HEALTH IN 2015

from MDGs

MILLENNIUM DEVELOPMENT GOALS

to SDGs

SUSTAINABLE DEVELOPMENT GOALS

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PREFACE

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In 2015 the Millennium Development Goals (MDGs) come to the end of their term, and a post-2015 agenda, comprising 17 Sustainable Development Goals (SDGs), takes their place. We stand on the threshold of a new era. This is an important moment to look back at the trends that have defined health-related development under the MDGs, noting achievements, highlighting lessons learned, drawing attention to unfinished business, and looking forward to the challenges we must now face.

While progress towards the MDGs has been impressive in many ways, much work remains to be done. In health, unprecedented progress has been made in reducing maternal and child mortality and in the fight against infectious diseases, even though several global and many country MDG targets were not met. The unfinished agenda needs to be addressed, but more importantly the dramatic progress paves the way for more ambitious achievements by 2030. Similarly important is addressing other significant, ongoing public health challenges that were left out of the MDGs altogether, notable among them the challengse of acute epidemic diseases, disasters and conflict siituations, the burgeoning epidemic of noncommunicable diseases and mental health disorders and large inequalities in all parts of the world.

The SDGs address many of these issues head on, setting a new health goal ("Ensure healthy lives and promote well-being for all at all ages") with a broad set of targets. The SDGs also significantly broaden the scope of action with 17 goals, covering a wide range of human activity across the three sustainable development dimensions (economic, social and environmental): people, planet, prosperity, peace and partnership, the five Ps of the new agenda, an agenda for all countries.

Fundamental to achieving the SDGs will be the recognition that eradicating poverty and inequality, creating inclusive economic growth, preserving the planet and improving population health are not just linked but interdependent. This has profound implications for development strategy, many of which will only be revealed as we move forward. But some seem fairly clear at the outset, including the fact that silo-based, vertical approaches to development will have to give way to broader, cross-cutting approaches coordinated around and aligned with countries' needs and priorities.

By taking a more integrated approach to development the SDGs present us with an opportunity to advance, seizing opportunities to collaborate and exploit synergies. However, there are clearly challenges too. For example, in order to take on cross-cutting issues, it will be necessary to achieve far greater intersectoral coherence and coordination of effort. To achieve that end, a new impetus will have to be given to global and regional partnerships and collaborations, with a focus on country action.

A great deal has been achieved since 2000. However, progress can easily be reversed if we do not maintain our commitment to making the world a better place for all, leaving no one behind. Key to achieving that vision will be focusing our efforts intelligently, and setting clear, measurable goals that national governments and development partners can support. In health the target on universal health coverage (UHC) provides the platform for integrated action across all 13 health targets. Rather than being seen as one target among many, it is my belief that UHC should be seen as the linchpin of the health development agenda, not only underpinning a more sustainable approach to the achievement of the other health targets, but allowing for a balance between them. Relevant to all, it can now be monitored within an accepted framework which will allow for target setting and measurement of progress. It is, I believe, our way forward. This report is a first step in a series of actions that I am taking to make WHO fit to fully support the implementation of the SDG agenda.

