



NONCOMMUNICABLE DISEASES





SUMMARY

NCDs are included as a specific SDG target (reducing premature mortality from NCDs by one third) and are part of several other health targets.

In 2012, an estimated 52% of all deaths under age 70 was due to NCDs, and three quarters of those deaths were caused by cardiovascular diseases (CVD), cancer, diabetes and chronic respiratory disease (CRD).

Premature mortality rates due to NCDs declined globally by 15% between 2000 and 2012. A major factor is the decrease in CVD mortality, driven by population-level blood pressure improvements, declines in tobacco use and advances in medical treatment. Declines have been greater in high-income countries than in the low- and middle-income countries.

Achieving the SDG target for NCDs will require major interventions to deal with a context characterized by ageing populations, rapid unplanned urbanization and globalization of markets that promote inactivity and unhealthy diets, and will focus on the development and implementation of strong national plans that emphasize prevention and treatment access for all (half of all countries had neither a national plan nor budget in 2013).

The UN Political Declaration on NCDs adopted at the UN General Assembly in 2011 and the UN Outcome Document on NCDs adopted at the UN General Assembly in 2014 include a roadmap of commitments made by governments. The WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 endorsed by the World Health Assembly in May 2013 sets priorities and provides strategic guidance on how countries can implement the roadmap of commitments. The Global Action Plan includes voluntary targets that focus on risk factors such as tobacco use, high blood pressure, high salt intake, obesity and physical inactivity, as well as targets on access to essential NCD medicines and technologies, and drug therapy and counselling.

The WHO Framework Convention on Tobacco Control (WHO FCTC), ratified by 180 Parties – representing 90% of the global population – is the first public health treaty negotiated under the auspices of WHO. SDG target 3.a commits governments to strengthen the implementation of the WHO FCTC in all countries. The prevalence of tobacco smoking among people age 15 years and older has declined globally from 27% in 2000 to 21% in 2013, though not in all regions. Effective country implementation of multisectoral control measures such as raising taxes on tobacco and banning smoking in public places are major success factors.

SDG Target 3.9 aims to reduce deaths and illnesses related to hazardous chemicals, as well as air, water and soil pollution and contamination. About 7 million NCD deaths are attributed to indoor and outdoor air pollution. Global awareness of the need for multisectoral action is exemplified by the inclusion of air quality in three other goals and a recent World Health Assembly resolution on addressing the health impacts of air pollution.

NCDs are estimated to kill around 38 million people per year, accounting for 68% of all deaths worldwide,¹ and the main NCDs (CVD, cancers, CRD and diabetes), taken singly, are among the top 10 leading killers. Nearly 80% of NCD deaths – 30 million – occurs in low-, middle- and non-OECD high-income countries, where NCDs are fast replacing infectious diseases and malnutrition as the leading causes of disability and premature death. Despite their obvious and growing significance, NCDs have long been hidden, misunderstood and underrecorded. They were passed over in the MDGs, which, by focusing attention on other issues, may have actually contributed to the sidelining of this core public health concern in global health.²

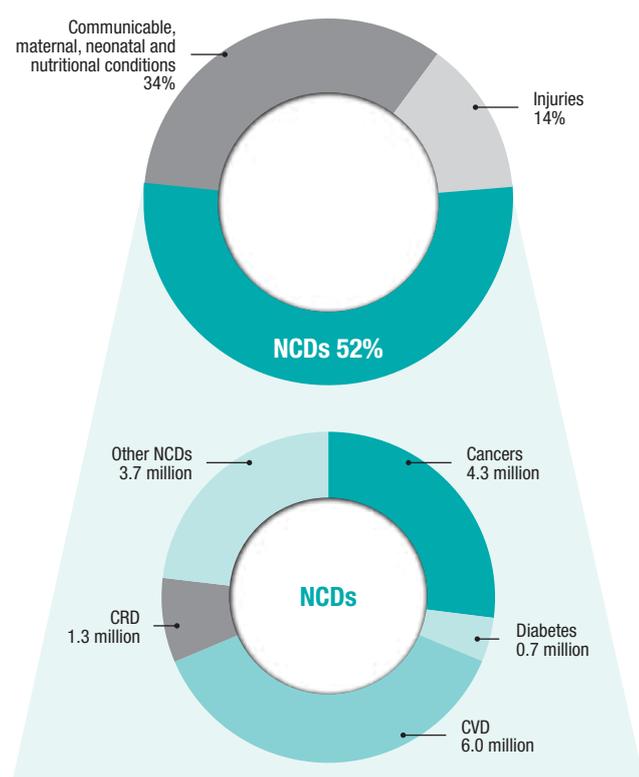
Unlike the MDGs, the SDGs include a specific target for NCDs and several NCD-related targets. Target 3.4 calls for a one third reduction in premature mortality from NCDs by 2030, and is an extension of the global voluntary NCD mortality target, which defines premature NCD mortality as the probability of dying from any of the four main NCDs between the ages of 30 and 70.³ Other relevant SDG targets include: Target 3.a on improvements in tobacco control; Target 3.5 on substance abuse, including harmful use of alcohol (discussed in Chapter 7 along with mental health); Target 3.b on supporting research and development of vaccines and medicines for NCDs that primarily affect developing countries, as well as providing access to affordable essential medicines and vaccines for NCDs; and Target 3.9 on deaths and illnesses related to

hazardous chemicals, as well as air, water and soil pollution and contamination (addressed in chapters 2, 5 and this chapter). Finally, Target 3.8 addresses UHC, which has implications for a wide range of NCD-related promotion, prevention and treatment interventions (UHC within the SDGs is discussed fully in Chapter 3).

The SDG NCD Target 3.4 lacks specificity in terms of diseases. Where the SDG do identify a particular issue, it is generally in terms of risk factors (for example, tobacco use or harmful use of alcohol) rather than a particular disease. However, there can be little doubt about the specific NCDs that should be addressed, the burden of disease being very much concentrated in the four major diseases already cited, and targeted by WHO,³ the UN General Assembly^{4,5} and the UN system.⁶ In terms of mortality, the leading NCD is CVD, which claimed 17.5 million lives in 2012 (46% of all NCD deaths), 6 million of which were people under age 70 (Figure 6.1).¹ Of those 17.5 million deaths, 7.4 million were due to coronary heart disease (heart attacks) and 6.7 million to stroke. Cancers kill around half as many (8.2 million, with 4.3 million under age 70), while CRD and diabetes accounted for 4.0 million and 1.5 million deaths, respectively.¹ Diabetes is also a risk factor for CVD, with about 11% of cardiovascular deaths attributed to high blood glucose.⁷

TRENDS

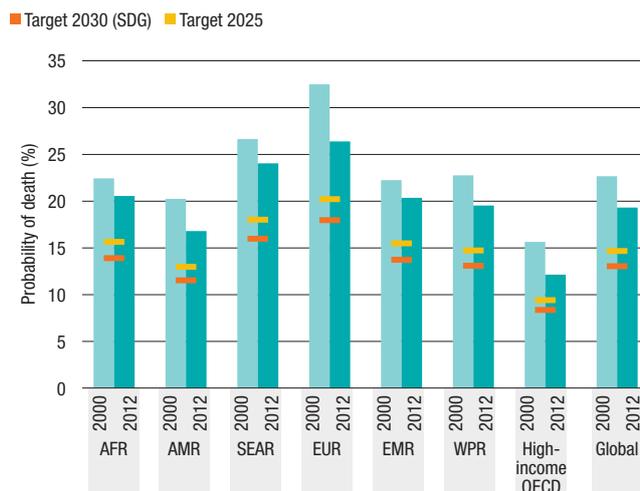
Figure 6.1
Proportion of global deaths under age 70, by cause of death, 2012¹



Overall, there has been a steady decline in NCD mortality rates in the past decade or so, with age-standardized rates falling 12% between 2000 and 2012 (from 613 per 100 000 to 538 per 100 000).¹ Much of the current public health focus is on premature mortality from NCDs, and this is reflected in the SDG target. Globally, the probability of premature death from the four main NCDs has fallen by 15% between 2000 and 2012 (Figure 6.2). In the high-income OECD countries, the probability of premature death from the four main NCDs is particularly low, indicating that many more of the deaths in other countries can be prevented by effective public health interventions, including risk reduction (public health interventions) and improved disease management interventions.

