

## Executive summary

Noncommunicable diseases (NCDs) are the leading global causes of death, causing more deaths than all other 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 NCDs 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 especially 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 are 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 creates 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. To ensure early detection and timely treatment, NCDs need to be integrated into primary health care. Expanding the package of primary health care services to include essential NCD interventions is central to any health system strengthening initiative.

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  $\geq 30$  years old with a 10-year risk of fatal or nonfatal cardiovascular events  $\geq 30\%^*$ ;
- 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.