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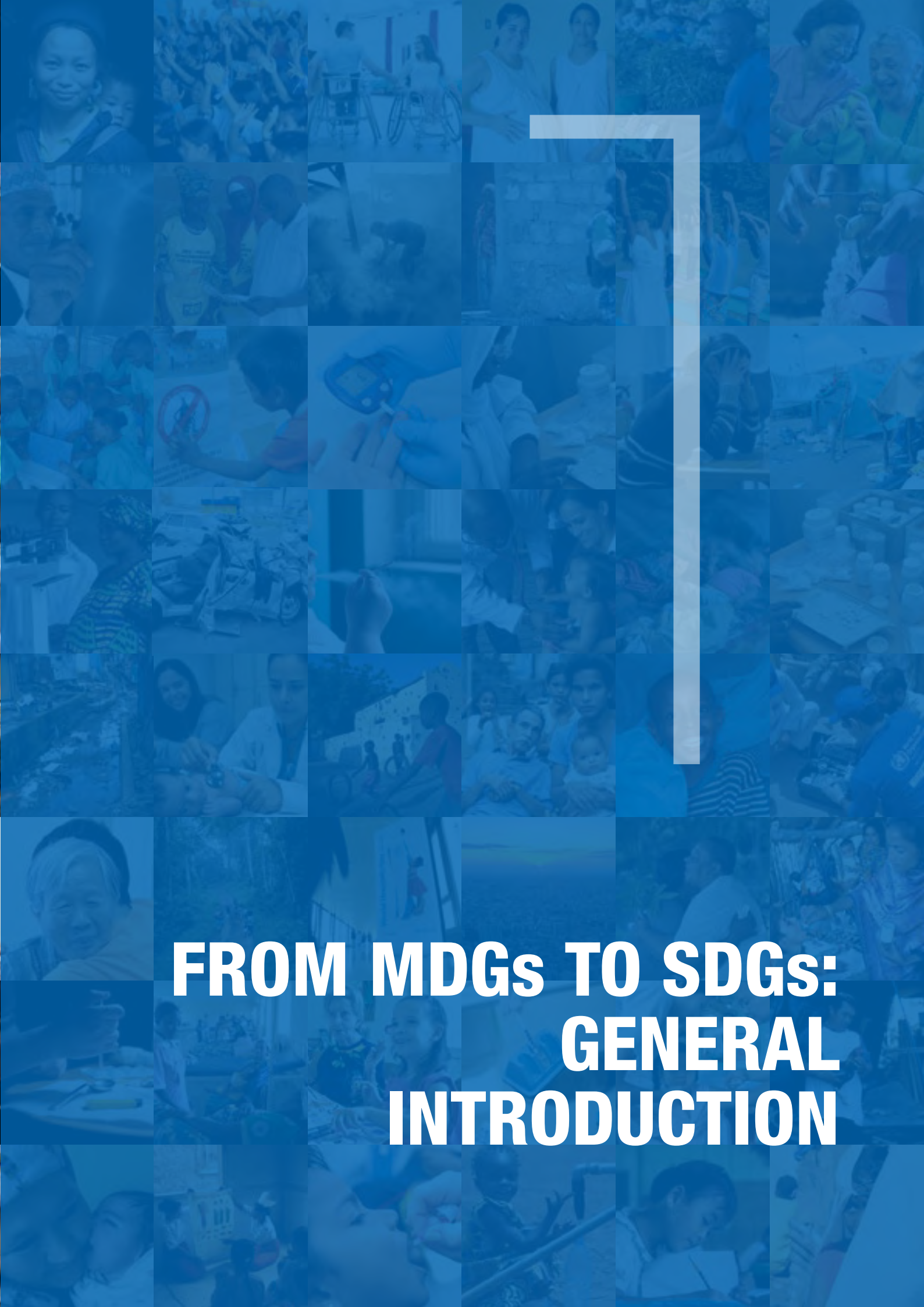
ABBREVIATIONS

ACT	artemisinin-based combination therapy
AFR	WHO African Region
AIDS	acquired immunodeficiency syndrome
AMR	WHO Region of the Americas
ART	antiretroviral therapy
ARV	antiretroviral drug
BCG	bacillus Calmette-Guérin
BMI	body mass index
CDC	Centers for Disease Control and Prevention (USA)
COPD	chronic obstructive pulmonary disorder
CRD	chronic respiratory disease
CRVS	civil registration and vital statistics
CVD	cardiovascular disease
DALY	disability-adjusted life year
DHS	Demographic and Health Survey
DTP	diphtheria, tetanus, pertussis (whooping cough)
ECOSOC	United Nations Economic and Social Council
EMR	WHO Eastern Mediterranean Region
ENAP	Every Newborn Action Plan
EPMM	Ending Preventable Maternal Mortality
EUR	WHO European Region
FGM	female genital mutilation
FP2020	Family Planning 2020
G8	Group of 8 countries
GDP	gross domestic product
GISRS	WHO Global Influenza Surveillance and Response System
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GNI	gross national income
GOARN	Global Outbreak Alert and Response Network
HAI	Health Action International
HBV	hepatitis B virus
HCV	hepatitis C virus
Hib	Haemophilus influenzae type b
HIV	human immunodeficiency virus
HLPF	High-Level Political Forum
HPV	human papillomavirus
HRH	human resources for health
IAEG	Inter-agency and Expert Group
ICT	information and communication technologies
IHP+	International Health Partnership and related initiatives