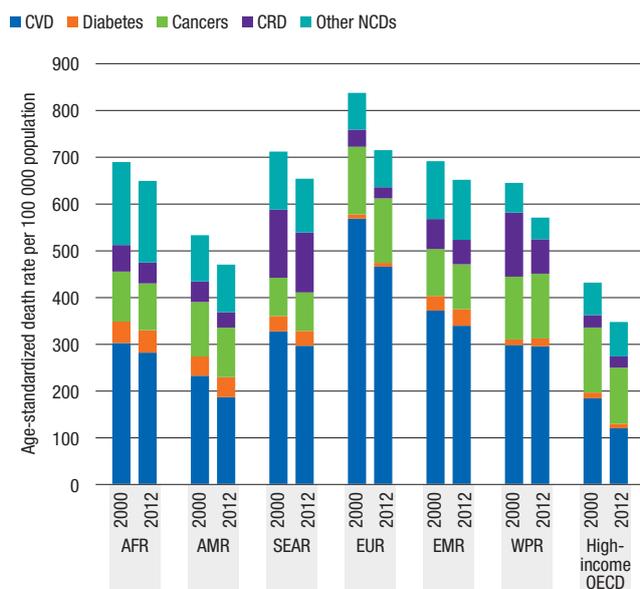
The major factor contributing to reduced NCD mortality is declining CVD deaths, which have decreased in every region (Figure 6.3). Age-standardized CVD death rates fell 16% globally between 2000 and 2012. Particularly significant declines have occurred in low-, middle- and non-OECD high-income countries in the European Region – the region with the highest levels of NCD mortality – and in high-income OECD countries.¹ These declines have been the main reason for overall improvements in life expectancy in high-income countries.⁹

Figure 6.2
Probability of death from the four main NCDs (CVD, cancer, CRD and diabetes) between ages 30 and 70, by region and globally, 2000 and 2012^{1a}



The leading risk factor for CVD is high blood pressure.⁷ Although population-level blood pressure improvements are a likely major contributor to declining CVD mortality rates in many countries, along with declines in tobacco use and advances in medical treatment, several countries have recorded increases in population-level blood pressure.¹⁰ So not all regions are making progress at the same rate. Reasons for this include inadequate reduction (or even increase) in tobacco use, high levels of salt consumption and lack of access to appropriate health care, including effective medication such as anti-hypertensive medicines and statins.¹¹

Figure 6.3
NCD death rates, by cause and region, 2000 and 2012^{1a}



By contrast, global declines in cancer mortality have been less striking, with only a 6% reduction in age-standardized rates during 2000–2012. That said, cancer covers many different conditions that present diverse mortality trends.

For example, stomach cancer, a leading cause of cancer death for both men and women, has declined around 20% globally since 2000. On the other hand, lung cancer mortality has fallen only 4% in men and has actually increased in women. Regional variability further complicates the picture, with an estimated 19% decrease in lung cancer mortality for men in the high-income OECD countries, compared to increases of greater than 15% for men in the South-East Asia Region, and both men and women in the Western Pacific Region, excluding high-income OECD countries. Lung cancer mortality rates are mainly determined by the prevalence of tobacco smoking. The largest overall improvement in cancer mortality during 2000–2012 was in the high-income OECD countries, due to falls in lung cancer mortality in men, stomach and colorectal cancer in both sexes, and breast cancer mortality in women (even though breast cancer incidence did not decline).

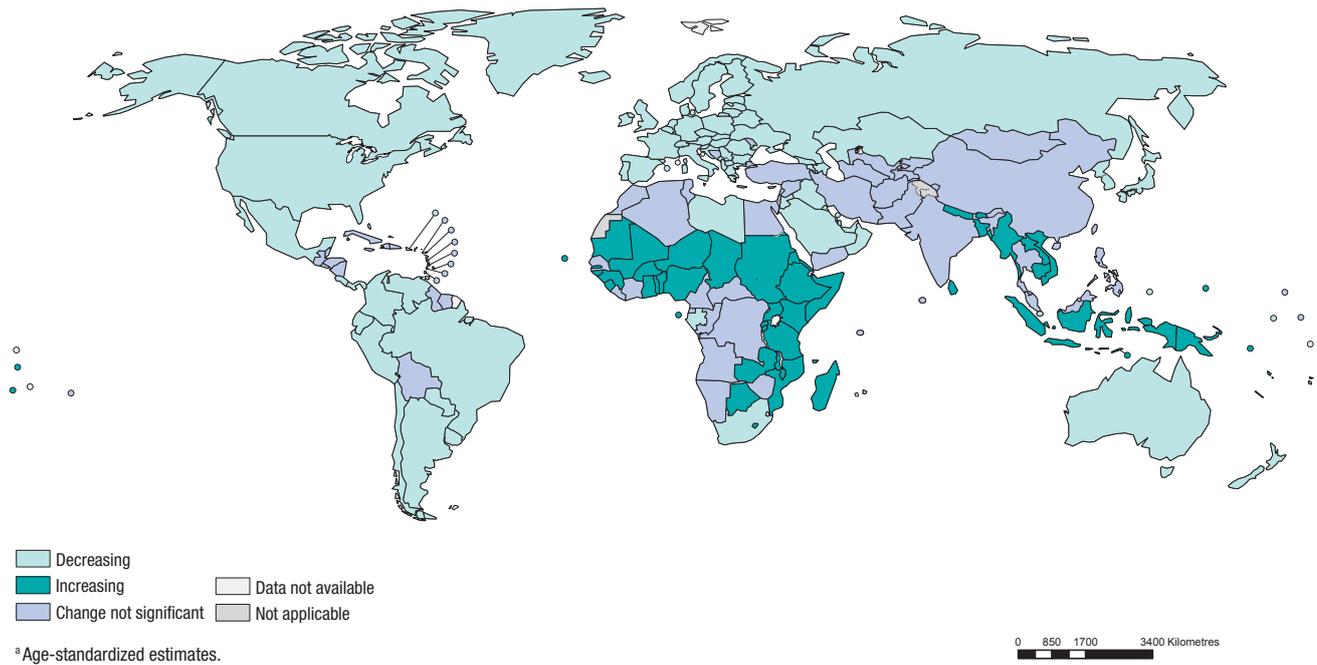
Globally, the prevalence of diabetes continues to increase.¹² The leading risk factors for type 2 diabetes are excess body weight and physical inactivity. Diabetes is highly correlated with the global prevalence of obesity, which has nearly doubled since 1980. In 2014, 11% of men and 15% of women age 18 and older were obese, while more than 42 million children under five years were overweight in 2013.¹³ It is encouraging to note, however, that a few high-income countries have managed to slow or halt the increase in obesity prevalence in children,^{14,15} which may eventually help to stabilize diabetes prevalence. In 2012, diabetes was the direct cause of 1.5 million deaths (4% of all NCD deaths), 46% of which occurred under age 70.¹ Apart from being a disease in its own right, diabetes is also a significant risk factor for CVD. The interlinked nature of the two diseases has important implications for health policy responses, as discussed below.

Progress on CRD has been impressive, with a 26% decline in estimated age-standardized CRD mortality rates between 2000 and 2012 and a near halving of CRD rates in the Western Pacific Region, excluding high-income OECD countries. Overall, it is estimated that CRD still accounted for 4 million deaths (10.7% of NCD deaths in 2012),¹ with 1.3 million of those deaths occurring under age 70. The reasons for these declines are not clear and some trends are puzzling. For example, the main known causes of the leading CRD, chronic obstructive pulmonary disease (COPD) are tobacco smoking and air pollution, but COPD mortality has declined even when tobacco smoking and air pollution have not improved.¹

POSITIVE DEVELOPMENTS

NCDs are characterized by multiple, often interlinked chains of causation, which means that identifying the specific factors that have led to their decline is challenging.

Figure 6.4
Trends in mean systolic blood pressure among females age 25 and older,^a 1980–2008^{16,17}



Nevertheless, important lessons have been learnt regarding where efforts should be focused.

A focus on prevention: It would be difficult to overstate the importance of health promotion and disease prevention in regard to NCDs, which are associated with a number of risk factors that present excellent opportunities for interventions at the population level. Reductions in tobacco use and elevated blood pressure levels have undoubtedly been key reasons for past declines in NCD mortality in many countries (figures 6.4 and 6.11).^{10,11}

Global action: The WHO FCTC, ratified in 2005 by 180 Parties, representing 90% of the global population, is the first public health treaty negotiated under the auspices of WHO and is designed to counter the tobacco use epidemic. The WHO FCTC requires its parties to implement policies designed to reduce both demand and supply of tobacco products, thus addressing social determinants of health. The WHO FCTC offers a model for addressing the negative effects of globalization on health, including the focus on a small number of evidence-based interventions, regular review of progress and country support.

Multisectoral responses: Many risk factors for NCDs relate to the air (and tobacco smoke) we breathe, the food and beverages we eat and drink, and the extent to which we move our bodies. NCD health gains have been achieved by influencing public policy in sectors such as trade, taxation, agriculture, urban development and food production. These types of policy responses are based on multisectoral consultation and collaboration. The Health-in-All-Policies approach advocated by WHO provides the foundation for the development of multisectoral responses to NCDs¹⁸ and

has already been highly effective in tobacco control.¹⁹ Its importance is recognized by the WHO FCTC, which lists comprehensive multisectoral measures and responses among its guiding principles.

Early detection, diagnosis and treatment: Lack of awareness and late detection is an issue across all the leading NCDs and it is essential to support and develop primary health-care services required for their early detection and management. Effective, low-cost interventions are available; for example, cervical cancer screening using visual inspection with acetic acid and cryotherapy or cold coagulation treatment of precancerous lesions. This type of “screen-and-treat” programme has been successfully implemented in, for instance, India.²⁰ New rapid and inexpensive tests for human papillomavirus detection are also becoming available.²¹

Integrated approaches to NCD care: Just as multisectoral collaboration is fundamental to a coherent and comprehensive NCD response, so is integrated health care. For example, the monitoring of blood pressure status should be integrated with the monitoring of blood cholesterol and blood sugar. The prevention of heart attacks and strokes through a “total cardiovascular risk approach” is more cost-effective than treatment based on individual risk factor thresholds only and should be part of the basic package for UHC.¹³ A total risk approach has been implemented in several high-income countries,²² and an increasing number of low- and middle-income countries are also adopting it, training primary care workers, including family practitioners, to assess and manage cardiovascular risk, using tools of the WHO Package of Essential Noncommunicable (PEN) disease interventions for primary health care in low-resource settings.²³ Innovative service delivery models such

as task sharing using community health workers for CVD risk assessment would free up trained health professionals in low-resource settings to do tasks that need high levels of professional training.²⁴

CHALLENGES

Despite declines in NCD mortality, business-as-usual will be insufficient to meet the WHO 25-by-25 NCD mortality target (a 25% relative reduction in premature mortality from the four main NCDs by 2025),²⁵ which can be considered a critical milestone for the SDG target of a one third reduction in premature NCD mortality by 2030. Many of the key challenges listed here are, effectively, inversions of the positive developments listed above. They include the following.

