-7.8	14.3	12.7-15.9	2007
	17.9-27.3	36.2	27.0-45.5	0.4	0.0-2.2	18.5	13.8-23.2	37.9	28.7-47.2	0.5	0.0-2.3	19.2	14.5-23.9	2004
	3.9-6.5	8.8	6.5-11.1	0.8	0.1-1.4	4.6	3.4-5.8	9.0	6.7-11.4	0.8	0.2-1.5	4.9	3.7-6.1	2007
	35.7-39.7	58.7	55.3-62.1	13.6	11.6-15.5	34.2	32.3-36.1	58.6	55.2-62.0	16.8	14.6-18.9	37.7	35.7-39.7	2001
	19.0-23.4	21.2	18.8-23.6	18.5	16.8-20.2	19.8	17.8-21.9	22.4	19.9-24.9	20.1	18.2-22.0	21.2	19.0-23.4	2001
	0.9-7.3	7.2	0.9-13.6	0.4	0.0-1.2	3.9	0.7-7.1	7.7	1.4-14.1	0.5	0.0-1.3	4.1	0.9-7.3	2006
	4.1-9.3	8.4	3.4-13.5	0.2	0.0-1.3	4.3	1.7-6.9	8.1	3.1-13.1	0.3	0.0-1.4	4.2	1.6-6.8	2008
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	27.2-30.0	32.9	30.0-35.8	23.7	23.1-24.4	28.2	26.8-29.6	29.8	27.0-32.6	23.2	22.6-23.9	26.5	25.1-27.9	2008
	31.7-43.5	42.8	26.7-48.9	29.5	24.3-34.7	35.8	30.2-41.5	43.5	37.3-49.7	31.7	26.1-37.3	37.6	31.7-43.5	2002
	8.2-10.4	17.9	15.8-20.0	0.7	0.4-1.0	9.2	8.1-10.3	15.9	13.9-17.9	0.8	0.5-1.2	8.4	7.4-9.4	2007
	13.3-13.9	17.1	16.6-17.6	10.8	10.5-11.1	13.9	13.6-14.2	16.3	15.8-16.8	10.5	10.2-10.8	13.4	13.1-13.7	2008
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	–	41.9	–	27.2	–	34.3	–	42.3	–	32.1	–	37.2	–	2007
	10.8-14.0	9.2	7.7-10.6	0.4	0.2-0.7	4.7	3.9-5.5	8.9	7.5-10.3	0.5	0.2-0.8	4.7	3.9-5.6	2003
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	25.1-27.5	42.7	40.5-44.9	3.3	2.7-3.9	22.2	21.1-23.3	44.5	42.3-46.7	3.7	3.1-4.3	24.1	23.0-25.2	2010
	5.9-6.9	8.0	7.1-8.9	0.6	0.4-0.8	4.3	3.9-4.7	8.9	8.0-9.9	0.6	0.4-0.8	4.8	4.3-5.3	2000
	13.1-14.1	15.2	14.7-16.1	11.4	10.8-12.0	13.3	12.9-13.8	15.4	14.7-16.1	11.6	11.0-12.2	13.5	13.0-14.0	2008
	–	7.1	–	0.4	–	3.5	–	7.1	–	0.4	–	3.8	–	2007
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	10.0-12.6	15.1	12.8-17.3	1.0	0.4-1.7	7.9	6.8-9.0	15.3	13.1-17.5	1.0	0.4-1.7	8.2	7.0-9.4	2003
	34.5-36.9	37.7	35.9-39.4	28.9	27.4-30.5	33.2	32.0-34.4	37.4	35.6-39.1	29.7	28.1-31.3	33.5	32.3-34.7	2006
	25.1-25.7	49.3	48.7-50.0	2.1	1.9-2.3	26.3	26.0-26.6	48.8	48.2-49.5	2.1	1.9-2.2	25.4	25.1-25.7	2007
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	7.3-21.7	12.9	4.0-21.7	2.1	0.0-13.3	7.4	0.3-14.5	15.1	6.1-24.0	2.6	0.0-13.8	8.8	1.6-16.0	2003
	1.6-6.2	5.2	0.9-9.6	0.2	0.0-1.1	2.7	0.5-4.9	5.4	1.0-9.7	0.2	0.0-1.2	2.8	0.6-5.0	2003
	19.7-46.1	38.9	21.3-56.4	29.7	10.1-49.4	34.4	21.3-47.5	37.4	19.9-55.0	28.5	8.8-48.1	32.9	19.7-46.1	2004
	4.6-7.3	9.5	7.6-11.3	2.4	1.7-3.2	6.0	4.7-7.3	9.3	7.4-11.2	2.4	1.6-3.2	5.9	4.6-7.3	2001
	8.2-10.0	10.7	9.3-12.0	0.5	0.2-0.7	5.7	5.0-6.4	10.2	8.8-11.5	0.5	0.2-0.8	5.3	4.6-6.0	2003
	28.0-30.9	31.7	30.0-33.4	22.3	21.3-23.3	26.7	25.3-28.1	33.1	31.3-34.9	25.6	24.5-26.7	29.4	28.0-30.9	2003
	–	35.2	–	25.4	–	30.3	–	34.4	–	24.2	–	29.3	–	2003
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	–	27.3	–	19.6	–	23.4	–	27.9	–	21.6	–	24.7	–	2008
	...	56.9	33.6-80.3	...	...	...	...	55.9	32.6-79.3	...	...	...	...	no national data
	2.5-7.5	6.1	1.4-10.8	0.2	0.0-1.5	3.1	0.7-5.5	6.2	1.5-10.9	0.3	0.0-1.6	3.3	0.9-5.7	no national data
	22.6-26.3	26.9	25.0-28.8	22.4	20.7-24.1	24.6	22.8-26.5	26.6	24.7-28.5	22.3	20.5-24.1	24.4	22.6-26.3	2004
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	3.7-6.3	6.6	4.4-8.9	2.8	1.4-4.1	4.7	3.4-6.0	6.7	4.5-9.0	2.8	1.4-4.1	4.7	3.4-6.0	2007
	10.8-15.8	12.0	8.1-15.9	8.4	5.6-11.2	10.2	7.8-12.6	13.2	9.3-17.2	9.2	6.4-12.1	11.2	8.8-13.6	2003
	2.9-4.8	5.4	4.2-6.6	1.2	0.8-1.7	3.3	2.5-4.1	5.8	4.5-7.1	1.4	0.9-1.9	3.6	2.7-4.5	2003

TOBACCO
2008 COMPARABLE ESTIMATES OF PREVALENCE OF CURRENT DAILY TOBACCO SMOKING AND CURRENT DAILY CIGARETTE SMOKING

Note: – indicates sample sizes were not available
… indicates no data were available

Country name	Region	Current Daily Tobacco Smoking						Current Daily Tobacco Smoking				
		Crude adjusted estimates						Age-standardized adjusted estimates				
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes
Egypt	EMR	35.1	31.3-38.9	0.5	0.0-1.1	17.8	15.9-19.7	37.2	33.4-41.0	0.6	0.0-1.1	18.9
El Salvador	AMR	…	…	…	…	…	…	…	…	…	…	…
Equatorial Guinea	AFR	…	…	…	…	…	…	…	…	…	…	…
Eritrea	AFR	9.7	8.0-11.4	0.4	0.0-0.8	4.9	4.1-5.7	10.3	8.5-12.0	0.4	0.1-0.8	5.4
Estonia	EUR	39.2	36.5-41.9	17.3	15.3-19.3	27.2	24.9-29.6	39.9	37.2-42.6	18.6	16.6-20.6	29.3
Ethiopia	AFR	4.5	3.7-5.4	0.2	0.0-0.4	2.4	1.9-2.9	5.5	4.5-6.5	0.3	0.0-0.6	2.9
Fiji	WPR	15.0	13.7-16.4	1.7	1.3-2.1	8.4	7.7-9.1	14.9	13.5-16.2	1.7	1.3-2.2	8.3
Finland	EUR	24.4	22.2-26.6	15.8	14.1-17.5	20.0	18.1-22.0	25.2	23.0-27.4	16.5	14.7-18.3	20.9
France	EUR	27.4	26.7-28.1	20.1	19.5-20.7	23.6	22.9-24.3	29.9	29.2-30.6	23.8	23.1-24.5	26.9
Gabon	AFR	16.3	9.2-23.4	2.3	0.0-7.5	9.3	4.9-13.7	16.4	9.3-23.5	2.4	0.0-7.6	9.4
Gambia	AFR	31.1	28.9-33.2	2.8	2.2-3.5	16.7	15.6-17.8	29.4	27.3-31.5	2.2	1.6-2.8	15.8
Georgia	EUR	49.4	37.3-61.4	3.7	1.1-6.4	24.7	19.0-30.4	50.9	38.8-62.9	4.0	1.4-6.7	27.5
Germany	EUR	28.3	26.2-30.4	18.6	17.4-19.8	23.3	21.7-25.0	30.2	28.0-32.4	21.8	20.4-23.2	26.0
Ghana	AFR	7.0	5.9-8.0	1.7	1.3-2.2	4.4	3.8-5.0	8.3	6.6-10.0	2.2	1.5-2.8	5.2
Greece	EUR	59.0	57.9-60.1	30.1	29.3-30.8	44.3	43.6-45.0	60.4	59.2-61.5	37.3	36.5-38.1	48.8
Grenada	AMR	…	…	…	…	…	…	…	…	…	…	…
Guatemala	AMR	7.3	5.6-9.0	0.8	0.4-1.2	3.9	2.9-4.9	7.5	5.8-9.2	0.9	0.5-1.3	4.2
Guinea	AFR	22.7	20.2-25.1	1.4	0.8-2.0	12.1	10.8-13.4	23.3	20.9-25.8	1.4	0.8-2.0	12.4
Guinea-Bissau	AFR	…	…	…	…	…	…	…	…	…	…	…
Guyana	AMR	…	…	…	…	…	…	…	…	…	…	…
Haiti	AMR	…	…	…	…	…	…	…	…	…	…	…
Honduras	AMR	…	…	0.6	0.0-1.3	…	…	…	…	0.6	0.0-1.3	…
Hungary	EUR	37.5	26.0-49.0	27.1	15.2-38.9	32.0	23.7-40.3	38.6	27.1-50.1	30.3	18.3-42.2	34.4
Iceland	EUR	20.0	–	14.5	–	17.3	–	20.1	–	14.9	–	17.5
India	SEAR	25.1	23.4-26.8	2.0	1.2-2.9	13.9	12.9-14.9	27.2	25.1-29.3	2.3	1.3-3.3	14.8
Indonesia	SEAR	53.4	–	3.4	–	28.2	–	53.5	–	3.9	–	28.7
Iran (Islamic Republic of)	EMR	19.4	18.8-20.1	1.1	0.9-1.2	10.4	10.1-10.7	20.8	20.1-21.4	1.3	1.1-1.5	11.0
Iraq	EMR	25.3	–	2.1	0.1-4.1	13.7	12.7-14.7	26.6	–	2.9	0.9-4.9	14.8
Ireland	EUR	24.1	21.7-26.5	19.7	17.4-22.0	21.9	19.5-24.3	24.5	21.9-27.1	20.0	17.5-22.5	22.3
Israel	EUR	23.9	22.1-25.8	14.9	13.6-16.2	19.3	18.2-20.4	24.2	22.3-26.0	15.1	13.8-16.5	19.6
Italy	EUR	26.3	24.3-28.3	13.5	12.5-14.5	19.6	18.1-21.1	27.9	25.8-30.0	15.5	14.3-16.7	21.7
Jamaica	AMR	17.4	13.4-21.4	7.6	4.9-10.3	12.3	9.9-14.7	18.4	14.1-22.6	7.8	4.8-10.8	13.1
Japan	WPR	36.6	27.0-46.0	8.7	1.5-16.0	22.2	7.8-36.6	37.8	9.0-66.6	10.3	3.1-17.5	24.1
Jordan	EMR	48.8	46.6-51.0	4.1	3.2-5.0	27.1	25.9-28.3	47.6	45.3-49.8	4.9	3.9-6.0	26.3
Kazakhstan	EUR	37.0	24.9-49.1	6.6	2.6-10.6	20.8	14.8-26.8	36.1	24.0-48.3	6.7	2.7-10.7	21.4
Kenya	AFR	18.0	16.7-19.3	0.7	0.0-2.8	9.3	8.0-10.6	20.6	19.2-21.9	1.0	0.0-3.2	10.8
Kiribati	WPR	73.3	70.2-76.4	61.7	58.6-64.8	67.4	65.2-69.6	73.5	70.4-76.6	62.0	58.9-65.1	67.8
Kuwait	EMR	34.6	22.4-46.9	2.6	0.4-4.7	22.6	14.9-30.3	31.2	19.0-43.4	2.8	0.6-5.0	17.0
Kyrgyzstan	EUR	38.2	26.4-50.0	1.3	0.3-2.4	19.2	13.4-25.0	40.3	28.5-52.1	1.4	0.3-2.4	20.8
Lao People's Democratic Republic	WPR	41.4	39.0-43.8	2.5	1.9-3.1	21.6	20.4-22.8	44.2	41.8-46.6	2.9	2.2-3.6	23.6
Latvia	EUR	44.6	29.8-59.5	14.0	5.7-22.2	27.8	19.7-35.9	45.4	30.6-60.2	17.4	9.1-25.7	31.4
Lebanon	EMR	44.1	40.8-47.4	30.0	27.3-32.7	36.8	34.7-38.9	44.6	41.3-47.9	30.7	28.0-33.4	37.6
Lesotho	AFR	…	…	…	…	…	…	…	…	…	…	…
Liberia	AFR	11.3	10.2-12.4	…	…	…	…	12.2	10.5-13.9	…	…	…
Libyan Arab Jamahiriya	EMR	45.5	40.8-50.3	0.2	0.0-0.8	23.8	21.3-26.3	45.2	40.4-49.9	0.2	0.0-0.8	22.7
Lithuania	EUR	41.7	27.1-56.3	13.0	5.9-20.1	26.2	18.5-33.9	42.0	27.4-56.7	14.8	7.7-22.0	28.4
Luxembourg	EUR	30.4	–	25.5	–	27.9	–	33.0	–	28.1	–	30.6
Madagascar	AFR	…	…	…	…	…	…	…	…	…	…	…
Malawi	AFR	20.1	18.2-22.0	2.1	1.6-2.5	10.9	9.9-11.9	22.3	20.3-24.2	3.1	2.5-3.6	12.7
Malaysia	WPR	40.9	28.9-52.8	1.6	0.2-3.0	21.5	15.4-27.6	39.8	27.9-51.8	1.7	0.3-3.1	20.8
Maldives	SEAR	38.1	30.8-45.4	7.3	4.8-9.9	22.8	17.9-27.7	38.1	30.8-45.4	9.4	6.2-12.6	23.8
Mali	AFR	26.5	23.8-29.1	1.3	0.7-1.8	13.5	12.2-14.8	27.1	24.4-29.8	1.8	1.1-2.4	14.4
Malta	EUR	26.2	–	16.2	–	21.2	–	26.5	–	17.5	–	22.0
Marshall Islands	WPR	31.6	16.4-46.7	3.8	0.0-7.7	17.3	9.7-24.9	30.2	15.0-45.3	3.7	0.0-7.5	16.9

		Current Daily Cigarette Smoking						Current Daily Cigarette Smoking						Latest Year of National Data
		Crude adjusted estimates						Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	17.0-20.8	31.5	27.7-35.3	0.3	0.0-0.8	15.9	14.0-17.8	32.7	28.9-36.5	0.3	0.0-0.9	16.5	14.6-18.4	2009
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	4.5-6.3	9.0	7.4-10.7	0.2	0.0-0.5	4.5	3.7-5.3	9.3	7.6-11.0	0.2	0.0-0.5	4.8	4.0-5.6	2004
	27.0-31.7	39.2	36.5-41.9	17.3	15.3-19.3	27.2	24.9-29.6	39.9	37.2-42.6	18.6	16.6-20.6	29.3	27.0-31.7	2006
	2.3-3.6	4.2	3.4-4.9	0.1	0.0-0.3	2.1	1.6-2.6	5.1	4.2-6.0	0.2	0.0-0.4	2.6	2.1-3.2	2005
	7.6-9.0	15.0	13.7-16.4	1.7	1.3-2.1	8.4	7.7-9.1	14.9	13.5-16.2	1.7	1.3-2.2	8.3	7.6-9.0	2002
	18.9-22.9	24.4	22.2-26.6	15.8	14.1-17.5	20.0	18.1-22.0	25.2	23.0-27.4	16.5	14.7-18.3	20.9	18.9-22.9	2007
	26.2-27.6	27.4	26.7-28.1	20.1	19.5-20.7	23.6	22.9-24.3	29.9	29.2-30.6	23.8	23.1-24.5	26.9	26.2-27.6	2005
	5.0-13.8	11.9	4.9-18.9	1.3	0.0-6.4	6.5	2.2-10.8	12.0	4.9-19.0	1.1	0.0-6.2	6.5	2.1-10.9	no national data
	14.7-16.9	25.5	23.4-27.5	0.6	0.3-0.9	12.8	11.8-13.8	22.4	20.5-24.4	0.5	0.2-0.8	11.5	10.5-12.5	2010
	21.3-33.7	49.4	37.3-61.4	3.7	1.1-6.4	24.7	19.0-30.4	50.9	38.8-62.9	4.0	1.4-6.7	27.5	21.3-33.7	2003
	24.2-27.8	28.3	26.2-30.4	18.6	17.4-19.8	23.3	21.7-25.0	30.2	28.0-32.4	21.8	20.4-23.2	26.0	24.2-27.8	2005
	4.3-6.1	4.5	3.5-5.4	0.4	0.1-0.7	2.5	2.0-3.0	5.1	3.5-6.7	0.4	0.0-0.9	2.8	2.0-3.6	2008
	48.1-49.5	59.0	57.9-60.1	30.1	29.3-30.8	44.3	43.6-45.0	60.4	59.2-61.5	37.3	36.5-38.1	48.8	48.1-49.5	1999
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	3.2-5.3	7.3	5.6-9.0	0.8	0.4-1.2	3.9	2.9-4.9	7.5	5.8-9.2	0.9	0.5-1.3	4.2	3.2-5.3	2003
	11.1-13.7	17.3	15.1-19.5	0.4	0.1-0.7	8.9	7.8-10.0	17.0	14.8-19.1	0.4	0.1-0.7	8.7	7.6-9.8	2009
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	0.6	0.0-1.3	...	...	...	...	0.6	0.0-1.3	...	–	2006
	26.1-42.7	37.5	26.0-49.0	27.1	15.2-38.9	32.0	23.7-40.3	38.6	27.1-50.1	30.3	18.3-42.2	34.4	26.1-42.7	2003
	–	20.0	–	14.5	–	17.3	–	20.1	–	14.9	–	17.5	–	2008
	13.6-16.0	20.1	18.4-21.8	0.3	0.0-1.2	10.5	9.5-11.5	21.5	19.5-23.6	0.4	0.0-1.4	10.9	9.7-12.1	2006
	–	49.1	–	2.9	–	25.8	–	48.9	–	3.2	–	26.1	–	2007
	10.7-11.3	15.6	15.0-16.2	0.4	0.3-0.5	8.1	7.8-8.4	16.5	15.9-17.1	0.4	0.3-0.6	8.5	8.2-8.8	2009
	–	24.8	–	1.4	0.0-3.4	13.1	12.1-14.1	25.6	–	2.1	0.1-4.1	13.8	12.8-14.8	2007
	19.8-24.9	24.1	21.7-26.5	19.7	17.4-22.0	21.9	19.5-24.3	24.5	21.9-27.1	20.0	17.5-22.5	22.3	19.8-24.9	2007
	18.5-20.7	23.9	22.1-25.8	14.9	13.6-16.2	19.3	18.2-20.4	24.2	22.3-26.0	15.1	13.8-16.5	19.6	18.5-20.7	2004
	20.1-23.4	26.3	24.3-28.3	13.5	12.5-14.5	19.6	18.1-21.1	27.9	25.8-30.0	15.5	14.3-16.7	21.7	20.1-23.4	2008
	10.5-15.7	15.4	11.6-19.3	6.3	3.7-8.9	10.7	8.4-13.0	16.2	12.1-20.4	6.4	3.5-9.3	11.3	8.8-13.8	2000
	9.3-38.9	36.6	7.8-65.4	8.7	1.5-16.0	22.2	7.8-36.6	37.8	9.0-66.6	10.3	3.1-17.5	24.1	9.3-38.9	2006
	25.1-27.5	37.2	35.0-39.3	2.7	1.9-3.5	20.4	19.2-21.6	36.2	34.0-38.3	3.2	2.4-4.0	19.7	18.6-20.8	2007
	15.0-27.8	37.0	24.9-49.1	6.6	2.6-10.6	20.8	14.8-26.8	36.1	24.0-48.3	6.7	2.7-10.7	21.4	15.0-27.8	2003
	9.5-12.1	16.1	14.9-17.3	0.3	0.0-2.5	8.2	7.0-9.4	17.6	16.3-18.8	0.4	0.0-2.6	9.0	7.8-10.2	2009
	65.6-70.0	0.0	0.0-0.0	0.0	0.0-0.0	0.0	0.0-0.0	0.0	0.0-0.0	0.0	0.0-0.0	0.0	0.0-0.0	2006
	10.8-23.2	34.0	21.7-46.2	1.4	0.0-3.5	21.7	14.0-29.4	29.8	17.5-42.0	1.3	0.0-3.4	15.5	9.3-21.7	2006
	14.9-26.7	38.2	26.4-50.0	1.3	0.3-2.4	19.2	13.4-25.0	40.3	28.5-52.1	1.4	0.3-2.4	20.8	14.9-26.7	2005
	22.4-24.8	38.7	36.3-41.0	2.2	1.6-2.8	20.1	18.9-21.3	40.6	38.2-42.9	2.6	1.9-3.2	21.6	20.4-22.8	2008
	22.9-39.9	44.6	29.8-59.5	14.0	5.7-22.2	27.8	19.7-35.9	45.4	30.6-60.2	17.4	9.1-25.7	31.4	22.9-39.9	2006
	35.5-39.7	43.5	40.2-46.8	30.0	27.3-32.7	36.5	34.4-38.6	43.7	40.4-47.0	30.7	28.0-33.4	37.2	35.1-39.3	2009
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	7.5	6.5-8.5	...	...	...	...	7.8	6.2-9.4	...	...	...	...	2007
	20.3-25.1	41.9	37.1-46.6	0.2	0.0-0.7	21.9	19.4-24.4	40.6	35.9-45.4	0.1	0.0-0.7	20.4	18.0-22.8	2009
	20.3-36.5	41.7	27.1-56.3	13.0	5.9-20.1	26.2	18.5-33.9	42.0	27.4-56.7	14.8	7.7-22.0	28.4	20.3-36.5	2006
	–	30.4	–	25.5	–	27.9	–	33.0	–	28.1	–	30.6	–	2004
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	11.7-13.7	18.1	16.2-19.9	0.8	0.5-1.1	9.3	8.4-10.2	19.0	17.1-20.8	1.2	0.8-1.6	10.1	9.1-11.1	2009
	14.8-26.8	37.5	25.6-49.5	1.4	0.0-2.8	19.7	13.6-25.8	36.3	24.3-48.2	1.5	0.1-2.9	18.9	12.9-24.9	2006
	18.6-29.1	34.1	27.5-40.6	5.4	3.5-7.3	19.8	15.6-24.0	33.0	26.7-39.3	6.8	4.4-9.2	19.9	15.6-24.3	2001
	13.0-15.8	21.3	18.9-23.8	0.4	0.1-0.7	10.5	9.3-11.7	19.5	17.1-21.9	0.4	0.1-0.7	10.0	8.8-11.2	2007
	–	26.2	–	16.2	–	21.2	–	26.5	–	17.5	–	22.0	–	2008
	9.1-24.7	31.6	16.4-46.7	3.8	0.0-7.7	17.3	9.7-24.9	30.2	15.0-45.3	3.7	0.0-7.5	16.9	9.1-24.7	2002

TOBACCO
2008 COMPARABLE ESTIMATES OF PREVALENCE OF CURRENT DAILY TOBACCO SMOKING AND CURRENT DAILY CIGARETTE SMOKING

Note: – indicates sample sizes were not available
… indicates no data were available

Country name	Region	Current Daily Tobacco Smoking						Current Daily Tobacco Smoking				
		Crude adjusted estimates						Age-standardized adjusted estimates				
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes
Mauritania	AFR	29.8	27.5-32.0	4.0	3.2-4.7	16.9	15.4-18.4	28.4	26.1-30.7	3.6	2.9-4.3	16.0
Mauritius	AFR	25.0	–	1.3	–	13.0	–	24.6	–	1.3	–	13.0
Mexico	AMR	21.0	–	6.2	–	13.4	–	20.7	–	6.2	–	13.5
Micronesia (Federated States of)	WPR	22.4	6.8-38.1	12.4	0.0-26.4	17.5	7.0-28.0	24.9	9.2-40.6	13.2	0.0-27.2	19.0
Monaco	EUR	…	…	…	…	…	…	…	…	…	…	…
Mongolia	WPR	43.0	40.9-45.0	5.2	4.4-5.9	23.7	22.6-24.8	42.7	40.7-44.8	5.2	4.4-5.9	24.0
Montenegro	EUR	…	…	…	…	…	…	…	…	…	…	…
Morocco	EMR	28.7	25.2-32.3	0.2	0.0-0.6	14.0	12.3-15.7	28.9	25.3-32.4	0.2	0.0-0.6	14.5
Mozambique	AFR	13.1	11.4-14.8	1.5	0.9-2.1	7.0	5.9-8.1	13.9	12.1-15.7	1.6	1.0-2.2	7.8
Myanmar	SEAR	31.6	19.1-44.0	10.1	3.5-16.7	20.5	13.6-27.4	33.9	21.4-46.3	11.3	4.7-17.8	22.6
Namibia	AFR	21.6	18.2-25.0	6.9	6.4-7.5	14.1	12.4-15.8	21.3	15.5-27.0	7.6	7.1-8.2	14.5
Nauru	WPR	44.3	26.4-62.2	50.5	28.3-72.7	47.5	33.2-61.8	43.6	25.7-61.6	49.9	27.7-72.1	46.8
Nepal	SEAR	25.4	23.3-27.6	21.3	20.2-22.5	23.3	22.1-24.5	29.9	27.4-32.4	25.4	24.1-26.7	27.7
Netherlands	EUR	24.6	–	23.6	–	24.1	–	25.8	–	24.2	–	25.0
New Zealand	WPR	21.4	19.4-23.4	20.1	18.2-22.0	20.7	19.4-22.1	21.5	19.8-23.2	19.5	18.1-21.0	20.5
Nicaragua	AMR	…	…	…	…	…	…	…	…	…	…	…
Niger	AFR	7.1	4.3-9.9	0.3	0.0-0.7	3.6	2.2-5.0	6.5	3.7-9.3	0.4	0.0-0.7	3.4
Nigeria	AFR	7.6	6.7-8.4	1.7	1.4-2.0	4.6	4.1-5.1	8.2	6.6-9.7	2.2	1.7-2.7	5.2
Niue	WPR	…	…	…	…	…	…	…	…	…	…	…
Norway	EUR	22.7	–	21.8	–	22.2	–	22.5	–	22.2	–	22.4
Oman	EMR	6.6	1.1-12.2	0.2	0.0-0.6	4.0	0.7-7.3	6.4	0.9-11.9	0.3	0.0-0.8	3.4
Pakistan	EMR	25.4	16.3-34.5	3.8	0.0-7.6	15.0	10.0-20.0	28.9	19.8-38.0	5.0	1.1-8.8	16.9
Palau	WPR	33.0	–	7.1	–	19.7	–	32.9	–	7.3	–	20.1
Panama	AMR	…	…	…	…	…	…	…	…	…	…	…
Papua New Guinea	WPR	56.9	54.3-59.5	24.8	22.6-27.0	40.9	39.2-42.6	54.8	52.2-57.4	26.3	24.0-28.5	40.5
Paraguay	AMR	21.6	18.8-24.4	6.8	5.6-8.1	14.3	12.3-16.3	22.9	20.0-25.8	7.4	6.1-8.7	15.1
Peru	AMR	…	…	…	…	…	…	…	…	…	…	…
Philippines	WPR	34.7	33.3-36.1	7.7	7.0-8.5	21.2	20.4-22.0	35.9	34.5-37.3	8.3	7.6-9.0	22.1
Poland	EUR	33.2	–	23.2	–	28.0	–	32.1	–	22.7	–	27.4
Portugal	EUR	27.0	–	10.7	–	18.5	–	28.3	–	12.7	–	20.5
Qatar	EMR	…	…	…	…	…	…	…	…	…	…	…
Republic of Korea	WPR	50.4	16.8-84.0	4.9	0.0-10.8	27.2	10.5-43.9	50.2	16.6-83.9	4.8	0.0-10.8	27.5
Republic of Moldova	EUR	37.0	25.0-49.1	3.4	0.0-7.8	19.1	13.0-25.2	38.1	26.1-50.1	4.0	0.1-7.8	21.0
Romania	EUR	38.6	32.1-45.1	17.7	11.9-23.5	27.8	21.7-34.0	38.9	33.1-44.7	19.2	13.3-25.1	29.1
Russian Federation	EUR	65.5	62.2-68.7	19.7	17.4-21.9	40.5	38.6-42.4	65.5	62.2-68.7	22.9	20.5-25.3	44.2
Rwanda	AFR	…	…	…	…	…	…	…	…	…	…	…
Saint Kitts and Nevis	AMR	8.3	5.9-10.6	1.8	0.9-2.7	5.0	3.8-6.2	8.3	6.0-10.7	1.8	0.9-2.6	5.1
Saint Lucia	AMR	25.8	20.9-30.7	9.4	0.0-24.4	17.4	9.3-25.5	26.8	21.9-31.7	10.5	0.0-25.5	18.6
Saint Vincent and the Grenadines	AMR	16.0	11.4-20.6	4.8	2.5-7.2	10.5	7.9-13.1	16.8	12.1-21.5	5.1	2.7-7.5	11.0
Samoa	WPR	53.6	35.9-71.3	17.1	2.2-32.1	36.2	24.5-47.9	55.3	37.7-73.0	17.7	2.8-32.6	36.5
San Marino	EUR	…	…	…	…	…	…	…	…	…	…	…
Sao Tome and Principe	AFR	4.8	3.5-6.1	0.9	0.4-1.4	2.8	2.1-3.5	6.6	5.1-8.1	1.0	0.5-1.6	3.8
Saudi Arabia	EMR	8.5	6.6-10.5	2.7	1.5-3.8	6.0	4.4-7.6	8.5	6.4-10.6	3.4	1.9-4.9	6.0
Senegal	AFR	12.9	7.2-18.6	0.5	0.0-2.0	6.6	3.7-9.5	13.5	7.8-19.2	0.7	0.0-2.1	7.1
Serbia	EUR	33.1	–	21.9	–	27.4	–	34.1	–	23.5	–	28.8
Seychelles	AFR	21.3	17.9-24.7	3.7	2.3-5.2	12.4	10.6-14.2	21.1	17.7-24.5	3.7	2.3-5.1	12.4
Sierra Leone	AFR	38.0	27.1-48.9	9.5	3.0-15.9	23.1	16.9-29.3	37.9	27.1-48.8	8.1	1.7-14.5	23.0
Singapore	WPR	25.1	23.7-26.5	4.0	3.4-4.6	14.5	13.7-15.3	24.9	23.5-26.3	4.3	3.7-5.0	14.6
Slovakia	EUR	34.2	23.9-44.5	14.4	6.8-22.1	23.9	17.6-30.2	34.4	24.1-44.7	15.8	8.2-23.5	25.1
Slovenia	EUR	24.1	15.7-32.5	17.2	8.1-26.3	20.5	14.3-26.7	26.6	18.1-35.1	18.3	9.2-27.5	22.5
Solomon Islands	WPR	42.4	39.6-45.1	14.4	12.7-16.1	28.8	27.1-30.5	41.0	38.2-43.7	14.2	12.5-15.9	27.6
Somalia	EMR	…	…	…	…	…	…	…	…	…	…	…
South Africa	AFR	21.2	18.3-24.2	7.0	5.4-8.6	14.0	11.7-16.3	21.5	18.5-24.5	7.3	5.8-8.8	14.4
Spain	EUR	30.5	–	21.6	–	25.9	–	30.7	–	24.7	–	27.7