IHR	International Health Regulations
IPCC	Intergovernmental Panel on Climate Change
ITN	insecticide-treated mosquito net
LLIN	long-lasting insecticidal net
MCV	measles-containing vaccine
MDG	Millennium Development Goal
MDR TB	multidrug-resistant TB
mhGAP	WHO Mental Health Gap Action Programme
MICS	Multiple Indicator Cluster Survey
MMR	maternal mortality ratio
NCD	noncommunicable disease
NMR	neonatal mortality rate
NTD	neglected tropical disease
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OWG	Open Working Group
PCV	pneumococcal conjugate vaccine
PEPFAR	United States President's Emergency Plan for AIDS Relief
POP	persistent organic pollutant
PPP	purchasing power parity
R&D	research and development
RMNCAH	reproductive, maternal, newborn, child and adolescent health
RMNCH	reproductive, maternal, newborn and child health
SARS	severe acute respiratory syndrome
SDG	Sustainable Development Goal
SEAR	WHO South-East Asia Region
SSFFC	substandard, spurious, falsified, falsely-labelled and counterfeit
STI	sexually transmitted infection
TB	tuberculosis
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
U5MR	under-five mortality rate
UHC	Universal Health Coverage
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNESCO	United Nations Education, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
USAID	United States Agency for International Development
WASH	drinking-water, sanitation and hygiene
WHA	World Health Assembly
WHO	World Health Organization
WHO FCTC	WHO Framework Convention on Tobacco Control
WHO PEN	WHO Package of Essential NCD Interventions
WPR	WHO Western Pacific Region
WTO	World Trade Organization
YLD	years of healthy life lost due to disability
YLL	years of life lost to mortality



1

FROM MDGs TO SDGs: GENERAL INTRODUCTION

SUMMARY

This report aims to describe global health in 2015, looking back 15 years at the trends and positive forces during the Millennium Development Goal (MDG) era and assessing the main challenges for the coming 15 years.

The 2030 Sustainable Development Agenda is of unprecedented scope and ambition, applicable to all countries, and goes well beyond the MDGs. While poverty eradication, health, education, and food security and nutrition remain priorities, the Sustainable Development Goals (SDGs) comprise a broad range of economic, social and environmental objectives, and offer the prospect of more peaceful and inclusive societies.

Progress towards the MDGs, on the whole, has been remarkable, including, for instance, poverty reduction, education improvements and increased access to safe drinking-water. Progress on the three health goals and targets has also been considerable. Globally, the HIV, tuberculosis (TB) and malaria epidemics were "turned around", child mortality and maternal mortality decreased greatly (53% and 44%, respectively, since 1990), despite falling short of the MDG targets.

During the MDG era, many global progress records were set. The MDGs have gone a long way to changing the way we think and talk about the world, shaping the international discourse and debate on development, and have also contributed to major increases in development assistance. However, several limitations of the MDGs have also become apparent, including a limited focus, resulting in verticalization of health and disease programmes in countries, a lack of attention to strengthening health systems, the emphasis on a "one-size-fits-all" development planning approach, and a focus on aggregate targets rather than equity.

The 17 goals and 169 targets, including one specific goal for health with 13 targets, of the new development agenda integrate the three dimensions of sustainable development around people, planet, prosperity, peace and partnership. The health goal is broad: "Ensure healthy lives and promote well-being for all at all ages". Health has a central place as a major contributor to and beneficiary of sustainable development policies. There are many linkages between the health goal and other goals and targets, reflecting the integrated approach that is underpinning the SDGs. Universal health coverage (UHC), one of the 13 health goal targets, provides an overall framework for the implementation of a broad and ambitious health agenda in all countries.

Monitoring and review of progress will be a critical element of the SDGs. An indicator framework is still being developed and is scheduled to be adopted in 2016.