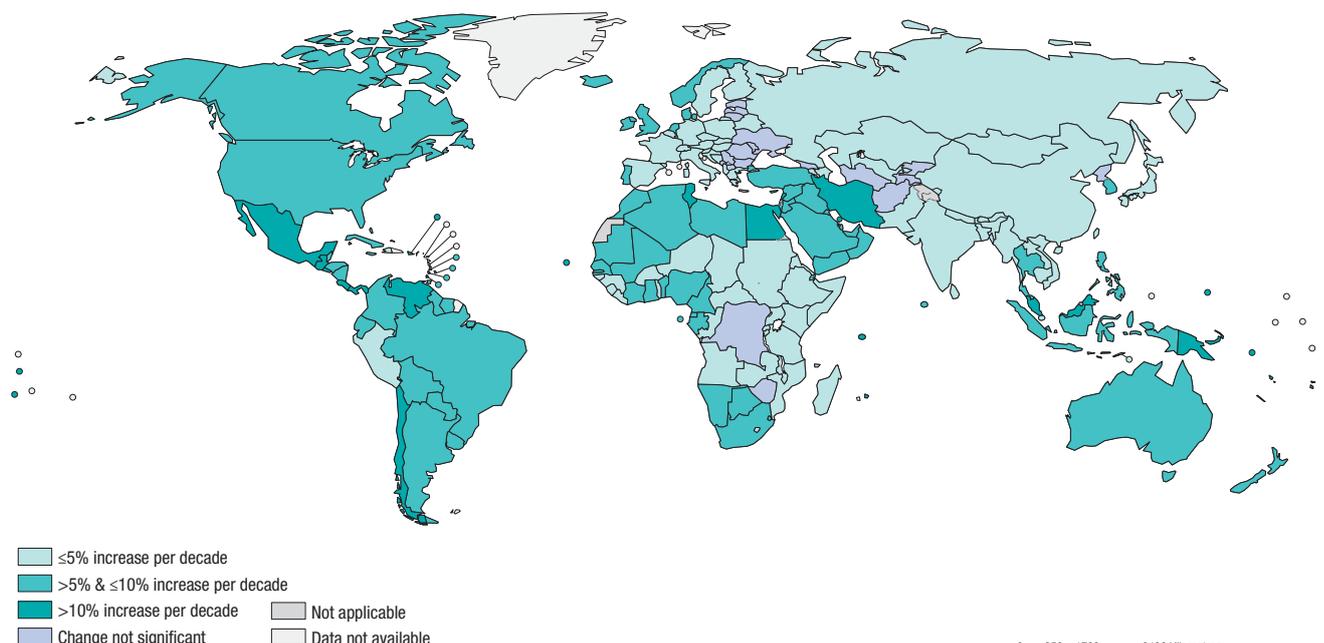
Lack of preventive action: While policy attention to NCDs has increased, too many countries continue to pay insufficient attention to the problem. For example, according to the WHO 2015 Country Capacity Survey, only 54% of countries reported having an operational national NCD policy with a budget for implementation (up from 32% of countries in 2010).^{5,26} Of these, only 37% have an NCD policy or plan which covers all four main NCDs and four main behavioural risk factors.²⁷ Where policies or plans exist, too often they are far from being fully funded. The effects of inadequate or inappropriate promotion and prevention are at least partly reflected in recent worldwide increases in body mass index, overweight (Figure 6.5) and obesity.

Limitations in primary health care, access to medicines and technology: In many countries, especially those with limited resources, health systems lack the financing, governance, workforce, health information, medical products and service delivery capacity required to meet the demands of the NCD epidemic. Primary health care services for NCDs have to be strengthened and chronic care models adopted.²⁹ Lessons learnt from management of chronic infections such as HIV may be useful.³⁰

Profit-driven disease: Many of the products associated with the development of NCDs make companies money. The multi-decade tobacco control struggle is just one example of how difficult it is to get companies to change their ways. Even though tobacco smoking prevalence is declining worldwide and in many settings, it is likely increasing in some regions, specifically among men in the African Region and the Eastern Mediterranean Region.³¹ The tobacco industry is also fiercely challenging the implementation of pictorial health warnings and plain packaging in multiple countries, arguing that the packaging regulations impinge upon trademark and intellectual property rights. Globalization of marketing and trade offers unprecedented opportunities for companies to promote products leading to tobacco use, harmful use of alcohol, consumption of food that is high in fat, especially saturated and trans fats, sugars, and salt/sodium, and sedentary lifestyles, often taking advantage of the weaker regulatory frameworks in many low- and middle-income countries³².

Rapid, unplanned urbanization: Unplanned or poorly managed urbanization brings with it many risks that have implications

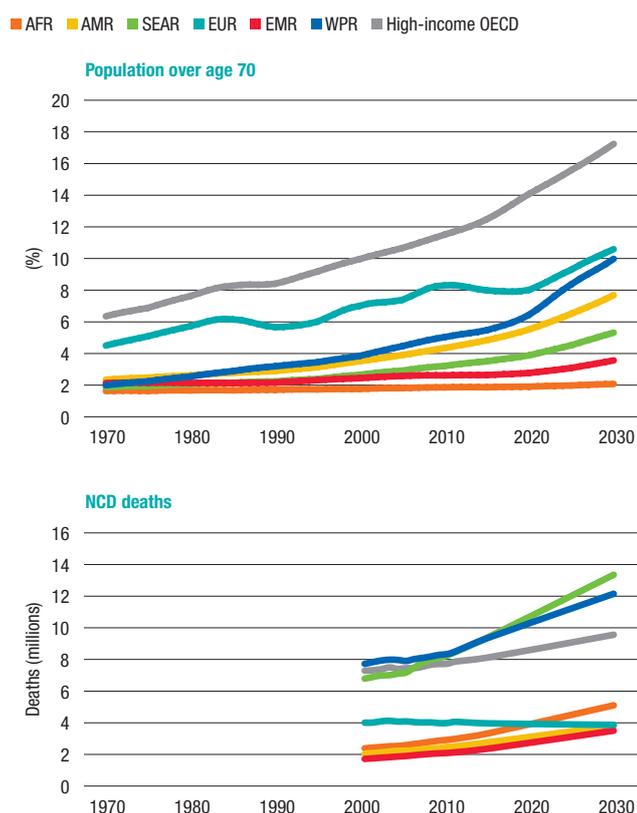
Figure 6.5
Trends in prevalence of overweight (BMI ≥ 25 kg/m²) among adults age 25 and older,^a 1980–2008²⁸



for NCD incidence and mortality, notably increased urban air pollution and sedentary lifestyles. To focus on one aspect: there has been little or no improvement in ambient air quality over the last decade, with roughly 75% of the global population being exposed to particulate matter in concentrations exceeding WHO Air Quality Guidelines in 2012, compared to 76% between 1998 and 2000. There are, however, important regional variations. For example, in many high-income countries, including in Europe and North America, air pollution has decreased markedly over the past decades because of efforts to reduce smog-forming emissions and particulate matter. These gains are balanced by significant declines in air quality in south and east Asia, largely as a result of population growth, rising population density in the regions' highly polluted cities, and increased industrialization.³³ It should be noted that urbanization also brings economic benefits and easier access to health care and public health messaging, and that sound urban planning can mitigate the negative effects of urbanization.

Ageing populations: NCD incidence and mortality increase sharply with age, and both the absolute number of older adults and percentage of the population that is older are increasing in all regions (Figure 6.6). In 2012, 58% of NCD deaths occurred in people over 70. The strain on health systems will increase in the coming years as ageing populations drive the increases in NCD disease and mortality. Patients with chronic conditions commonly suffer from several diseases simultaneously, making their treatment more complex, and increasing the need for quality care.^{34,35}

Figure 6.6
Percentage of population over age 70 by region, 1970–2030;³⁶ number of NCD deaths by region, 2000–2030²⁵



Inequalities: Overall declines in NCD mortality can mask increasing inequalities within countries.³⁷ Where data are of sufficient quality to measure NCD mortality by socioeconomic status, those with lower status generally have higher mortality than those with higher status.³⁸ In many countries, NCD inequalities are the most important source of inequalities in total mortality and life expectancy.³⁸ Achieving global targets for NCD will increasingly depend on governments' ability to implement policies and services that work effectively across all social groups to achieve UHC.

NCDs are now recognized by governments as one of the major challenges for development in low- and middle-income countries in the 21st century.³⁹ Poverty exposes people to risk factors for NCDs and, in turn, the resulting NCDs may keep people trapped in chronic poverty.

STRATEGIC PRIORITIES

The SDG target for NCDs is based on previous UN and WHO declarations that provide strategic direction. The UN Political Declaration on NCDs,³⁹ adopted at the UN General Assembly in 2011 by heads of state and governments, included a roadmap of concrete commitments, among which was a commitment to establish multisectoral national policies and plans for the prevention and control of NCDs. This declaration was followed by the World Health Assembly in May 2013, with the endorsement of the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020.³ The plan includes six key strategic objectives:

- To raise the priority accorded to the prevention and control of NCDs in global, regional and national agendas and internationally agreed development goals, through strengthened international cooperation and advocacy.
- To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of NCDs.
- To reduce modifiable risk factors for NCDs and underlying social determinants through creation of health-promoting environments.
- To strengthen and orient health systems to address the prevention and control of NCDs and the underlying social determinants through people-centred primary health care and UHC.
- To promote and support national capacity for high-quality research and development for the prevention and control of NCDs.
- To monitor the trends and determinants of NCDs and evaluate progress in their prevention and control.