		Current Daily Cigarette Smoking						Current Daily Cigarette Smoking						Latest Year of National Data
		Crude adjusted estimates						Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	14.5-17.5	22.2	20.3-24.2	0.5	0.2-0.8	11.4	10.3-12.5	19.3	17.4-21.2	0.5	0.2-0.8	9.9	8.8-11.0	2006
	–	25.0	–	1.3	–	13.0	–	24.6	–	1.3	–	13.0	–	2004
	–	21.0	–	6.2	–	13.4	–	20.7	–	6.2	–	13.5	–	2006
	8.5-29.5	22.4	6.8-38.1	12.4	0.0-26.4	17.5	7.0-28.0	24.9	9.2-40.6	13.2	0.0-27.2	19.0	8.5-29.5	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	22.9-25.1	43.0	40.9-45.0	5.2	4.4-5.9	23.7	22.6-24.8	42.7	40.7-44.8	5.2	4.4-5.9	24.0	22.9-25.1	2009
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	12.7-16.3	25.7	22.2-29.2	0.2	0.0-0.6	12.5	10.8-14.2	25.4	21.9-29.0	0.2	0.0-0.5	12.8	11.0-14.6	2006
	6.6-9.0	12.0	10.4-13.6	0.6	0.3-0.9	6.0	5.0-7.0	12.3	10.6-14.0	0.6	0.3-0.9	6.5	5.5-7.5	no national data
	15.6-29.6	28.7	16.2-41.1	8.6	2.0-15.1	18.3	11.4-25.2	30.4	18.0-42.9	9.5	2.9-16.0	20.0	13.0-27.0	2007
	11.6-17.4	19.8	16.4-23.2	5.5	5.0-6.0	12.4	10.7-14.1	19.3	13.6-25.0	6.0	5.5-6.5	12.7	9.8-15.6	2007
	32.5-61.1	44.3	26.4-62.2	50.5	28.3-72.7	47.5	33.2-61.8	43.6	25.7-61.6	49.9	27.7-72.1	46.8	32.5-61.1	2004
	26.3-29.1	20.7	18.6-22.7	21.1	20.0-22.2	20.9	19.7-22.1	24.2	21.8-26.6	25.3	24.0-26.6	24.7	23.3-26.1	2006
	–	24.6	–	23.6	–	24.1	–	25.8	–	24.2	–	25.0	–	2005
	19.4-21.6	21.4	19.4-23.4	20.1	18.2-22.0	20.7	19.4-22.1	21.5	19.8-23.2	19.5	18.0-21.0	20.5	19.4-21.6	2008
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	2.0-4.8	5.7	2.9-8.5	0.2	0.0-0.6	2.9	1.5-4.3	5.2	2.4-7.9	0.2	0.0-0.6	2.7	1.3-4.1	2007
	4.4-6.0	5.4	4.6-6.2	0.4	0.1-0.7	2.9	2.5-3.3	5.6	4.1-7.1	0.4	0.0-0.9	3.0	2.2-3.8	2008
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	–	22.7	–	21.8	–	22.2	–	22.5	–	22.2	–	22.4	–	2006
	0.6-6.2	5.2	0.0-10.7	0.0	0.0-0.4	3.1	0.0-6.4	4.8	0.0-10.3	0.0	0.0-0.4	2.4	0.0-5.2	2000
	12.0-21.8	20.4	11.3-29.5	1.4	0.0-5.1	11.2	6.2-16.2	23.1	14.0-32.2	1.7	0.0-5.5	12.4	7.5-17.3	2003
	–	33.0	–	7.1	–	19.7	–	32.9	–	7.3	–	20.1	–	1991
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	38.8-42.2	56.9	54.3-59.5	24.8	22.6-27.0	40.9	39.2-42.6	54.8	52.2-57.4	26.3	24.0-28.5	40.5	38.8-42.2	2007
	13.0-17.2	20.7	18.0-23.4	5.9	4.8-7.0	13.3	11.4-15.2	21.7	18.9-24.5	6.1	5.0-7.2	13.9	12.0-15.9	2003
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	21.3-22.9	31.8	30.4-33.1	6.7	6.1-7.4	19.3	18.5-20.1	32.4	31.1-33.8	7.1	6.4-7.8	19.8	19.0-20.6	2003
	–	33.2	–	23.2	–	28.0	–	32.1	–	22.7	–	27.4	–	2007
	–	27.0	–	10.7	–	18.5	–	28.3	–	12.7	–	20.5	–	2006
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	10.4-44.6	50.4	16.8-84.0	4.9	0.0-10.8	27.2	10.5-43.9	50.2	16.6-83.9	4.8	0.0-10.8	27.5	10.4-44.6	2005
	14.7-27.3	37.0	25.0-49.1	3.4	0.0-7.8	19.1	13.0-25.2	38.1	26.1-50.1	4.0	0.1-7.8	21.0	14.7-27.3	2005
	23.3-35.0	38.6	32.1-45.1	17.7	11.9-23.5	27.8	21.7-34.0	38.9	33.1-44.7	19.2	13.3-25.1	29.1	23.3-35.0	2005
	42.2-46.2	65.5	62.2-68.7	19.7	17.4-21.9	40.5	38.6-42.4	65.5	62.2-68.7	22.9	20.5-25.3	44.2	42.2-46.2	2001
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	3.8-6.4	7.8	5.5-10.1	1.7	0.9-2.6	4.7	3.5-5.9	7.9	5.6-10.2	1.7	0.8-2.5	4.8	3.6-6.0	no national data
	10.7-26.5	22.6	17.8-27.4	7.0	0.0-22.0	14.6	6.5-22.7	22.9	18.1-27.8	7.8	0.0-22.8	15.4	7.5-23.3	2006
	8.3-13.7	16.0	11.4-20.6	4.8	2.5-7.2	10.5	7.9-13.1	16.8	12.1-21.5	5.1	2.7-7.5	11.0	8.3-13.7	1991
	24.9-48.1	53.6	35.9-71.3	17.1	2.2-32.1	36.2	24.5-47.9	55.3	37.7-73.0	17.7	2.8-32.6	36.5	24.9-48.1	2004
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	3.0-4.6	4.2	3.0-5.4	0.6	0.2-1.0	2.3	1.7-2.9	5.6	4.2-7.0	0.6	0.2-1.0	3.1	2.4-3.8	2009
	4.2-7.8	6.9	5.1-8.7	2.1	1.1-3.2	4.9	3.5-6.3	6.6	4.8-8.4	2.8	1.5-4.1	4.7	3.2-6.3	2000
	4.2-10.0	9.5	3.8-15.2	0.2	0.0-1.6	4.7	1.8-7.6	8.9	3.3-14.6	0.2	0.0-1.6	4.6	1.7-7.5	2003
	–	33.1	–	21.9	–	27.4	–	34.1	–	23.5	–	28.8	–	2006
	10.6-14.2	18.0	14.8-21.2	1.3	0.5-2.2	9.5	7.9-11.1	17.7	14.5-20.8	1.3	0.4-2.1	9.5	7.9-11.1	2004
	16.7-29.3	28.2	17.3-39.0	0.8	0.0-7.2	13.9	7.8-20.0	24.5	13.7-35.3	0.8	0.0-7.1	12.6	6.3-18.9	2009
	13.8-15.4	22.9	21.5-24.3	3.5	2.9-4.1	13.2	12.5-13.9	23.0	21.6-24.3	3.8	3.2-4.5	13.4	12.6-14.2	2007
	18.7-31.5	34.2	23.9-44.5	14.4	6.8-22.1	23.9	17.6-30.2	34.4	24.1-44.7	15.8	8.2-23.5	25.1	18.7-31.5	2003
	16.3-28.7	24.1	15.7-32.5	17.2	8.1-26.3	20.5	14.3-26.7	26.6	18.1-35.1	18.3	9.2-27.5	22.5	16.3-28.7	2003
	26.0-29.2	42.4	39.6-45.1	14.4	12.7-16.1	28.8	27.1-30.5	41.0	38.2-43.7	14.2	12.5-15.9	27.6	26.0-29.2	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	12.2-16.7	19.0	16.2-21.9	5.5	4.2-6.8	12.1	10.0-14.2	19.1	16.3-21.9	5.7	4.3-7.1	12.4	10.3-14.5	2004
	–	30.5	–	21.6	–	25.9	–	30.7	–	24.7	–	27.7	–	2006

TOBACCO
2008 COMPARABLE ESTIMATES OF PREVALENCE OF CURRENT DAILY TOBACCO SMOKING AND CURRENT DAILY CIGARETTE SMOKING

Note: – indicates sample sizes were not available
… indicates no data were available

Country name	Region	Current Daily Tobacco Smoking						Current Daily Tobacco Smoking					
		Crude adjusted estimates						Age-standardized adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	
Sri Lanka	SEAR	21.4	20.4-22.5	0.3	0.2-0.4	10.6	10.1-11.1	21.3	20.3-22.3	0.3	0.2-0.4	10.8	
Sudan	EMR	24.5	–	2.0	–	13.2	–	23.1	–	2.2	–	12.7	
Suriname	AMR	…	…	…	…	…	…	…	…	…	…	…	
Swaziland	AFR	10.8	7.9-13.7	0.8	0.2-1.4	5.6	4.2-7.0	11.6	8.6-14.6	0.8	0.2-1.4	6.2	
Sweden	EUR	11.9	–	16.1	–	14.0	–	11.3	–	16.0	–	13.7	
Switzerland	EUR	22.9	20.9-24.9	16.7	15.2-18.2	19.7	18.0-21.5	23.8	21.7-25.9	17.7	16.1-19.3	20.7	
Syrian Arab Republic	EMR	36.8	29.7-43.9	…	…	…	–	38.9	31.4-46.4	…	–	…	
Tajikistan	EUR	…	…	…	…	…	…	…	…	…	…	…	
Thailand	SEAR	36.2	–	1.6	–	18.4	–	35.6	–	1.5	–	18.5	
The former Yugoslav Republic of Macedonia	EUR	…	…	…	…	…	…	…	…	…	…	…	
Timor-Leste	SEAR	…	…	…	…	…	…	…	…	…	…	…	
Togo	AFR	…	…	…	…	…	…	…	…	…	…	…	
Tonga	WPR	36.6	36.0-37.1	7.5	7.2-7.8	22.0	21.7-22.3	38.0	37.5-38.6	7.6	7.3-7.9	22.8	
Trinidad and Tobago	AMR	19.0	15.0-23.0	7.7	0.0-16.8	13.1	8.0-18.2	20.1	16.1-24.1	7.8	0.0-16.9	14.0	
Tunisia	EMR	56.5	51.9-61.1	6.8	4.3-9.3	31.6	29.0-34.2	55.6	51.0-60.3	6.6	4.1-9.0	31.1	
Turkey	EUR	45.9	34.3-57.6	17.3	11.2-23.5	31.6	25.0-38.2	44.7	33.1-56.4	16.3	10.2-22.4	30.5	
Turkmenistan	EUR	…	…	…	…	…	…	…	…	…	…	…	
Tuvalu	WPR	47.8	31.7-63.9	15.5	1.4-29.7	32.0	21.3-42.7	49.7	33.6-65.8	16.5	2.3-30.6	33.1	
Uganda	AFR	12.3	10.6-13.9	1.5	1.0-1.9	6.8	6.0-7.6	12.8	10.7-14.9	2.3	1.2-3.5	7.6	
Ukraine	EUR	58.8	46.1-71.5	18.3	10.7-26.0	36.7	29.6-43.8	59.0	46.3-71.7	21.4	13.7-29.2	40.2	
United Arab Emirates	EMR	15.4	6.7-24.0	1.2	0.0-3.3	11.3	5.1-17.5	13.1	4.6-21.7	1.2	0.0-3.4	7.2	
United Kingdom	EUR	18.5	17.4-19.6	16.2	15.3-17.1	17.3	16.3-18.4	19.4	18.3-20.5	16.9	15.9-17.9	18.1	
United Republic of Tanzania	AFR	14.1	13.0-15.2	1.8	0.0-11.3	7.9	3.1-12.7	17.7	16.5-19.0	2.5	0.0-12.1	10.1	
United States of America	AMR	18.6	–	12.7	–	15.6	–	18.7	–	12.9	–	15.8	
Uruguay	AMR	35.2	31.0-39.5	25.6	22.1-29.2	30.2	26.3-34.1	35.4	31.1-39.7	27.2	23.3-31.1	31.3	
Uzbekistan	EUR	16.8	13.1-20.5	2.7	2.4-3.0	9.6	7.6-11.6	18.6	14.8-22.4	2.4	2.1-2.7	10.5	
Vanuatu	WPR	21.3	18.1-24.5	3.1	1.9-4.3	12.3	10.6-14.0	19.6	16.5-22.7	2.3	1.3-3.3	11.0	
Venezuela (Bolivarian Republic of)	AMR	…	…	…	…	…	…	…	…	…	…	…	
Viet Nam	WPR	40.4	–	1.0	–	20.1	–	41.3	–	1.0	–	21.1	
Yemen	EMR	28.5	–	7.6	1.9-13.4	18.1	–	29.3	–	8.0	2.2-13.7	18.6	
Zambia	AFR	18.3	16.9-19.7	2.1	1.6-2.6	10.1	9.4-10.8	20.1	18.2-22.0	3.2	2.0-4.3	11.6	
Zimbabwe	AFR	18.0	16.7-19.4	2.1	1.6-2.6	9.6	8.9-10.3	25.0	23.1-27.0	3.1	2.0-4.3	14.1	

		Current Daily Cigarette Smoking						Current Daily Cigarette Smoking						Latest Year of National Data
		Crude adjusted estimates						Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	10.3-11.3	16.4	15.5-17.3	0.1	0.0-0.2	8.0	7.5-8.5	16.3	15.3-17.2	0.1	0.0-0.2	8.2	7.7-8.7	2006
	–	22.2	–	1.5	–	11.8	–	20.2	–	1.5	–	10.9	–	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	4.7-7.7	9.5	6.8-12.3	0.7	0.2-1.3	4.9	3.6-6.2	9.9	7.1-12.7	0.7	0.2-1.3	5.3	3.9-6.7	2007
	–	11.9	–	16.1	–	14.0	–	11.3	–	16.0	–	13.7	–	2007
	18.9-22.6	22.9	20.9-24.9	16.7	15.2-18.2	19.7	18.0-21.5	23.8	21.7-25.9	17.7	16.1-19.3	20.7	18.9-22.6	2007
	–	36.5	29.5-43.4	...	...	...	–	38.3	31.0-45.6	...	–	...	–	2002
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	–	32.7	–	1.4	–	16.6	–	32.1	–	1.3	–	16.7	–	2007
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	22.5-23.1	36.6	36.0-37.1	7.5	7.2-7.8	22.0	21.7-22.3	38.0	37.5-38.6	7.6	7.3-7.9	22.8	22.5-23.1	2006
	9.0-19.0	17.2	13.3-21.1	6.0	0.0-15.1	11.4	6.3-16.5	17.7	13.8-21.7	6.0	0.0-15.1	11.9	7.0-16.8	2007
	28.5-33.7	52.6	48.0-57.3	5.9	3.4-8.4	29.2	26.6-31.8	51.1	46.5-55.8	5.5	3.1-7.9	28.3	25.7-30.9	2003
	23.9-37.1	45.9	34.3-57.6	17.3	11.2-23.5	31.6	25.0-38.2	44.7	33.1-56.4	16.3	10.2-22.4	30.5	23.9-37.1	2003
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	22.4-43.8	47.8	31.7-63.9	15.5	1.4-29.7	32.0	21.3-42.7	49.7	33.6-65.8	16.5	2.3-30.6	33.1	22.4-43.8	2002
	6.4-8.8	11.4	9.8-13.0	0.6	0.2-1.0	6.0	5.2-6.8	11.6	9.5-13.7	0.9	0.0-2.0	6.2	5.0-7.4	2006
	32.8-47.6	58.8	46.1-71.5	18.3	10.7-26.0	36.7	29.6-43.8	59.0	46.3-71.7	21.4	13.7-29.2	40.2	32.8-47.6	2005
	2.8-11.6	14.2	5.6-22.8	0.3	0.0-2.4	10.2	4.0-16.4	11.5	3.0-20.0	0.3	0.0-2.3	5.9	1.5-10.3	2003
	17.1-19.2	18.5	17.5-19.5	16.2	15.3-17.1	17.3	16.3-18.4	19.4	18.3-20.5	16.9	15.9-17.9	18.1	17.1-19.2	2007
	5.3-14.9	11.8	10.7-12.8	0.6	0.0-10.1	6.1	1.3-10.9	13.5	12.4-14.6	0.8	0.0-10.3	7.2	2.4-12.0	no national data
	–	18.6	–	12.7	–	15.6	...	18.7	–	12.9	–	15.8	–	2007
	27.2-35.4	35.2	31.0-39.5	25.6	22.1-29.2	30.2	26.3-34.1	35.4	31.1-39.7	27.2	23.3-31.1	31.3	27.2-35.4	2006
	8.5-12.6	16.8	13.1-20.5	2.7	2.4-3.0	9.6	7.6-11.6	18.6	14.8-22.4	2.4	2.1-2.7	10.5	8.5-12.6	2006
	9.4-12.6	20.9	17.7-24.1	2.6	1.5-3.7	11.9	10.2-13.6	19.2	16.1-22.3	2.0	1.0-3.0	10.6	9.0-12.2	1998
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	–	36.9	–	0.8	–	18.4	–	37.4	–	0.9	–	19.1	–	2006
	–	28.2	–	7.6	1.9-13.3	18.0	–	28.4	–	7.9	2.2-13.6	18.2	–	2003
	10.5-12.7	16.6	15.3-18.0	0.8	0.3-1.2	8.6	7.9-9.3	17.6	15.7-19.5	1.1	0.0-2.3	9.4	8.3-10.5	2007
	13.0-15.2	15.3	14.0-16.6	0.8	0.3-1.2	7.6	6.9-8.3	19.7	17.8-21.6	1.1	0.0-2.3	10.4	9.3-11.5	2006

PHYSICAL INACTIVITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF INSUFFICIENT PHYSICAL ACTIVITY

Note: … indicates no data were available

Country name	Region	Insufficiently active					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Afghanistan	EMR	…	…	…	…	…	
Albania	EUR	…	…	…	…	…	
Algeria	AFR	30.8	28.5-33.3	47.6	45.5-49.6	39.2	
Andorra	EUR	…	…	…	…	…	
Angola	AFR	…	…	…	…	…	
Antigua and Barbuda	AMR	…	…	…	…	…	
Argentina	AMR	65.6	31.7-86.5	72.0	37.2-89.3	68.9	
Armenia	EUR	…	…	…	…	…	
Australia	WPR	38.0	16.6-70.3	42.5	18.5-74.2	40.3	
Austria	EUR	32.1	12.8-66.0	40.3	17.0-74.0	36.3	
Azerbaijan	EUR	…	…	…	…	…	
Bahamas	AMR	…	…	…	…	…	
Bahrain	EMR	…	…	…	…	…	
Bangladesh	SEAR	2.9	2.4-3.4	6.5	5.9-7.3	4.7	
Barbados	AMR	38.3	34.5-42.1	57.1	52.8-61.5	48.1	
Belarus	EUR	…	…	…	…	…	
Belgium	EUR	43.6	19.9-75.4	49.4	27.3-82.3	46.6	
Belize	AMR	…	…	…	…	…	
Benin	AFR	6.1	5.4-7.0	9.9	8.9-11.0	8.0	
Bhutan	SEAR	41.2	12.0-64.2	63.5	30.1-85.0	51.5	
Bolivia (Plurinational State of)	AMR	…	…	…	…	…	
Bosnia and Herzegovina	EUR	31.5	11.5-61.8	39.2	16.3-72.6	35.5	
Botswana	AFR	21.7	19.7-23.8	43.4	40.6-46.2	32.6	
Brazil	AMR	46.0	19.5-76.4	51.1	22.3-79.7	48.6	
Brunei Darussalam	WPR	…	…	…	…	…	
Bulgaria	EUR	24.6	9.1-58.7	31.8	12.7-65.8	28.4	
Burkina Faso	AFR	11.5	3.3-31.0	12.7	3.9-33.1	12.1	
Burundi	AFR	…	…	…	…	…	
Cambodia	WPR	10.8	9.9-11.9	10.9	9.5-12.4	10.9	
Cameroon	AFR	30.5	8.0-51.2	47.6	17.7-72.9	39.1	
Canada	AMR	34.0	13.7-67.8	37.4	15.6-71.3	35.7	
Cape Verde	AFR	9.9	7.3-12.6	29.0	26.6-31.8	20.2	
Central African Republic	AFR	…	…	…	…	…	
Chad	AFR	20.9	7.0-51.1	24.7	8.7-57.0	22.8	
Chile	AMR	…	…	…	…	…	
China	WPR	29.3	28.2-30.4	32.0	30.9-33.0	30.6	
Colombia	AMR	38.1	14.2-70.5	47.1	18.0-76.4	42.7	
Comoros	AFR	4.8	1.2-14.4	9.1	2.7-26.5	6.9	
Congo	AFR	40.7	15.8-71.8	50.3	22.4-79.5	45.5	
Cook Islands	WPR	71.6	68.7-74.3	73.0	69.8-76.1	72.3	
Costa Rica	AMR	…	…	…	…	…	
Côte d'Ivoire	AFR	27.3	10.5-61.1	37.4	15.5-71.9	32.2	
Croatia	EUR	27.8	10.9-62.0	25.6	11.0-58.3	26.7	
Cuba	AMR	…	…	…	…	…	
Cyprus	EUR	49.3	21.8-78.8	63.8	30.2-85.9	56.9	
Czech Republic	EUR	30.7	12.2-59.5	27.6	11.0-55.6	29.1	
Democratic People's Republic of Korea	SEAR	…	…	…	…	…	
Democratic Republic of the Congo	AFR	35.1	31.7-38.6	49.7	46.8-52.6	42.5	
Denmark	EUR	35.8	14.3-69.7	37.3	15.6-71.6	36.6	
Djibouti	EMR	…	…	…	…	…	
Dominica	AMR	14.9	11.0-18.9	36.2	33.1-39.7	25.5	
Dominican Republic	AMR	56.1	25.9-82.7	62.1	29.1-85.1	59.1	
Ecuador	AMR	36.8	14.5-70.6	47.8	20.0-77.8	42.3	
Egypt	EMR	…	…	…	…	…	
El Salvador	AMR	…	…	…	…	…	
Equatorial Guinea	AFR	…	…	…	…	…	

		Insufficiently active						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	37.6-40.7	31.9	29.5-34.3	49.2	47.2-51.2	40.5	39.0-42.1	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	31.3-87.3	65.8	31.8-86.6	70.9	36.3-89.0	68.3	31.0-87.1	2010
	...	...	...	...	...	...	...	no national data
	16.3-72.1	35.9	14.9-68.5	39.9	16.6-72.2	37.9	14.9-70.5	2003
	16.5-72.0	30.3	11.7-63.8	39.2	15.9-72.5	34.8	14.4-69.7	2005
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	4.3-5.1	2.7	2.3-3.3	6.6	5.9-7.3	4.7	4.3-5.1	2009
	45.2-51.0	38.3	34.4-42.0	55.6	51.2-60.0	46.9	44.0-49.8	2007
	...	...	...	...	...	...	...	no national data
	20.6-77.0	40.4	17.4-72.4	45.0	21.4-76.9	42.7	17.7-73.9	2005
	...	...	...	...	...	...	...	no national data
	7.4-8.7	7.1	6.3-8.0	11.2	10.2-12.3	9.1	8.5-9.8	2008
	18.7-73.2	40.9	13.4-66.0	63.6	30.6-85.2	52.3	19.7-74.1	no national data
	...	...	...	...	...	...	...	no national data
	13.4-66.9	30.3	10.8-60.3	37.0	15.1-70.4	33.6	12.4-65.2	2003
	31.0-34.3	26.3	24.2-28.4	44.1	41.3-46.9	35.2	33.5-36.8	2007
	77.8-77.7	47.2	20.4-77.1	51.6	22.6-79.9	49.4	78.2-78.0	2003
	...	...	...	...	...	...	...	no national data
	10.7-63.3	24.7	9.0-58.5	28.8	11.1-62.4	26.8	10.0-61.7	2005
	3.9-36.2	14.6	4.6-37.9	16.3	5.4-40.5	15.5	5.6-42.9	2003
	...	...	...	...	...	...	...	no national data
	10.1-11.7	11.4	10.4-12.5	11.1	9.7-12.5	11.2	10.4-12.1	2010
	13.8-64.7	33.0	9.2-54.4	48.3	18.7-73.8	40.7	15.8-67.0	no national data
	13.8-69.2	32.3	12.7-65.9	35.4	14.2-69.2	33.9	12.9-67.6	2003
	18.3-22.1	12.1	9.4-14.8	29.4	26.9-32.1	20.7	18.9-22.7	2007
	...	...	...	...	...	...	...	no national data
	8.2-57.1	22.8	8.1-54.6	26.2	9.8-59.7	24.5	9.1-59.6	2003
	...	...	...	...	...	...	...	no national data
	29.8-31.4	29.7	28.6-30.8	32.3	31.2-33.3	31.0	30.2-31.8	no national data
	14.9-74.4	39.7	15.2-72.0	48.0	18.5-77.0	43.9	15.4-75.0	no national data
	2.3-25.6	6.1	1.5-17.6	10.6	3.4-30.0	8.3	2.9-29.2	no national data
	18.1-76.1	44.4	17.5-74.5	52.9	24.8-81.5	48.6	19.3-77.4	no national data
	70.2-74.3	70.9	68.0-73.6	73.2	70.0-76.3	72.0	69.9-74.1	2003
	...	...	...	...	...	...	...	no national data
	12.4-66.7	28.8	12.0-63.8	36.9	15.6-71.8	32.8	13.1-67.7	no national data
	10.3-60.4	26.2	9.9-59.7	21.0	8.1-50.2	23.6	8.7-56.5	2003
	...	...	...	...	...	...	...	no national data
	23.9-82.0	48.1	20.9-78.0	62.6	29.5-85.6	55.4	23.3-81.6	2005
	11.4-61.8	27.6	10.8-56.2	22.3	8.2-49.3	25.0	9.8-58.3	2003
	...	...	...	...	...	...	...	no national data
	40.3-44.8	38.4	35.0-41.9	52.0	49.1-54.9	45.2	43.0-47.4	no national data
	14.7-70.9	34.8	13.6-68.5	35.4	14.1-69.3	35.1	13.6-69.1	2005
	...	...	...	...	...	...	...	no national data
	23.0-28.2	14.3	10.5-18.4	34.4	31.3-37.9	24.4	21.8-27.1	2007
	25.5-83.3	57.0	26.7-83.2	62.9	30.0-85.5	60.0	26.0-83.6	2003
	17.0-74.6	37.0	14.7-70.9	48.3	20.3-78.1	42.6	17.3-74.9	2003
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data

PHYSICAL INACTIVITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF INSUFFICIENT PHYSICAL ACTIVITY

Note: … indicates no data were available

Country name	Region	Insufficiently active					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Eritrea	AFR	23.9	20.9-27.2	52.1	48.8-55.4	38.5	
Estonia	EUR	16.6	6.5-45.9	22.1	9.2-54.4	19.6	
Ethiopia	AFR	15.4	4.7-40.9	20.4	6.8-50.0	17.9	
Fiji	WPR	…	…	…	…	…	
Finland	EUR	43.3	18.5-75.1	38.5	16.4-71.8	40.8	
France	EUR	29.1	26.9-31.4	36.5	34.3-38.7	33.0	
Gabon	AFR	23.3	5.0-37.8	44.2	13.6-66.0	33.9	
Gambia	AFR	17.2	15.4-19.1	26.0	24.2-27.9	21.7	
Georgia	EUR	21.3	19.5-23.2	24.2	23.0-25.5	22.9	
Germany	EUR	29.7	11.4-63.3	31.1	12.2-65.2	30.4	
Ghana	AFR	13.0	11.6-14.4	19.3	17.7-21.0	16.1	
Greece	EUR	20.2	6.8-44.3	15.5	5.4-45.2	17.8	
Grenada	AMR	…	…	…	…	…	
Guatemala	AMR	14.6	4.6-40.9	16.4	5.4-45.0	15.6	
Guinea	AFR	4.0	1.5-15.6	15.7	4.6-34.3	9.8	
Guinea-Bissau	AFR	…	…	…	…	…	
Guyana	AMR	…	…	…	…	…	
Haiti	AMR	…	…	…	…	…	
Honduras	AMR	…	…	…	…	…	
Hungary	EUR	27.6	11.4-61.8	29.5	13.6-63.3	28.6	
Iceland	EUR	…	…	…	…	…	
India	SEAR	10.8	9.9-11.8	17.3	16.4-18.2	14.0	
Indonesia	SEAR	31.9	28.7-35.1	27.9	25.2-30.7	29.9	
Iran (Islamic Republic of)	EMR	25.2	24.6-25.9	46.5	45.7-47.3	35.7	
Iraq	EMR	59.1	56.9-61.3	51.3	49.3-53.2	55.2	
Ireland	EUR	48.3	21.1-78.7	59.9	28.3-84.1	54.1	
Israel	EUR	…	…	…	…	…	
Italy	EUR	51.0	23.4-81.0	61.8	30.9-86.3	56.6	
Jamaica	AMR	43.6	18.5-75.2	51.5	23.2-80.1	47.7	
Japan	WPR	64.4	26.5-83.2	66.1	27.5-84.9	65.3	
Jordan	EMR	…	…	…	…	…	
Kazakhstan	EUR	30.9	12.0-64.8	31.2	12.8-65.9	31.0	
Kenya	AFR	13.7	4.0-37.0	17.0	5.3-44.1	15.4	
Kiribati	WPR	42.4	38.8-46.1	57.1	53.9-60.4	49.8	
Kuwait	EMR	58.0	55.6-60.4	71.3	68.0-74.5	63.0	
Kyrgyzstan	EUR	…	…	…	…	…	
Lao People's Democratic Republic	WPR	15.6	4.8-41.6	19.5	6.5-48.7	17.6	
Latvia	EUR	29.2	11.5-62.2	36.5	14.4-70.3	33.2	
Lebanon	EMR	52.4	49.0-55.7	42.0	39.1-45.0	47.0	
Lesotho	AFR	…	…	…	…	…	
Liberia	AFR	…	…	…	…	…	
Libyan Arab Jamahiriya	EMR	35.4	33.1-37.8	53.6	51.4-56.0	44.2	
Lithuania	EUR	20.9	17.5-24.7	24.8	21.2-28.6	23.0	
Luxembourg	EUR	49.9	21.3-81.2	44.3	18.0-77.1	47.1	
Madagascar	AFR	16.5	14.8-18.2	26.6	24.8-28.6	21.6	
Malawi	AFR	6.8	5.5-8.1	12.6	11.4-14.0	9.8	
Malaysia	WPR	56.0	52.9-59.0	65.0	62.6-67.4	60.5	
Maldives	SEAR	36.6	10.3-59.9	41.3	14.7-69.0	38.9	
Mali	AFR	16.7	5.0-42.8	21.8	7.3-52.1	19.3	
Malta	EUR	70.7	32.1-88.5	74.2	37.8-89.8	72.5	
Marshall Islands	WPR	46.3	43.5-49.2	57.1	54.7-59.4	51.7	
Mauritania	AFR	38.5	17.5-76.1	46.2	27.0-85.0	42.3	
Mauritius	AFR	37.1	14.6-69.5	39.1	15.7-70.8	38.1	
Mexico	AMR	36.0	14.2-69.1	37.9	15.1-71.2	37.0	
Micronesia (Federated States of)	WPR	56.4	53.4-59.3	74.3	70.1-78.4	65.2	
Monaco	EUR	…	…	…	…	…	