On 25 September 2015, the United Nations (UN) General Assembly adopted the new development agenda "Transforming our world: the 2030 agenda for sustainable development".[1] The new agenda is of unprecedented scope and ambition, and applicable to all countries. The post-2015 framework goes far beyond the MDGs, which nevertheless provided an important framework for combatting poverty and promoting development in low- and middle-income countries during the past 15 years. While poverty eradication, health as a basic human right, education, and food security and nutrition remain priorities, the SDGs comprise a broad range of economic, social and environmental objectives, as well as offering the promise of more peaceful and inclusive societies. The 17 goals and 169 targets, including one specific goal for health with 13 targets, have many linkages and cross-cutting elements, reflecting the integrated approach that underpins the SDGs.

This report aims to describe global health in 2015, looking back 15 years at the trends and positive forces during the MDG era and assessing the main challenges for the coming 15 years. The following chapter describes the context, including population and epidemiological changes, and the economic, social and environmental determinants of health. The subsequent six chapters present the trends and challenges for the main health areas that are prominent in the health goal of the SDGs: UHC; reproductive, maternal, newborn, child and adolescent health; infectious diseases; noncommunicable diseases (NCDs); mental health and substance abuse; and injuries and violence. Some chapters cover multiple health targets and, where relevant, refer to SDG targets that are in other goals. The final chapter reflects on the implications of the SDG for health.

Each chapter summarizes the achievements and progress towards the health-related MDGs since 2000, or trends in areas that were not prioritized in the MDGs. Key factors that have contributed to the success of the past 15 years are identified, ranging from country actions to global partnerships, funding increases and scale-up of new interventions. The major challenges for health in 2015 and the next 15 years are also summarized. The last part of each chapter puts together the strategic priorities as defined in the SDG targets, and links those to World Health Organization (WHO) resolutions, global action plans and other critical strategic documents. For many areas, the World Health Assembly has already laid out what countries and the international community should prioritize to make significant progress towards the new SDG targets. In many other areas, the SDGs offer a new, broader and integrated perspective that needs further concretization and impetus in regard to UHC and intersectoral approaches.

This introductory chapter starts with a brief review of the general health-related MDG achievements, strengths and limitations. The second part describes the health-related SDG targets, including how health is reflected in other goals and targets, and discusses how the monitoring of progress towards the health-related SDG can be accomplished.

MDGs

In September 2000, the UN General Assembly adopted the Millennium Declaration, establishing a global partnership of countries and development partners committed to eight voluntary development goals, to be achieved by 2015. Representing ambitious moral and practical commitments, the MDGs[2] called for action to: (1) eradicate extreme poverty and hunger; (2) achieve universal primary education; (3) promote gender equality and empower women; (4) reduce child mortality; (5) improve maternal health; (6) combat HIV/AIDS, malaria and other diseases; (7) ensure environmental sustainability; and (8) develop a global partnership for development. Three of the eight MDGs are focused on health, while health is also a component of several other MDGs (nutrition, water and sanitation).[3]

There has been unprecedented mobilization of resources around MDG-related activities across a wide spectrum of global and national initiatives and the development community has convened on a regular basis to assess progress. Major global events related to the MDGs include: the 2001 and 2011 UN special sessions on HIV/AIDS, convened to intensify international activity to fight the epidemic;[4] the 2005 World Summit,[5] which reaffirmed the commitments to the Millennium Declaration; the 2008 high-level event at the UN in New York,[6] at which there was a call to accelerate progress towards the MDGs; the 2010 Millennium Development Goals Summit, which concluded with the adoption of a Global Action Plan and the announcement of multiple initiatives against poverty, hunger and disease, as well as initiatives designed to accelerate progress on women's and children's health, and at which specific MDG-related commitments were made by countries and others;[7] and, most recently, the 2013 UN special event to follow up on MDG-related efforts.[6] Many regional and country events have also been held to review progress and make new commitments.

The MDGs have gone a long way to changing the way we think and talk about the world, shaping the international discourse and debate on development, and stimulating popular awareness of moral imperatives such as achieving gender equality and ending poverty and starvation. The MDGs have also contributed to major increases in development assistance,[8,9,10] as evidenced by the 66% jump in official development assistance (ODA, in real terms) between 2000 and 2014 when it reached an unprecedented US$ 135 billion.[3] More aid has flowed into education and public health, while also being directed towards poorer countries to supplement the increases in domestically

sourced development finance.[11] The influence on donor policies and practices and – more variably – on governments in the developing world, has been considerable.[12] For instance, the MDGs (specifically MDG 6) were integral considerations in the policy formation of the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), which was created in 2002.