The stated aim of the strategy is progress on nine global NCD targets to be attained in 2025 (Box 6.1), including the target of a 25% relative reduction in premature mortality from NCDs by 2025, that is to say an approximate doubling of what has been achieved since 2000. The mortality target is extended to a one third reduction in premature NCD mortality by 2030 for SDG Target 3.4. Meeting six of the global NCD targets (for hypertension, overweight/obesity, diabetes, high sodium, tobacco and alcohol use) (Box 6.1) would go most of the way towards meeting the NCD mortality target.²⁵ Action on tobacco use and raised blood pressure, including reducing salt intake would make the largest contribution to reducing NCD mortality. The SDG targets specify only two of the risk factors: tobacco use and harmful use of alcohol (see Chapter 7).

Box 6.1
Global voluntary targets⁴¹

In May 2013, the Sixty-sixth World Health Assembly adopted the comprehensive global monitoring framework for the prevention and control of NCDs. This framework includes 25 indicators to monitor trends and assess progress made in the prevention and control of NCDs; nine areas were selected from the 25 indicators to be targets. All targets were set for 2025, with a baseline of 2010. The global voluntary targets are:

1. A 25% relative reduction in the risk of premature mortality from CVD, cancer, diabetes or CRD.
2. At least 10% relative reduction in the harmful use of alcohol.
3. A 10% relative reduction in prevalence of insufficient physical activity.
4. A 30% relative reduction in mean population intake of salt/sodium.
5. A 30% relative reduction in prevalence of current tobacco use.
6. A 25% relative reduction in the prevalence of raised blood pressure.
7. Halt the rise in diabetes and obesity.
8. At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes.
9. An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major NCDs in both public and private facilities.

The first global voluntary target is closely linked to SDG Target 3.4, to reduced premature NCD mortality by one third by 2030.

Also central to this endeavour is the transition to UHC, including person-centred primary care integrating the WHO PEN²³ interventions. This includes achieving the two NCD health coverage targets: (i) at least 50% of eligible people receive drug therapy and counselling to prevent heart attacks and strokes; and (ii) at least 80% availability of essential medicines required to treat major NCDs. The WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 also highlights the importance of implementing cost-effective interventions to combat NCDs.⁴⁰ UHC provides an overall framework for the integration of NCD prevention and treatment services with other health services.

Finally, the plan calls for promotion and support for national research and development capacity for the prevention and control of NCDs, and support for improved measurement and monitoring of the disease burden imposed by NCDs

and their risk factors. At a more macro level, the plan underlines the importance of managing real, perceived or potential conflicts of interest, and the need for multisectoral action. It is perhaps in these last areas that we face our biggest challenge.

In 2014, the UN General Assembly adopted the 2014 Outcome Document on NCDs in which ministers committed themselves to setting (by 2015) national targets for 2025 and process indicators based on national situations, taking into account the nine global targets for NCDs.⁵ In September 2015, WHO published the WHO NCD Progress Monitor 2015⁴² which provides information for each country related to their progress regarding these indicators based on data collected during the first half of 2015. The Director-General of WHO will use the indicators to report towards the end of 2017 to the UN General Assembly, in preparation for the third UN High-level Meeting on NCDs in 2018 to take stock of national progress in implementing the roadmap of commitments included in the 2011 UN Political Declaration and 2014 Outcome Document on NCDs.

Tobacco control is a critical measure to achieve SDG Target 3.4 on reducing premature mortality due to NCDs, being one of the leading risk factors. In addition, one of the health targets is specifically about tobacco control: “Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate”.

The SDG means of implementation (Target 3.a) implies strengthening of the implementation of the WHO FCTC in all countries. These interventions include, among others: raising taxes on tobacco; banning smoking in public places; pictorial health warnings; bans on tobacco advertising; controlling illicit trade of tobacco products; identifying alternative crops to tobacco farming and preventing sales to and by minors; and collecting and sharing data on tobacco use and prevention efforts.

Unlike tobacco control, environmental determinants such as air, water and soil pollution and contamination and hazardous chemicals are not central to most NCD policies and strategies. These environmental risk factors are, however, receiving increasing attention, especially air quality, as exemplified by a recent WHA resolution to strengthen international cooperation to address air pollution. The SDGs, with air quality dimensions in at least three other goals, can provide a good platform for integrated efforts to address air pollution and other environmental determinants of NCDs.

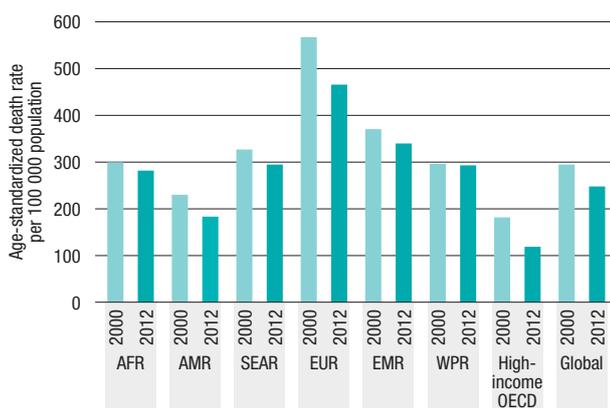
CARDIOVASCULAR DISEASES

More people die annually from CVD than from any other cause, with an estimated 17.5 million deaths in 2012 (46% of all NCD deaths).¹³ Of these deaths, an estimated 7.4 million were due to coronary heart disease and 6.7 million were due to stroke. Around one third of these CVD deaths occur in adults age 30–70, which are the focus of the global NCD and SDG targets.

TRENDS

Total CVD mortality is estimated to have declined in every region, with the largest declines in the low-, middle- and non-OECD high-income countries in the European Region, and in the high-income OECD countries, where age-standardized mortality rates declined a staggering 35% in 12 years (Figure 6.7).¹ Declines in CVD mortality rates ranged from 1% to 20% in other regions, with a global average of 16%.

Figure 6.7
CVD death rates, by region and globally, 2000 and 2012^{1,8}



POSITIVE DEVELOPMENTS

The leading risk factor for CVD is high blood pressure, which is in turn associated with unhealthy diets, particularly diets high in salt, and physical inactivity.⁷ Some 58% of cardiovascular deaths is attributable to high blood pressure.⁷ Common in all countries across the income range, and affecting both men and women, blood pressure is nevertheless susceptible to amelioration with well-established health interventions, including regular physical activity, healthy eating and treatment with anti-hypertensive medicines. Tobacco use is another major risk factor for CVD, with 30% of cardiovascular deaths caused by direct tobacco smoking or second-hand smoke.⁷

Declines in tobacco smoking, improvements in medical care and drug therapies, and population-level improvements in mean systolic blood pressure are thought to be the leading causes of declining CVD mortality rates in many countries.^{10,11} CVD mortality rates declined in spite of the ongoing obesity epidemic.^{10,43,44} The driving factors in the declines in CVD mortality include:

- Improvements in coronary care during and after acute events (myocardial infarctions) have been strongly linked to declining case-fatality and cardiovascular mortality.⁴⁵
- Targeted preventive treatment for high-risk patients with no history of coronary heart disease with anti-hypertensives and statins has protected the people who were most likely to die from CVD.⁴⁶
- Mean systolic blood pressure and cholesterol have declined in some countries, protecting the larger number of people who are at lower risk of dying from CVD.^{16,47}
- Global and country measures have resulted in declines in tobacco use (see specific section below) and contributed to improvements in cardiovascular mortality.^{10,11}
- Other factors such as reduced infections, nutritional and health-care changes, including fetal and childhood health, may have contributed to these declines, but further evidence is needed to substantiate these hypotheses.¹⁰

CHALLENGES

Despite declines in mortality, CVD remain a problem everywhere, including mortality due to CVD before age 70. Low- and middle-income countries face the heaviest disease burden. The principal challenges faced are:

- *Undetected hypertension, diabetes, and other risk factors:* Prevalence of hypertension, blood cholesterol, and diabetes remain high in some regions (figures 6.8 and 6.10). People are often unaware of their blood pressure, blood cholesterol and blood sugar levels.⁴⁸ Undetected, these can increase the risk of premature mortality from CVD.
- *Lack of access to integrated health care services:* People who suffer from CVD and other NCDs need access to effective, equitable and responsive health-care services, including diagnosis, medication and treatment, with an emphasis on continuity of care.²⁹
- *Unhealthy diet and the food industry:* Processed foods and beverages high in trans fats, saturated fats, sugar and salt are associated with increased risk of hypertension, diabetes, raised cholesterol and CVD.
- *Tobacco use and exposure to air pollution:* (see specific sections in this chapter).
- *Sedentary lifestyles:* Increased urbanization and mechanization, including use of motorized transport, may be causing less physically active lifestyles, which have implications for cardiovascular health. Data on trends in overall physical activity are sparse and inconsistent.⁴⁹
- *Equity:* Cardiovascular mortality rates are higher in poorer countries. Scaling up interventions will be challenging in settings with weak health systems that still have a large burden of communicable diseases. Within countries, people living in poorer communities generally have higher cardiovascular mortality than those living in wealthier communities.³⁸