		Insufficiently active						
		Age-standardized adjusted estimates						Latest Year of National Data
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	36.2-40.9	26.0	23.0-29.2	54.8	51.4-58.0	40.4	38.0-42.8	2004
	7.6-52.4	15.7	6.1-44.4	18.8	7.0-49.3	17.2	6.4-49.4	2003
	6.4-49.6	16.5	5.2-43.0	22.1	7.5-52.4	19.3	7.2-51.8	2003
	...	...	...	...	...	...	...	no national data
	16.2-72.9	40.8	16.9-73.1	34.9	14.0-68.3	37.8	14.7-70.8	2005
	31.4-34.6	27.7	25.5-30.1	37.2	35.1-39.5	32.5	30.9-34.1	2008
	9.0-52.7	26.8	6.1-42.3	46.4	15.0-68.2	36.6	10.1-55.5	no national data
	20.4-23.0	20.4	18.5-22.3	28.7	26.8-30.6	24.5	23.2-25.9	2010
	21.9-23.9	21.1	19.3-23.0	23.5	22.3-24.7	22.3	21.3-23.3	2010
	11.0-64.0	27.5	10.3-60.6	28.5	10.7-62.3	28.0	10.2-62.0	2005
	15.0-17.2	14.4	13.0-15.8	20.8	19.1-22.5	17.6	16.5-18.7	2009
	7.1-49.8	16.7	5.4-37.8	14.5	4.7-41.4	15.6	5.5-43.9	2005
	...	...	...	...	...	...	...	no national data
	5.4-46.8	15.3	5.0-42.9	17.0	5.7-46.4	16.2	5.7-48.0	2003
	2.6-22.4	6.1	1.9-18.6	18.1	5.6-37.5	12.1	3.3-25.5	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	10.6-62.2	26.4	10.7-60.5	25.6	10.4-58.7	26.0	9.7-60.2	2003
	...	...	...	...	...	...	...	no national data
	13.3-14.6	12.7	11.8-13.7	18.4	17.5-19.3	15.6	14.9-16.2	no national data
	27.8-32.0	31.5	28.4-34.8	28.1	25.4-30.9	29.8	27.7-31.9	no national data
	35.1-36.2	27.1	26.4-27.8	47.0	46.2-47.8	37.0	36.5-37.6	2007
	53.7-56.7	62.8	60.6-64.9	54.0	52.0-55.9	58.4	56.9-59.8	2006
	23.9-81.4	47.8	20.7-78.3	58.5	27.0-83.4	53.2	23.0-80.8	2005
	...	...	...	...	...	...	...	no national data
	23.4-81.7	49.6	21.9-79.6	59.8	28.3-84.8	54.7	22.5-81.0	2005
	19.5-77.8	43.9	18.6-75.4	51.6	23.1-80.2	47.8	19.4-77.8	2007
	26.4-83.9	58.9	24.6-81.1	61.6	26.3-83.7	60.2	24.8-82.5	no national data
	...	...	...	...	...	...	...	no national data
	11.9-65.7	32.0	12.8-66.3	31.0	12.7-65.7	31.5	12.1-66.0	2003
	5.1-44.6	15.1	4.6-40.4	18.0	6.1-46.8	16.5	5.6-46.9	2004
	47.3-52.2	38.4	34.8-42.1	54.9	51.7-58.2	46.7	44.2-49.1	2004
	61.0-65.0	56.9	54.4-59.2	72.1	68.8-75.3	64.5	62.5-66.4	2006
	...	...	...	...	...	...	...	no national data
	6.1-48.9	16.7	5.3-43.5	21.0	7.3-51.0	18.8	6.6-50.6	2003
	12.7-67.7	28.1	10.9-60.9	35.9	14.0-69.7	32.0	12.1-66.5	2005
	44.8-49.2	51.9	48.5-55.2	41.7	38.8-44.7	46.8	44.6-49.0	2008
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	42.5-45.9	37.3	34.9-39.7	54.4	52.1-56.7	45.8	44.2-47.5	2009
	20.5-25.7	20.3	16.9-24.1	24.9	21.4-28.8	22.6	20.1-25.3	2010
	18.9-77.3	49.9	21.3-81.2	45.5	18.4-77.6	47.7	18.4-76.6	2005
	20.3-22.9	18.3	16.6-20.1	28.3	26.4-30.3	23.3	22.0-24.6	no national data
	8.9-10.7	7.3	6.0-8.6	13.2	11.9-14.6	10.2	9.3-11.2	2009
	58.5-62.4	57.3	54.3-60.4	65.6	63.1-67.9	61.4	59.5-63.3	2005
	13.1-63.9	36.6	10.3-59.9	41.3	14.7-69.0	39.0	13.1-63.9	no national data
	6.9-52.0	17.9	5.6-45.7	23.8	8.8-56.7	20.9	8.0-55.5	2003
	31.7-87.5	70.7	32.1-88.5	73.1	36.7-89.4	71.9	31.0-87.2	2005
	49.9-53.5	43.5	40.6-46.3	55.7	53.3-58.1	49.6	47.7-51.4	2002
	20.7-82.0	40.0	19.1-77.6	47.6	29.6-86.3	43.8	22.5-83.1	2003
	14.8-70.4	38.2	15.0-70.0	39.1	15.5-70.6	38.6	15.1-70.7	2003
	14.1-70.0	37.1	14.8-70.0	38.4	15.5-71.7	37.7	14.4-70.5	2003
	62.7-67.7	58.2	55.2-61.1	74.4	70.2-78.6	66.3	63.8-68.8	no national data
	...	...	...	...	...	...	...	no national data

PHYSICAL INACTIVITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF INSUFFICIENT PHYSICAL ACTIVITY

Note: … indicates no data were available

Country name	Region	Insufficiently active					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Mongolia	WPR	7.9	6.9-9.1	8.4	7.4-9.3	8.2	
Montenegro	EUR	…	…	…	…	…	
Morocco	EMR	…	…	…	…	…	
Mozambique	AFR	6.3	5.0-7.8	6.8	5.7-8.1	6.6	
Myanmar	SEAR	9.8	8.7-11.0	14.4	13.4-15.4	12.2	
Namibia	AFR	49.5	21.0-78.7	62.8	29.6-85.4	56.3	
Nauru	WPR	47.7	44.7-50.7	51.2	48.1-54.3	49.4	
Nepal	SEAR	12.6	3.9-36.0	15.7	5.1-42.1	14.2	
Netherlands	EUR	23.7	9.6-56.7	16.4	5.9-47.0	20.0	
New Zealand	WPR	45.9	44.6-47.3	50.2	49.0-51.4	48.1	
Nicaragua	AMR	…	…	…	…	…	
Niger	AFR	21.6	19.3-24.0	31.2	28.6-33.9	26.5	
Nigeria	AFR	…	…	…	…	…	
Niue	WPR	…	…	…	…	…	
Norway	EUR	45.1	20.1-77.1	45.9	20.0-77.7	45.5	
Oman	EMR	…	…	…	…	…	
Pakistan	EMR	30.6	11.5-63.7	46.6	18.9-76.3	38.4	
Palau	WPR	…	…	…	…	…	
Panama	AMR	…	…	…	…	…	
Papua New Guinea	WPR	14.1	12.1-16.3	18.1	16.3-20.0	16.1	
Paraguay	AMR	39.5	15.7-71.9	41.0	16.4-73.1	40.3	
Peru	AMR	…	…	…	…	…	
Philippines	WPR	20.0	7.1-52.4	25.7	9.4-59.9	22.9	
Poland	EUR	24.0	9.0-57.8	32.5	13.1-67.6	28.5	
Portugal	EUR	50.0	26.1-82.1	57.5	26.6-83.0	53.9	
Qatar	EMR	…	…	…	…	…	
Republic of Korea	WPR	…	…	…	…	…	
Republic of Moldova	EUR	…	…	…	…	…	
Romania	EUR	31.2	12.0-65.6	47.9	19.2-77.5	39.9	
Russian Federation	EUR	22.9	8.2-55.1	22.4	8.4-50.6	22.6	
Rwanda	AFR	…	…	…	…	…	
Saint Kitts and Nevis	AMR	32.2	28.2-36.3	49.0	45.7-52.3	40.6	
Saint Lucia	AMR	…	…	…	…	…	
Saint Vincent and the Grenadines	AMR	…	…	…	…	…	
Samoa	WPR	35.1	32.6-37.6	65.6	62.9-68.4	49.7	
San Marino	EUR	…	…	…	…	…	
Sao Tome and Principe	AFR	10.0	7.7-12.5	23.8	21.9-25.9	17.1	
Saudi Arabia	EMR	60.7	58.6-62.7	74.9	73.1-76.7	66.8	
Senegal	AFR	19.1	6.1-48.0	23.7	8.0-55.0	21.4	
Serbia	EUR	65.3	32.5-86.3	76.3	40.8-90.3	70.9	
Seychelles	AFR	23.9	20.9-27.1	22.9	19.5-26.5	23.4	
Sierra Leone	AFR	12.1	10.0-14.4	19.8	17.9-21.9	16.1	
Singapore	WPR	…	…	…	…	…	
Slovakia	EUR	23.1	8.1-55.4	22.0	8.0-54.7	22.5	
Slovenia	EUR	27.8	10.2-61.9	34.4	14.0-69.5	31.2	
Solomon Islands	WPR	36.8	34.1-39.7	48.6	46.1-51.1	42.6	
Somalia	EMR	…	…	…	…	…	
South Africa	AFR	46.4	43.9-48.8	55.7	53.6-57.7	51.1	
Spain	EUR	47.7	20.5-78.4	56.3	26.1-82.4	52.1	
Sri Lanka	SEAR	18.4	17.4-19.4	33.3	32.1-34.5	26.0	
Sudan	EMR	…	…	…	…	…	
Suriname	AMR	…	…	…	…	…	
Swaziland	AFR	62.9	29.6-85.7	69.7	34.1-88.0	66.5	
Sweden	EUR	46.0	20.5-77.7	48.1	22.6-79.2	47.1	
Switzerland	EUR	…	…	…	…	…	
Syrian Arab Republic	EMR	…	…	…	…	…	

		Insufficiently active						
		Age-standardized adjusted estimates						Latest Year of National Data
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	7.5-8.9	9.3	8.3-10.5	9.5	8.6-10.4	9.4	8.7-10.1	2009
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	5.7-7.5	6.7	5.4-8.2	7.4	6.3-8.7	7.1	6.2-8.0	2005
	11.4-13.0	10.4	9.3-11.6	14.9	13.9-15.9	12.7	11.9-13.4	2009
	23.7-82.0	51.9	22.7-80.2	65.1	31.7-86.4	58.5	25.3-83.1	2003
	47.3-51.6	43.0	40.0-46.0	50.0	46.9-53.1	46.5	44.3-48.7	2004
	4.7-41.8	13.9	4.5-38.3	17.0	5.9-44.1	15.5	5.4-44.0	2003
	8.2-55.4	21.3	8.2-52.5	15.2	5.2-43.6	18.2	7.2-52.5	2005
	47.2-49.0	45.0	43.6-46.3	50.4	49.2-51.6	47.7	46.8-48.6	2006
	...	...	...	...	...	...	...	no national data
	24.8-28.3	24.4	22.1-26.8	34.2	31.6-36.9	29.3	27.6-31.1	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	17.4-75.2	43.4	18.7-75.5	45.0	18.9-76.6	44.2	16.9-74.7	2003
	...	...	...	...	...	...	...	no national data
	15.1-71.8	32.7	12.7-65.7	48.1	20.1-77.5	40.4	16.1-72.8	2003
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	14.7-17.5	17.2	15.2-19.3	21.5	19.7-23.4	19.3	18.0-20.8	no national data
	15.7-72.7	40.7	16.6-72.9	42.0	17.2-73.9	41.3	16.3-73.3	2003
	...	...	...	...	...	...	...	no national data
	8.2-56.8	21.2	7.6-53.6	26.2	9.8-60.4	23.7	8.6-57.6	2003
	11.2-64.1	23.5	8.7-56.8	31.6	12.3-66.1	27.6	10.6-62.9	2005
	22.3-80.3	47.5	23.1-79.3	54.4	24.3-81.5	51.0	20.9-79.1	2005
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	15.0-71.9	31.2	11.9-65.5	46.2	18.5-76.4	38.7	14.7-71.4	2005
	8.1-53.9	22.7	8.2-54.7	18.8	6.7-46.1	20.8	7.4-52.1	no national data
	...	...	...	...	...	...	...	no national data
	38.0-43.2	28.7	24.8-32.8	47.9	44.5-51.2	38.3	35.7-40.9	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	47.8-51.6	36.8	34.3-39.3	65.4	62.7-68.1	51.1	49.2-53.0	2002
	...	...	...	...	...	...	...	no national data
	15.5-18.7	11.6	9.3-14.1	26.3	24.5-28.4	19.0	17.5-20.6	2009
	65.4-68.1	61.5	59.4-63.5	76.2	74.3-77.9	68.8	67.4-70.2	2005
	7.9-55.7	20.4	6.9-51.1	25.8	9.3-58.5	23.1	9.3-59.2	2003
	32.8-87.6	63.2	30.7-85.5	73.3	37.5-89.4	68.3	31.0-86.9	2006
	21.1-25.7	22.4	19.5-25.6	22.4	19.1-26.1	22.4	20.2-24.8	2004
	14.7-17.6	16.2	14.1-18.5	23.6	21.6-25.7	19.9	18.4-21.4	2009
	...	...	...	...	...	...	...	no national data
	9.4-59.8	23.3	8.2-55.6	21.2	7.5-53.1	22.2	9.1-59.0	2003
	11.6-65.6	26.5	9.6-59.9	33.6	13.2-68.0	30.0	11.1-64.5	2003
	40.7-44.4	38.0	35.3-40.8	49.5	47.0-52.0	43.7	41.9-45.6	no national data
	...	...	...	...	...	...	...	no national data
	49.6-52.7	48.4	46.0-50.9	56.5	54.4-58.5	52.4	50.9-54.0	2009
	21.3-79.6	47.4	20.1-78.1	53.1	23.6-81.0	50.2	20.4-78.9	2003
	25.3-26.8	18.5	17.5-19.5	33.3	32.2-34.5	25.9	25.1-26.7	2006
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	29.2-86.4	65.9	32.1-86.9	72.1	36.8-89.0	69.0	31.0-87.2	2003
	19.8-77.4	44.1	18.9-75.9	44.3	19.3-75.8	44.2	17.9-75.3	2005
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data

PHYSICAL INACTIVITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF INSUFFICIENT PHYSICAL ACTIVITY

Note: … indicates no data were available

Country name	Region	Insufficiently active					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Tajikistan	EUR	…	…	…	…	…	
Thailand	SEAR	16.5	15.7-17.3	20.7	19.9-21.5	18.7	
The former Yugoslav Republic of Macedonia	EUR	…	…	…	…	…	
Timor-Leste	SEAR	…	…	…	…	…	
Togo	AFR	…	…	…	…	…	
Tonga	WPR	30.6	26.0-35.5	52.1	47.8-56.4	41.4	
Trinidad and Tobago	AMR	…	…	…	…	…	
Tunisia	EMR	30.0	11.6-62.5	39.1	16.3-71.3	34.6	
Turkey	EUR	48.1	20.6-77.9	61.2	28.6-84.4	54.6	
Turkmenistan	EUR	…	…	…	…	…	
Tuvalu	WPR	…	…	…	…	…	
Uganda	AFR	…	…	…	…	…	
Ukraine	EUR	20.7	7.4-52.6	19.1	8.2-49.6	19.8	
United Arab Emirates	EMR	54.6	24.2-81.8	67.5	33.4-88.0	58.3	
United Kingdom	EUR	61.1	60.0-62.3	71.6	70.6-72.5	66.5	
United Republic of Tanzania	AFR	…	…	…	…	…	
United States of America	AMR	35.5	33.9-37.2	50.6	48.9-52.3	43.2	
Uruguay	AMR	28.7	25.2-32.3	42.0	39.3-44.8	35.7	
Uzbekistan	EUR	…	…	…	…	…	
Vanuatu	WPR	…	…	…	…	…	
Venezuela (Bolivarian Republic of)	AMR	…	…	…	…	…	
Viet Nam	WPR	14.2	4.2-38.3	15.6	5.0-41.2	14.9	
Yemen	EMR	…	…	…	…	…	
Zambia	AFR	13.3	4.0-36.4	17.7	5.7-44.9	15.5	
Zimbabwe	AFR	18.2	6.0-45.3	24.8	9.0-57.7	21.7	

		Insufficiently active						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	...	...	...	...	...	...	...	no national data
	18.1-19.2	17.1	16.3-17.8	21.4	20.6-22.1	19.2	18.7-19.8	2008
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	38.2-44.7	31.8	27.1-36.7	51.9	47.6-56.2	41.8	38.6-45.1	2004
	...	...	...	...	...	...	...	no national data
	13.3-67.6	31.5	12.4-63.8	40.3	17.0-72.1	35.9	13.9-68.4	2003
	22.8-80.8	49.5	21.6-78.8	62.5	29.7-84.9	56.0	23.8-81.4	2003
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	7.3-52.2	20.4	7.2-52.4	16.3	6.2-44.6	18.4	6.6-50.3	2003
	24.9-83.4	56.1	25.8-82.9	68.9	34.6-88.3	62.5	25.5-83.6	2003
	65.7-67.3	58.0	56.8-59.1	68.6	67.6-69.6	63.3	62.5-64.1	2008
	...	...	...	...	...	...	...	no national data
	42.0-44.4	33.5	31.9-35.2	47.4	45.7-49.1	40.5	39.3-41.7	2007
	33.5-37.9	28.0	24.5-31.6	40.2	37.5-42.9	34.1	31.9-36.3	2006
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	5.3-43.6	14.6	4.5-39.5	15.9	5.2-41.8	15.3	5.6-44.4	2003
	...	...	...	...	...	...	...	no national data
	5.2-44.6	15.1	4.8-40.8	19.3	6.6-48.2	17.2	5.9-47.7	2003
	7.9-55.7	21.8	7.9-51.8	25.8	9.5-58.9	23.8	8.9-58.2	2003

ALCOHOL
2008 COMPARABLE PROJECTED ESTIMATES OF ADULT PER CAPITA CONSUMPTION IN LITRES OF PURE ALCOHOL

Note: … indicates no data were available

Country name	Region	Adult per capita consumption of pure alcohol (litres)
		Crude adjusted estimates
		Both sexes
Afghanistan	EMR	0.03
Albania	EUR	7.29
Algeria	AFR	0.69
Andorra	EUR	10.17
Angola	AFR	5.57
Antigua and Barbuda	AMR	8.17
Argentina	AMR	9.35
Armenia	EUR	13.66
Australia	WPR	10.21
Austria	EUR	12.40
Azerbaijan	EUR	13.34
Bahamas	AMR	8.65
Bahrain	EMR	4.19
Bangladesh	SEAR	0.17
Barbados	AMR	6.42
Belarus	EUR	18.85
Belgium	EUR	10.41
Belize	AMR	5.92
Benin	AFR	2.08
Bhutan	SEAR	0.54
Bolivia (Plurinational State of)	AMR	5.78
Bosnia and Herzegovina	EUR	9.60
Botswana	AFR	6.97
Brazil	AMR	10.08
Brunei Darussalam	WPR	1.86
Bulgaria	EUR	11.40
Burkina Faso	AFR	7.32
Burundi	AFR	9.65
Cambodia	WPR	4.71
Cameroon	AFR	7.90
Canada	AMR	10.20
Cape Verde	AFR	4.98
Central African Republic	AFR	3.17
Chad	AFR	4.39
Chile	AMR	8.81
China	WPR	5.56
Colombia	AMR	6.59
Comoros	AFR	0.28
Congo	AFR	4.46
Cook Islands	WPR	3.23
Costa Rica	AMR	5.81
Côte d'Ivoire	AFR	6.47
Croatia	EUR	15.00
Cuba	AMR	5.12
Cyprus	EUR	8.84
Czech Republic	EUR	16.47
Democratic People's Republic of Korea	SEAR	4.34
Democratic Republic of the Congo	AFR	3.39
Denmark	EUR	12.02
Djibouti	EMR	1.87
Dominica	AMR	8.68
Dominican Republic	AMR	6.28
Ecuador	AMR	9.43
Egypt	EMR	0.32
El Salvador	AMR	3.99
Equatorial Guinea	AFR	6.12

ALCOHOL
2008 COMPARABLE PROJECTED ESTIMATES OF ADULT PER CAPITA CONSUMPTION IN LITRES OF PURE ALCOHOL

Note: … indicates no data was available

Country name	Region	Adult per capita consumption of pure alcohol (litres)
		Crude adjusted estimates
		Both sexes
Eritrea	AFR	1.64
Estonia	EUR	17.24
Ethiopia	AFR	4.10
Fiji	WPR	2.76
Finland	EUR	13.10
France	EUR	12.48
Gabon	AFR	9.46
Gambia	AFR	3.58
Georgia	EUR	6.66
Germany	EUR	12.14
Ghana	AFR	3.11
Greece	EUR	11.01
Grenada	AMR	10.71
Guatemala	AMR	7.10
Guinea	AFR	0.79
Guinea-Bissau	AFR	3.90
Guyana	AMR	8.70
Haiti	AMR	5.92
Honduras	AMR	4.43
Hungary	EUR	16.12
Iceland	EUR	7.38
India	SEAR	2.69
Indonesia	SEAR	0.56
Iran (Islamic Republic of)	EMR	1.03
Iraq	EMR	0.47
Ireland	EUR	14.92
Israel	EUR	2.52
Italy	EUR	9.72
Jamaica	AMR	5.17
Japan	WPR	7.79
Jordan	EMR	0.65
Kazakhstan	EUR	11.10
Kenya	AFR	3.88
Kiribati	WPR	2.70
Kuwait	EMR	0.10
Kyrgyzstan	EUR	4.72
Lao People's Democratic Republic	WPR	6.99
Latvia	EUR	13.45
Lebanon	EMR	2.30
Lesotho	AFR	5.56
Liberia	AFR	5.07
Libyan Arab Jamahiriya	EMR	0.10
Lithuania	EUR	16.30
Luxembourg	EUR	12.84
Madagascar	AFR	1.32
Malawi	AFR	1.44
Malaysia	WPR	0.87
Maldives	SEAR	…
Mali	AFR	0.99
Malta	EUR	4.10
Marshall Islands	WPR	…
Mauritania	AFR	0.11
Mauritius	AFR	3.53
Mexico	AMR	8.55
Micronesia (Federated States of)	WPR	5.25
Monaco	EUR	…

ALCOHOL
2008 COMPARABLE PROJECTED ESTIMATES OF ADULT PER CAPITA CONSUMPTION IN LITRES OF PURE ALCOHOL

Note: … indicates no data were available

Country name	Region	Adult per capita consumption of pure alcohol (litres)
		Crude adjusted estimates
		Both sexes
Mongolia	WPR	3.41
Montenegro	EUR	…
Morocco	EMR	1.24
Mozambique	AFR	2.27
Myanmar	SEAR	0.58
Namibia	AFR	11.46
Nauru	WPR	4.81
Nepal	SEAR	2.42
Netherlands	EUR	9.75
New Zealand	WPR	9.99
Nicaragua	AMR	5.21
Niger	AFR	0.34
Nigeria	AFR	12.72
Niue	WPR	8.69
Norway	EUR	8.35
Oman	EMR	0.92
Pakistan	EMR	0.05
Palau	WPR	9.86
Panama	AMR	7.30
Papua New Guinea	WPR	3.64
Paraguay	AMR	7.91
Peru	AMR	6.53
Philippines	WPR	6.08
Poland	EUR	14.43
Portugal	EUR	13.89
Qatar	EMR	1.29
Republic of Korea	WPR	14.81
Republic of Moldova	EUR	23.01
Romania	EUR	16.15
Russian Federation	EUR	16.23
Rwanda	AFR	9.99
Saint Kitts and Nevis	AMR	10.62
Saint Lucia	AMR	12.05
Saint Vincent and the Grenadines	AMR	4.99
Samoa	WPR	4.51
San Marino	EUR	…
Sao Tome and Principe	AFR	8.45
Saudi Arabia	EMR	0.34
Senegal	AFR	0.51
Serbia	EUR	12.21
Seychelles	AFR	12.11
Sierra Leone	AFR	9.48
Singapore	WPR	1.54
Slovakia	EUR	13.31
Slovenia	EUR	14.94
Solomon Islands	WPR	1.37
Somalia	EMR	0.50
South Africa	AFR	10.16
Spain	EUR	11.83
Sri Lanka	SEAR	0.81
Sudan	EMR	2.56
Suriname	AMR	6.56
Swaziland	AFR	5.05
Sweden	EUR	9.98
Switzerland	EUR	11.41
Syrian Arab Republic	EMR	1.49

ALCOHOL
2008 COMPARABLE PROJECTED ESTIMATES OF ADULT PER CAPITA CONSUMPTION IN LITRES OF PURE ALCOHOL

Note: … indicates no data was available

Country name	Region	Adult per capita consumption of pure alcohol (litres)
		Crude adjusted estimates
		Both sexes
Tajikistan	EUR	3.39
Thailand	SEAR	7.08
The former Yugoslav Republic of Macedonia	EUR	8.94
Timor-Leste	SEAR	0.74
Togo	AFR	1.92
Tonga	WPR	3.92
Trinidad and Tobago	AMR	6.16
Tunisia	EMR	1.05
Turkey	EUR	3.02
Turkmenistan	EUR	5.00
Tuvalu	WPR	2.14
Uganda	AFR	16.40
Ukraine	EUR	17.47
United Arab Emirates	EMR	0.52
United Kingdom	EUR	13.24
United Republic of Tanzania	AFR	7.86
United States of America	AMR	9.70
Uruguay	AMR	8.99
Uzbekistan	EUR	3.61
Vanuatu	WPR	0.96
Venezuela (Bolivarian Republic of)	AMR	7.60
Viet Nam	WPR	3.91
Yemen	EMR	0.20
Zambia	AFR	3.56
Zimbabwe	AFR	4.96

RAISED BLOOD PRESSURE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD PRESSURE

Note: … indicates no data were available

Country name	Region	Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Afghanistan	EMR	…	…	…	…	…	
Albania	EUR	49.3	39.0-59.1	43.5	33.0-54.1	46.3	
Algeria	AFR	38.3	30.6-46.4	37.6	29.1-46.1	38.0	
Andorra	EUR	…	…	…	…	…	
Angola	AFR	…	…	…	…	…	
Antigua and Barbuda	AMR	…	…	…	…	…	
Argentina	AMR	41.8	31.7-52.1	32.0	21.3-43.7	36.7	
Armenia	EUR	51.5	43.6-59.2	50.1	42.5-57.6	50.7	
Australia	WPR	41.1	32.8-48.9	32.0	24.4-39.8	36.4	
Austria	EUR	46.2	36.0-56.9	41.4	30.0-52.5	43.8	
Azerbaijan	EUR	43.7	36.6-51.0	39.8	32.5-47.2	41.6	
Bahamas	AMR	…	…	…	…	…	
Bahrain	EMR	38.3	29.8-47.4	35.3	26.3-44.7	37.1	
Bangladesh	SEAR	…	…	…	…	…	
Barbados	AMR	44.5	35.2-53.5	42.0	32.8-51.3	43.2	
Belarus	EUR	52.0	42.1-62.1	49.5	37.2-61.1	50.6	
Belgium	EUR	43.9	34.7-53.5	38.8	28.4-49.8	41.2	
Belize	AMR	35.9	28.6-43.5	27.4	20.9-34.2	31.7	
Benin	AFR	40.4	34.4-46.4	37.0	31.3-42.9	38.7	
Bhutan	SEAR	35.6	27.2-44.2	33.3	24.9-41.9	34.6	
Bolivia (Plurinational State of)	AMR	…	…	…	…	…	
Bosnia and Herzegovina	EUR	49.9	41.0-58.4	53.4	44.6-61.7	51.7	
Botswana	AFR	41.0	34.8-47.6	40.6	34.3-46.8	40.8	
Brazil	AMR	45.0	38.9-51.2	35.5	29.7-41.1	40.0	
Brunei Darussalam	WPR	…	…	…	…	…	
Bulgaria	EUR	52.6	43.6-61.2	50.3	39.1-60.4	51.4	
Burkina Faso	AFR	…	…	…	…	…	
Burundi	AFR	…	…	…	…	…	
Cambodia	WPR	30.5	24.4-36.4	25.1	19.1-31.4	27.6	
Cameroon	AFR	39.6	32.0-47.3	34.2	27.4-41.8	36.9	
Canada	AMR	35.8	27.3-44.2	31.6	22.4-40.9	33.6	
Cape Verde	AFR	46.8	40.1-53.8	41.9	35.6-48.4	44.1	
Central African Republic	AFR	…	…	…	…	…	
Chad	AFR	39.2	31.1-47.1	34.6	26.4-42.8	36.8	
Chile	AMR	47.3	38.6-56.2	39.3	31.2-47.6	43.2	
China	WPR	40.1	35.4-44.5	36.2	31.7-40.7	38.2	
Colombia	AMR	40.4	34.2-46.6	33.8	28.0-39.7	37.0	
Comoros	AFR	…	…	…	…	…	
Congo	AFR	41.4	32.6-50.7	38.6	29.8-47.7	40.0	
Cook Islands	WPR	46.0	37.0-55.2	36.8	28.3-45.6	41.5	
Costa Rica	AMR	40.1	30.7-49.2	30.9	22.6-39.5	35.6	
Côte d'Ivoire	AFR	44.1	36.0-52.6	38.6	30.3-47.1	41.5	
Croatia	EUR	54.2	45.1-62.7	53.3	43.3-62.4	53.7	
Cuba	AMR	…	…	…	…	…	
Cyprus	EUR	45.2	35.1-55.7	36.2	25.5-47.3	40.5	
Czech Republic	EUR	50.7	44.3-56.8	45.6	39.0-51.8	48.1	
Democratic People's Republic of Korea	SEAR	…	…	…	…	…	
Democratic Republic of the Congo	AFR	39.4	30.8-48.1	35.8	26.9-44.9	37.6	
Denmark	EUR	45.6	37.0-54.3	36.7	27.3-46.4	41.0	
Djibouti	EMR	…	…	…	…	…	
Dominica	AMR	49.1	42.2-56.4	44.7	37.8-51.4	46.8	
Dominican Republic	AMR	41.9	33.1-50.9	36.0	27.0-44.9	39.0	
Ecuador	AMR	…	…	…	…	…	
Egypt	EMR	35.5	28.7-42.1	34.5	28.1-41.0	35.0	
El Salvador	AMR	35.6	26.6-44.3	28.6	20.2-37.1	31.9	
Equatorial Guinea	AFR	…	…	…	…	…	

	Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)							Latest Year of National Data
	Age-standardized adjusted estimates							
95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
…	…	…	…	…	…	…	…	no national data
39.0-53.7	48.0	38.0-57.7	42.0	31.7-52.5	44.9	37.7-52.2	no national data
32.1-43.8	43.8	35.6-52.3	43.0	33.7-52.1	43.5	37.2-49.6	no national data
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
29.1-44.4	41.8	31.5-52.1	29.2	19.3-40.3	35.2	27.8-42.8	no national data
45.0-56.3	49.8	42.1-57.6	46.0	38.7-53.4	47.8	42.2-53.3	2005
30.6-42.5	37.4	29.5-45.1	26.2	19.4-33.3	31.8	26.3-37.5	2005
35.7-52.0	42.6	32.9-52.9	33.4	23.6-43.7	38.0	30.9-45.7	no national data
36.5-46.9	46.0	38.7-53.4	41.1	33.6-48.5	43.4	38.2-48.8	2006
…	…	…	…	…	…	…	no national data
30.9-43.8	44.3	35.2-53.4	42.5	32.8-52.0	43.7	37.1-50.4	1996
…	…	…	…	…	…	…	no national data
36.7-49.7	44.8	35.7-53.7	38.8	30.1-47.9	41.8	35.5-48.2	2000
42.1-58.5	51.2	41.4-61.3	42.3	30.8-53.6	46.6	38.5-54.4	no national data
33.9-48.4	39.3	30.7-48.5	30.4	21.6-40.4	34.8	28.2-41.5	1995
26.9-36.6	41.0	33.2-49.1	33.0	25.4-40.7	37.0	31.6-42.5	2004
34.4-43.0	47.0	40.7-53.2	43.3	37.1-49.5	45.3	40.8-49.8	2008
28.6-40.6	40.4	31.1-49.3	37.4	28.3-46.7	39.1	32.7-45.5	no national data
…	…	…	…	…	…	…	no national data
45.4-57.9	47.2	38.7-55.6	46.6	38.2-55.0	47.1	41.0-53.1	2002
36.2-45.5	47.9	41.3-54.7	46.6	39.9-53.1	47.5	42.6-52.3	2007
35.9-44.2	47.8	41.7-54.1	37.1	31.2-42.9	42.3	38.0-46.5	2005
…	…	…	…	…	…	…	no national data
43.9-58.2	48.1	39.4-56.8	40.9	30.7-50.6	44.5	37.5-51.2	no national data
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
23.1-32.1	35.5	28.5-41.9	28.1	21.5-35.0	31.5	26.5-36.5	2010
31.7-42.2	45.2	37.1-53.3	39.8	32.1-48.0	42.6	36.8-48.2	no national data
27.0-40.2	33.1	25.1-41.1	26.3	18.3-34.6	29.7	23.8-35.8	1989
39.3-49.2	53.8	46.9-60.7	47.1	40.3-53.8	50.4	45.3-55.5	2007
…	…	…	…	…	…	…	no national data
31.1-42.5	45.1	36.5-53.3	40.8	31.7-49.5	43.0	36.7-49.1	no national data
37.2-49.2	47.6	39.0-56.5	37.4	29.4-45.6	42.5	36.6-48.4	2003
34.9-41.5	40.8	36.2-45.2	36.3	31.8-40.7	38.6	35.4-41.9	2009
32.6-41.2	43.9	37.5-50.3	36.6	30.4-42.6	40.1	35.6-44.5	2007
…	…	…	…	…	…	…	no national data
33.5-46.3	48.3	38.8-57.8	45.0	35.2-54.6	46.7	39.7-53.3	no national data
35.1-47.6	48.4	39.3-57.6	38.5	29.8-47.4	43.6	37.1-49.8	2003
29.2-41.9	42.5	32.7-51.8	32.9	24.1-41.9	37.8	31.1-44.3	no national data
35.5-47.6	49.3	40.7-57.8	44.8	35.8-53.8	47.1	40.8-53.4	no national data
47.0-60.3	49.8	41.1-58.4	43.4	34.1-52.4	46.7	40.2-53.2	no national data
…	…	…	…	…	…	…	no national data
32.7-48.4	42.4	32.7-52.8	32.0	22.3-42.4	37.0	29.7-44.7	no national data
43.5-52.5	47.6	41.4-53.6	37.6	31.6-43.4	42.7	38.3-46.9	2005
…	…	…	…	…	…	…	no national data
31.5-44.0	46.9	37.7-55.9	42.7	32.7-52.4	44.8	38.0-51.6	no national data
34.3-47.9	40.6	32.4-48.8	28.4	20.6-37.2	34.5	28.5-40.8	no national data
…	…	…	…	…	…	…	no national data
41.9-51.9	49.6	42.7-56.9	44.2	37.3-51.0	46.9	41.9-52.0	2007
32.7-45.2	44.7	35.6-53.8	39.2	29.7-48.4	41.9	35.4-48.3	1997
…	…	…	…	…	…	…	no national data
30.3-39.6	38.8	31.7-45.5	37.4	30.7-44.1	38.1	33.2-43.0	2002
25.7-38.1	39.4	29.7-48.7	31.4	22.1-40.8	35.2	28.5-41.9	no national data
…	…	…	…	…	…	…	no national data

RAISED BLOOD PRESSURE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD PRESSURE

Note: … indicates no data were available

Country name	Region	Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Eritrea	AFR	33.9	26.4-41.6	29.8	22.7-37.1	31.7	
Estonia	EUR	56.0	47.3-64.7	52.7	42.6-61.8	54.1	
Ethiopia	AFR	37.3	30.4-44.1	33.2	26.0-40.6	35.2	
Fiji	WPR	40.1	31.0-49.3	37.5	28.7-46.6	38.8	
Finland	EUR	52.3	44.2-60.8	46.3	38.2-54.3	49.2	
France	EUR	47.5	40.4-54.5	38.4	31.0-45.2	42.7	
Gabon	AFR	43.9	36.6-51.5	38.7	31.0-46.5	41.3	
Gambia	AFR	43.6	35.0-52.1	38.7	30.3-46.8	41.1	
Georgia	EUR	52.8	42.6-62.7	50.3	39.3-60.7	51.4	
Germany	EUR	49.8	41.9-58.0	44.8	36.4-52.5	47.2	
Ghana	AFR	37.6	32.3-43.0	35.2	30.1-40.1	36.4	
Greece	EUR	43.8	35.0-53.0	41.4	32.6-50.3	42.6	
Grenada	AMR	…	…	…	…	…	
Guatemala	AMR	36.7	28.6-44.8	28.5	21.1-35.5	32.3	
Guinea	AFR	…	…	…	…	…	
Guinea-Bissau	AFR	…	…	…	…	…	
Guyana	AMR	…	…	…	…	…	
Haiti	AMR	…	…	…	…	…	
Honduras	AMR	37.5	28.7-46.7	30.1	21.9-38.5	33.7	
Hungary	EUR	52.6	44.5-60.3	49.6	39.7-59.0	51.0	
Iceland	EUR	42.9	34.2-51.5	31.7	23.2-40.6	37.2	
India	SEAR	33.2	27.2-38.7	31.7	26.4-37.1	32.5	
Indonesia	SEAR	38.9	31.8-46.0	36.0	29.6-42.5	37.4	
Iran (Islamic Republic of)	EMR	35.8	30.6-41.1	31.7	26.8-36.5	33.7	
Iraq	EMR	…	…	…	…	…	
Ireland	EUR	47.8	40.6-55.3	37.1	30.5-43.7	42.4	
Israel	EUR	38.3	31.0-45.8	33.5	25.8-41.2	35.8	
Italy	EUR	47.9	41.3-54.5	44.4	37.5-51.0	46.1	
Jamaica	AMR	42.1	35.5-48.1	38	31.6-44.4	39.9	
Japan	WPR	47.1	40.5-53.8	41.0	34.9-47.2	43.9	
Jordan	EMR	31.4	25.5-37.5	25.9	20.5-31.6	28.8	
Kazakhstan	EUR	…	…	…	…	…	
Kenya	AFR	38.9	30.9-47.0	35.1	26.7-44.1	37.0	
Kiribati	WPR	39.1	30.4-47.7	28.7	21.3-36.7	33.7	
Kuwait	EMR	31.5	25.0-38.0	24.7	19.1-30.5	29.1	
Kyrgyzstan	EUR	…	…	…	…	…	
Lao People's Democratic Republic	WPR	34.4	27.0-42.1	30.0	22.3-37.8	32.1	
Latvia	EUR	…	…	…	…	…	
Lebanon	EMR	42.9	36.5-49.2	35.6	29.1-41.9	39	
Lesotho	AFR	…	…	…	…	…	
Liberia	AFR	…	…	…	…	…	
Libyan Arab Jamahiriya	EMR	45.9	39.6-52.0	39.1	33.4-45.0	42.6	
Lithuania	EUR	54.3	45.6-63.4	52.6	42.4-62.0	53.4	
Luxembourg	EUR	…	…	…	…	…	
Madagascar	AFR	43.2	35.1-51.4	40.4	32.2-48.8	41.8	
Malawi	AFR	45.6	39.4-52.0	41.4	35.5-47.4	43.4	
Malaysia	WPR	36.9	29.4-44.4	32.4	25.3-39.5	34.7	
Maldives	SEAR	…	…	…	…	…	
Mali	AFR	34.0	26.2-41.2	35.3	27.4-43.2	34.7	
Malta	EUR	46.6	36.9-56.8	40.7	28.9-51.6	43.6	
Marshall Islands	WPR	37.4	28.6-46.4	28.4	20.8-36.8	32.7	
Mauritania	AFR	…	…	…	…	…	
Mauritius	AFR	…	…	…	…	…	
Mexico	AMR	37.2	30.1-44.1	30.9	24.3-37.4	33.9	
Micronesia (Federated States of)	WPR	42.7	33.9-51.9	34.1	25.4-43.1	38.3	
Monaco	EUR	…	…	…	…	…	

		Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	26.5-37.2	42.7	34.2-51.2	38.2	29.6-46.7	40.5	34.3-46.8	2004
	47.2-60.5	52.9	44.3-61.7	42.2	32.7-51.1	47.3	40.6-53.6	no national data
	30.1-40.3	43.2	35.8-50.4	39.0	30.9-47.0	41.1	35.4-46.6	no national data
	32.3-45.2	43.2	33.7-52.5	39.7	30.8-48.8	41.6	34.9-48.1	2002
	43.1-55.4	47.4	39.6-55.7	36.3	28.9-43.7	41.9	36.2-47.8	2001
	37.3-48.2	42.3	35.6-49.2	29.3	23.0-35.4	35.7	30.7-40.9	2007
	36.0-46.8	48.2	40.7-56.0	42.9	34.6-51.0	45.6	40.0-51.3	no national data
	35.2-47.1	48.0	39.1-56.6	43.3	34.4-51.7	45.7	39.5-51.9	1997
	43.8-58.7	49.9	39.8-59.8	43.5	33.2-53.9	46.5	39.2-53.8	no national data
	41.2-53.2	44.8	37.3-52.8	34.3	27.0-41.5	39.7	34.1-45.5	1998
	32.5-40.1	43.0	37.3-48.5	41.1	35.5-46.4	42.1	38.0-46.0	2009
	35.9-49.3	39.4	31.0-48.3	32.7	24.9-41.1	36.1	30.0-42.6	no national data
	...	...	...	...	...	...	...	no national data
	26.7-37.8	39.9	31.3-48.3	32.7	24.3-40.6	36.0	29.8-41.9	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	27.6-39.9	41.7	32.1-51.2	35.2	25.8-44.5	38.4	31.8-45.1	no national data
	44.4-57.0	50.0	42.0-57.6	41.0	31.9-50.2	45.5	39.3-51.3	1987
	30.9-43.8	40.2	32.0-48.8	27.3	19.6-35.6	33.8	27.8-40.0	no national data
	28.4-36.3	36.0	29.7-41.8	34.2	28.6-39.9	35.2	30.9-39.2	2007
	32.5-42.1	42.7	35.3-49.9	39.2	32.5-46.0	41.0	35.9-45.8	2001
	30.1-37.3	41.4	35.9-46.8	37.3	31.9-42.5	39.4	35.5-43.1	2007
	...	...	...	...	...	...	...	no national data
	37.1-47.9	47.0	39.8-54.5	34.2	27.7-40.7	40.6	35.4-46.2	2007
	30.1-41.5	37.4	30.1-44.9	29.9	22.6-37.3	33.6	28.0-39.3	2002
	40.9-51.3	42.2	35.9-48.8	33.6	27.4-39.8	37.9	33.0-43.0	2001
	35.3-44.5	42.7	36.1-48.8	38.6	32.1-45.1	40.6	35.8-45.2	2008
	38.9-49.2	41.3	35.0-47.9	30.7	25.4-36.2	36.0	31.3-41.0	2007
	24.7-33.0	38.0	31.4-44.5	32.0	25.5-38.6	35.1	30.4-39.9	2007
	...	...	...	...	...	...	...	no national data
	31.0-43.2	46.2	37.7-54.8	42.7	33.1-52.4	44.5	37.9-51.2	no national data
	28.0-39.7	42.2	33.1-50.9	32.8	24.4-41.4	37.4	31.2-43.6	2004
	24.3-33.7	40.3	32.9-47.3	34.7	27.4-41.7	38.4	32.9-43.5	2006
	...	...	...	...	...	...	...	no national data
	26.7-37.6	39.7	31.6-47.9	35.1	26.2-43.7	37.3	31.2-43.4	no national data
	...	...	...	...	...	...	...	no national data
	34.5-43.7	44.3	37.7-50.6	36.8	30.3-43.4	40.4	35.7-45.1	2009
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	38.3-47.1	51.7	45.4-58.0	47.4	41.1-53.5	49.6	45.0-54.1	2009
	46.3-60.0	52.1	43.5-61.2	43.4	33.7-52.7	47.7	41.0-54.3	no national data
	...	...	...	...	...	...	...	no national data
	35.8-47.6	48.7	40.3-57.1	46.4	37.6-55.1	47.6	41.3-53.6	no national data
	38.9-48.1	51.5	45.0-58.0	47.8	41.4-54.0	49.7	45.1-54.5	2009
	29.4-40.1	40.3	32.4-47.8	35.7	28.1-43.2	38.0	32.5-43.6	2004
	...	...	...	...	...	...	...	no national data
	29.4-40.3	41.0	32.0-48.8	41.0	32.1-49.6	41.1	34.9-47.2	no national data
	35.8-51.8	43.3	34.0-53.2	33.8	23.7-43.9	38.6	31.5-46.3	no national data
	26.9-38.9	40.7	31.5-49.9	33.1	24.5-42.3	36.8	30.6-43.3	2002
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	29.0-38.7	39.4	32.1-46.5	33.1	26.0-40.0	36.1	30.9-41.2	2006
	32.1-44.8	46.2	37.1-55.6	37.5	28.2-47.0	41.8	35.2-48.4	no national data
	...	...	...	...	...	...	...	no national data

RAISED BLOOD PRESSURE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD PRESSURE

Note: … indicates no data were available

Country name	Region	Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Mongolia	WPR	44.6	39.4-50.1	36.4	31.1-41.5	40.4	
Montenegro	EUR	…	…	…	…	…	
Morocco	EMR	40.7	32.1-49.2	41.7	33.2-50.3	41.2	
Mozambique	AFR	46.7	39.2-54.9	43.3	36.0-50.9	44.9	
Myanmar	SEAR	40.7	34.4-46.8	36.7	30.4-43.2	38.6	
Namibia	AFR	45.1	37.5-53.3	41.8	34.4-49.7	43.4	
Nauru	WPR	45.0	36.6-53.4	34.6	26.8-42.4	39.6	
Nepal	SEAR	…	…	…	…	…	
Netherlands	EUR	46.8	38.4-55.6	38.2	29.7-47.0	42.4	
New Zealand	WPR	40.8	31.0-50.3	33.0	22.9-43.4	36.8	
Nicaragua	AMR	38.4	29.8-47.7	30.4	21.7-39.4	34.3	
Niger	AFR	52.5	45.3-60.1	42.8	35.6-49.8	47.8	
Nigeria	AFR	41.5	33.9-49.4	44.0	36.0-52.6	42.8	
Niue	WPR	…	…	…	…	…	
Norway	EUR	50.4	41.8-59.2	43.4	34.9-52.0	46.8	
Oman	EMR	36.6	28.9-44.7	31.3	23.4-39.5	34.5	
Pakistan	EMR	36.1	27.7-44.9	34.5	25.9-43.3	35.3	
Palau	WPR	…	…	…	…	…	
Panama	AMR	…	…	…	…	…	
Papua New Guinea	WPR	29.4	22.4-36.4	24.6	18.2-31.8	27.0	
Paraguay	AMR	…	…	…	…	…	
Peru	AMR	35.3	27.6-42.5	28.3	21.2-35.4	31.7	
Philippines	WPR	35.4	28.2-42.3	30.0	23.0-36.8	32.7	
Poland	EUR	51.2	44.6-58.1	49.5	42.5-56.2	50.3	
Portugal	EUR	50.4	42.5-58.8	45.7	37.6-53.9	47.9	
Qatar	EMR	36.1	29.7-42.7	27.6	21.8-33.6	33.8	
Republic of Korea	WPR	33.3	25.7-40.7	28.0	21.3-34.6	30.6	
Republic of Moldova	EUR	…	…	…	…	…	
Romania	EUR	49.5	40.1-59.0	48.8	38.8-58.1	49.1	
Russian Federation	EUR	46.6	40.1-53.0	48.4	41.1-55.3	47.6	
Rwanda	AFR	…	…	…	…	…	
Saint Kitts and Nevis	AMR	49.9	42.3-57.6	42.7	34.4-50.9	46.2	
Saint Lucia	AMR	…	…	…	…	…	
Saint Vincent and the Grenadines	AMR	…	…	…	…	…	
Samoa	WPR	43.5	34.1-53.1	36.2	27.7-44.6	40.0	
San Marino	EUR	…	…	…	…	…	
Sao Tome and Principe	AFR	46.0	39.4-52.8	43.2	36.9-49.4	44.5	
Saudi Arabia	EMR	35.2	28.7-41.7	30.0	24.1-35.8	33.1	
Senegal	AFR	…	…	…	…	…	
Serbia	EUR	53.4	46.6-60.1	50.1	43.4-56.6	51.7	
Seychelles	AFR	46.6	38.7-54.5	41.8	34.3-49.1	44.2	
Sierra Leone	AFR	44.1	38.5-49.8	43.9	38.3-50.0	44.0	
Singapore	WPR	39.7	32.9-46.9	33.9	27.4-40.6	36.8	
Slovakia	EUR	…	…	…	…	…	
Slovenia	EUR	…	…	…	…	…	
Solomon Islands	WPR	32.7	24.8-40.1	28.9	21.3-36.4	30.8	
Somalia	EMR	…	…	…	…	…	
South Africa	AFR	43.1	37.8-48.7	41.4	36.2-46.9	42.2	
Spain	EUR	44.5	37.7-51.6	39.0	32.6-45.8	41.7	
Sri Lanka	SEAR	41.4	33.5-49.2	37.1	29.3-44.8	39.2	
Sudan	EMR	…	…	…	…	…	
Suriname	AMR	…	…	…	…	…	
Swaziland	AFR	…	…	…	…	…	
Sweden	EUR	49.3	41.8-57.5	42.7	35.1-50.4	46.0	
Switzerland	EUR	45.8	37.3-54.6	35.6	26.4-44.8	40.4	
Syrian Arab Republic	EMR	…	…	…	…	…	

	Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)						Latest Year of National Data
	Age-standardized adjusted estimates						
95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
36.6-44.3	51.4	46.0-56.8	42.7	37.0-48.1	47.0	42.9-51.1	2009
…	…	…	…	…	…	…	no national data
35.2-47.3	43.9	35.0-52.6	46	37.2-54.8	45	38.8-51.2	2000
39.5-50.6	52.6	44.9-60.8	49.3	41.5-57.0	50.9	45.3-56.6	2005
34.0-43.2	44.3	37.7-50.5	39.8	33.1-46.5	42	37.2-46.8	2009
38.1-49.2	51.0	43.0-59.2	46.9	39.1-54.9	49.1	43.3-54.9	2005
33.8-45.4	48.4	39.8-56.7	39.7	31.2-47.8	43.9	37.8-49.8	2004
…	…	…	…	…	…	…	no national data
36.0-49.0	42.4	34.5-50.8	30.8	23.4-38.9	36.6	30.7-42.8	2000
29.5-44.2	37.5	28.2-46.6	28.0	19.0-37.5	32.6	25.9-39.7	no national data
28.0-40.8	42.6	33.4-52.2	35.5	25.5-45.4	39.0	32.0-46.0	no national data
42.6-53.3	55.5	48.3-63.0	49.3	41.6-56.3	52.3	47.0-57.9	2007
37.2-48.7	47.3	39.5-55.4	49.7	41.4-58.3	48.6	42.9-54.5	no national data
…	…	…	…	…	…	…	no national data
40.4-53.7	46.3	37.9-55.1	35.2	27.3-43.5	40.9	34.8-47.7	no national data
28.7-40.5	43.2	34.7-51.9	38.6	29.3-47.9	41.4	34.8-47.8	2000
29.2-41.5	40.1	31.1-49.3	38.8	29.3-48.2	39.5	32.9-46.0	1992
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
22.0-31.9	34.4	26.4-42.0	29.8	22.1-38.2	32.1	26.3-37.8	2007
…	…	…	…	…	…	…	no national data
26.5-37.0	38.1	30.0-45.7	30.6	22.9-38.1	34.3	28.7-39.9	no national data
27.6-37.6	40.0	32.4-47.2	34.4	26.7-41.8	37.2	31.6-42.6	2004
45.4-55.2	49.3	42.8-56.1	42.4	35.8-49.0	46.0	41.2-50.8	2005
41.8-54.2	46.5	38.8-54.9	37.4	29.9-45.4	41.9	36.1-48.1	2003
28.8-39.1	44.4	37.5-51.0	38.1	31.0-44.9	42.7	37.3-48.0	2006
25.1-35.9	33.5	25.9-40.9	25.8	19.5-32.1	29.8	24.4-35.0	2005
…	…	…	…	…	…	…	no national data
42.1-56.2	47.1	37.9-56.7	41.7	32.3-51.0	44.5	37.8-51.5	no national data
42.6-52.6	46.2	39.8-52.5	41.3	34.4-47.9	43.8	39.0-48.7	1994
…	…	…	…	…	…	…	no national data
40.4-51.8	50.4	42.9-58.1	42.3	33.9-50.5	46.3	40.4-51.9	no national data
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
33.5-46.4	46.5	36.8-56.0	38.5	29.6-47.3	42.7	35.9-49.3	2002
…	…	…	…	…	…	…	no national data
39.8-49.4	52.6	45.7-59.4	49.9	43.2-56.3	51.3	46.4-56.3	2009
28.6-37.6	43.1	36.0-50.0	38.9	32.0-45.6	41.4	36.4-46.4	2005
…	…	…	…	…	…	…	no national data
46.8-56.4	50.1	43.4-56.8	43.0	36.5-49.4	46.6	41.9-51.2	2006
38.8-49.7	50.3	42.3-58.1	41.5	33.8-48.9	46.1	40.5-51.6	2004
39.9-48.6	49.4	43.7-55.1	48.7	42.9-54.9	49.1	44.9-53.6	2009
31.7-42.1	38.2	31.6-44.9	30.9	25.1-37.0	34.6	29.9-39.5	2006
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
25.4-36.1	38.5	29.6-46.8	36.2	27.2-44.6	37.4	31.2-43.2	no national data
…	…	…	…	…	…	…	no national data
38.4-46.2	48.3	42.8-53.9	44.4	39.0-49.9	46.4	42.5-50.4	2009
36.5-47.1	41.5	34.8-48.5	31.7	25.8-38.2	36.7	31.6-42.1	2005
33.5-44.6	41.9	34.0-49.6	37.0	29.4-44.6	39.4	33.8-44.8	2006
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
…	…	…	…	…	…	…	no national data
40.1-51.9	43.1	35.9-50.9	32.5	25.8-39.5	37.9	32.4-43.6	no national data
33.8-47.1	41.6	33.6-50.3	28.2	20.5-36.4	34.8	28.8-40.9	no national data
…	…	…	…	…	…	…	no national data

RAISED BLOOD PRESSURE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD PRESSURE

Note: … indicates no data were available

Country name	Region	Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Tajikistan	EUR	…	…	…	…	…	
Thailand	SEAR	36.4	30.7-41.9	32.4	26.7-38.0	34.3	
The former Yugoslav Republic of Macedonia	EUR	…	…	…	…	…	
Timor-Leste	SEAR	…	…	…	…	…	
Togo	AFR	…	…	…	…	…	
Tonga	WPR	42.1	33.7-50.6	38.0	29.6-46.4	40.1	
Trinidad and Tobago	AMR	41.7	32.3-51.4	36.3	26.2-46.0	38.9	
Tunisia	EMR	39.0	31.3-47.0	38.1	29.9-46.2	38.5	
Turkey	EUR	32.5	26.9-38.0	33.0	27.9-37.9	32.8	
Turkmenistan	EUR	…	…	…	…	…	
Tuvalu	WPR	…	…	…	…	…	
Uganda	AFR	…	…	…	…	…	
Ukraine	EUR	54.2	47.1-61.2	53.1	45.9-60.2	53.6	
United Arab Emirates	EMR	29.9	22.7-37.6	20.7	14.7-27.1	27.5	
United Kingdom	EUR	46.4	40.2-52.9	40.8	34.3-47.4	43.5	
United Republic of Tanzania	AFR	40.0	31.5-48.9	38.3	29.7-47.3	39.2	
United States of America	AMR	34.8	28.6-41.1	32.8	27.2-38.5	33.8	
Uruguay	AMR	48.8	40.9-56.7	42.9	34.1-50.9	45.7	
Uzbekistan	EUR	36.7	28.3-45.4	32.1	24.6-40.1	34.4	
Vanuatu	WPR	44.5	36.5-52.9	39.1	31.0-47.3	41.8	
Venezuela (Bolivarian Republic of)	AMR	43.3	33.9-52.5	32.8	24.1-41.7	38.0	
Viet Nam	WPR	36.0	28.9-42.9	30.0	23.5-36.6	33.0	
Yemen	EMR	…	…	…	…	…	
Zambia	AFR	41.3	33.7-49.3	39.0	31.9-46.3	40.1	
Zimbabwe	AFR	38.2	29.9-46.9	39.9	30.4-49.4	39.0	

		Raised blood pressure (SBP≥ 140 and/or DBP ≥ 90 or on medication)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	…	…	…	…	…	…	…	no national data
	30.1-38.2	37.0	31.3-42.5	31.6	26.0-37.1	34.2	30.0-38.1	2009
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	33.9-46.1	44.3	35.5-53.1	37.7	29.2-46.3	41.1	34.8-47.4	2004
	32.1-45.8	44.4	34.6-54.0	37.6	27.2-47.3	40.9	33.9-47.9	no national data
	32.8-44.2	42.6	34.5-50.9	41.2	32.6-49.6	42.0	36.0-47.8	no national data
	28.8-36.6	36.2	30.1-41.8	35.8	30.4-41.0	36.1	31.8-40.1	2008
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	48.5-58.8	52.2	45.2-59.2	44.6	37.9-51.5	48.3	43.3-53.5	2007
	22.0-33.5	41.3	32.7-49.8	32.5	23.4-41.4	38.9	32.2-45.6	2000
	38.5-48.9	42.2	36.3-48.7	32.8	27.0-39.0	37.5	32.7-42.7	no national data
	33.1-45.6	45.9	36.7-55.2	44.0	34.4-53.5	45.0	38.3-51.8	no national data
	29.1-38.5	32.6	26.7-38.7	27.1	22.1-32.4	29.9	25.5-34.5	2008
	39.5-51.4	46.3	38.5-54.2	36.0	28.1-43.7	41.0	35.2-46.7	2006
	28.7-40.2	41.5	32.4-50.6	36.5	28.1-45.0	39.1	32.8-45.2	2002
	36.1-47.9	48.9	40.3-57.4	45.6	36.9-54.1	47.2	41.1-53.5	1998
	31.7-44.5	46.3	36.6-55.7	35.6	26.4-44.8	41.0	34.4-47.7	no national data
	28.1-38.0	40.0	32.5-47.3	33.7	26.5-40.8	36.8	31.7-42.2	2002
	…	…	…	…	…	…	…	no national data
	34.9-45.6	48.9	40.6-57.1	46.1	38.2-53.8	47.7	42.0-53.3	no national data
	32.6-45.7	45.9	36.6-55.2	45.7	35.2-55.8	45.9	38.7-53.1	no national data

RAISED BLOOD GLUCOSE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD GLUCOSE

Note: … indicates no data were available

Country name	Region	Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Afghanistan	EMR	…	…	…	…	…	
Albania	EUR	…	…	…	…	…	
Algeria	AFR	7.9	4.1-12.8	8.2	4.5-13.1	8.0	
Andorra	EUR	…	…	…	…	…	
Angola	AFR	…	…	…	…	…	
Antigua and Barbuda	AMR	…	…	…	…	…	
Argentina	AMR	11.0	5.3-18.6	11.1	5.7-18.4	11.1	
Armenia	EUR	…	…	…	…	…	
Australia	WPR	10.8	5.0-18.8	8.0	3.6-14.3	9.4	
Austria	EUR	8.1	3.0-16.1	6.1	2.4-12.0	7.1	
Azerbaijan	EUR	…	…	…	…	…	
Bahamas	AMR	…	…	…	…	…	
Bahrain	EMR	11.6	5.5-20.2	10.2	4.8-17.7	11.0	
Bangladesh	SEAR	8.0	4.2-13.0	8.7	4.7-14.0	8.4	
Barbados	AMR	12.8	5.6-22.1	16.3	8.1-27.1	14.6	
Belarus	EUR	…	…	…	…	…	
Belgium	EUR	…	…	…	…	…	
Belize	AMR	7.4	4.3-11.5	10.8	6.7-15.7	9.1	
Benin	AFR	5.5	3.6-8.0	5.6	3.6-8.0	5.6	
Bhutan	SEAR	10.6	6.5-15.7	11.6	7.3-16.9	11.1	
Bolivia (Plurinational State of)	AMR	…	…	…	…	…	
Bosnia and Herzegovina	EUR	…	…	…	…	…	
Botswana	AFR	…	…	…	…	…	
Brazil	AMR	9.7	5.5-15.4	9.6	5.5-14.6	9.7	
Brunei Darussalam	WPR	…	…	…	…	…	
Bulgaria	EUR	…	…	…	…	…	
Burkina Faso	AFR	…	…	…	…	…	
Burundi	AFR	…	…	…	…	…	
Cambodia	WPR	3.9	2.3-5.9	4.5	2.8-6.6	4.2	
Cameroon	AFR	8.2	5.1-12.1	9.3	5.8-13.8	8.8	
Canada	AMR	…	…	…	…	…	
Cape Verde	AFR	12.9	8.5-18.1	13.1	8.9-18.0	13.0	
Central African Republic	AFR	…	…	…	…	…	
Chad	AFR	…	…	…	…	…	
Chile	AMR	11.1	6.3-17.2	10.0	5.5-15.8	10.6	
China	WPR	9.5	7.2-12.2	9.3	7.1-12.0	9.4	
Colombia	AMR	6.0	3.7-8.9	5.7	3.5-8.5	5.9	
Comoros	AFR	…	…	…	…	…	
Congo	AFR	…	…	…	…	…	
Cook Islands	WPR	19.5	9.9-31.4	20.5	10.7-32.5	20.0	
Costa Rica	AMR	9.4	5.9-13.6	9.7	6.3-14.1	9.5	
Côte d'Ivoire	AFR	…	…	…	…	…	
Croatia	EUR	…	…	…	…	…	
Cuba	AMR	11.8	5.5-20.2	13.0	6.2-22.0	12.4	
Cyprus	EUR	…	…	…	…	…	
Czech Republic	EUR	12.5	8.4-17.4	11.2	7.6-15.6	11.8	
Democratic People's Republic of Korea	SEAR	…	…	…	…	…	
Democratic Republic of the Congo	AFR	…	…	…	…	…	
Denmark	EUR	…	…	…	…	…	
Djibouti	EMR	…	…	…	…	…	
Dominica	AMR	15.4	9.5-22.5	20.9	13.4-29.5	18.2	
Dominican Republic	AMR	7.4	3.0-13.6	8.3	3.7-15.2	7.8	
Ecuador	AMR	…	…	…	…	…	
Egypt	EMR	6.2	3.6-9.6	6.9	4.0-10.3	6.5	
El Salvador	AMR	10.0	5.6-16.0	9.9	5.7-15.1	9.9	

		Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	5.2-11.5	9.0	4.8-14.4	9.3	5.1-14.6	9.2	6.0-13.0	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	6.9-16.2	11.0	5.3-18.5	10.3	5.0-17.3	10.6	6.5-15.7	no national data
	...	...	...	...	...	...	...	no national data
	5.5-14.1	9.6	4.4-16.9	6.7	2.9-12.2	8.1	4.7-12.4	2005
	3.6-11.8	7.1	2.6-14.2	4.6	1.6-9.5	5.8	2.9-9.9	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	6.6-16.9	13.5	6.7-22.9	12.1	6.0-20.4	13.0	8.0-19.3	1996
	5.5-12.0	9.2	4.9-14.8	9.9	5.5-15.6	9.5	6.4-13.5	no national data
	8.9-21.5	12.8	5.6-22.0	15.2	7.5-25.5	14.1	8.6-20.8	1990
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	6.4-12.3	8.7	5.1-13.4	12.7	8.1-18.3	10.7	7.6-14.3	2005
	4.1-7.3	6.7	4.3-9.7	6.5	4.2-9.2	6.6	4.9-8.6	2008
	8.0-14.6	12.0	7.4-17.5	12.6	8.0-18.2	12.2	8.9-16.0	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	6.6-13.4	10.4	5.9-16.4	10.0	5.8-15.2	10.2	7.0-14.1	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	3.0-5.7	4.7	2.8-7.1	5.2	3.3-7.6	5.1	3.6-6.8	2010
	6.3-11.7	9.5	5.9-13.7	10.4	6.5-15.3	9.9	7.2-13.2	2007
	...	...	...	...	...	...	...	no national data
	9.9-16.6	15.6	10.4-21.6	14.7	10.0-20.1	15.2	11.6-19.2	2007
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	7.1-14.7	11.2	6.4-17.3	9.5	5.2-15.1	10.3	7.0-14.4	2003
	7.8-11.3	9.6	7.3-12.4	9.4	7.1-12.0	9.5	7.8-11.4	2008
	4.2-7.8	6.7	4.2-10.0	6.1	3.8-9.1	6.4	4.6-8.5	2007
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	13.0-28.1	20.5	10.6-32.5	21.1	11.2-33.2	20.8	13.6-29.0	no national data
	7.0-12.5	10.1	6.4-14.5	10.2	6.6-14.7	10.2	7.5-13.2	2005
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	7.5-18.2	11.3	5.2-19.5	12.0	5.6-20.5	11.7	7.0-17.3	no national data
	...	...	...	...	...	...	...	no national data
	9.0-15.0	11.5	7.7-16.1	9.1	6.0-12.9	10.3	7.8-13.1	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	13.4-23.9	15.6	9.7-22.7	20.7	13.3-29.4	18.3	13.4-24.0	2007
	4.6-12.3	8.0	3.3-14.6	9.0	4.1-16.3	8.5	5.0-13.3	1997
	...	...	...	...	...	...	...	no national data
	4.5-8.9	7.0	4.1-10.7	7.4	4.4-11.1	7.2	5.0-9.7	no national data
	6.7-13.8	11.3	6.4-17.8	10.7	6.2-16.4	11.0	7.4-15.2	no national data

RAISED BLOOD GLUCOSE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD GLUCOSE

Note: … indicates no data were available

Country name	Region	Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Equatorial Guinea	AFR	…	…	…	…	…	
Eritrea	AFR	…	…	…	…	…	
Estonia	EUR	9.7	3.9-17.7	9.8	4.1-18.2	9.7	
Ethiopia	AFR	…	…	…	…	…	
Fiji	WPR	12.0	6.9-19.0	15.6	9.5-23.0	13.8	
Finland	EUR	12.4	5.8-21.5	8.3	3.7-15.1	10.3	
France	EUR	8.2	3.8-14.3	5.5	2.6-9.5	6.8	
Gabon	AFR	…	…	…	…	…	
Gambia	AFR	8.8	4.0-15.9	10.3	4.8-17.8	9.6	
Georgia	EUR	…	…	…	…	…	
Germany	EUR	11.9	5.5-20.8	9.5	4.7-16.1	10.6	
Ghana	AFR	8.6	3.7-15.9	9.0	4.0-15.9	8.8	
Greece	EUR	11.2	4.2-21.8	10.5	4.2-20.5	10.8	
Grenada	AMR	…	…	…	…	…	
Guatemala	AMR	10.7	6.3-16.4	12.6	7.6-18.7	11.7	
Guinea	AFR	…	…	…	…	…	
Guinea-Bissau	AFR	…	…	…	…	…	
Guyana	AMR	…	…	…	…	…	
Haiti	AMR	…	…	…	…	…	
Honduras	AMR	7.5	4.0-12.5	7.4	3.9-12.0	7.5	
Hungary	EUR	…	…	…	…	…	
Iceland	EUR	…	…	…	…	…	
India	SEAR	10.0	7.2-13.1	10.0	7.3-13.1	10.0	
Indonesia	SEAR	6.0	3.2-9.5	6.5	3.8-10.2	6.3	
Iran (Islamic Republic of)	EMR	7.8	5.4-10.6	8.9	6.4-11.8	8.3	
Iraq	EMR	10.7	6.2-16.5	10.6	6.0-16.4	10.6	
Ireland	EUR	8.6	4.3-14.9	6.3	3.1-11.0	7.4	
Israel	EUR	10.4	3.5-21.9	9.6	3.3-20.6	10.0	
Italy	EUR	10.6	6.0-17.0	7.6	4.3-12.0	9.1	
Jamaica	AMR	10.0	6.0-15.1	12.7	8.1-18.3	11.4	
Japan	WPR	8.9	5.7-12.8	6.7	4.2-9.5	7.7	
Jordan	EMR	14.2	9.4-19.8	14.7	10.2-20.3	14.4	
Kazakhstan	EUR	…	…	…	…	…	
Kenya	AFR	…	…	…	…	…	
Kiribati	WPR	22.0	14.4-30.9	22.8	15.4-31.8	22.4	
Kuwait	EMR	12.7	8.4-17.7	10.4	6.9-14.6	11.9	
Kyrgyzstan	EUR	…	…	…	…	…	
Lao People's Democratic Republic	WPR	…	…	…	…	…	
Latvia	EUR	…	…	…	…	…	
Lebanon	EMR	12.5	6.0-21.4	10.6	4.9-18.4	11.5	
Lesotho	AFR	…	…	…	…	…	
Liberia	AFR	…	…	…	…	…	
Libyan Arab Jamahiriya	EMR	12.1	8.6-16.2	11.3	8.2-15.0	11.8	
Lithuania	EUR	…	…	…	…	…	
Luxembourg	EUR	…	…	…	…	…	
Madagascar	AFR	…	…	…	…	…	
Malawi	AFR	5.5	3.4-8.1	5.4	3.4-7.8	5.4	
Malaysia	WPR	10.6	6.2-16.0	10.3	6.2-15.6	10.5	
Maldives	SEAR	6.3	3.2-10.3	6.2	3.1-10.3	6.2	
Mali	AFR	…	…	…	…	…	
Malta	EUR	13.0	3.5-29.6	11.0	3.1-24.9	12.0	
Marshall Islands	WPR	23.8	14.5-35.3	29.0	18.5-41.1	26.5	
Mauritania	AFR	6.3	3.4-10.1	7.3	4.0-11.4	6.8	
Mauritius	AFR	11.1	6.5-16.9	9.8	5.6-14.9	10.4	
Mexico	AMR	12.3	7.9-17.6	13.7	9.4-18.9	13.1	

		Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	5.4-15.6	9.0	3.6-16.6	7.8	3.0-15.2	8.4	4.5-13.5	no national data
	...	...	...	...	...	...	...	no national data
	9.6-18.8	13.2	7.6-20.5	16.4	10.1-23.9	14.8	10.4-20.0	2002
	6.1-15.8	10.3	4.8-18.0	6.3	2.8-11.9	8.1	4.7-12.9	no national data
	4.0-10.2	7.2	3.3-12.6	4.3	1.9-7.8	5.7	3.4-8.7	2007
	...	...	...	...	...	...	...	no national data
	5.7-14.5	9.9	4.6-17.6	11.3	5.4-19.3	10.6	6.4-15.9	no national data
	...	...	...	...	...	...	...	no national data
	6.4-16.1	9.8	4.5-17.5	6.3	2.8-11.4	8.0	4.6-12.4	1998
	5.0-13.5	9.9	4.4-17.8	10.3	4.6-18.0	10.1	5.9-15.3	no national data
	5.9-17.7	9.5	3.5-19.0	7.9	2.9-16.2	8.7	4.5-14.5	no national data
	...	...	...	...	...	...	...	no national data
	8.2-15.9	11.5	6.7-17.6	14.0	8.5-20.6	12.8	9.1-17.3	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	4.8-10.7	8.6	4.6-14.1	8.4	4.4-13.5	8.5	5.5-12.1	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	8.0-12.2	11.1	8.1-14.4	10.8	7.9-14.1	10.9	8.8-13.2	no national data
	4.2-8.8	6.6	3.6-10.3	7.1	4.1-10.9	6.9	4.7-9.5	no national data
	6.6-10.3	9.3	6.5-12.5	10.5	7.6-13.7	9.9	7.8-12.2	2007
	7.3-14.6	12.7	7.5-19.3	12.5	7.3-19.0	12.6	8.8-17.1	2006
	4.5-11.1	8.4	4.1-14.5	5.6	2.6-10.0	7.0	4.2-10.5	2007
	4.9-17.6	10.2	3.3-21.7	8.7	2.8-19.4	9.4	4.4-16.9	no national data
	6.2-12.7	8.8	4.9-14.4	5.4	2.9-8.8	7.1	4.7-10.1	2001
	8.3-15.1	10.2	6.1-15.4	12.9	8.2-18.7	11.6	8.4-15.4	2008
	5.7-10.1	7.2	4.5-10.4	4.7	2.9-7.0	5.9	4.2-7.8	2007
	11.0-18.3	17.2	11.6-23.6	18.1	12.7-24.5	17.7	13.7-22.0	2007
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	17.0-28.6	23.6	15.7-32.6	24.9	17.1-34.3	24.2	18.5-30.5	2004
	8.8-15.5	17.0	11.6-23.2	14.8	10.2-20.1	16.2	12.4-20.5	2006
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	7.0-17.2	13.0	6.4-22.1	11.0	5.1-18.9	11.9	7.3-17.8	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	9.3-14.5	14.5	10.4-19.2	14.4	10.4-18.9	14.4	11.5-17.7	2009
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	3.9-7.1	6.4	4.1-9.5	6.2	4.0-9.0	6.3	4.6-8.3	2009
	7.4-14.2	11.6	6.9-17.3	11.2	6.8-16.6	11.4	8.1-15.3	2004
	4.0-9.1	7.8	4.0-12.7	7.5	3.8-12.2	7.6	4.9-11.1	no national data
	...	...	...	...	...	...	...	no national data
	5.4-22.3	11.8	3.1-27.2	8.9	2.3-21.0	10.4	4.6-19.7	no national data
	19.2-34.8	25.5	15.8-37.3	31.9	20.7-44.4	28.7	21.1-37.3	2002
	4.5-9.5	7.5	4.1-12.0	8.3	4.7-12.8	8.0	5.3-11.1	no national data
	7.2-14.2	11.6	6.9-17.6	9.9	5.7-15.0	10.7	7.4-14.6	2004
	9.9-16.6	13.2	8.6-18.8	14.9	10.2-20.4	14.1	10.8-17.8	2006

RAISED BLOOD GLUCOSE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD GLUCOSE

Note: … indicates no data were available

Country name	Region	Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Micronesia (Federated States of)	WPR	12.8	7.1-19.9	18.3	11.1-27.0	15.6	
Monaco	EUR	…	…	…	…	…	
Mongolia	WPR	9.7	6.9-12.9	7.8	5.6-10.5	8.7	
Montenegro	EUR	…	…	…	…	…	
Morocco	EMR	9.8	4.9-15.9	10.0	5.2-16.6	9.9	
Mozambique	AFR	…	…	…	…	…	
Myanmar	SEAR	5.4	2.9-8.5	6.5	3.7-10.2	6.0	
Namibia	AFR	…	…	…	…	…	
Nauru	WPR	11.6	6.5-18.2	13.3	8.1-19.7	12.5	
Nepal	SEAR	8.4	4.3-14.1	8.3	4.2-14.0	8.4	
Netherlands	EUR	7.2	2.1-15.9	5.5	1.6-12.0	6.3	
New Zealand	WPR	…	…	…	…	…	
Nicaragua	AMR	7.6	3.9-12.3	7.8	4.2-12.5	7.7	
Niger	AFR	…	…	…	…	…	
Nigeria	AFR	6.9	2.9-12.4	10.0	4.6-17.6	8.5	
Niue	WPR	…	…	…	…	…	
Norway	EUR	12.2	3.5-26.4	10.0	2.7-22.5	11.1	
Oman	EMR	9.9	5.1-16.1	9.6	5.1-15.4	9.7	
Pakistan	EMR	10.6	6.1-16.2	12.9	7.7-19.5	11.7	
Palau	WPR	…	…	…	…	…	
Panama	AMR	…	…	…	…	…	
Papua New Guinea	WPR	13.4	8.9-19.0	13.2	8.7-18.4	13.3	
Paraguay	AMR	9.8	4.0-18.2	9.4	3.7-17.5	9.6	
Peru	AMR	5.3	3.3-7.7	5.7	3.7-8.2	5.5	
Philippines	WPR	5.7	3.0-9.4	5.9	3.2-9.1	5.8	
Poland	EUR	8.7	5.1-13.3	8.5	5.1-12.6	8.6	
Portugal	EUR	8.3	2.5-18.1	7.5	2.3-15.8	7.9	
Qatar	EMR	9.9	6.1-14.5	8.3	4.9-12.6	9.5	
Republic of Korea	WPR	6.8	3.6-11.3	5.7	3.0-9.3	6.3	
Republic of Moldova	EUR	…	…	…	…	…	
Romania	EUR	…	…	…	…	…	
Russian Federation	EUR	…	…	…	…	…	
Rwanda	AFR	…	…	…	…	…	
Saint Kitts and Nevis	AMR	…	…	…	…	…	
Saint Lucia	AMR	…	…	…	…	…	
Saint Vincent and the Grenadines	AMR	…	…	…	…	…	
Samoa	WPR	19.7	12.0-29.2	22.5	14.4-32.5	21.1	
San Marino	EUR	…	…	…	…	…	
Sao Tome and Principe	AFR	…	…	…	…	…	
Saudi Arabia	EMR	18.1	11.8-25.6	17.7	11.6-25.0	17.9	
Senegal	AFR	…	…	…	…	…	
Serbia	EUR	…	…	…	…	…	
Seychelles	AFR	12.4	7.5-18.5	13.4	8.4-19.3	12.9	
Sierra Leone	AFR	…	…	…	…	…	
Singapore	WPR	8.0	3.7-13.4	5.9	2.8-10.3	6.9	
Slovakia	EUR	…	…	…	…	…	
Slovenia	EUR	…	…	…	…	…	
Solomon Islands	WPR	14.3	8.9-21.1	15.4	10.0-22.5	14.9	
Somalia	EMR	…	…	…	…	…	
South Africa	AFR	10.3	5.5-16.5	11.0	6.0-17.1	10.6	
Spain	EUR	12.0	6.5-19.9	10.6	5.7-17.8	11.3	
Sri Lanka	SEAR	9.1	5.5-13.7	8.5	5.2-12.7	8.8	
Sudan	EMR	…	…	…	…	…	
Suriname	AMR	…	…	…	…	…	
Swaziland	AFR	…	…	…	…	…	
Sweden	EUR	9.6	3.0-20.0	8.1	2.4-17.5	8.8	

	Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)						Latest Year of National Data
	Age-standardized adjusted estimates						
95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
10.9-21.0	14.0	7.9-21.5	19.8	12.1-28.8	17.0	11.9-22.8	no national data
...	...	...	...	...	...	...	no national data
6.9-10.8	10.9	7.7-14.5	8.9	6.4-11.9	9.9	7.8-12.2	2009
...	...	...	...	...	...	...	no national data
6.4-14.2	10.6	5.4-17.0	10.9	5.8-17.9	10.8	7.0-15.3	2000
...	...	...	...	...	...	...	no national data
4.0-8.3	6.1	3.3-9.6	7.1	4.1-11.1	6.6	4.5-9.2	no national data
...	...	...	...	...	...	...	no national data
8.7-17.0	12.8	7.3-19.8	15.2	9.4-22.1	14.0	9.9-18.9	2004
5.3-12.2	9.8	5.2-16.1	9.3	4.8-15.3	9.5	6.2-13.8	no national data
2.8-11.7	6.1	1.8-13.8	4.1	1.1-9.3	5.1	2.2-9.6	2001
...	...	...	...	...	...	...	no national data
5.1-11.0	8.6	4.5-13.9	9.4	5.1-14.7	9.0	6.0-12.8	no national data
...	...	...	...	...	...	...	no national data
4.9-13.1	7.9	3.3-14.0	12.0	5.7-20.6	10.1	5.9-15.3	no national data
...	...	...	...	...	...	...	no national data
4.9-20.1	10.6	2.9-23.2	7.7	1.9-18.5	9.1	3.9-17.0	no national data
6.3-13.8	12.0	6.4-19.1	12.3	6.8-19.2	12.2	8.1-16.9	2000
8.1-16.0	11.7	6.9-17.8	14.1	8.5-21.1	12.9	9.0-17.4	1996
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
10.0-17.0	15.2	10.3-21.1	14.7	9.9-20.4	15.0	11.4-19.0	2007
5.2-15.3	10.6	4.4-19.6	10.1	4.1-18.7	10.3	5.7-16.4	no national data
4.0-7.2	5.8	3.6-8.4	6.1	3.9-8.8	6.0	4.4-7.8	no national data
3.8-8.1	6.5	3.4-10.4	6.6	3.7-10.2	6.6	4.4-9.1	2004
6.0-11.7	8.2	4.8-12.6	6.9	4.0-10.6	7.6	5.3-10.4	2005
3.6-14.1	7.5	2.2-16.4	5.7	1.6-12.7	6.6	2.9-12.0	no national data
6.5-13.0	12.4	7.8-17.8	11.0	6.8-16.0	12.0	8.4-16.1	2008
4.0-9.0	6.8	3.6-11.2	5.3	2.7-8.7	6.1	3.9-8.7	2007
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
15.2-27.7	21.2	13.0-31.0	23.7	15.3-33.8	22.4	16.3-29.3	2002
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
13.5-23.2	22.0	14.8-30.2	21.7	14.6-29.9	21.8	16.8-27.6	2005
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
9.2-17.2	13.7	8.3-20.2	13.2	8.2-19.2	13.5	9.7-18.0	2004
...	...	...	...	...	...	...	no national data
4.1-10.4	7.5	3.5-12.6	5.4	2.5-9.3	6.4	3.9-9.6	2006
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
10.8-19.5	17.1	10.7-24.7	18.3	12.1-26.0	17.7	13.0-23.0	no national data
...	...	...	...	...	...	...	no national data
7.0-14.8	11.9	6.5-18.7	11.7	6.5-18.0	11.7	7.9-16.2	no national data
7.3-16.3	11.0	5.9-18.5	8.8	4.5-15.2	9.9	6.3-14.5	2005
6.3-11.9	9.3	5.7-13.8	8.6	5.3-12.6	8.9	6.4-11.9	2006
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	no national data
4.0-15.7	8.1	2.5-17.0	6.0	1.6-13.6	7.0	3.1-12.8	no national data

RAISED BLOOD GLUCOSE
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED BLOOD GLUCOSE

Note: … indicates no data were available

Country name	Region	Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Switzerland	EUR	10.7	4.2-20.3	6.7	2.5-13.9	8.6	
Syrian Arab Republic	EMR	…	…	…	…	…	
Tajikistan	EUR	…	…	…	…	…	
Thailand	SEAR	7.2	5.0-9.8	7.3	5.2-9.8	7.3	
The former Yugoslav Republic of Macedonia	EUR	…	…	…	…	…	
Timor-Leste	SEAR	…	…	…	…	…	
Togo	AFR	…	…	…	…	…	
Tonga	WPR	15.8	9.9-23.2	19.1	12.5-27.7	17.5	
Trinidad and Tobago	AMR	…	…	…	…	…	
Tunisia	EMR	11.0	5.7-18.0	11.9	6.2-19.3	11.4	
Turkey	EUR	9.0	6.3-12.1	9.1	6.3-12.3	9.0	
Turkmenistan	EUR	…	…	…	…	…	
Tuvalu	WPR	…	…	…	…	…	
Uganda	AFR	…	…	…	…	…	
Ukraine	EUR	…	…	…	…	…	
United Arab Emirates	EMR	10.2	6.1-15.0	10.4	6.1-15.4	10.2	
United Kingdom	EUR	9.2	4.6-15.6	7.6	3.9-12.8	8.3	
United Republic of Tanzania	AFR	6.9	2.9-12.4	7.5	3.3-13.2	7.2	
United States of America	AMR	13.8	8.9-19.7	10.9	7.1-15.7	12.3	
Uruguay	AMR	11.3	4.7-20.6	11.7	5.1-20.7	11.5	
Uzbekistan	EUR	11.2	6.1-17.9	9.9	5.2-16.1	10.5	
Vanuatu	WPR	8.1	3.2-15.4	8.0	3.3-15.5	8.0	
Venezuela (Bolivarian Republic of)	AMR	10.1	5.2-16.6	10.0	5.0-16.6	10.0	
Viet Nam	WPR	6.6	3.1-11.9	7.2	3.4-12.8	6.9	
Yemen	EMR	…	…	…	…	…	
Zambia	AFR	5.7	3.3-9.0	6.4	3.8-9.8	6.1	
Zimbabwe	AFR	…	…	…	…	…	

		Raised blood glucose (Fasting glucose ≥7.0 mmol/L or on medication)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	4.5-14.2	9.3	3.7-17.7	5.3	1.9-11.3	7.2	3.6-12.1	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	5.7-9.0	7.3	5.1-9.9	7.1	5.1-9.6	7.2	5.6-8.9	2009
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	12.8-23.1	17.0	10.7-25.0	19.3	12.5-28.1	18.2	13.3-24.0	2004
	...	...	...	...	...	...	...	no national data
	7.4-16.4	12.0	6.4-19.5	12.7	6.7-20.5	12.4	8.1-17.6	1997
	7.0-11.3	10.1	7.1-13.5	9.8	6.8-13.2	10.0	7.8-12.4	2008
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	no national data
	7.0-14.0	15.3	9.8-21.6	15.8	9.8-22.4	15.5	11.1-20.4	2000
	5.2-12.3	7.8	3.8-13.4	5.7	2.7-10.1	6.7	4.1-10.1	no national data
	4.2-11.0	8.3	3.6-14.6	8.5	3.8-14.8	8.4	5.0-12.7	no national data
	9.1-16.0	12.6	8.1-18.1	9.1	5.7-13.3	10.8	7.9-14.2	2008
	6.5-17.7	10.7	4.4-19.6	10.0	4.1-18.4	10.4	5.7-16.3	1992
	6.9-14.8	12.6	7.0-20.0	10.9	5.8-17.6	11.7	7.8-16.4	2002
	4.3-12.9	9.2	3.8-17.1	9.6	4.2-17.9	9.4	5.2-14.8	1998
	6.4-14.4	11.1	5.8-18.1	10.9	5.6-17.9	11.0	7.1-15.6	no national data
	4.1-10.6	7.5	3.5-13.4	7.9	3.7-13.8	7.7	4.6-11.7	no national data
	...	...	...	...	...	...	...	no national data
	4.2-8.3	7.2	4.2-11.1	7.5	4.5-11.3	7.4	5.1-10.0	no national data
	...	...	...	...	...	...	...	no national data

OVERWEIGHT AND OBESITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF OVERWEIGHT AND OBESITY

Note: … indicates no data were available

Country name	Region	Overweight (BMI ≥ 25 kg/m²) Crude adjusted estimates						Overweight (BMI ≥ 25 kg/m²) Age-standardized adjusted estimates				
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes
Afghanistan	EMR	…	…	…	…	…	…	…	…	…	…	…
Albania	EUR	60.5	45.1-72.5	48.5	31.4-63.2	54.4	43.1-64.3	60.5	45.1-72.6	48.2	31.0-63.1	54.2
Algeria	AFR	39.1	29.0-49.8	51.8	40.8-62.0	45.5	37.9-52.8	41.8	31.5-53.0	54.5	42.9-64.7	48.2
Andorra	EUR	…	…	…	…	…	…	…	…	…	…	…
Angola	AFR	…	…	…	…	…	…	…	…	…	…	…
Antigua and Barbuda	AMR	…	…	…	…	…	…	…	…	…	…	…
Argentina	AMR	66.3	57.7-74.1	62.2	52.4-71.0	64.2	57.7-70.1	66.8	58.3-74.5	61.1	51.2-70.1	64.0
Armenia	EUR	48.6	39.7-56.8	60.9	53.9-67.5	55.5	49.9-60.9	49.2	40.2-57.3	59.3	52.7-65.8	55.1
Australia	WPR	68.2	64.5-71.8	59.3	54.4-64.0	63.7	60.5-66.7	66.5	62.6-70.3	56.2	51.3-60.9	61.3
Austria	EUR	60.1	43.2-72.7	48.5	28.3-65.4	54.1	41.5-65.2	56.9	40.5-69.9	42.1	23.5-58.7	49.6
Azerbaijan	EUR	50.6	43.3-57.4	61.0	54.5-66.9	56.1	51.0-60.8	52.0	44.5-59.0	61.9	55.3-67.8	57.4
Bahamas	AMR	…	…	…	…	…	…	…	…	…	…	…
Bahrain	EMR	70.9	62.2-77.8	70.3	61.6-78.4	70.6	64.5-76.0	70.2	61.3-77.4	70.5	61.6-78.4	70.3
Bangladesh	SEAR	7.4	2.8-15.1	7.8	5.2-11.4	7.6	4.8-11.7	7.6	2.8-15.7	7.8	5.1-11.5	7.7
Barbados	AMR	62.1	46.4-73.8	76.7	65.0-85.7	69.7	60.2-77.3	60.8	45.1-72.7	75.1	63.1-84.5	68.3
Belarus	EUR	…	…	…	…	…	…	…	…	…	…	…
Belgium	EUR	63.4	53.4-71.3	49.9	36.0-61.2	56.4	47.9-63.6	59.8	49.8-68.2	43.1	30.0-54.4	51.5
Belize	AMR	64.3	56.4-71.0	75.3	69.4-80.5	69.8	64.7-74.2	65.4	57.7-71.6	76.6	71.0-81.6	71.0
Benin	AFR	19.0	13.9-24.5	29.9	24.5-35.6	24.5	20.8-28.4	20.4	14.9-26.3	31.7	25.7-38.1	26.1
Bhutan	SEAR	23.0	11.8-35.7	24.0	10.7-38.0	23.4	14.6-33.1	24.5	12.5-37.7	24.4	10.7-39.1	24.4
Bolivia (Plurinational State of)	AMR	39.3	24.4-55.2	57.3	51.1-62.3	48.5	40.7-56.6	40.4	25.1-56.7	58.9	52.3-64.4	50.0
Bosnia and Herzegovina	EUR	63.7	54.5-71.2	58.0	48.6-66.2	60.7	54.3-66.5	61.9	52.7-69.7	53.1	43.7-61.4	57.6
Botswana	AFR	16.0	11.2-21.6	47.0	39.6-54.3	31.7	27.3-36.3	18.3	12.7-24.7	52.3	44.6-59.2	36.2
Brazil	AMR	52.4	46.0-58.7	51.0	45.4-56.2	51.7	47.4-55.7	53.5	47.1-59.9	52.0	46.4-57.2	52.8
Brunei Darussalam	WPR	…	…	…	…	…	…	…	…	…	…	…
Bulgaria	EUR	63.1	54.5-69.9	53.2	42.6-62.1	57.9	51.2-63.8	61.2	52.6-68.3	47.1	36.8-56.3	54.3
Burkina Faso	AFR	10.8	4.1-21.4	14.1	8.3-21.4	12.5	7.8-18.8	11.9	4.5-23.6	14.2	8.0-22.2	13.0
Burundi	AFR	…	…	…	…	…	…	…	…	…	…	…
Cambodia	WPR	10.8	7.4-15.0	13.2	9.9-17.1	12.1	9.6-14.9	11.4	7.7-16.0	13.8	10.1-18.2	12.7
Cameroon	AFR	30.2	20.6-40.1	40.5	32.2-49.0	35.4	29.0-41.8	32.6	22.3-43.2	42.3	33.4-51.5	37.5
Canada	AMR	67.8	64.4-71.0	58.7	53.5-63.5	63.2	60.0-66.1	65.7	62.2-69.1	55.2	50.0-60.2	60.5
Cape Verde	AFR	28.3	21.8-34.8	39.6	31.4-48.5	34.4	28.9-40.1	30.8	23.8-37.5	42.6	33.9-51.8	37.6
Central African Republic	AFR	11.5	2.1-30.3	20.1	7.4-36.0	16.0	7.0-27.5	12.4	2.3-32.4	20.9	7.2-38.1	16.9
Chad	AFR	12.1	5.4-21.5	15.6	9.5-22.7	13.9	9.0-19.7	14.6	6.4-25.7	16.9	9.8-25.4	15.7
Chile	AMR	64.3	56.6-70.4	66.2	58.6-73.3	65.3	59.8-70.2	64.2	56.4-70.3	65.7	58.0-72.8	64.9
China	WPR	25.5	21.1-29.9	25.4	19.6-30.9	25.4	21.7-29.0	25.1	20.8-29.5	24.9	19.2-30.3	25.0
Colombia	AMR	43.5	37.4-49.9	52.7	47.4-57.6	48.3	44.2-52.3	44.9	38.6-51.5	53.8	48.4-58.7	49.6
Comoros	AFR	18.0	4.9-37.5	21.6	10.4-34.8	19.8	10.4-31.4	19.4	5.3-39.4	21.1	9.5-35.2	20.1
Congo	AFR	15.0	6.0-27.7	25.1	15.4-34.9	20.2	13.3-27.9	16.9	6.6-30.9	27.0	16.2-37.8	22.1
Cook Islands	WPR	91.0	87.9-93.7	89.9	85.7-93.4	90.5	87.8-92.8	91.0	87.8-93.7	90.2	86.1-93.6	90.6
Costa Rica	AMR	59.4	49.9-67.5	57.2	48.7-65.3	58.3	51.9-64.2	60.3	51.1-68.3	58.8	50.4-66.7	59.6
Côte d'Ivoire	AFR	20.5	9.8-33.1	30.5	19.9-41.2	25.4	17.7-33.5	21.8	10.3-35.3	32.3	20.8-44.1	26.9
Croatia	EUR	64.1	52.0-73.8	51.9	37.0-64.4	57.7	48.1-65.9	61.6	49.2-72.1	44.6	30.1-57.9	53.2
Cuba	AMR	48.6	36.3-61.1	60.2	48.0-70.6	54.5	45.8-62.7	47.5	35.6-59.9	57.9	46.1-68.1	52.8
Cyprus	EUR	66.0	57.7-73.8	52.1	41.6-62.0	58.8	51.7-65.1	64.6	55.9-72.7	47.6	37.2-57.7	55.9
Czech Republic	EUR	72.3	67.3-77.0	60.3	53.7-66.4	66.1	61.9-70.0	69.9	64.8-74.7	53.1	46.3-59.6	61.7
Democratic People's Republic of Korea	SEAR	…	…	…	…	…	…	…	…	…	…	…
Democratic Republic of the Congo	AFR	5.3	1.7-11.7	13.4	8.6-19.8	9.4	6.1-13.7	6.1	1.9-14.0	14.5	9.0-21.8	10.5
Denmark	EUR	57.8	45.5-67.7	46.2	29.8-60.9	51.9	41.7-61.2	54.6	42.7-64.5	42.1	26.9-56.2	48.4
Djibouti	EMR	…	…	…	…	…	…	…	…	…	…	…
Dominica	AMR	41.2	33.8-49.5	71.0	64.3-76.8	56.5	51.5-61.6	41.4	34.0-49.7	71.2	64.5-76.9	56.7
Dominican Republic	AMR	48.8	35.6-61.8	59.8	47.9-70.0	54.3	45.8-62.7	49.6	36.3-62.9	61.1	49.0-71.2	55.4
Ecuador	AMR	50.8	35.1-65.7	59.2	49.6-67.2	55.0	45.8-63.6	51.8	35.8-66.8	60.2	50.2-68.3	56.0
Egypt	EMR	60.4	51.1-68.1	75.3	72.5-78.0	67.9	63.2-72.0	62.4	53.5-69.5	76.9	74.1-79.6	69.8
El Salvador	AMR	57.5	43.0-69.6	64.4	58.7-69.9	61.1	53.5-67.7	59.1	44.4-71.0	65.6	59.9-71.1	62.5
Equatorial Guinea	AFR	…	…	…	…	…	…	…	…	…	…	…