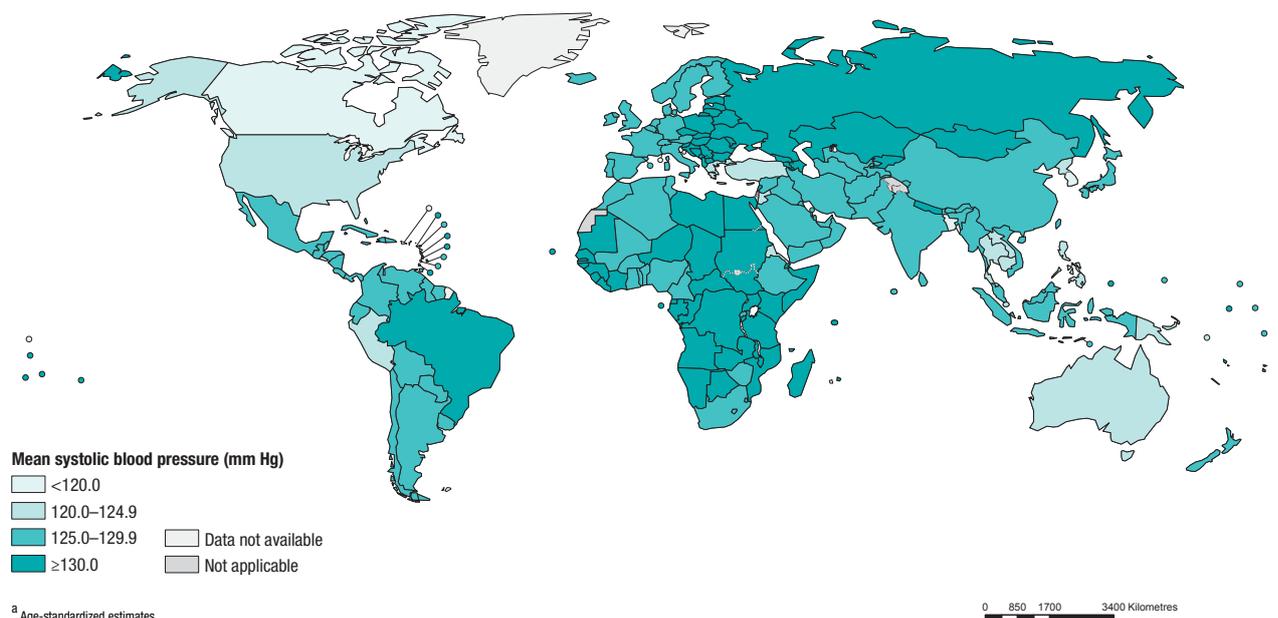
STRATEGIC PRIORITIES

The 2011 UN Political Declaration on NCDs³⁹ and the 2014 UN Outcome Document on NCDs⁵ include a roadmap of commitments which governments have made to reduce premature mortality from NCDs, which will attain the NCD-related targets included in the SDGs. The WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020³ outlines strategic priorities and policy options on how governments can fulfil these commitments.

Promotion of healthy diets will be an important step towards meeting these targets. This implies limiting the marketing of unhealthy foods/non-alcoholic beverages to children (per WHO recommendations), reducing the amount of salt consumed, increasing the consumption of fruit and vegetables, replacing saturated fatty acids/trans fats with unsaturated fatty acids, reducing free/added sugars in food and non-alcoholic beverages, and reducing calorie intake through smaller portion sizes and less energy-dense foods. The promotion of physical activity will be another key area of focus, including “active transport” (cycling and walking, supported by urban planning/transport policies to improve infrastructure for walking and cycling), recreation, leisure and sport. Quality physical education is also vital, not just in schools and for children, but also for people of all ages. Reducing the harmful use of alcohol and tobacco will also play important roles (discussed elsewhere). Finally, mass media campaigns can play an important part in changing attitudes to healthy living.

On the health systems front, a total-risk approach, which is more cost-effective than treatment decisions based on individual risk factor thresholds only,⁴⁶ needs to be adopted for early detection and cost-effective management of cardiovascular health in order to prevent heart attacks, strokes and other complications.²³ The WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 sets the global target that at least 50% of eligible people should receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes. It has been estimated that scaling up a multidrug regimen targeted at individuals with existing CVD or who are at high absolute risk of CVD could avert almost 18 million deaths over the next 10 years in 23 low-income and middle-income countries.⁵⁰

Figure 6.8
Mean systolic blood pressure among males age 18 and older,^a 2014¹³



CANCER

In 2012, the worldwide incidence of cancer rose to an estimated 14 million new cases per year, with an estimated 8.2 million cancer deaths. Globally, in 2012 the most common cancers diagnosed were those of the lung (1.8 million cases, 13% of the total), breast (1.7 million, 11.9%) and colon (1.4 million, 9.7%). The most common causes of cancer death were cancers of the lung (1.6 million, 19.4% of total cancer deaths), liver (0.7 million, 9.1%) and stomach (0.7 million, 8.8%).⁵¹ For some cancer types such as lung cancer, incidence rates are similar to death rates, indicating that most diagnosed cases end in death, while other cancer types, such as breast or cervical cancer, are less likely to be fatal and can be diagnosed early and effectively treated.

TRENDS

Worldwide age-standardized cancer mortality improved modestly between 2000 and 2012, with a 6% decline overall (Figure 6.9). But that number masks significant regional, gender and disease type variations. The largest regional improvement in cancer mortality during 2000–2012 was in the high-income OECD region, mainly due to improvements in men’s lung cancer mortality, stomach cancer and colorectal cancer mortality in both sexes, and women’s breast cancer mortality. Age-standardized cancer death rates increased in the South-East Asia Region and the Western Pacific Region, excluding high-income OECD countries.

Among the leading cancers, the largest decline in mortality rates was observed in stomach cancer, which has declined around 20% globally since 2000 (Table 6.1). Cervical cancer was the only other major cancer with a mortality decline since 2000 exceeding 10%.

Lung cancer mortality has fallen 4% for men, but increased for women. There is evidence of considerable regional variability, with an estimated 19% decrease in lung cancer mortality for men in the high-income OECD countries, compared to increases of greater than 10% for men in the South-East Asia Region and both men and women in the Western Pacific Region, excluding high-income OECD countries.

Unlike CVD, total cancer mortality rates are not lowest in the high-income OECD countries. Cancer totals mask diverse patterns in specific cancer types, some of which have higher incidence in wealthier countries (e.g. colorectal and breast cancer), while others have a lower incidence in such settings (e.g. stomach cancer and cervical cancer). Still others vary according to their main cause (e.g. lung cancer is mainly determined by tobacco use, which does not have a linear relationship with wealth). Nearly one third of cancer deaths are caused by five leading behavioural and dietary risks: high body mass index; low fruit and vegetable intake; lack of physical activity; tobacco use; and alcohol use.⁵³ Chronic infections, mainly *Helicobacter pylori*, human papillomavirus, and HBV/HCV are estimated to be associated with around 16% of cancers worldwide (with a larger role in sub-Saharan Africa).⁵⁴

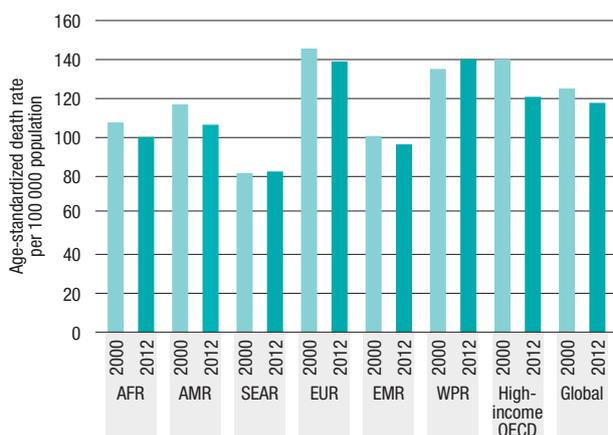
POSITIVE DEVELOPMENTS

Improved prevention: Reductions in tobacco use, as the single most important risk factor for cancer causing about 20% of global cancer deaths, have contributed to declines in cancer mortality, especially lung cancer.⁷ Several other changes in exposures and lifestyles have likely contributed to declines in incidence and mortality from stomach cancer, including reductions in salt intake coupled with increases in fresh fruits and vegetable consumption and improvements in hygiene leading to reduced infection with *Helicobacter pylori*.⁵⁵

Early detection, diagnosis and treatment: In high-income countries, declines in mortality in the face of increasing cancer incidence are likely a result of advanced quality health care.^{56,57} However, low-tech approaches to early detection of cancer have proven their efficacy in developing countries too. A prime example is cervical cancer screening using visual inspection with acetic acid and cryotherapy or cold coagulation treatment of precancerous lesions. This type of “screen-and-treat” programme has been successfully implemented in India.⁵⁸

Legislation to reduce exposure and risk behaviours: Lessons from cancer control measures in high-income countries show that prevention works, but that health promotion needs to be supported by appropriate legislation. For instance, the first international treaty sponsored by WHO, the FCTC, has been critical in reducing tobacco consumption through legislative actions, including those that increase tobacco taxes, which is one of the most effective tobacco control interventions to reduce consumption. Similar approaches need to be evaluated with regard to the consumption of alcohol, and in limiting exposure to occupational and environmental carcinogenic risks, including air pollution.

Figure 6.9
Cancer death rates, by region and globally, 2000 and 2012^{1,8}



CHALLENGES

Lack of access to effective, timely diagnosis and treatment: In the absence of effective early detection programmes such as cancer awareness or screening, patients are diagnosed at very late stages when curative treatment is no longer an option. Population-based screening methods have been implemented for cancer of the cervix, breast and colon-rectum in some high-income countries. Screening, however, is not widely implemented as the necessary resources are not available in most regions. Furthermore, diagnostic services including histopathology and treatment access are poor in many low- and lower-middle-income countries, resulting in high cancer-related mortality. Immediate investment in human resources, health services and sustainable supply chains are needed to provide timely diagnosis and treatment.

Profit-driven disease: Many of the product consumption risks associated with the development of cancers are found in high-sodium processed foods and alcoholic beverages, both of which make companies money.⁵⁹ The sale of tobacco is also extremely profitable. Challenging the production and distribution of profit-generating carcinogens is a major challenge for all countries.

Sedentary lifestyles: Physical inactivity increases the risk of several cancers, both directly⁶⁰ and as a result of increased body mass index (BMI).⁶¹

Spiralling costs: The financial cost of dealing with the growing cancer burden is damaging the economies of even the richest countries. In 2010, the total annual economic cost of cancer was estimated to reach approximately US\$ 1.16 trillion.⁵⁶ The costs of treatment for individuals can be prohibitive, resulting in forgoing treatment or catastrophic medical expenses. At the country level, failing to invest in basic cancer management can result in billions of dollars of economic loss.⁶²

Lack of palliative care: Moderate to severe cancer pain is suffered by over 80% of cancer patients in the terminal phase.⁶³ Effective public health strategies, comprising community- and home-based care, and including improved access to oral morphine are thus essential.

STRATEGIC PRIORITIES

Cancer prevention and control efforts programmes are a critical component for the achievement of the SDG target reduction in premature mortality due to NCDs. The SDG also includes several other targets that aim to reduce the exposure of people to carcinogens by creating a healthier environment with less pollution and contamination of air, water and soil (for example, Target 3.9).

As this brief outline indicates, any cancer response will need to be carried forward on multiple fronts. WHO and the International Agency for Research on Cancer (IARC) are collaborating with other UN agencies on the UN Noncommunicable Diseases Interagency Taskforce (2014) to increase political commitment for cancer prevention and control. Efforts are focusing on coordinating and conducting research on the causes of human cancer and the mechanisms of carcinogenesis, as well as on the monitoring of the cancer burden (as part of the work of the Global Initiative on Cancer Registries).

Going forward, it will be imperative to develop proven strategies for cancer prevention and control, and to generate new knowledge, and disseminate existing knowledge to facilitate the delivery of evidence-based approaches. It will also be essential to develop standards and tools to guide the planning and implementation of interventions for prevention, early detection, treatment and care, and to provide technical assistance for rapid, effective transfer of best practice interventions to developing countries. Implementation of WHO toolkits, such as the WHO Package of Essential Noncommunicable Diseases Interventions, will improve service delivery throughout the health sector by promoting early detection and effective management.²³ Finally, countries themselves need to increase efforts to strengthen health systems at national and local levels to ensure early diagnosis and deliver care for cancer patients.

Table 6.1

Six leading cancer causes of death globally, by sex, 2012, and trends in the death rates globally and by region, 2000–2012^{1,52}

Global 2012 rank	Cancer type	Global	AFR	AMR	SEAR	EUR	EMR	WPR	High-income OECD
Females									
1	Breast cancer	-8							
2	Trachea, bronchus, lung cancers	9							
3	Colon and rectum cancers	-8							
4	Cervix uteri cancer	-12							
5	Stomach cancer	-21							
6	Liver cancer	7							
Males									
1	Trachea, bronchus, lung cancers	-4							
2	Liver cancer	-2							
3	Stomach cancer	-20							
4	Colon and rectum cancers	-7							
5	Prostate cancer	-8							
6	Oesophagus cancer	-8							

■ ASDR decreased by more than 5%
■ ASDR increased by more than 5%
■ Between -5% and 5% change in ASDR

DIABETES

Type 2 diabetes accounts for 90% of diabetes cases,⁶⁴ and is largely the result of excess body weight and physical inactivity. Previously only seen in adults, type 2 diabetes is now also occurring in children as a result of increasing childhood obesity and overweight.¹³ Over time, hyperglycaemia in uncontrolled diabetes leads to serious damage to many of the body's systems. It increases the chance of foot ulcers and infection (which may eventually lead to limb amputation) and also increases the risk of blindness, heart disease and stroke.⁶⁵ The overall risk of premature death among people with diabetes is at least double the risk of their non-diabetic peers.⁶⁶

TRENDS

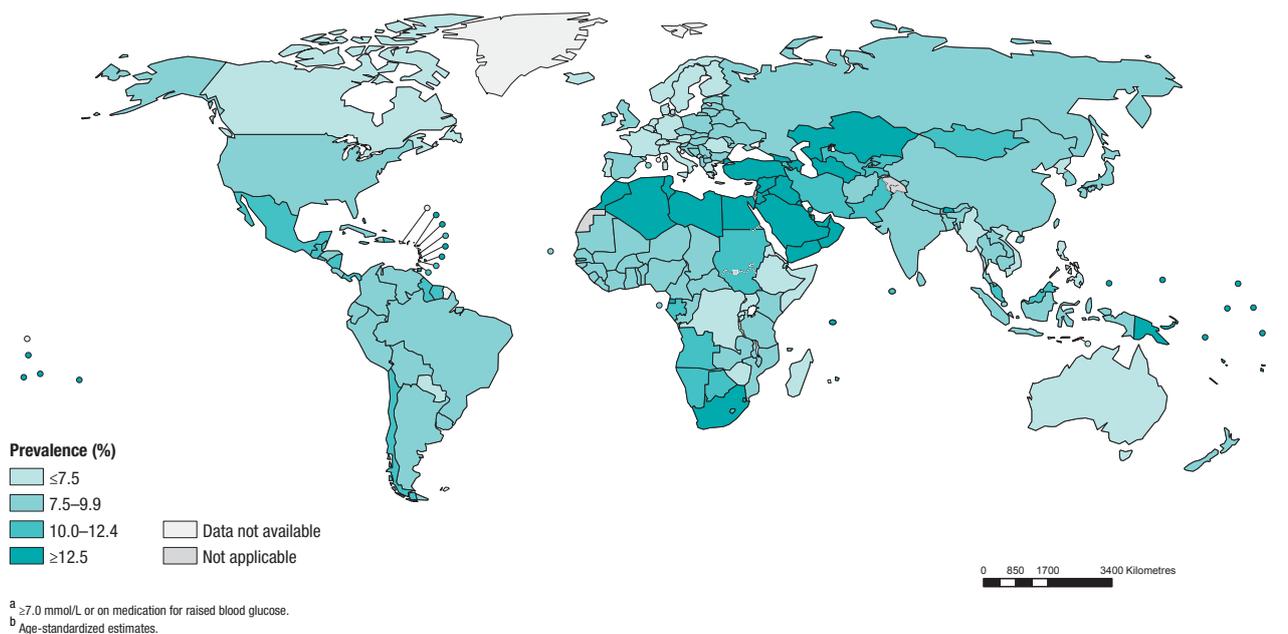
It is estimated that 9% of adults age 18 years and older has diabetes (Figure 6.10).¹³ The prevalence of diabetes is highest in the Eastern Mediterranean Region (14% for both sexes) and lowest (including high-income countries) in the European Region and the Western Pacific Region (8% and 9% for both sexes, respectively).¹³ In addition to the 1.5 million deaths for which diabetes was the underlying cause of death in 2012, diabetes was also a contributing factor for many deaths from CVD.¹

Improvements in diabetes epidemiology are hard to come by: diabetes prevalence increased in most regions of the world in recent years, and has not decreased in any region.¹² Similarly, the prevalence of obesity has nearly doubled since 1980, with no decrease recorded in any region.¹² It is encouraging to note that a few high-income countries have documented a levelling off of obesity prevalence in children,^{14,15} which may eventually stabilize diabetes prevalence. Elsewhere, obesity is continuing to increase.

POSITIVE DEVELOPMENTS

Given the lack of progress in reducing obesity and diabetes prevalence, it would be inappropriate to talk of success. However, there is good evidence that type 2 diabetes can be prevented by adopting a healthy diet, engaging in regular physical activity and maintaining a normal body weight.^{67,68,69,70} Early diagnosis, which can be accomplished through relatively inexpensive blood testing, and appropriate treatment help to avoid complications.

Figure 6.10
Prevalence of raised fasting blood glucose^a among people age 18 and older,^b 2014¹¹³



CHALLENGES

Diabetes is an increasing challenge in all countries; the following are some contributing factors.

Unhealthy diet and the food industry: Processed foods and beverages that are high in sugar are associated with obesity which increases the risk of diabetes.

Lack of political engagement: According to the WHO 2015 Country Capacity Survey, 72% of countries reported having an operational diabetes policy, strategy or action plan.²⁷ Where a policy or plan is in place, too often it is not fully funded.

Lack of diabetes prevention: Nutrition and physical activity policies are also lacking, with just over half of countries reporting that they have operational policies.

Lack of timely diagnosis and appropriate diabetes treatment: Diabetes is frequently undetected.^{71,72,73} Once it is diagnosed, management of diabetes is complex and multifaceted, including a healthy lifestyle, self-management skills and frequent need for several medicines. Even in high-income settings the management of diabetes is often inadequate. In low-resource settings, essential medicines are frequently unavailable or unaffordable.

Lack of monitoring and surveillance: Ability to measure and track the full extent of the diabetes epidemic is crucial to setting targets and monitoring progress. Some countries are only just beginning to monitor and collect data formally.