		Obesity (BMI ≥ 30 kg/m²)						Obesity (BMI ≥ 30 kg/m²)						Latest Year of National Data
		Crude adjusted estimates						Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	42.8-64.3	21.8	11.9-31.6	20.8	9.8-32.6	21.3	13.7-28.9	21.7	11.9-31.5	20.5	9.6-32.3	21.1	13.5-28.8	no national data
	40.3-55.7	9.6	6.0-14.7	22.4	14.6-30.6	16.0	11.5-20.7	10.7	6.5-16.4	24.3	15.6-33.0	17.5	12.5-22.6	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	57.5-70.0	27.1	20.1-34.6	32.0	23.3-40.8	29.7	24.0-35.5	27.4	20.4-35.0	31.0	22.5-39.8	29.4	23.9-35.1	no national data
	49.6-60.3	14.3	9.6-19.5	31.7	24.8-38.9	24.0	19.5-28.7	14.4	9.8-19.6	30.2	24.0-36.8	23.4	19.3-27.9	2005
	58.1-64.3	26.4	23.2-29.7	27.1	22.9-31.3	26.8	24.1-29.4	25.2	22.1-28.4	24.9	21.0-28.9	25.1	22.5-27.6	2007-2008
	37.7-60.5	21.0	10.7-31.2	20.9	8.0-34.8	20.9	12.5-29.7	19.2	9.8-28.9	17.1	6.5-29.2	18.3	11.0-26.1	no national data
	52.3-62.2	15.1	11.1-19.5	31.4	25.3-37.4	23.8	19.9-27.6	15.8	11.5-20.4	32.1	25.8-38.3	24.7	20.5-28.8	2006
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	64.2-75.6	29.5	22.0-37.0	38.0	29.2-47.3	32.9	27.2-38.6	28.9	21.3-36.4	38.2	29.1-47.5	32.6	26.8-38.3	1998-1999
	4.8-12.0	0.9	0.3-2.2	1.3	0.8-2.1	1.1	0.7-1.9	1.0	0.3-2.4	1.3	0.8-2.2	1.1	0.6-1.9	2007
	58.7-76.0	22.5	12.2-32.5	45.9	32.4-59.1	34.7	26.1-43.0	21.6	11.7-31.5	44.2	30.9-57.0	33.4	25.1-41.6	1988-1992
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	43.4-58.8	23.3	16.0-30.1	21.0	11.8-30.2	22.1	16.3-27.9	21.2	14.4-27.6	16.9	9.2-24.8	19.1	14.0-24.3	1979-1984
	66.1-75.2	23.7	17.8-29.2	43.8	37.1-50.5	33.7	29.3-38.2	24.4	18.5-29.8	45.4	38.6-52.2	34.9	30.2-39.3	2004-2005
	22.0-30.6	3.2	2.1-4.6	8.8	6.5-11.5	6.0	4.7-7.5	3.5	2.2-5.0	9.5	6.9-12.6	6.5	5.0-8.3	2008
	15.0-34.5	4.3	1.6-8.1	6.4	2.0-12.5	5.3	2.6-8.7	4.7	1.7-8.7	6.6	2.0-12.9	5.5	2.7-9.1	no national data
	41.9-58.4	9.6	4.5-17.2	25.9	20.8-30.5	17.9	14.2-22.2	10.0	4.6-17.9	27.1	21.6-32.3	18.9	14.8-23.5	2008
	51.2-63.4	23.8	17.1-30.2	28.9	20.7-37.1	26.5	21.2-31.7	22.7	16.2-29.0	25.3	18.0-32.7	24.2	19.3-29.1	2002
	31.3-40.8	2.6	1.5-3.9	19.6	14.7-24.5	11.2	8.6-13.8	3.0	1.8-4.7	22.8	17.0-28.3	13.5	10.4-16.6	2007
	48.5-56.9	16.0	12.3-20.1	21.4	17.2-25.5	18.8	16.0-21.6	16.5	12.7-20.8	22.1	17.8-26.3	19.5	16.5-22.4	2006-2007
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	47.6-60.3	23.1	16.8-28.8	24.3	16.2-32.0	23.7	18.5-28.7	22.0	16.0-27.6	20.4	13.3-27.5	21.4	16.7-26.0	2004
	8.0-19.8	1.5	0.4-3.8	3.0	1.4-5.2	2.3	1.2-3.8	1.7	0.5-4.2	3.0	1.4-5.5	2.4	1.2-4.0	2003
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	9.9-15.9	1.5	0.9-2.3	2.7	1.8-3.8	2.1	1.5-2.8	1.6	0.9-2.4	2.8	1.8-4.2	2.3	1.6-3.1	2010
	30.7-44.3	6.4	3.5-9.8	14.1	9.6-19.5	10.3	7.6-13.4	7.0	3.9-11.0	15.1	10.1-21.1	11.1	8.1-14.6	2004
	57.2-63.5	26.0	23.2-29.0	26.4	22.0-30.4	26.2	23.5-28.8	24.6	21.8-27.5	23.9	19.8-27.8	24.3	21.7-26.8	2008
	31.7-43.7	5.7	3.8-7.7	13.8	9.4-19.2	10.0	7.5-13.1	6.3	4.2-8.5	15.3	10.4-21.4	11.5	8.5-15.1	2007
	7.1-29.2	1.8	0.2-6.2	5.1	1.2-11.4	3.5	1.1-7.3	2.0	0.2-6.8	5.3	1.2-12.4	3.7	1.1-8.0	1994
	9.9-22.6	1.9	0.6-4.1	3.4	1.7-5.9	2.7	1.5-4.3	2.4	0.8-5.1	3.8	1.8-6.8	3.1	1.6-5.1	2004
	59.4-69.9	24.6	18.8-29.9	34.0	26.9-41.4	29.4	24.7-34.1	24.5	18.6-29.8	33.6	26.5-41.0	29.1	24.4-33.8	2003
	21.4-28.5	4.7	3.5-6.1	6.7	4.6-9.0	5.7	4.4-7.0	4.6	3.5-5.9	6.5	4.5-8.8	5.6	4.3-6.9	2008-2009
	45.4-53.7	11.3	8.6-14.6	22.9	18.8-27.0	17.3	14.7-20.0	11.9	9.0-15.3	23.7	19.5-27.9	18.1	15.4-20.9	2007
	10.3-32.3	3.2	0.6-8.7	5.5	1.9-10.7	4.4	1.8-8.0	3.5	0.6-9.4	5.3	1.7-10.8	4.4	1.8-8.3	1996
	14.4-30.6	2.4	0.7-5.5	6.9	3.3-11.1	4.7	2.6-7.2	2.8	0.8-6.4	7.5	3.5-12.5	5.3	2.8-8.2	1987
	88.0-92.9	59.7	52.4-67.3	67.9	59.2-76.6	63.7	58.1-69.5	59.7	52.4-67.4	68.5	59.8-77.3	64.1	58.3-69.8	2003
	53.4-65.4	20.4	14.4-26.4	27.1	20.5-34.1	23.7	19.2-28.3	20.9	14.9-26.9	28.3	21.6-35.3	24.6	20.1-29.3	2004-2006
	18.6-35.7	3.6	1.3-7.2	8.9	4.7-14.2	6.2	3.6-9.2	3.9	1.3-7.8	9.7	4.9-15.7	6.7	3.8-10.0	1998-1999
	43.8-61.9	24.4	15.5-33.1	23.9	13.1-34.6	24.2	17.0-31.1	22.8	14.4-31.3	19.4	10.2-29.2	21.3	14.8-27.8	1997-1999
	44.4-60.9	13.7	8.1-21.2	29.2	19.0-39.3	21.5	15.7-27.7	13.3	7.9-20.5	27.5	17.9-37.1	20.5	15.0-26.4	2001-2002
	48.9-62.4	25.9	19.3-33.3	25.1	16.9-33.5	25.5	20.0-31.0	24.8	18.4-32.0	21.9	14.6-29.7	23.4	18.3-28.6	1999-2000
	57.3-65.7	32.6	27.5-37.9	32.7	26.5-39.0	32.7	28.6-36.8	30.5	25.7-35.5	26.5	21.1-32.1	28.7	25.0-32.5	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	6.7-15.4	0.6	0.1-1.7	2.8	1.5-4.7	1.7	1.0-2.8	0.7	0.2-2.1	3.0	1.6-5.3	1.9	1.1-3.2	2007
	38.8-57.2	18.7	11.5-26.1	17.6	8.3-28.4	18.2	12.1-24.8	17.1	10.5-23.8	15.4	7.3-24.9	16.2	10.9-22.1	no national data
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	51.8-61.8	10.0	7.3-13.8	39.0	32.2-45.6	24.9	21.1-28.6	10.1	7.3-13.9	39.1	32.4-45.7	25.0	21.2-28.8	2007
	46.7-63.9	14.0	7.9-22.1	28.3	18.5-38.3	21.2	15.4-27.5	14.4	8.1-22.8	29.3	19.2-39.6	21.9	15.9-28.3	1996-1998
	46.6-64.8	15.2	7.7-25.0	27.4	19.5-35.1	21.4	15.6-27.5	15.7	8.0-25.7	28.2	19.9-36.2	22.0	16.1-28.4	2004
	65.2-73.6	21.4	15.4-27.1	44.5	41.1-48.0	33.1	29.8-36.4	22.5	16.5-28.3	46.3	42.7-49.9	34.6	31.2-38.0	2008
	55.0-68.9	19.2	10.7-28.3	31.8	26.7-37.4	25.8	20.9-31.1	20.2	11.2-29.4	32.9	27.6-38.5	26.9	21.8-32.3	2008
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data

OVERWEIGHT AND OBESITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF OVERWEIGHT AND OBESITY

Note: … indicates no data were available

Country name	Region	Overweight (BMI ≥ 25 kg/m²) Crude adjusted estimates						Overweight (BMI ≥ 25 kg/m²) Age-standardized adjusted estimates				
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes
Eritrea	AFR	8.4	4.7-13.3	9.7	5.4-15.7	9.1	6.1-12.8	9.6	5.3-15.3	11.4	6.0-19.2	10.7
Estonia	EUR	59.0	45.9-69.4	49.4	33.1-63.6	53.7	43.0-63.2	57.8	44.8-68.5	45.0	29.1-59.5	51.0
Ethiopia	AFR	6.2	3.0-11.0	8.6	5.4-12.8	7.4	5.0-10.5	7.1	3.3-12.9	9.0	5.4-13.9	8.0
Fiji	WPR	58.3	48.0-66.6	71.7	64.0-78.4	65.0	58.6-70.5	60.1	49.7-68.4	72.9	65.0-79.6	66.6
Finland	EUR	63.4	57.4-68.6	52.9	45.7-59.7	58.0	53.3-62.5	59.6	53.5-65.1	46.2	39.1-53.3	53.0
France	EUR	56.4	50.5-61.6	45.4	37.2-53.2	50.7	45.5-55.7	52.0	46.1-57.5	40.0	32.6-47.6	45.9
Gabon	AFR	34.4	25.7-43.4	49.1	40.9-57.0	41.8	35.8-47.7	36.5	27.3-46.2	51.6	42.7-59.8	44.1
Gambia	AFR	13.8	6.3-24.2	39.3	25.3-55.2	26.7	18.6-35.7	14.9	6.8-26.2	40.9	26.3-57.2	28.0
Georgia	EUR	…	…	…	…	…	…	…	…	…	…	…
Germany	EUR	66.8	61.1-72.0	54.5	47.0-61.3	60.5	55.9-64.8	62.8	56.7-68.3	46.6	39.0-53.6	54.8
Ghana	AFR	23.1	17.9-28.4	34.9	30.6-39.8	28.9	25.5-32.6	24.2	18.8-29.6	36.7	32.2-42.0	30.4
Greece	EUR	59.7	50.2-68.0	47.9	36.5-57.9	53.7	46.2-60.3	56.6	47.1-65.4	41.3	30.3-51.8	49.1
Grenada	AMR	…	…	…	…	…	…	…	…	…	…	…
Guatemala	AMR	46.4	34.8-58.1	56.0	46.6-63.7	51.5	44.3-58.6	48.6	36.3-60.7	58.6	48.7-66.3	53.9
Guinea	AFR	20.8	5.9-40.3	20.0	12.7-28.3	20.4	11.8-31.1	22.2	6.4-42.1	20.8	12.7-30.0	21.5
Guinea-Bissau	AFR	…	…	…	…	…	…	…	…	…	…	…
Guyana	AMR	…	…	…	…	…	…	…	…	…	…	…
Haiti	AMR	32.7	12.5-55.2	28.7	21.0-36.4	30.6	20.1-42.2	35.0	13.4-57.7	29.4	21.0-38.0	32.0
Honduras	AMR	44.7	30.4-59.5	55.1	47.5-61.3	50.1	42.3-58.1	46.7	31.8-62.1	57.8	50.0-64.1	52.4
Hungary	EUR	67.8	55.9-77.7	56.1	38.7-70.5	61.5	51.0-70.9	65.8	53.9-76.1	49.4	32.1-64.5	57.7
Iceland	EUR	65.1	53.2-75.2	51.7	34.1-66.8	58.4	48.2-67.3	63.6	51.6-73.9	49.1	31.8-64.0	56.4
India	SEAR	9.9	7.2-12.9	12.2	9.1-15.8	11.0	8.9-13.3	10.0	7.4-13.2	12.5	9.3-16.3	11.2
Indonesia	SEAR	16.3	11.2-22.1	25.6	18.5-32.7	21.0	16.6-25.6	16.1	11.0-21.9	25.3	18.2-32.6	20.7
Iran (Islamic Republic of)	EMR	46.0	41.1-51.0	56.8	52.6-60.8	51.4	48.2-54.7	48.8	43.6-54.2	61.0	56.8-64.9	55.0
Iraq	EMR	59.5	52.2-66.0	65.1	57.5-72.3	62.3	57.1-67.0	62.2	55.1-68.3	68.2	60.9-74.8	65.2
Ireland	EUR	67.8	63.7-71.6	56.0	49.6-61.7	61.9	58.0-65.4	67.1	63.0-70.9	54.8	48.4-60.5	60.9
Israel	EUR	62.4	56.9-67.8	59.4	53.4-65.6	60.9	56.7-65.0	62.5	56.9-67.8	57.8	51.5-64.2	60.1
Italy	EUR	61.8	55.4-67.0	47.1	39.0-54.5	54.1	48.9-58.9	58.3	51.8-63.6	40.1	32.7-47.3	49.2
Jamaica	AMR	39.6	33.6-46.0	69.9	64.3-74.7	55.3	51.2-59.4	40.7	34.6-47.2	70.6	65.1-75.3	56.2
Japan	WPR	30.1	25.9-34.2	19.2	14.6-24.0	24.4	21.3-27.7	28.9	25.0-32.9	15.9	12.0-20.0	22.4
Jordan	EMR	62.3	56.9-67.1	66.0	62.9-68.7	64.1	61.0-66.9	66.5	61.7-71.0	71.2	68.3-73.8	68.8
Kazakhstan	EUR	55.2	36.2-70.2	56.0	43.6-66.6	55.6	44.6-64.8	57.0	37.9-71.9	55.9	43.4-66.4	56.7
Kenya	AFR	13.3	4.1-28.0	24.0	18.2-29.9	18.7	13.3-26.4	15.2	4.6-31.7	25.5	18.7-32.7	20.5
Kiribati	WPR	78.4	73.0-83.1	82.8	77.5-87.3	80.7	77.0-84.1	78.4	72.9-83.3	82.5	76.8-87.3	80.5
Kuwait	EMR	78.4	74.5-82.2	79.5	75.3-83.1	78.8	75.9-81.5	78.1	74.1-81.9	81.3	77.3-84.8	79.3
Kyrgyzstan	EUR	41.4	24.9-58.4	46.0	31.7-58.5	43.8	32.7-54.5	43.4	26.4-60.5	48.9	33.9-61.6	46.6
Lao People's Democratic Republic	WPR	10.0	4.3-18.7	16.4	9.5-24.4	13.3	8.5-19.1	11.6	4.9-21.7	17.8	10.0-27.0	14.8
Latvia	EUR	60.7	48.0-71.6	55.0	41.0-67.1	57.5	48.2-65.9	59.4	46.6-70.7	47.8	33.5-61.2	53.6
Lebanon	EMR	66.1	61.8-70.1	57.9	52.8-63.0	61.8	58.5-65.1	67.0	62.8-70.9	58.7	53.6-63.8	62.8
Lesotho	AFR	15.4	3.7-34.6	54.6	45.6-62.1	37.3	29.8-46.8	17.3	4.2-38.1	58.1	48.6-65.9	41.0
Liberia	AFR	16.3	4.0-34.5	25.1	18.0-32.5	20.7	13.2-30.6	17.7	4.4-37.0	27.5	18.9-36.3	22.7
Libyan Arab Jamahiriya	EMR	57.8	51.9-63.3	66.2	60.7-71.4	61.9	57.7-65.7	60.4	54.7-65.5	71.0	66.0-75.6	65.4
Lithuania	EUR	64.0	51.9-73.7	57.9	45.2-69.4	60.7	51.8-68.5	62.8	50.4-72.8	51.0	37.5-63.5	56.9
Luxembourg	EUR	66.7	52.7-78.2	54.7	35.9-70.3	60.6	49.2-70.2	64.0	49.7-76.0	49.2	30.7-65.7	56.7
Madagascar	AFR	12.0	6.8-19.2	8.6	6.1-11.6	10.3	7.3-13.9	12.6	6.9-20.2	8.8	6.0-12.1	10.6
Malawi	AFR	16.5	11.8-21.8	23.5	18.4-29.0	20.1	16.6-23.9	16.7	12.1-22.0	24.3	18.7-30.2	20.6
Malaysia	WPR	42.1	36.3-48.4	46.3	39.1-53.4	44.2	39.4-48.9	42.4	36.5-48.8	47.0	39.6-54.1	44.6
Maldives	SEAR	27.3	7.9-51.2	43.8	33.6-52.8	35.4	24.3-48.5	29.4	8.6-54.2	52.5	41.6-61.9	40.7
Mali	AFR	13.7	7.3-22.1	24.1	17.6-31.3	19.2	14.4-24.4	15.3	7.9-25.1	25.7	18.3-33.8	21.0
Malta	EUR	68.4	54.9-78.8	60.4	42.8-74.5	64.3	53.7-73.2	66.8	53.4-77.4	56.0	38.4-70.5	61.6
Marshall Islands	WPR	77.4	70.9-83.0	81.0	74.5-85.9	79.2	74.7-83.2	78.2	71.7-83.8	82.0	75.6-87.0	80.2
Mauritania	AFR	20.3	9.8-32.2	51.6	41.3-60.3	36.0	28.8-43.5	22.8	11.1-35.5	53.9	42.9-63.0	38.7
Mauritius	AFR	47.4	34.5-60.4	52.7	39.2-63.3	50.1	41.0-58.6	46.7	33.8-59.7	51.7	38.3-62.2	49.4
Mexico	AMR	67.3	62.4-71.5	69.3	64.2-73.9	68.3	64.8-71.5	67.8	62.9-71.9	70.3	65.3-74.9	69.1
Micronesia (Federated States of)	WPR	67.9	58.9-76.0	82.5	76.1-87.8	75.2	69.7-80.2	71.4	63.2-78.7	82.5	75.7-88.0	76.8
Monaco	EUR	…	…	…	…	…	…	…	…	…	…	…

	Obesity (BMI ≥ 30 kg/m²)							Obesity (BMI ≥ 30 kg/m²)						Latest Year of National Data
	Crude adjusted estimates							Age-standardized adjusted estimates						
95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI		Males	95% CI	Females	95% CI	Both Sexes	95% CI	
6.8-15.5	1.1	0.5-2.0	1.8	0.8-3.6	1.5	0.8-2.4		1.3	0.6-2.3	2.3	0.9-4.7	1.8	1.0-3.3	2004
40.6-60.7	20.9	12.5-29.1	20.4	10.1-32.0	20.6	13.7-28.0		20.2	12.0-28.2	17.6	8.4-28.3	18.9	12.5-25.9	1997
5.3-11.7	0.7	0.3-1.5	1.5	0.8-2.6	1.1	0.7-1.8		0.9	0.3-1.8	1.6	0.8-2.9	1.2	0.7-2.0	2005
60.0-72.1	20.3	13.6-26.6	41.1	32.7-49.3	30.6	25.1-36.0		21.3	14.3-28.0	42.2	33.5-50.7	31.9	26.1-37.4	2002
48.3-57.6	23.3	18.9-27.5	22.8	17.5-28.3	23.0	19.5-26.6		21.0	16.8-25.0	18.6	14.0-23.6	19.9	16.7-23.2	2001-2002
41.1-50.8	19.1	15.2-22.7	17.4	12.2-23.1	18.2	14.9-21.9		16.8	13.3-20.1	14.6	10.4-19.4	15.6	12.8-18.7	2006-2007
37.7-50.4	7.7	4.9-11.4	20.0	14.3-26.0	13.9	10.6-17.3		8.4	5.3-12.5	21.5	15.3-28.1	15.0	11.4-18.8	2000
19.6-37.7	2.1	0.7-4.6	13.6	6.7-24.0	7.9	4.3-13.1		2.3	0.8-5.0	14.4	7.0-25.5	8.5	4.6-14.1	1996-1997
...	...	...	...	...	...	...		...	...	...	...	...	...	no national data
50.2-59.3	25.9	21.2-30.6	24.4	18.7-30.0	25.1	21.5-28.8		23.1	18.8-27.6	19.2	14.3-24.2	21.3	18.0-24.7	1998
26.9-34.2	4.1	2.9-5.6	10.9	8.9-13.5	7.5	6.3-8.9		4.4	3.0-5.9	11.7	9.4-14.5	8.0	6.7-9.6	2008-2009
41.7-56.0	20.4	14.2-26.6	19.9	12.4-27.1	20.1	15.2-24.9		18.8	13.0-24.7	16.1	9.6-22.8	17.5	13.1-22.0	no national data
...	...	...	...	...	...	...		...	...	...	...	...	...	no national data
46.4-61.2	12.8	7.7-19.4	24.8	17.5-31.4	19.2	14.5-23.9		13.8	8.2-21.1	26.7	18.7-33.8	20.7	15.6-25.8	2002
12.2-32.5	3.9	0.7-9.8	4.8	2.5-7.9	4.4	2.1-7.6		4.3	0.7-10.5	5.1	2.5-8.6	4.7	2.2-8.2	2005
...	...	...	...	...	...	...		...	...	...	...	...	...	no national data
...	...	...	...	...	...	...		...	...	...	...	...	...	no national data
20.9-43.9	7.7	1.8-17.4	8.1	5.1-11.6	7.9	4.5-12.9		8.4	1.9-19.1	8.4	5.1-12.3	8.4	4.7-13.9	2005-2006
44.3-60.8	12.1	6.2-20.5	24.3	18.6-29.5	18.4	14.2-23.3		12.9	6.6-22.1	26.3	20.0-31.8	19.8	15.4-25.1	2005-2006
47.1-67.2	27.6	18.1-37.9	27.6	14.1-41.4	27.6	19.3-36.6		26.2	17.0-36.3	22.9	11.1-35.6	24.8	17.2-33.2	1985-1988
46.3-65.3	24.4	15.7-34.0	22.1	10.4-34.8	23.2	16.1-30.8		23.4	15.0-32.6	20.3	9.6-32.3	21.9	15.1-29.1	no national data
9.1-13.7	1.3	0.9-1.9	2.4	1.6-3.5	1.9	1.4-2.4		1.3	0.9-1.9	2.5	1.6-3.6	1.9	1.4-2.5	2007
16.2-25.4	2.6	1.6-4.0	6.9	4.3-9.9	4.8	3.3-6.4		2.5	1.5-3.9	6.9	4.2-9.8	4.7	3.2-6.4	2001
51.6-58.3	12.4	10.0-15.1	26.5	22.9-30.0	19.4	17.3-21.6		13.6	10.9-16.6	29.5	25.7-33.2	21.6	19.3-24.0	2007
60.1-69.8	20.6	15.9-25.2	33.4	26.5-40.6	27.0	22.8-31.0		22.3	17.2-27.1	36.2	29.0-43.6	29.4	24.9-33.7	2006
57.1-64.5	26.2	22.9-29.6	24.2	19.2-28.9	25.2	22.1-28.0		25.7	22.5-29.1	23.3	18.5-28.0	24.5	21.5-27.4	2006-2007
55.9-64.4	23.2	19.3-27.5	29.0	23.8-34.5	26.2	22.8-29.7		23.2	19.3-27.5	27.6	22.5-33.2	25.5	22.2-29.1	2004-2005
44.2-53.8	21.2	16.8-25.4	18.5	13.3-23.9	19.8	16.3-23.3		19.3	15.3-23.2	14.9	10.6-19.5	17.2	14.1-20.2	1998-2002
52.1-60.2	9.7	7.3-12.5	37.5	31.8-42.8	24.1	20.9-27.2		10.0	7.6-12.9	38.2	32.5-43.5	24.6	21.4-27.7	2007-2008
19.6-25.4	5.8	4.6-7.1	4.4	2.9-6.0	5.0	4.1-6.1		5.5	4.4-6.7	3.5	2.3-4.8	4.5	3.7-5.5	2008
66.0-71.4	24.0	20.2-27.9	36.4	33.4-39.4	30.0	27.6-32.5		27.3	23.4-31.4	41.7	38.4-44.9	34.3	31.7-36.9	2009
45.5-65.8	19.1	8.5-30.9	27.6	17.4-37.7	23.7	16.1-31.3		20.2	9.0-32.5	27.4	17.3-37.4	24.4	16.6-32.1	1999
14.0-29.0	2.1	0.4-5.7	6.2	4.1-8.6	4.2	2.7-6.2		2.5	0.5-6.6	6.8	4.3-9.8	4.7	2.9-7.1	2008-2009
76.6-84.1	37.7	31.3-44.2	53.8	46.2-61.2	46.0	41.2-51.1		37.7	31.2-44.4	53.6	45.7-61.4	45.8	40.8-51.1	2004
76.4-82.0	37.5	32.9-42.5	49.8	44.3-55.1	42.0	38.3-45.8		37.2	32.4-42.3	52.4	46.7-58.0	42.8	39.1-46.7	2006
35.0-57.5	10.9	4.7-19.9	19.8	10.2-29.6	15.5	9.4-22.1		11.7	5.0-21.4	21.6	11.3-32.1	17.2	10.4-24.4	1997
9.3-21.5	1.4	0.5-3.3	3.7	1.7-6.5	2.6	1.4-4.3		1.7	0.5-3.9	4.1	1.8-7.5	3.0	1.5-5.0	2006
44.2-62.5	22.4	13.8-31.3	27.0	16.1-37.9	24.9	17.9-32.2		21.5	13.2-30.4	21.8	12.1-32.0	22.0	15.6-29.0	1997
59.5-66.0	25.8	22.2-29.2	29.0	24.6-33.6	27.4	24.6-30.4		26.4	22.8-29.9	29.7	25.2-34.3	28.2	25.3-31.2	1997
32.8-50.8	2.6	0.4-7.8	24.0	17.2-30.7	14.6	10.5-18.8		3.1	0.4-8.8	26.6	18.9-33.9	16.9	12.1-21.6	2004
14.5-33.3	2.8	0.4-7.6	6.8	4.1-10.0	4.8	2.8-7.7		3.1	0.5-8.5	7.7	4.4-11.9	5.5	3.0-8.9	2007
61.6-68.9	19.9	16.2-23.7	36.4	31.3-41.4	27.8	24.7-30.9		21.5	17.5-25.4	41.3	36.0-46.5	30.8	27.4-34.1	2009
47.9-65.3	24.8	15.9-33.5	29.9	19.1-40.9	27.6	20.5-34.7		23.9	15.3-32.5	24.7	14.9-35.0	24.7	18.0-31.5	1997
45.3-66.6	26.3	15.6-37.4	25.8	12.2-40.0	26.0	17.4-34.8		24.5	14.4-35.4	22.2	10.2-35.4	23.4	15.6-31.5	no national data
7.5-14.6	1.7	0.8-3.2	1.5	0.9-2.2	1.6	1.0-2.4		1.8	0.8-3.4	1.5	0.9-2.3	1.7	1.1-2.5	2008-2009
16.9-24.8	2.6	1.6-3.8	6.0	4.2-8.1	4.3	3.3-5.6		2.6	1.7-3.8	6.2	4.2-8.5	4.5	3.3-5.8	2009
39.8-49.5	10.4	8.1-13.3	17.6	13.1-22.7	14.0	11.3-16.8		10.4	8.1-13.4	17.9	13.2-23.1	14.1	11.4-17.1	2005-2006
28.9-54.5	5.9	1.0-15.3	20.2	13.0-27.7	12.9	8.3-18.8		6.5	1.1-16.9	26.1	17.1-35.2	16.1	10.5-22.8	2001
15.4-26.9	2.1	0.9-4.0	6.3	3.9-9.2	4.3	2.9-6.0		2.4	1.0-4.7	6.8	4.2-10.2	4.8	3.1-6.9	2006
51.1-70.7	27.3	16.8-37.9	30.3	16.0-44.7	28.8	20.1-37.7		26.1	16.0-36.4	26.8	13.8-40.0	26.6	18.5-35.0	no national data
75.6-84.1	37.9	30.2-45.9	52.4	43.4-61.1	45.4	39.5-51.3		38.8	30.8-47.0	53.9	44.6-62.9	46.5	40.3-52.6	2002
30.7-46.6	3.7	1.3-7.0	21.7	14.5-28.6	12.7	8.9-16.5		4.3	1.5-8.1	23.3	15.2-31.0	14.0	9.6-18.3	2000-2001
40.4-57.9	13.2	7.5-21.0	23.6	13.7-32.6	18.5	12.7-24.5		12.9	7.3-20.5	23.0	13.3-31.8	18.2	12.4-24.0	1998
65.6-72.3	26.3	22.1-30.1	37.4	32.0-42.5	32.1	28.7-35.3		26.7	22.4-30.5	38.4	33.0-43.7	32.8	29.4-36.1	2005-2006
71.6-81.6	28.1	21.1-35.8	53.2	44.5-62.1	40.6	35.0-46.4		30.9	23.5-38.8	53.4	44.2-62.5	42.0	36.2-48.1	no national data
...	...	...	...	...	...	...		...	...	...	...	...	...	no national data

OVERWEIGHT AND OBESITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF OVERWEIGHT AND OBESITY

Note: … indicates no data were available

Country name	Region	Overweight (BMI ≥ 25 kg/m²) Crude adjusted estimates						Overweight (BMI ≥ 25 kg/m²) Age-standardized adjusted estimates				
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes
Mongolia	WPR	40.7	36.3-45.0	45.7	40.5-50.3	43.2	39.9-46.4	44.4	39.5-49.3	49.6	43.9-54.5	47.1
Montenegro	EUR	…	…	…	…	…	…	…	…	…	…	…
Morocco	EMR	41.4	31.0-52.3	51.7	43.4-59.1	46.8	40.1-53.3	43.1	32.5-54.3	53.6	44.9-60.9	48.5
Mozambique	AFR	14.9	9.4-21.6	26.5	18.7-34.2	21.1	16.0-26.3	16.5	10.4-24.1	28.0	19.4-36.5	22.7
Myanmar	SEAR	13.3	9.3-18.0	23.4	15.9-31.1	18.4	14.1-23.0	13.8	9.6-18.7	23.6	16.0-31.5	18.8
Namibia	AFR	20.3	13.4-27.8	41.2	34.1-47.8	31.1	26.0-36.1	23.3	15.5-31.6	44.7	36.7-52.0	34.6
Nauru	WPR	93.5	91.3-95.3	92.3	89.5-94.7	92.9	91.0-94.5	93.5	91.0-95.3	92.3	89.2-94.9	92.8
Nepal	SEAR	9.3	2.7-20.8	8.9	5.5-13.7	9.1	5.2-14.9	9.8	2.8-22.0	8.9	5.3-14.1	9.3
Netherlands	EUR	56.4	49.9-62.0	48.7	40.5-56.2	52.5	47.4-57.3	52.4	46.0-57.9	43.2	35.3-50.7	47.8
New Zealand	WPR	69.2	65.3-73.2	62.6	56.3-68.2	65.8	62.1-69.3	67.8	63.7-71.9	60.6	54.2-66.3	64.1
Nicaragua	AMR	50.6	35.6-63.7	60.2	54.8-65.1	55.5	47.8-62.5	53.3	37.7-66.5	63.2	57.7-68.3	58.4
Niger	AFR	10.9	7.2-15.6	15.7	10.7-21.4	13.2	10.0-16.8	11.0	7.2-16.1	16.6	11.0-23.3	13.7
Nigeria	AFR	24.2	14.2-34.4	29.3	23.5-34.9	26.8	21.1-32.7	26.2	15.5-37.1	31.2	24.8-37.2	28.8
Niue	WPR	…	…	…	…	…	…	…	…	…	…	…
Norway	EUR	64.4	57.6-70.0	51.1	41.5-59.6	57.6	51.7-63.0	62.3	55.5-68.0	47.6	38.6-56.0	55.0
Oman	EMR	56.9	47.1-65.0	54.2	43.5-62.7	55.8	48.6-61.9	57.8	47.8-66.1	57.2	46.0-66.1	57.5
Pakistan	EMR	19.1	10.0-30.4	27.1	15.3-40.5	23.0	15.5-31.5	20.0	10.3-31.8	28.8	16.1-43.2	24.3
Palau	WPR	…	…	…	…	…	…	…	…	…	…	…
Panama	AMR	57.8	46.5-68.0	63.5	52.5-73.4	60.6	52.8-68.1	58.2	47.2-68.1	64.1	53.5-73.8	61.2
Papua New Guinea	WPR	45.3	38.1-53.3	51.2	40.6-60.6	48.3	42.0-54.4	45.4	37.7-53.8	50.3	39.4-60.4	47.8
Paraguay	AMR	…	…	…	…	…	…	…	…	…	…	…
Peru	AMR	41.8	35.5-48.3	50.7	45.0-56.0	46.3	42.1-50.5	43.3	36.9-50.0	52.2	46.4-57.5	47.9
Philippines	WPR	24.6	17.4-32.3	28.4	19.6-37.0	26.5	20.7-32.3	24.5	17.1-32.2	29.1	20.0-38.1	26.9
Poland	EUR	62.8	57.3-67.7	54.7	48.6-60.6	58.6	54.5-62.5	61.6	55.9-66.6	49.6	43.1-56.0	55.7
Portugal	EUR	61.8	53.5-68.6	56.6	48.4-64.1	59.1	53.4-64.1	59.7	51.4-66.5	50.8	42.3-58.5	55.3
Qatar	EMR	73.1	68.8-77.3	70.2	64.3-75.5	72.3	68.7-75.6	72.5	68.0-76.8	71.3	65.4-76.6	72.1
Republic of Korea	WPR	34.3	29.4-39.2	29.2	23.5-35.4	31.8	27.9-35.5	33.4	28.5-38.2	27.4	22.0-33.3	30.6
Republic of Moldova	EUR	38.4	14.6-62.0	60.1	52.1-67.0	50.0	38.2-61.5	38.7	14.7-62.4	57.7	50.3-64.5	49.2
Romania	EUR	53.1	39.5-64.7	49.1	34.7-61.2	51.0	41.2-59.5	51.7	38.3-63.3	45.4	31.4-57.5	48.6
Russian Federation	EUR	56.2	51.3-61.1	62.8	58.4-66.9	59.8	56.5-63.0	55.8	50.9-60.7	58.9	54.5-63.2	57.8
Rwanda	AFR	21.3	5.3-43.4	18.8	12.3-26.0	19.9	11.5-31.2	24.0	6.0-47.8	17.5	10.8-25.5	20.3
Saint Kitts and Nevis	AMR	72.2	65.5-78.5	79.4	73.1-84.5	75.9	71.3-80.1	72.7	66.0-78.9	79.5	73.4-84.5	76.2
Saint Lucia	AMR	42.8	24.5-60.8	62.4	45.1-75.6	52.9	40.4-64.4	44.1	25.4-62.3	63.6	46.2-76.7	54.2
Saint Vincent and the Grenadines	AMR	…	…	…	…	…	…	…	…	…	…	…
Samoa	WPR	81.2	75.3-86.1	88.2	83.9-91.9	84.6	81.0-87.8	82.6	77.1-87.3	88.9	84.6-92.5	85.6
San Marino	EUR	…	…	…	…	…	…	…	…	…	…	…
Sao Tome and Principe	AFR	27.6	20.8-34.7	37.8	28.3-47.1	32.9	26.9-38.8	30.9	23.3-38.0	42.1	32.1-52.2	36.9
Saudi Arabia	EMR	69.1	64.9-73.5	68.8	64.3-72.3	69.0	65.9-72.0	70.2	66.0-74.6	73.2	68.9-76.7	71.3
Senegal	AFR	15.3	5.4-29.8	33.3	25.2-41.8	24.4	17.8-32.4	18.0	6.4-34.2	37.0	28.1-46.4	27.7
Serbia	EUR	66.5	61.5-70.9	51.0	44.0-57.3	58.6	54.3-62.6	65.3	60.2-69.7	46.2	39.2-52.6	55.9
Seychelles	AFR	49.8	40.0-59.0	64.1	56.4-71.1	56.8	50.5-62.5	50.9	40.8-60.3	64.1	56.3-71.0	57.7
Sierra Leone	AFR	20.8	14.9-27.1	32.7	27.1-38.2	26.9	22.8-31.1	21.2	15.2-27.6	33.4	27.3-39.5	27.5
Singapore	WPR	33.9	28.0-39.7	26.4	19.6-33.1	30.2	25.6-34.8	32.3	26.5-38.0	23.7	17.5-29.9	28.1
Slovakia	EUR	…	…	…	…	…	…	…	…	…	…	…
Slovenia	EUR	…	…	…	…	…	…	…	…	…	…	…
Solomon Islands	WPR	61.0	52.5-68.2	69.6	61.6-76.5	65.2	59.8-70.2	64.9	56.3-71.9	71.1	62.5-78.3	67.9
Somalia	EMR	…	…	…	…	…	…	…	…	…	…	…
South Africa	AFR	58.5	52.5-63.4	71.8	67.6-75.5	65.4	61.8-68.5	62.0	56.1-66.6	73.6	69.5-77.1	68.0
Spain	EUR	67.7	62.9-72.2	56.6	50.5-62.5	62.0	58.1-65.7	65.1	60.2-69.8	50.9	44.6-57.0	58.2
Sri Lanka	SEAR	16.7	11.8-22.6	26.8	19.1-34.3	21.9	17.2-26.6	16.5	11.7-22.5	26.5	18.8-34.1	21.7
Sudan	EMR	…	…	…	…	…	…	…	…	…	…	…
Suriname	AMR	…	…	…	…	…	…	…	…	…	…	…
Swaziland	AFR	25.0	7.7-46.7	62.9	56.9-68.2	45.3	36.7-55.8	28.2	8.8-51.3	68.2	61.7-73.7	50.3
Sweden	EUR	60.2	52.5-66.8	46.6	37.1-55.4	53.3	47.3-58.8	57.3	49.6-64.1	42.5	33.6-50.9	50.0
Switzerland	EUR	59.3	47.9-67.8	40.0	25.6-53.1	49.2	40.1-57.1	55.0	43.6-64.0	34.1	21.3-46.5	44.3
Syrian Arab Republic	EMR	58.7	49.8-66.0	63.6	55.4-71.0	61.2	55.4-66.4	63.4	55.0-70.3	69.3	61.6-76.1	66.4

	Obesity (BMI ≥ 30 kg/m²) Crude adjusted estimates						Obesity (BMI ≥ 30 kg/m²) Age-standardized adjusted estimates						Latest Year of National Data
95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
43.3-50.6	10.4	8.5-12.4	18.3	14.8-21.8	14.4	12.4-16.4	11.9	9.6-14.5	20.7	16.5-24.8	16.4	14.0-18.9	2009
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
41.7-55.2	10.5	6.5-15.9	21.9	15.9-27.7	16.4	12.6-20.4	11.1	6.8-17.0	23.1	16.7-29.2	17.3	13.3-21.5	2003-2004
17.2-28.5	2.3	1.2-3.8	7.2	4.3-10.5	4.9	3.2-6.8	2.6	1.4-4.4	7.8	4.5-11.6	5.4	3.5-7.7	2005
14.3-23.4	1.9	1.2-2.9	6.0	3.5-9.1	4.0	2.6-5.7	2.0	1.2-3.1	6.1	3.5-9.2	4.1	2.7-5.8	2009
28.8-40.2	3.6	2.0-5.7	15.0	10.8-19.5	9.5	7.1-12.0	4.3	2.4-6.8	16.8	11.9-22.1	10.9	8.0-14.0	2006-2007
90.9-94.6	67.7	60.5-74.6	74.4	67.0-81.5	71.1	66.1-76.3	67.5	60.1-74.6	74.7	67.0-82.1	71.1	65.9-76.5	2004
5.2-15.4	1.3	0.3-3.6	1.6	0.8-2.8	1.4	0.7-2.7	1.4	0.3-3.8	1.6	0.8-2.9	1.5	0.7-2.7	2006
43.0-52.6	18.1	14.1-22.1	19.5	14.0-24.9	18.8	15.5-22.2	16.1	12.5-19.7	16.1	11.4-21.0	16.2	13.3-19.3	2005-2006
60.3-67.7	27.3	23.8-31.1	29.3	23.8-34.6	28.3	25.0-31.6	26.2	22.8-29.9	27.7	22.4-32.9	27.0	23.8-30.2	2006-2007
50.4-65.5	15.4	8.1-23.9	28.8	24.2-33.6	22.2	17.9-27.0	16.8	8.7-26.0	31.3	26.3-36.5	24.2	19.4-29.5	2006-2007
10.2-17.6	1.5	0.8-2.4	3.4	2.0-5.3	2.4	1.6-3.4	1.5	0.9-2.5	3.7	2.0-5.9	2.5	1.6-3.7	2007
22.7-35.0	4.6	2.1-7.6	8.4	5.9-10.9	6.5	4.7-8.5	5.1	2.3-8.4	9.0	6.4-11.8	7.1	5.2-9.3	2008
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
49.2-60.3	23.0	17.9-27.6	20.1	13.8-26.7	21.5	17.3-25.7	21.6	16.8-26.2	17.9	12.3-24.0	19.8	16.0-23.6	no national data
50.1-63.8	18.9	13.0-25.0	23.8	15.8-31.1	20.9	16.1-25.6	19.4	13.2-25.7	25.9	17.2-33.9	22.0	16.8-26.9	2000
16.4-33.4	3.3	1.3-6.3	7.8	3.3-14.3	5.5	3.0-8.9	3.5	1.4-6.7	8.4	3.5-15.6	5.9	3.2-9.6	1990-1994
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
53.5-68.5	19.2	12.5-26.5	31.5	22.6-41.0	25.4	19.6-31.5	19.4	12.7-26.7	32.1	23.2-41.5	25.8	20.1-31.8	2003
41.3-54.4	11.7	8.7-15.9	20.6	13.7-28.0	16.2	12.3-20.3	11.8	8.6-16.0	20.1	13.1-27.7	15.9	12.0-20.3	2007
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
43.5-52.2	10.5	8.0-13.6	20.7	16.6-24.8	15.7	13.2-18.3	11.1	8.4-14.4	21.7	17.4-25.9	16.5	13.9-19.2	2004-2008
20.9-32.9	4.6	2.7-6.8	8.0	4.7-12.0	6.3	4.3-8.6	4.5	2.7-6.8	8.3	4.7-12.4	6.4	4.4-8.8	2003-2004
51.5-59.8	23.8	19.5-27.7	26.7	21.8-31.9	25.3	22.0-28.6	22.9	18.7-26.8	22.9	18.4-27.9	23.2	20.0-26.4	2003-2007
49.5-60.5	21.6	15.8-27.0	26.3	19.8-33.0	24.0	19.7-28.3	20.4	14.9-25.6	22.3	16.4-28.5	21.6	17.5-25.5	2003-2005
68.5-75.5	31.3	27.1-36.0	38.1	32.2-44.0	33.2	29.6-36.8	30.8	26.6-35.6	39.3	33.2-45.6	33.1	29.5-36.8	2006
26.8-34.2	7.2	5.6-8.8	8.3	6.0-11.0	7.7	6.3-9.3	6.9	5.4-8.5	7.7	5.5-10.2	7.3	6.0-8.9	2007
37.4-61.0	9.9	2.2-22.5	31.0	23.3-38.5	21.2	15.5-28.1	10.0	2.2-22.8	28.8	21.9-35.6	20.4	14.8-27.2	2005
39.1-57.1	16.9	9.5-25.0	21.2	11.3-31.1	19.1	12.8-25.6	16.3	9.2-24.1	19.0	10.0-28.3	17.7	11.8-23.8	1997
54.4-61.0	18.6	15.4-22.1	32.9	28.7-37.2	26.5	23.7-29.3	18.4	15.1-21.8	29.8	25.8-33.9	24.9	22.2-27.6	2005
11.1-32.0	4.2	0.6-11.4	4.4	2.5-6.9	4.3	2.2-7.9	4.9	0.7-13.4	4.0	2.1-6.7	4.3	2.0-8.4	2005
71.6-80.3	31.7	25.2-38.6	49.2	41.3-56.7	40.7	35.4-45.9	32.0	25.5-39.0	49.4	41.5-56.9	40.9	35.6-46.2	no national data
41.5-65.8	11.4	4.5-21.3	30.8	16.5-44.5	21.4	13.1-29.9	11.9	4.7-22.3	31.9	17.1-45.9	22.3	13.6-30.9	no national data
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
82.1-88.7	43.6	35.9-51.3	65.5	56.6-74.3	54.1	48.5-60.1	45.3	37.5-53.1	66.7	57.7-75.7	55.5	49.8-61.7	2002
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
30.5-43.3	5.5	3.6-7.7	13.2	8.3-18.9	9.5	6.8-12.5	6.4	4.1-8.8	15.4	9.7-22.3	11.3	7.9-15.2	2009
68.3-74.2	28.6	24.7-33.1	39.1	34.3-43.3	33.0	29.9-36.1	29.5	25.5-34.1	43.5	38.3-48.2	35.2	32.0-38.4	2004-2005
20.2-36.7	2.6	0.6-6.6	10.8	6.9-15.7	6.8	4.4-9.8	3.2	0.8-7.8	12.5	8.0-18.3	8.0	5.2-11.6	2005
51.5-60.0	26.3	22.2-30.4	23.3	18.0-28.5	24.8	21.4-28.2	25.5	21.4-29.5	20.3	15.4-25.1	23.0	19.8-26.2	2006
51.4-63.4	14.6	9.7-20.2	33.7	26.5-40.8	23.9	19.6-28.3	15.1	10.0-21.0	33.7	26.5-40.8	24.6	20.2-29.0	2004
23.2-32.0	3.6	2.2-5.2	9.8	7.3-12.5	6.8	5.3-8.3	3.6	2.3-5.3	10.1	7.4-13.1	7.0	5.4-8.8	2009
23.8-32.4	7.0	5.2-9.0	7.1	4.5-9.9	7.1	5.4-8.8	6.6	4.8-8.5	6.2	3.9-8.7	6.4	5.0-8.0	2004-2007
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
62.3-72.9	22.6	16.6-28.6	37.7	29.6-45.6	30.0	25.1-34.9	25.3	18.6-31.8	39.2	30.3-47.9	32.1	26.8-37.4	no national data
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
64.6-71.0	21.0	16.9-24.5	41.0	36.5-45.3	31.3	28.3-34.2	23.2	18.9-26.9	42.8	38.2-47.2	33.5	30.4-36.5	2008-2009
54.2-62.0	26.5	22.7-30.9	26.7	22.0-31.9	26.6	23.5-30.0	24.9	21.1-29.1	23.0	18.4-27.8	24.1	21.1-27.3	2005
17.0-26.5	2.6	1.6-4.0	7.4	4.4-10.7	5.1	3.4-6.9	2.6	1.6-3.9	7.3	4.4-10.6	5.0	3.4-6.8	2006
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
41.3-61.0	5.2	1.0-12.8	32.4	26.7-37.9	19.7	16.0-24.2	6.1	1.1-15.2	37.1	30.2-43.5	23.4	18.8-28.5	2006-2007
44.2-55.4	19.9	14.9-24.9	17.3	11.6-23.4	18.6	14.8-22.5	18.2	13.6-23.0	15.0	10.1-20.4	16.6	13.3-20.2	no national data
36.0-52.0	20.7	13.2-27.2	14.5	7.0-23.3	17.5	12.1-22.9	18.3	11.6-24.4	11.6	5.5-19.0	14.9	10.3-19.6	no national data
60.8-71.4	20.7	15.1-26.2	33.5	26.2-41.1	27.1	22.5-31.8	23.8	17.6-29.9	39.0	31.0-47.1	31.6	26.5-36.6	2002

OVERWEIGHT AND OBESITY
2008 COMPARABLE ESTIMATES OF PREVALENCE OF OVERWEIGHT AND OBESITY

Note: … indicates no data were available

Country name	Region	Overweight (BMI ≥ 25 kg/m²) Crude adjusted estimates						Overweight (BMI ≥ 25 kg/m²) Age-standardized adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	
Tajikistan	EUR	31.2	11.1-53.7	30.5	16.3-45.6	30.9	18.5-44.4	33.7	12.1-56.8	33.9	17.7-49.9	33.8	
Thailand	SEAR	26.5	21.9-31.2	37.4	31.7-43.5	32.2	28.5-36.2	25.8	21.3-30.5	36.4	30.9-42.3	31.4	
The former Yugoslav Republic of Macedonia	EUR	60.5	39.0-77.0	47.8	28.3-63.2	54.0	39.8-65.9	59.6	38.1-76.2	46.0	27.9-61.2	52.8	
Timor-Leste	SEAR	…	…	…	…	…	…	…	…	…	…	…	
Togo	AFR	16.2	4.3-35.2	22.3	11.1-34.7	19.3	10.6-30.3	17.4	4.6-36.6	23.3	11.1-36.8	20.5	
Tonga	WPR	84.2	79.9-88.0	89.9	85.8-93.3	87.0	84.1-89.6	85.8	81.6-89.3	90.6	86.7-93.9	88.1	
Trinidad and Tobago	AMR	58.1	40.6-71.5	69.1	54.2-80.6	63.8	52.8-72.9	59.7	42.2-73.0	69.6	54.7-81.0	64.7	
Tunisia	EMR	45.1	33.3-56.5	62.3	52.1-71.2	53.7	45.8-61.2	47.5	34.9-59.0	64.2	54.0-73.1	55.9	
Turkey	EUR	59.7	55.8-63.1	64.1	60.4-67.9	61.9	59.2-64.5	61.4	57.6-64.7	65.8	62.1-69.4	63.6	
Turkmenistan	EUR	44.8	23.0-66.4	38.5	24.7-51.8	41.5	28.9-54.4	47.1	25.1-68.4	40.4	25.5-54.7	43.6	
Tuvalu	WPR	…	…	…	…	…	…	…	…	…	…	…	
Uganda	AFR	20.1	5.0-41.9	19.8	13.5-26.9	19.9	11.6-31.3	22.2	5.6-45.4	20.4	13.3-28.8	21.2	
Ukraine	EUR	50.5	26.5-71.3	56.0	38.8-69.0	53.5	39.4-65.8	49.8	26.2-70.9	53.2	38.6-65.0	51.8	
United Arab Emirates	EMR	71.3	64.3-77.3	71.2	64.3-77.5	71.3	65.9-76.0	71.3	64.2-77.5	73.9	66.8-80.2	72.0	
United Kingdom	EUR	67.7	64.3-70.9	60.8	56.3-65.1	64.2	61.3-66.9	65.6	62.1-68.9	57.5	52.8-61.8	61.5	
United Republic of Tanzania	AFR	19.4	8.8-31.8	24.6	16.8-32.8	22.1	15.4-29.4	22.1	10.0-35.7	25.8	17.2-34.7	23.9	
United States of America	AMR	73.5	70.8-76.2	68.2	64.5-71.9	70.8	68.5-73.1	72.5	69.8-75.3	66.3	62.6-70.0	69.4	
Uruguay	AMR	59.8	51.6-67.2	58.3	48.7-66.5	59.0	52.8-64.7	59.0	50.9-66.6	55.4	46.1-63.9	57.3	
Uzbekistan	EUR	45.1	35.0-54.4	43.4	31.8-53.1	44.2	36.6-51.1	48.9	38.1-58.6	47.2	34.7-57.2	48.1	
Vanuatu	WPR	59.2	50.2-66.5	65.7	57.9-72.7	62.4	56.4-67.7	62.4	53.0-69.7	68.5	60.6-75.7	65.4	
Venezuela (Bolivarian Republic of)	AMR	67.8	57.2-75.7	66.0	56.1-74.8	66.9	59.7-73.0	67.9	57.2-75.8	67.0	57.2-75.8	67.5	
Viet Nam	WPR	9.5	5.9-14.2	10.9	6.6-16.8	10.2	7.2-13.9	9.4	5.8-14.2	10.8	6.4-16.9	10.1	
Yemen	EMR	…	…	…	…	…	…	…	…	…	…	…	
Zambia	AFR	7.7	3.6-13.7	23.6	17.8-29.5	15.7	12.1-20.0	9.1	4.2-16.4	26.0	19.5-32.4	17.8	
Zimbabwe	AFR	15.1	9.2-22.0	35.6	28.5-42.9	25.5	20.8-30.6	17.6	10.5-25.6	40.3	32.3-48.6	29.4	

		Obesity (BMI ≥ 30 kg/m²)						Obesity (BMI ≥ 30 kg/m²)						Latest Year of National Data
		Crude adjusted estimates						Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	20.4-47.7	7.2	1.6-16.8	10.0	3.8-18.5	8.6	4.1-14.6	8.0	1.7-18.7	11.6	4.0-21.8	9.9	4.5-17.0	2003
	27.8-35.3	5.0	3.8-6.4	12.2	9.4-15.7	8.8	7.2-10.8	4.9	3.6-6.2	11.8	9.0-15.1	8.5	6.9-10.4	2008-2009
	38.8-64.8	22.2	9.2-36.7	20.0	8.1-33.3	21.1	11.7-30.9	21.6	8.9-36.0	18.9	7.8-30.8	20.3	11.4-29.8	1999
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	11.1-32.0	2.8	0.5-7.8	5.7	2.1-10.8	4.3	1.9-7.7	3.0	0.5-8.3	6.1	2.1-11.8	4.6	2.0-8.5	1998
	85.2-90.6	46.6	39.8-53.2	68.5	60.4-76.8	57.6	52.2-62.9	49.1	42.0-56.0	70.3	61.8-78.7	59.6	54.1-65.1	2004
	53.7-73.8	20.6	10.1-31.2	37.5	23.1-51.2	29.3	20.5-38.3	21.6	10.5-32.8	38.0	23.3-51.8	30.0	20.9-39.1	no national data
	47.7-63.5	12.8	7.3-19.4	31.7	22.7-41.0	22.3	16.8-28.2	13.9	7.8-21.0	33.4	24.0-43.1	23.8	18.0-30.1	1996-1997
	61.0-66.1	21.7	19.0-24.2	34.0	30.5-37.7	27.8	25.6-30.1	22.8	20.0-25.4	35.6	32.0-39.4	29.3	27.0-31.6	2007-2009
	30.4-56.6	12.9	4.3-26.0	13.5	6.5-22.5	13.2	7.3-20.7	13.9	4.7-27.7	14.5	6.8-24.6	14.3	7.7-22.3	2000
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	12.1-33.3	3.8	0.6-10.5	4.7	2.7-7.3	4.3	2.2-7.8	4.3	0.7-12.1	4.9	2.7-7.9	4.6	2.2-8.6	2006
	38.1-64.1	15.9	5.1-30.2	25.7	12.9-38.3	21.3	12.2-30.8	15.5	5.0-29.8	23.6	12.7-34.4	20.1	11.9-28.9	2002
	66.6-76.8	30.0	23.7-36.4	39.9	32.5-47.4	32.7	27.8-37.8	30.2	23.7-37.0	43.0	35.0-51.1	33.7	28.6-39.1	1999-2000
	58.6-64.3	26.0	23.0-28.8	27.7	23.8-31.5	26.9	24.3-29.4	24.4	21.6-27.3	25.2	21.5-28.9	24.9	22.4-27.3	no national data
	16.4-31.8	3.4	1.1-6.9	6.4	3.7-9.8	5.0	3.0-7.2	4.0	1.3-8.1	6.8	3.7-10.5	5.4	3.3-8.0	2004-2005
	67.1-71.8	31.1	28.3-34.1	34.8	31.0-38.7	33.0	30.6-35.6	30.2	27.5-33.2	33.2	29.6-37.0	31.8	29.5-34.3	2007-2008
	51.3-63.0	21.1	15.4-26.8	28.1	20.1-36.1	24.8	19.7-29.8	20.7	15.1-26.2	26.0	18.9-33.1	23.6	19.0-28.2	2006
	39.8-55.2	12.8	8.0-18.2	17.4	10.0-24.5	15.1	10.7-19.7	14.5	9.0-20.6	19.8	11.3-27.8	17.3	12.0-22.5	2002
	59.1-70.7	21.0	14.8-26.7	34.2	26.8-41.8	27.5	22.6-32.3	22.9	16.2-29.2	36.8	28.8-45.0	29.8	24.3-34.9	1998
	60.4-73.7	26.6	18.2-34.4	33.9	24.7-43.5	30.3	24.1-36.5	26.6	18.2-34.5	34.8	25.4-44.5	30.8	24.5-37.1	no national data
	7.1-13.9	1.2	0.7-2.1	2.1	1.1-3.7	1.7	1.0-2.5	1.2	0.7-2.1	2.0	1.0-3.7	1.6	1.0-2.5	2002
	...	...	...	...	...	...	...	...	...	...	...	...	...	no national data
	13.5-22.7	1.0	0.4-2.1	6.2	4.0-8.5	3.6	2.5-4.9	1.2	0.4-2.6	7.0	4.5-9.7	4.2	2.8-5.8	2007
	24.0-35.3	2.4	1.2-4.0	11.6	8.1-15.9	7.0	5.2-9.4	2.8	1.4-4.8	13.8	9.6-19.2	8.6	6.3-11.6	2005

RAISED TOTAL CHOLESTEROL
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED TOTAL CHOLESTEROL

Note: … indicates no data were available

Country name	Region	Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Afghanistan	EMR	…	…	…	…	…	
Albania	EUR	46.8	25.5-68.8	45.4	22.3-68.4	46.1	
Algeria	AFR	36.6	21.2-53.8	40.5	21.5-61.8	38.5	
Andorra	EUR	…	…	…	…	…	
Angola	AFR	…	…	…	…	…	
Antigua and Barbuda	AMR	…	…	…	…	…	
Argentina	AMR	…	…	…	…	…	
Armenia	EUR	…	…	…	…	…	
Australia	WPR	55.9	40.9-69.7	58.9	39.5-75.2	57.4	
Austria	EUR	62.8	39.9-81.9	61.6	35.8-81.7	62.2	
Azerbaijan	EUR	…	…	…	…	…	
Bahamas	AMR	…	…	…	…	…	
Bahrain	EMR	…	…	…	…	…	
Bangladesh	SEAR	…	…	…	…	…	
Barbados	AMR	…	…	…	…	…	
Belarus	EUR	…	…	…	…	…	
Belgium	EUR	…	…	…	…	…	
Belize	AMR	…	…	…	…	…	
Benin	AFR	18.6	11.7-27.4	20.5	11.9-31.7	19.6	
Bhutan	SEAR	32.0	19.5-46.5	29.3	16.0-44.7	30.7	
Bolivia (Plurinational State of)	AMR	…	…	…	…	…	
Bosnia and Herzegovina	EUR	…	…	…	…	…	
Botswana	AFR	…	…	…	…	…	
Brazil	AMR	43.0	24.4-63.7	42.6	21.7-63.0	42.8	
Brunei Darussalam	WPR	…	…	…	…	…	
Bulgaria	EUR	…	…	…	…	…	
Burkina Faso	AFR	…	…	…	…	…	
Burundi	AFR	…	…	…	…	…	
Cambodia	WPR	26.4	18.2-36.0	31.1	19.8-43.9	29.0	
Cameroon	AFR	…	…	…	…	…	
Canada	AMR	54.8	30.9-76.6	57.6	32.0-78.5	56.2	
Cape Verde	AFR	22.4	14.4-31.9	23.5	13.1-36.8	23.0	
Central African Republic	AFR	…	…	…	…	…	
Chad	AFR	…	…	…	…	…	
Chile	AMR	49.0	31.3-66.7	49.1	27.1-69.5	49.1	
China	WPR	31.8	22.2-43.0	35.3	22.9-49.1	33.5	
Colombia	AMR	40.8	29.5-52.8	41.8	27.2-56.5	41.4	
Comoros	AFR	…	…	…	…	…	
Congo	AFR	…	…	…	…	…	
Cook Islands	WPR	58.8	35.2-79.3	57.3	32.7-77.9	58.1	
Costa Rica	AMR	37.1	17.6-60.9	43.6	20.8-68.0	40.3	
Côte d'Ivoire	AFR	…	…	…	…	…	
Croatia	EUR	…	…	…	…	…	
Cuba	AMR	…	…	…	…	…	
Cyprus	EUR	…	…	…	…	…	
Czech Republic	EUR	54.9	41.7-67.6	56.9	41.4-70.3	56.0	
Democratic People's Republic of Korea	SEAR	…	…	…	…	…	
Democratic Republic of the Congo	AFR	…	…	…	…	…	
Denmark	EUR	70.9	50.8-86.1	68.5	48.2-83.6	69.7	
Djibouti	EMR	…	…	…	…	…	
Dominica	AMR	31.7	19.0-46.6	43.7	27.6-60.1	37.9	
Dominican Republic	AMR	27.5	12.7-48.1	34.5	14.0-57.7	31.1	
Ecuador	AMR	…	…	…	…	…	
Egypt	EMR	33.3	22.5-45.6	43.7	29.4-58.1	38.6	
El Salvador	AMR	…	…	…	…	…	
Equatorial Guinea	AFR	…	…	…	…	…	

		Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	…	…	…	…	…	…	…	no national data
	30.3-61.9	46.3	25.2-68.0	44.3	21.6-67.2	45.3	29.8-61.0	no national data
	26.1-51.8	37.3	21.3-55.0	41.4	21.3-63.8	39.4	26.2-53.3	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	45.6-68.7	54.8	40.0-68.5	55.3	36.6-71.6	55.2	43.6-66.3	2005
	45.4-76.7	61.3	38.9-80.4	57.7	34.0-77.8	59.7	43.6-74.1	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	13.6-26.7	18.9	11.8-28.1	21.4	11.8-33.6	20.3	13.9-28.1	2008
	21.2-41.4	32.2	19.4-47.0	30.6	16.4-47.2	31.6	21.5-42.8	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	28.7-57.1	44.0	25.0-64.9	44.0	22.5-64.6	44.2	29.7-58.8	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	21.5-37.1	26.9	18.3-36.8	32.0	20.1-45.5	30.0	21.9-38.7	2010
	…	…	…	…	…	…	…	no national data
	39.3-72.1	53.4	30.2-75.0	52.9	28.8-74.1	53.4	37.2-69.1	1988
	16.0-31.1	23.7	14.9-34.2	24.8	13.5-39.3	24.5	16.6-33.7	2007
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	34.3-62.7	48.6	31.1-66.3	48.1	26.5-68.3	48.6	34.0-62.0	2003
	25.4-42.1	31.5	22.0-42.6	35.1	22.8-48.7	33.4	25.3-41.9	2002
	32.0-50.6	41.1	29.6-53.2	43.2	28.1-58.1	42.4	32.8-52.0	2007
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	41.4-72.7	59.3	35.6-79.7	58.3	33.5-78.7	59.0	42.2-73.5	no national data
	24.9-57.6	37.4	17.6-61.2	44.6	21.2-69.3	41.1	25.4-58.6	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	45.6-65.2	54.4	41.4-66.9	52.7	38.2-65.7	53.9	44.0-63.0	2005
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	55.9-81.0	68.3	48.2-84.1	61.8	41.4-78.4	65.2	51.4-77.1	no national data
	…	…	…	…	…	…	…	no national data
	27.2-49.2	31.7	19.1-46.8	43.4	27.5-59.7	37.9	27.2-49.3	2007
	17.8-46.4	28.0	12.8-49.1	36.2	14.6-60.0	32.1	18.2-47.8	1997
	…	…	…	…	…	…	…	no national data
	29.2-47.8	33.9	22.9-46.5	45.3	30.5-59.9	39.9	30.3-49.3	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data

RAISED TOTAL CHOLESTEROL
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED TOTAL CHOLESTEROL

Note: … indicates no data were available

Country name	Region	Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Eritrea	AFR	…	…	…	…	…	
Estonia	EUR	56.8	30.5-79.1	61.1	30.7-83.8	59.2	
Ethiopia	AFR	…	…	…	…	…	
Fiji	WPR	56.1	36.6-74.4	48.9	26.8-71.2	52.5	
Finland	EUR	59.2	47.2-70.9	67.4	54.9-77.6	63.5	
France	EUR	64.9	52.9-75.8	65.5	50.6-77.5	65.2	
Gabon	AFR	…	…	…	…	…	
Gambia	AFR	17.9	7.4-34.0	21.9	7.8-44.3	19.9	
Georgia	EUR	…	…	…	…	…	
Germany	EUR	72.2	51.3-86.9	67.4	43.8-84.4	69.7	
Ghana	AFR	15.3	5.3-33.2	19.8	8.0-36.5	17.6	
Greece	EUR	51.3	32.9-68.9	50.7	28.1-71.1	51.0	
Grenada	AMR	…	…	…	…	…	
Guatemala	AMR	22.7	11.6-37.3	29.6	13.6-49.0	26.4	
Guinea	AFR	…	…	…	…	…	
Guinea-Bissau	AFR	…	…	…	…	…	
Guyana	AMR	…	…	…	…	…	
Haiti	AMR	…	…	…	…	…	
Honduras	AMR	…	…	…	…	…	
Hungary	EUR	55.8	30.2-79.2	58.8	30.2-81.9	57.4	
Iceland	EUR	73.6	53.7-88.1	70.0	47.6-85.7	71.8	
India	SEAR	25.8	17.4-35.5	28.3	17.5-40.2	27.1	
Indonesia	SEAR	32.8	16.6-52.1	37.2	16.6-60.3	35.1	
Iran (Islamic Republic of)	EMR	48.8	39.0-58.7	54.7	42.5-66.3	51.7	
Iraq	EMR	42.3	29.3-56.1	41.3	25.8-57.0	41.8	
Ireland	EUR	…	…	…	…	…	
Israel	EUR	51.5	32.0-70.2	55.5	32.2-75.9	53.6	
Italy	EUR	63.5	51.9-74.2	66.8	53.7-77.9	65.2	
Jamaica	AMR	27.0	17.9-37.5	33.5	20.7-48.2	30.4	
Japan	WPR	57.0	48.5-65.2	58.5	46.7-69.1	57.8	
Jordan	EMR	46.3	34.5-58.1	46.4	32.5-60.1	46.4	
Kazakhstan	EUR	…	…	…	…	…	
Kenya	AFR	…	…	…	…	…	
Kiribati	WPR	32.8	19.4-49.1	36.6	19.0-57.1	34.8	
Kuwait	EMR	55.8	42.4-68.3	50.7	35.2-65.0	54.0	
Kyrgyzstan	EUR	…	…	…	…	…	
Lao People's Democratic Republic	WPR	…	…	…	…	…	
Latvia	EUR	…	…	…	…	…	
Lebanon	EMR	…	…	…	…	…	
Lesotho	AFR	…	…	…	…	…	
Liberia	AFR	…	…	…	…	…	
Libyan Arab Jamahiriya	EMR	33.3	24.2-43.2	33.6	22.4-45.9	33.4	
Lithuania	EUR	55.4	28.4-78.8	57.4	24.8-82.6	56.5	
Luxembourg	EUR	70.7	49.4-86.4	67.3	43.5-84.6	69.0	
Madagascar	AFR	…	…	…	…	…	
Malawi	AFR	22.8	15.4-31.7	24.1	15.0-35.9	23.5	
Malaysia	WPR	…	…	…	…	…	
Maldives	SEAR	…	…	…	…	…	
Mali	AFR	…	…	…	…	…	
Malta	EUR	61.5	38.2-81.0	60.9	34.7-80.7	61.2	
Marshall Islands	WPR	42.8	24.8-62.2	45.9	25.2-66.6	44.4	
Mauritania	AFR	21.2	11.6-33.8	22.5	11.2-37.8	21.8	
Mauritius	AFR	…	…	…	…	…	
Mexico	AMR	47.1	33.3-61.2	51.6	35.5-67.1	49.5	
Micronesia (Federated States of)	WPR	47.1	28.7-65.7	45.4	25.0-65.8	46.2	
Monaco	EUR	…	…	…	…	…	

		Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	…	…	…	…	…	…	…	no national data
	39.1-76.0	56.0	30.3-78.1	56.7	28.5-79.9	56.7	37.5-73.4	no national data
	…	…	…	…	…	…	…	no national data
	37.4-66.9	56.4	36.7-74.8	49.7	27.0-72.1	53.2	38.0-67.8	2002
	55.0-71.4	57.5	45.8-69.0	59.3	46.4-70.4	59.0	50.4-67.1	no national data
	55.8-73.4	63.5	51.7-74.4	60.2	46.5-72.2	62.0	53.1-70.1	2007
	…	…	…	…	…	…	…	no national data
	10.5-33.1	18.1	7.4-34.5	22.5	7.8-46.3	20.3	10.5-34.1	no national data
	…	…	…	…	…	…	…	no national data
	54.4-81.5	69.6	48.8-84.9	61.4	39.1-79.4	65.6	50.4-77.7	1998
	9.0-29.4	15.6	5.2-34.1	20.6	8.0-38.4	18.1	9.1-30.4	no national data
	36.5-64.8	50.1	32.1-67.3	45.9	25.2-65.7	48.2	34.4-61.6	no national data
	…	…	…	…	…	…	…	no national data
	16.2-38.2	23.3	11.6-39.0	31.6	14.0-52.7	27.7	16.6-40.7	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	38.3-74.6	55.4	30.0-78.7	54.0	27.4-77.7	55.2	36.6-72.3	1987
	56.8-83.2	72.5	52.7-87.3	67.0	45.0-83.5	69.8	54.9-81.5	no national data
	20.2-34.6	26.3	17.6-36.2	29.5	18.2-41.9	27.9	20.8-35.8	no national data
	21.3-49.8	33.1	16.6-52.8	38.2	16.8-62.0	35.8	21.6-51.0	no national data
	43.9-59.4	49.8	39.8-60.0	58.1	45.3-69.8	54.1	45.9-61.9	2007
	31.6-52.5	43.7	30.2-57.8	44.1	26.9-60.9	44.0	33.0-55.3	2006
	…	…	…	…	…	…	…	no national data
	38.5-67.5	51.8	32.2-70.5	54.8	31.6-75.2	53.5	38.5-67.5	no national data
	56.5-73.1	62.3	50.8-72.9	61.6	49.1-72.9	62.2	53.8-70.0	2001
	22.3-39.4	27.1	18.0-37.7	34.0	21.0-48.7	30.7	22.5-39.8	2008
	50.0-64.8	58.2	50.0-66.2	55.7	45.0-65.4	57.1	49.9-63.7	2007
	37.2-55.6	47.8	35.4-59.9	49.6	34.4-64.2	48.8	39.0-58.5	2007
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	23.2-47.8	32.6	19.0-49.0	38.2	19.5-59.6	35.5	23.4-49.0	2004
	43.7-63.7	56.2	42.3-69.0	55.7	38.5-70.5	56.2	45.4-66.3	2006
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	26.2-41.1	34.8	25.3-45.0	36.6	24.1-50.0	35.6	27.8-43.9	2009
	34.8-75.3	54.9	28.2-78.2	54.0	23.8-79.0	54.8	34.2-73.1	no national data
	53.4-81.4	69.5	48.3-85.4	64.1	41.2-82.0	66.9	51.8-79.6	no national data
	…	…	…	…	…	…	…	no national data
	17.3-30.8	23.1	15.3-32.5	24.9	15.0-37.5	24.1	17.4-32.0	2009
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	44.0-75.8	60.7	37.5-80.2	56.9	32.2-77.1	59.0	42.4-73.6	no national data
	30.6-58.6	43.1	24.8-62.8	49.0	26.8-70.0	46.1	31.6-60.5	2002
	14.0-31.4	21.3	11.5-34.3	22.9	11.0-39.3	22.2	14.0-32.4	no national data
	…	…	…	…	…	…	…	no national data
	39.0-60.2	47.4	33.5-61.6	53.6	36.8-69.1	50.7	39.9-61.5	2006
	31.9-60.3	48.5	29.7-67.5	47.5	26.1-68.1	48.1	33.3-62.4	no national data
	…	…	…	…	…	…	…	no national data

RAISED TOTAL CHOLESTEROL
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED TOTAL CHOLESTEROL

Note: … indicates no data were available

Country name	Region	Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Mongolia	WPR	36.4	23.3-51.4	36.2	19.5-55.5	36.3	
Montenegro	EUR	…	…	…	…	…	
Morocco	EMR	34.4	18.2-52.9	37.0	17.8-58.3	35.7	
Mozambique	AFR	25.2	14.8-38.2	24.9	12.5-41.5	25.0	
Myanmar	SEAR	…	…	…	…	…	
Namibia	AFR	…	…	…	…	…	
Nauru	WPR	41.2	26.0-57.2	48.1	28.8-67.2	44.7	
Nepal	SEAR	…	…	…	…	…	
Netherlands	EUR	…	…	…	…	…	
New Zealand	WPR	57.5	32.3-79.4	57.9	29.3-80.9	57.7	
Nicaragua	AMR	…	…	…	…	…	
Niger	AFR	…	…	…	…	…	
Nigeria	AFR	13.6	5.3-27.6	18.5	6.5-37.7	16.1	
Niue	WPR	…	…	…	…	…	
Norway	EUR	…	…	…	…	…	
Oman	EMR	…	…	…	…	…	
Pakistan	EMR	29.9	15.9-47.5	30.4	14.5-50.5	30.1	
Palau	WPR	…	…	…	…	…	
Panama	AMR	…	…	…	…	…	
Papua New Guinea	WPR	36.1	17.2-59.2	37.5	16.3-63.9	36.8	
Paraguay	AMR	…	…	…	…	…	
Peru	AMR	36.7	24.9-49.2	37.7	24.4-51.0	37.2	
Philippines	WPR	39.0	24.9-54.5	44.5	26.0-63.5	41.8	
Poland	EUR	60.4	45.0-73.9	56.8	37.4-74.0	58.5	
Portugal	EUR	58.0	38.3-76.0	58.2	33.8-78.3	58.1	
Qatar	EMR	…	…	…	…	…	
Republic of Korea	WPR	42.2	30.7-53.9	44.1	29.1-58.8	43.2	
Republic of Moldova	EUR	…	…	…	…	…	
Romania	EUR	46.2	22.6-69.7	47.9	21.8-72.8	47.1	
Russian Federation	EUR	47.8	23.5-71.9	56.4	27.6-79.5	52.6	
Rwanda	AFR	…	…	…	…	…	
Saint Kitts and Nevis	AMR	…	…	…	…	…	
Saint Lucia	AMR	…	…	…	…	…	
Saint Vincent and the Grenadines	AMR	…	…	…	…	…	
Samoa	WPR	31.0	16.3-49.7	36.6	16.3-59.4	33.7	
San Marino	EUR	…	…	…	…	…	
Sao Tome and Principe	AFR	15.6	9.6-23.1	18.4	10.5-28.7	17.0	
Saudi Arabia	EMR	35.4	22.7-49.7	38.2	22.5-54.9	36.6	
Senegal	AFR	…	…	…	…	…	
Serbia	EUR	46.8	22.8-73.6	51.5	21.7-82.8	49.2	
Seychelles	AFR	58.8	42.1-73.7	55.3	34.0-73.6	57.1	
Sierra Leone	AFR	…	…	…	…	…	
Singapore	WPR	57.9	44.4-70.6	62.1	44.3-77.3	60.0	
Slovakia	EUR	…	…	…	…	…	
Slovenia	EUR	…	…	…	…	…	
Solomon Islands	WPR	29.5	16.9-44.7	35.4	19.1-54.7	32.4	
Somalia	EMR	…	…	…	…	…	
South Africa	AFR	31.3	15.0-51.6	36.5	16.4-60.3	34.0	
Spain	EUR	59.4	45.5-71.7	56.0	38.7-71.1	57.6	
Sri Lanka	SEAR	…	…	…	…	…	
Sudan	EMR	…	…	…	…	…	
Suriname	AMR	…	…	…	…	…	
Swaziland	AFR	…	…	…	…	…	
Sweden	EUR	58.6	41.2-73.8	53.7	36.2-69.3	56.1	
Switzerland	EUR	62.6	45.9-76.9	62.2	43.3-77.5	62.4	
Syrian Arab Republic	EMR	…	…	…	…	…	

		Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	25.3-48.3	37.0	23.4-52.4	37.4	19.6-57.9	37.3	25.6-50.2	2005
	…	…	…	…	…	…	…	no national data
	23.0-49.9	35.3	18.6-54.1	39.0	18.6-61.2	37.2	23.9-51.8	2000
	16.4-35.1	26.1	15.2-39.7	25.9	12.6-43.7	26.0	16.7-36.8	2005
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	32.0-57.5	41.2	25.9-57.5	50.9	30.3-70.4	46.2	33.0-59.2	2004
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	39.0-74.1	56.8	32.1-78.6	55.4	27.9-78.6	56.2	38.1-72.4	1989
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	8.1-27.9	14.0	5.3-29.1	19.4	6.6-40.3	16.8	8.3-29.8	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	19.1-43.1	30.5	16.1-48.5	31.4	14.8-52.3	31.0	19.4-44.2	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	22.1-53.9	36.5	17.4-60.1	39.8	16.8-67.4	38.2	22.6-55.9	no national data
	…	…	…	…	…	…	…	no national data
	28.2-46.3	37.5	25.4-50.4	39.4	25.5-53.3	38.6	29.2-47.9	no national data
	30.1-54.0	39.3	24.8-55.2	46.7	27.3-66.2	43.3	31.0-56.0	2004
	46.1-69.4	59.9	44.7-73.4	53.8	35.3-70.7	57.1	45.2-67.8	2005
	42.5-72.2	57.2	37.8-75.2	54.3	31.2-74.7	55.9	41.1-70.0	no national data
	…	…	…	…	…	…	…	no national data
	33.9-52.6	41.7	30.4-53.3	42.7	28.2-57.0	42.5	33.4-51.8	2005
	…	…	…	…	…	…	…	no national data
	29.5-64.5	46.0	22.4-69.1	45.2	20.7-69.7	45.8	28.8-63.0	no national data
	33.6-69.9	47.3	23.3-71.3	52.1	25.1-75.5	50.6	32.3-67.9	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	20.7-48.1	31.4	16.6-50.1	37.8	16.7-61.0	34.6	21.1-49.4	2002
	…	…	…	…	…	…	…	no national data
	11.9-23.4	15.9	9.7-24.0	19.7	11.0-31.3	18.1	12.3-25.2	2009
	26.3-47.0	36.4	23.1-51.2	42.1	24.2-60.3	39.0	27.8-50.2	2005
	…	…	…	…	…	…	…	no national data
	29.6-69.8	47.4	23.3-73.7	52.0	22.8-81.9	49.8	30.6-69.9	no national data
	43.7-68.8	59.1	42.2-74.3	55.3	34.1-73.6	57.7	44.2-69.5	2004
	…	…	…	…	…	…	…	no national data
	48.9-70.3	56.3	43.1-68.9	58.5	41.4-73.5	57.5	46.7-67.7	2006
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	21.9-44.7	30.1	16.8-46.1	36.5	18.9-57.4	33.2	22.1-46.4	no national data
	…	…	…	…	…	…	…	no national data
	20.7-49.2	31.6	14.9-52.3	38.0	17.0-62.4	35.5	21.3-51.2	no national data
	46.5-67.7	58.9	45.1-71.1	52.9	36.4-68.0	56.1	45.4-66.0	2005
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	44.0-67.4	56.1	39.3-71.3	47.0	31.0-62.3	51.8	40.2-62.8	no national data
	49.9-73.2	61.1	44.6-75.4	56.9	39.2-72.7	59.2	47.0-70.1	no national data
	…	…	…	…	…	…	…	no national data

RAISED TOTAL CHOLESTEROL
2008 COMPARABLE ESTIMATES OF PREVALENCE OF RAISED TOTAL CHOLESTEROL

Note: … indicates no data were available

Country name	Region	Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)					
		Crude adjusted estimates					
		Males	95% CI	Females	95% CI	Both Sexes	
Tajikistan	EUR	…	…	…	…	…	
Thailand	SEAR	55.1	45.0-64.5	57.0	44.9-68.1	56.1	
The former Yugoslav Republic of Macedonia	EUR	…	…	…	…	…	
Timor-Leste	SEAR	…	…	…	…	…	
Togo	AFR	…	…	…	…	…	
Tonga	WPR	52.5	35.4-70.0	44.9	25.1-65.6	48.7	
Trinidad and Tobago	AMR	…	…	…	…	…	
Tunisia	EMR	36.6	17.6-60.7	42.2	20.2-65.3	39.4	
Turkey	EUR	37.2	27.3-47.9	39.3	26.7-52.2	38.3	
Turkmenistan	EUR	…	…	…	…	…	
Tuvalu	WPR	…	…	…	…	…	
Uganda	AFR	…	…	…	…	…	
Ukraine	EUR	…	…	…	…	…	
United Arab Emirates	EMR	…	…	…	…	…	
United Kingdom	EUR	65.6	48.1-80.3	65.7	44.5-81.4	65.6	
United Republic of Tanzania	AFR	19.9	7.9-38.2	24.1	9.0-46.0	22.1	
United States of America	AMR	53.3	44.3-61.8	56.9	44.6-68.0	55.2	
Uruguay	AMR	43.3	28.4-59.2	43.8	24.6-62.8	43.6	
Uzbekistan	EUR	23.5	11.9-39.4	26.8	10.7-47.4	25.2	
Vanuatu	WPR	…	…	…	…	…	
Venezuela (Bolivarian Republic of)	AMR	32.7	15.9-52.7	41.4	19.5-63.4	37.1	
Viet Nam	WPR	…	…	…	…	…	
Yemen	EMR	…	…	…	…	…	
Zambia	AFR	25.5	15.2-38.0	26.9	15.1-41.4	26.2	
Zimbabwe	AFR	…	…	…	…	…	

		Raised cholesterol (total cholesterol ≥ 5.0 mmol/L)						Latest Year of National Data
		Age-standardized adjusted estimates						
	95% CI	Males	95% CI	Females	95% CI	Both Sexes	95% CI	
	…	…	…	…	…	…	…	no national data
	48.1-63.7	54.6	44.6-64.0	56.1	44.2-67.1	55.5	47.6-63.1	2009
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	35.4-62.2	53.4	35.8-71.2	45.4	25.4-66.3	49.7	36.1-63.5	2004
	…	…	…	…	…	…	…	no national data
	24.4-55.9	37.3	17.7-61.7	43.8	20.8-67.3	40.7	25.2-57.5	no national data
	30.2-46.5	38.1	28.0-49.0	41.0	27.8-54.3	39.7	31.3-48.3	2008
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	52.3-77.0	65.2	48.0-79.7	61.3	40.8-77.3	63.4	50.5-74.8	no national data
	11.6-35.6	21.6	8.3-41.6	25.5	9.1-49.4	23.7	12.1-38.5	no national data
	47.5-62.6	52.9	44.1-61.3	54.2	42.5-65.0	53.8	46.4-61.0	2008
	31.3-56.0	43.3	28.5-59.1	40.9	23.3-58.9	42.3	30.8-54.3	2006
	14.8-38.1	24.2	12.0-40.7	28.9	11.3-50.9	26.8	15.5-40.7	2002
	…	…	…	…	…	…	…	no national data
	22.4-52.0	33.4	16.2-53.8	43.1	20.3-65.4	38.4	23.3-53.8	no national data
	…	…	…	…	…	…	…	no national data
	…	…	…	…	…	…	…	no national data
	17.9-35.6	26.5	15.5-40.0	28.5	15.7-44.3	27.7	18.6-37.9	no national data
	…	…	…	…	…	…	…	no national data

Annex 5

Core indicators for consideration as part of the framework for NCD surveillance

Exposures

Behavioral risk factors

- Prevalence of current daily tobacco smoking among adults (%).
- Prevalence of insufficiently active adults (defined as less than 5 times 30 minutes of moderate activity per week, or less than 3 times 20 minutes of vigorous activity per week, or equivalent) (%).
- Prevalence of adult population consuming more than 5 grams of dietary sodium chloride per day (%).
- Prevalence of population consuming less than five total servings (400 grams) of fruit and vegetables per day (%).
- Adult per capita consumption in litres of pure alcohol (recorded and unrecorded).

Physiological and metabolic risk factors

- Prevalence of raised blood glucose among adults (defined as fasting plasma glucose value ≥ 7.0 mmol/L (126 mg/dl) or on medication for raised blood glucose) (%).
- Prevalence of raised blood pressure among adults (defined as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥90 mmHg or on medication for raised blood pressure (%).
- Prevalence of overweight and obesity in adults and adolescents (defined as body mass index greater than 25 kg/m2 for overweight or 30kg/m2 for obesity or for adolescents according to the WHO Growth Reference) (%).
- Prevalence of low weight at birth (< 2.5 kg) (%).
- Prevalence of raised total cholesterol among adults (defined as total cholesterol ≥ 5.0 mmol/l or 190mg/dl) (%).

Outcomes

Mortality

- All-cause mortality by age, sex and region (urban and rural, or by other administrative areas, as available).
- Cause-specific mortality data (urban and rural, or other administrative areas, as available).
- Unconditional probability of death between ages 30 and 70 years from cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases.

Morbidity

- Cancer incidence data from cancer registries, by type of cancer.

Annex 6

Recommended approaches to implementing effective and sustainable multisectoral action on health[1]

Health and quality of life of individuals and populations are determined by a complex set of interrelated factors. Such complexity means that measures to promote and protect health and well-being cannot be confined to the health sector alone. Designing and implementing public policies that improve quality of life requires the active involvement and engagement of other sectors of society in all steps of the process.

Working together across sectors to improve health and influence its determinants is often referred to as *intersectoral action on health*. The following guidance aims to present some simple steps that policy-makers can take to work across sectors more systematically in order to improve the health of their citizens and health equity among communities.

Strategies to promote intersectoral action on health

Two overall strategies for promoting intersectoral action can be described:

- One general strategy integrates a systematic consideration of health concerns into all other sectors' routine policy processes, and identifies approaches and opportunities to promote better quality of life: *"Health in all policies"*.
- An alternative approach is more issue-centred and narrower, aiming to integrate specific health concerns into relevant sectors' policies, programmes and activities, as appropriate. Widespread adoption of the *WHO Framework Convention of Tobacco Control* is an excellent example of this approach.

Steps to implement intersectoral action on health

There are a series of steps that can be taken to initiate and accomplish intersectoral action on health. The steps described below are relevant to both issue-centred approaches and to the general *Health in all policies* strategy.

Self-assessment

- Assess the health sector's capabilities, readiness, existing relationships with relevant sectors and participation in relevant intergovernmental bodies.
- Strengthen institutional capacity by improving staff abilities to interact with other sectors (e.g. public health expertise, overall understanding of public policies, politics, economics, human rights expertise etc.), in order to identify intersectoral opportunities and communicate potential co-benefits.

Assessment of other sectors

- Achieve a better understanding of other sectors, their policies and priorities, and establish links and means of communication to assess their relevance to the established health priorities.
- Use health impact assessment as a tool to identify potential (positive and negative) health impacts of other sectors' policies, actions that can enhance positive impacts and reduce risks; and the roles and responsibilities of other sectors in achieving healthy policies.
- Conduct a stakeholder and sector analysis. Identify relevant intersectoral processes, bodies, laws, mandates for intersectoral action.
- Improve interaction and strengthen mutual, intersectoral engagement, including through participation in activities led by other sectors.

[1] Based on analysis of international experiences and a series of expert consultations hosted by WHO between June 2009 and October 2010.

Analyse the area of concern

- Define the specific area of concern and potential interventions.
- Present sector-specific, disaggregated data focusing on the impact on other sectors and analyse the feasibility of the intervention.
- Build your case using convincing data to describe how policies in the sector of interest affect health, and propose ways these can be changed to promote health-related co-benefits. Use evidence to highlight potential co-benefits.

Develop engagement plans

- Develop a strategy to involve relevant sectors. The emphasis is on win-win and the creation of a climate of trust. Salient features of the plan include shared goals and targets; pooled resources; defined tasks, roles and responsibilities. Selection of an engagement approach is a key component in the plan and the approach can be on sector, issue or even "opportunistic" basis.

Use a framework to foster common understanding between sectors

- A key factor for successful intersectoral action is the ability to identify a common understanding of the key issues and required actions to address them. This can be aided through the use of the same framework to facilitate a common understanding of the causal pathways and key intervention points.

Strengthen governance structures, political will and accountability mechanisms

- Establish/strengthen governance structures to ensure successful intersectoral action. Examples include national constitutions, presidential mandates, adoption of new laws, compulsory reporting, human rights accountability, shared budgets, and implementation of international agreements such as the FCTC.
- Develop accountability mechanisms by means such as promoting open access to information, meaningful public/civil society participation at all levels, disclosure, grievance and ombudsperson functions.
- Utilize relevant sections of human rights treaties, and reporting mechanisms mandated by international agreements, to support integration of health determinants across sectors.

Enhance community participation

- Enhance community participation throughout the policy development, implementation and evaluation processes through public consultation/hearings, disseminating information using mass media, web-based tools and facilitating the equal and meaningful involvement of constituency/NGO representatives at all levels.

Choose other good practices to foster intersectoral action

- Join other sectors in establishing common policies/programmes/initiatives with joint reporting on implementation with common targets.
- Be an agent in other sectors' policies/programmes/initiatives, and invite other sectors to be an agent in yours.
- Provide tools and techniques to include health in the policies of other sectors and to address health inequalities/inequities (e.g. health impact assessment, economic analysis, data disaggregated by gender, class, ethnicity, participatory research, and qualitative analysis etc.).

Monitor and evaluate

- Follow closely the implementation of intersectoral action through monitoring and evaluation processes in order to determine the progress in achieving planned outcomes, and identify opportunities for productive changes in approach.

The world has a sound vision and a clear road map to address NCDs

2000 Global Strategy for the Prevention and Control of Noncommunicable Diseases

2003

WHO Framework Convention on Tobacco Control

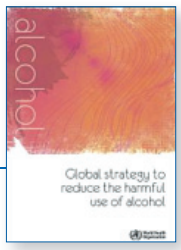
2004

Global Strategy on Diet, Physical Activity and Health

2008

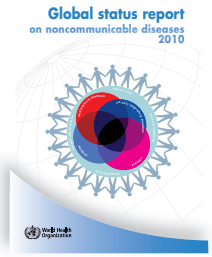
Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases

2010



Global Strategy to Reduce the Harmful Use of Alcohol

The *Global Status Report on Noncommunicable Diseases* is the first report on the worldwide epidemic of cardiovascular diseases, cancer, diabetes and chronic respiratory diseases, along with their risk factors and determinants. Noncommunicable diseases killed 36 million people in 2008, and a large proportion of these deaths occurred before the age of 60, so during the most productive period of life. The magnitude of these diseases continues to rise, especially in low- and middle-income countries. This report reviews the current status of noncommunicable diseases and provides a road map for reversing the epidemic by strengthening national and global monitoring and surveillance, scaling up the implementation of evidence-based measures to reduce risk factors like tobacco use, unhealthy diet, physical inactivity and harmful alcohol use, and improving access to cost-effective health-care interventions to prevent complications, disabilities and premature death. This report, and subsequent editions, also provide a baseline for future monitoring of trends and for assessing the progress Member States are making to address the epidemic. The *Global Status Report on Noncommunicable Diseases* was developed as part of the implementation of the *2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases*, which was endorsed by the World Health Assembly in 2008.



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