STRATEGIC PRIORITIES

Diabetes control is part of Target 3.4 on reducing premature mortality due to NCD by 2030. To push back against the twin epidemics of obesity and diabetes, a multisectoral population-based approach is required, focusing on prenatal and childhood health actions targeting the most vulnerable groups. This is acknowledged in the 2011 UN Political Declaration on NCDs⁴ and the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020³ outlines the strategic priorities.

Policies should simultaneously address different sectors that contribute to the production, distribution and marketing of food, while concurrently supporting the development of a culture of healthy physical activity.^{74,75,76} However, it is also important to develop the health services required to treat the associated health risks, notably the primary health-care services required for early detection and management. Treatment of diabetes involves lowering blood glucose and the levels of other known risk factors that damage blood vessels. Moderate blood glucose control is both cost saving and feasible in developing countries. People with type 2 diabetes can be treated with oral medication, but may also require insulin injections. Blood pressure and lipid control, foot care and screening for microvascular complications are an integral part of diabetes management.²³ Regular monitoring of the prevalence of obesity and diabetes should also be instituted as part of routine NCD surveillance.

The setting of an international target for diabetes, such as “to halt the rise in diabetes and obesity”,³ is of tremendous significance for the global diabetes community and hopefully heralds a new era of diabetes action.



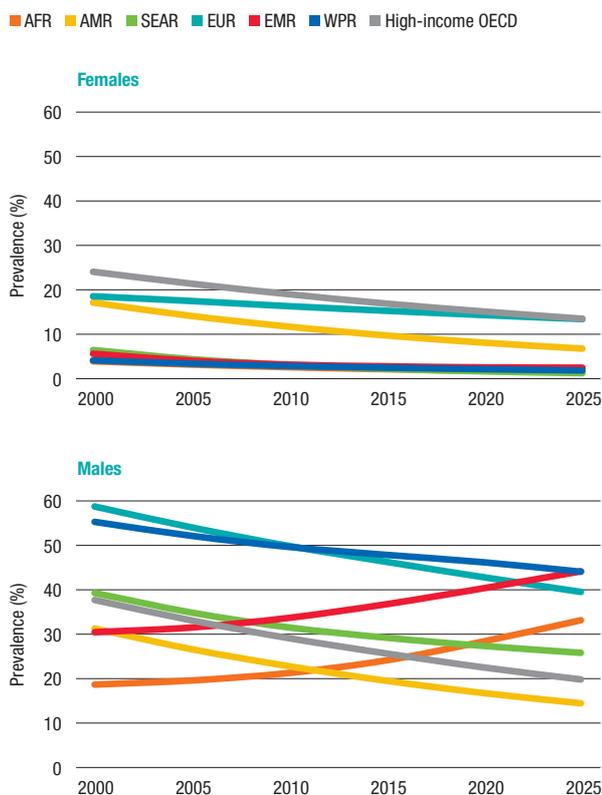
TOBACCO USE

It is estimated that there are 1.1 billion tobacco smokers worldwide.¹⁹ In 2013, high-income OECD countries accounted for around 200 million smokers, and non-OECD countries accounted for 900 million smokers. Tobacco use currently causes almost 6 million deaths per year. More than 5 million of those deaths are the result of direct tobacco use⁷⁷, while over 600 000 deaths are the result of non-smokers being exposed to second-hand smoke (including 170 000 deaths among children).⁷⁸ Other types of tobacco use, such as chewing tobacco or snuff, cause additional cancer deaths.

TRENDS

The global prevalence of tobacco smoking among people age 15 years and older is estimated to have declined from 27% in 2000 to 21% in 2013.⁷⁹ Globally, smoking prevalence declined in both men and women. Declines were largest for men in the high-income OECD countries, and in low-, middle- and non-OECD high-income countries in the European Region and the Region of the Americas (all with declines of around 10%) (Figure 6.11).

Figure 6.11
Prevalence of tobacco smoking among people age 15 years and older, by region and sex, 2000–2025⁸⁰



POSITIVE DEVELOPMENTS

Global action: The WHO FCTC has stimulated many countries to implement tobacco control measures. The WHO FCTC Secretariat, civil society and WHO have been instrumental in advocating for and operationalizing of the FCTC into country tobacco control policies and programmes (Box 6.2).

Reducing demand: In 2008, WHO identified six evidence based tobacco control measures that are the most effective in reducing tobacco use, to assist countries with implementing selected WHO FCTC obligations. Known as MPOWER, these measures that correspond to one or more of the demand reduction provisions of the WHO FCTC are:

- Monitoring tobacco use and tobacco control policies;
- Protect people from tobacco use;
- Offer help to quit tobacco use;
- Warn about the dangers of tobacco;
- Enforce bans on tobacco advertising, promotion and sponsorship;
- Raise taxes on tobacco.

Today, more than half of the world's countries, representing nearly 40% of the world's population – 2.8 billion people – has implemented at least one of these tobacco control demand reduction measures at the highest level of achievement (Figure 6.12).¹⁹ This progress more than doubles the number of countries and nearly triples the number of people covered since 2007.

Specific actions by countries: There has been steady progress in global tobacco-control efforts in recent years, both in terms of the number of countries protecting their people and the number of people worldwide protected by effective tobacco-control measures. By 2014, 49 countries had introduced comprehensive, smoke-free laws covering all public places and workplaces; 24 countries were offering adequate help to quit tobacco use; 42 countries had mandated large graphic warning labels on their cigarette packaging; 29 countries had a comprehensive ban on all tobacco advertising, promotion and sponsorship, and 33 countries had taxes representing 75% of the price of a packet of cigarettes. These achievements were realized in the face of interference and threats from the tobacco industry. Success depended on high level political leadership in government and civil society support to champion tobacco control efforts.

Box 6.2 WHO FCTC

The WHO FCTC, ratified by 180 Parties – representing 90% of the global population – is the first public health treaty negotiated under the auspices of WHO and is designed to counter the tobacco epidemic. The WHO FCTC requires its Parties to implement policies designed to reduce both demand and supply of tobacco products thus addressing social determinants of health. These interventions include, among others, raising taxes on tobacco; banning smoking in public places; pictorial health warnings; bans on tobacco advertising; controlling illicit trade of tobacco products; identifying alternative crops to tobacco farming and preventing sales to and by minors, and collecting and sharing data on tobacco use and prevention efforts. In February 2015, Parties to the FCTC celebrated 10 years of its entry into force. The WHO FCTC offers a model for addressing the negative effects of globalization on health.

CHALLENGES

Increasing use in some regions: Even though tobacco smoking prevalence is declining worldwide and in many countries, it appears to be increasing in the African Region and the Eastern Mediterranean Region.³¹ In the European Region, the Western Pacific Region and the South-East Asia Region, prevalence of tobacco smoking is still high and efforts must be intensified to reduce it. Other forms of tobacco use also need to be addressed.

Industry interference and industry tactics: The tobacco industry is fiercely challenging the implementation of pictorial health warnings and plain packaging in multiple countries, arguing that the packaging regulations impinge upon trademark and intellectual property rights. International trade and investment agreements are being used by the tobacco industry to challenge tobacco control measures in countries. New products, including Electronic Nicotine Delivery Systems (ENDS), and the growth in the use of existing products in new settings, such as water pipes, are presenting new challenges to tobacco control policymakers and regulatory bodies.

Illicit trade: Illicit trade is a significant challenge to the reduction of tobacco use: one in 10 tobacco products available worldwide has been illicitly traded. Contraband cigarettes not only reduce governments' tax revenues, but are also more affordable to vulnerable populations such as youth and low-income groups. In some instances, illicit trade has been supported by tobacco companies as a way of getting a foothold in markets.

Farmers and agriculture: Supply reduction cannot be forced upon farmers who depend on tobacco crops for their livelihoods. However, economically viable alternative crops should be explored: tobacco growing is harmful to health in itself,⁸² and support needs to be available for farmers wishing to switch to alternative crops.

Equity: An analysis of the association between smoking prevalence and wealth within countries, using survey data from 2002 to 2004 in 48 low- and middle-income countries, found that current smoking was generally more prevalent in the poorer wealth quintiles, with the exception of women in some middle-income countries.⁸³

STRATEGIC PRIORITIES

Tobacco control is a critical measure to achieve SDG Target 3.4 on reducing premature mortality due to NCD, being one of the leading risk factors for NCD. In addition, one of the health targets is specifically about tobacco control: "Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate".

The MPOWER measures for tobacco control, in line with the WHO FCTC, are listed in the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020,³ including the most cost-effective interventions ("best buys") for tobacco control.⁸⁴ Evidence shows that the most cost-effective reduction measures for reducing tobacco use are:

- reducing the affordability of tobacco products by increasing tobacco excise taxes;
- creating by law completely smoke-free environments in all indoor workplaces, indoor public places and public transport;
- alerting people to the dangers of tobacco and tobacco smoke through effective health warnings and mass media campaigns;
- banning all forms of tobacco advertising, promotion and sponsorship.

The measures are far more likely to be effective where implemented as part of a comprehensive approach, as envisaged by the WHO FCTC. Full implementation of the WHO FCTC involves adopting other demand reduction measures such as helping tobacco users to quit and regulating tobacco products. These provisions should be implemented via national tobacco control legislation and countries should ensure effective law enforcement. Integrating the implementation of the WHO FCTC with national health and development strategies and plans is also fundamental. Because tobacco control is a multisectoral issue, it requires an increase in multisectoral discussions and actions, including, for example, setting up and financing a functional multisectoral coordination mechanism, a focus on the relation between tobacco control and international trade or alternative livelihoods for tobacco farmers. When implementing the WHO FCTC, the infrastructures and capacities dedicated for broader tobacco control efforts should be integrated with other communicable and NCD programmes, such as for tuberculosis or respiratory diseases.

Figure 6.12
Number of POWER interventions implemented at the highest level, 2014⁸¹



AIR POLLUTION

SDG Target 3.9 aims to reduce deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. Exposure to air pollution is discussed here because of its strong link to NCDs; water-related issues are discussed in Chapter 5, and other environmental risks in Chapter 2. Exposure to indoor (household, due to burning of solid fuels such as wood and charcoal) and outdoor (ambient) air pollution is a major risk factor for NCDs such as heart disease, stroke, COPD and lung cancer. Exposure to indoor air pollution is particularly high among women and young children, who spend the most time near the domestic hearth.⁸⁵

TRENDS

Indoor and outdoor air pollution are jointly responsible for about 7 million premature deaths annually (Figure 6.13),⁸⁶ the vast majority occurring in low- and middle-income countries. Worldwide, 3.7 million premature deaths were attributable to outdoor pollution in 2012. About 88% of these deaths occurred in low- and middle-income countries, which represent 82% of the world population. The South-East Asia Region and the Western Pacific Region bear most of the burden of outdoor air pollution with 936 000 and 1.74 million deaths, respectively.⁸⁷

Between 1980 and 2012, there was a significant decrease in the proportion of households primarily relying on solid fuels for cooking, the fraction dropping from 62% in 1980 to 41% in 2012.⁸⁸ However, the absolute number of people relying on solid fuel use primarily for cooking has remained relatively constant over the last three decades at around 3 billion people. One of the most striking success stories for household air pollution is in China, where a national improved cookstoves programme distributed over 130 million improved chimney cookstoves in the 1990s. This programme led to a decreased risk of lung cancer, COPD and pneumonia in adults.⁸⁹

Little or no improvement in outdoor air quality has been made over the last decade. In 2012, roughly three quarters of the global population was exposed to particulate matter in concentrations exceeding WHO Air Quality Guidelines, a figure that remained unchanged since 1998–2000 (Figure 6.14). There are, however, important regional variations. For example, in many high-income countries, including in Europe and North America, air pollution has decreased markedly over the past decades due to efforts to reduce smog-forming emissions and particulate matter. These gains are balanced by significant declines in air quality in south and east Asia, largely as a result of population growth (and increasing population density in the regions' highly polluted cities) and increasing industrialization.³³



POSITIVE DEVELOPMENTS

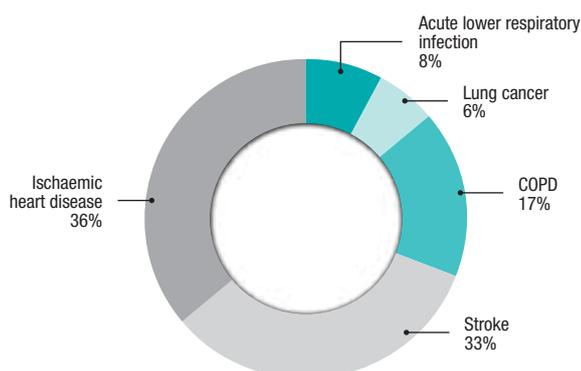
Clean air policies: Air pollution levels can be reduced through investments in sustainable policy options for transport (including mass transit development and encouraging walking and cycling), clean and renewable energy, energy efficient buildings, waste reduction and recycling (to avoid the burning of solid and agricultural waste) and energy efficient industry. The use of health impact assessments and cost–benefit analysis of the policies has stimulated the selection of policy options that are most beneficial for air quality and for health.

Norms and standards: National and international emissions benchmarks have created a level playing field that has enabled industry to develop and use more efficient and less polluting products. Examples include internationally recognized air pollution targets, clean fuel standards and emission rates targets for household fuel combustion,⁹¹ all of which have helped guide the development and implementation of effective policies.

Tracking progress, monitoring and evaluation: Comparative risk assessment estimates have been a major factor in raising awareness and motivating the engagement of development actors. Databases on household energy, household air pollution⁹² and ambient air quality in cities⁹³ are integral to the design, implementation and monitoring of policies and interventions to reduce air pollution, and serve as key information resources for robust disease burden estimates and global initiatives on energy and climate.

Partnerships and conventions: International initiatives, such as the UN Secretary-General Sustainable Energy for All Initiative, the Climate and Clean Air Coalition, the Convention on Long-Range Transboundary Air Pollution, the Partnership for Clean Indoor Air, the Global Alliance for Clean Cookstoves, and the Partnership for Clean Fuels and Vehicles, have spurred major actions with benefits for air quality and health.

Figure 6.13
Distribution of 7 million deaths attributable to the joint effects of household and ambient air pollution by disease, 2012⁸⁶



CHALLENGES

Air pollution remains a problem everywhere, but low- and middle-income countries carry the greatest air pollution burden. The following are the principal challenges to be faced.

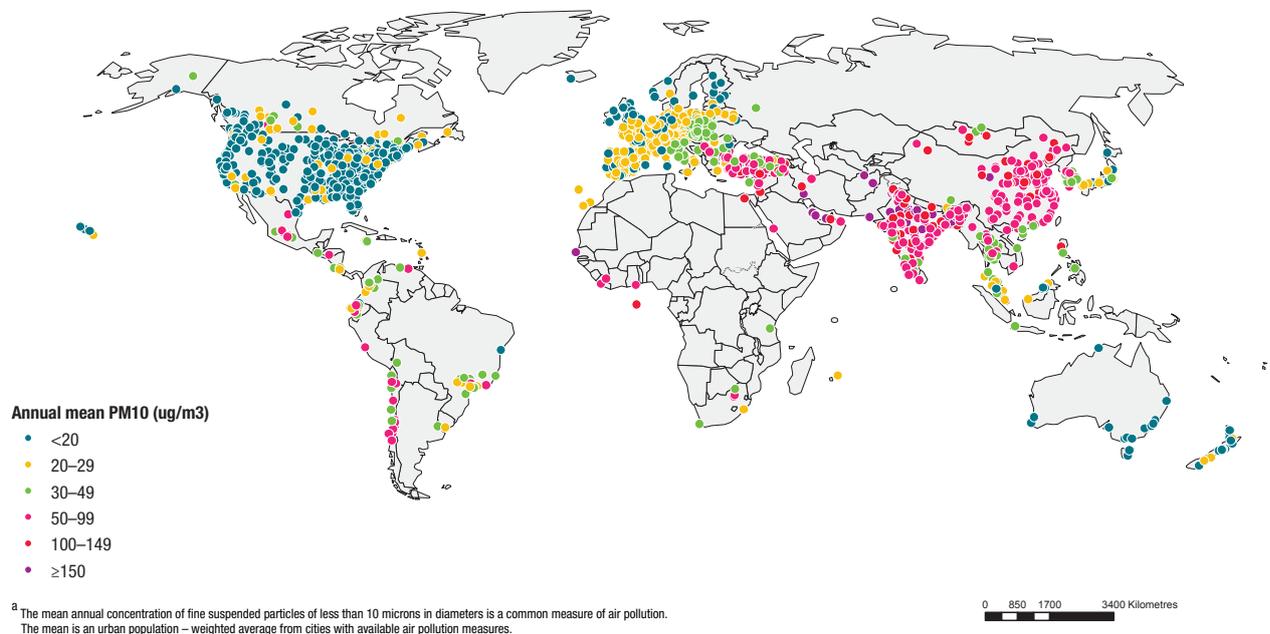
- *Uncontrolled urban expansion:* Cities are growing fast, but most in an uncontrolled manner or based on outdated models of urban development that lead to pollution and ill-health. Sustainability and a Health-in-All-Policies¹⁸ approach need to be mainstreamed into urban development.
- *Lack of multisectoral policy-making:* Working across the many sectors that relate to health and air pollution presents challenges. The polluting sectors are largely unaware of the potential health benefits cleaner policies could bring, and the health sector often lacks access to the knowledge, tools and skills to support multisectoral action to tackle air pollution.
- *Lack of finance for research and development:* Resources are needed to support investments in technology improvements to tackle the sources of air pollution in low- and middle-income countries.
- *Lack of monitoring:* Comprehensive monitoring of air pollutants and their sources is still lacking in many countries, limiting decision-makers' ability to assess risk, set targets and measure progress.
- *Exposure to and health burden from air pollution:* Both of these are highest in low- and middle-income countries where governments are faced with many other competing health and development challenges and limited resources.

STRATEGIC PRIORITIES

The SDG targets pay considerable attention to the need to address air quality, as part of a target on the health consequences of contamination and pollution under the health goal (Target 3.9) and as a component of several other goals such as those on safe, sustainable cities and human settlements (SDG 11), sustainable energy (SDG 7), sustainable industrialization (SDG 9), and combating climate change (SDG 13). In May 2015, the World Health Assembly resolution "Addressing the health impacts of air pollution", adopted unanimously by the 194 Member States, aimed to further strengthen efforts and international cooperation to address air pollution. Key strategic priorities for the future include: developing new energy efficient and affordable technologies such as induction stoves that can reduce household air pollution and related health risks; strengthening health sector capacity to contribute to multisectoral policy-making that benefits health and air quality; and improving the monitoring of air quality and identification of pollution sources, including through satellite remote sensing, portable monitors, data mining and crowd sourcing.

Figure 6.14

Exposure to particulate matter with an aerodynamic diameter of 10 µm or less (PM₁₀) in 1600 urban areas,^a 2008–2013⁹⁰



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