Tracking progress towards the MDGs has required a significant investment in measuring the 60 key indicators which are used to monitor the 8 MDGs and their 21 targets. Annual progress reports are produced by the Inter-agency and Expert Group (IAEG) on MDG indicators, coordinated by the UN Statistics Division, and based on the contributions of technical agencies.[3] In 2008, the World Health Assembly called for regular monitoring of progress towards the health MDGs[13] and has conducted annual reviews of progress since 2009, based on a report prepared by the Secretariat derived from the WHO annual statistical overview and WHO Global Health Observatory data.[14,15]

Health in the MDG: achievements

Progress towards the MDGs has, on the whole, been remarkable. With regard to extreme poverty, for example, the number of people living on less than US$ 1.25 per day has declined by more than half, from 1.9 billion in 1990 to 836 million in 2015. Similarly, the proportion of undernourished people in the developing regions has fallen from 23% in 1990–1992 to 13% in 2014–2016. The child undernutrition indicator target has almost been met (Table 1.1).

Table 1.1
Global and WHO regional status of the health-related MDGs

Met or on track Half way Insufficient progress

		Target	Global	AFR	AMR	SEAR	EUR	EMR	WPR
Target 1.C Halve, between 1990 and 2015, the proportion of people who suffer from hunger	Percent reduction in proportion of underweight children under-five years of age, 1990–2015	50	44	35	63	49	85	39	82
Target 4.A Reduce by two thirds, between 1990 and 2015, the under-five mortality rate	Percent reduction in under-five mortality rate, 1990–2015	67	53	54	65	64	65	48	74
	Measles immunization coverage among one-year-olds[a] (%), 2014	90	85	73	92	84	94	77	97
Target 5.A Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio	Percent reduction in maternal mortality ratio, 1990–2015	75	44	44	49	69	63	54	64
	Births attended by skilled health personnel[b] (%), 2013	90	73	54	96	59	99	67	95
Target 5.B Achieve, by 2015, universal access to reproductive health	Antenatal care coverage (%): at least one visit, 2013	100	88	81	99	84	99	79	95
	Unmet need for family planning (%), 2015	0	24	55	19	27	28	42	10
Target 6.A Have halted by 2015 and begun to reverse the spread of HIV/AIDS	Percent reduction in HIV incidence, 2000–2014	>0	45	59	28	50	-16	< -50	27
Target 6.C Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	Percent reduction in incidence of malaria, 2000–2015	>0	37	42	78	49	100	70	65
	Percent reduction in incidence of tuberculosis, 1990–2014	>0	17	1	49	17	14	12	48
Target 7.C Halve, by 2015, the proportion of people without sustainable access to safe drinking-water	Percent reduction in proportion of population without access to improved drinking-water sources, 1990–2015	50	62	38	62	74	67	39	84
	Percent reduction in proportion of population without access to improved sanitation, 1990–2015	50	31	7	47	32	28	54	54

AFR, African Region; AMR, Region of the Americas; SEAR, South-East Asia Region; EUR, European Region; EMR, Eastern Mediterranean Region; WPR, Western Pacific Region.
[a] Target for measles immunization coverage was set by the World Health Assembly.
[b] Target for births attended by skilled health personnel was set by the International Conference on Population and Development.

Significant progress has also been achieved with regard to education, with the primary school net enrolment rate in the developing regions reaching 91% in 2015, up from 83% in 2000. Many more girls are now in school compared to 15 years ago, with developing regions as a whole having achieved the target to eliminate gender disparity in primary, secondary and tertiary education, which is likely to yield considerable maternal and child health benefits.[16]

Major progress has been made on water and sanitation, which has a significant impact on the transmission of infectious diseases. In 2015, 91% of the global population is using an improved drinking-water source, compared to 76% in 1990, thus meeting the MDG target, while the proportion of people practising open defecation has fallen almost by half. Globally, 147 countries have met the drinking-water target, 95 countries have met the sanitation target and 77 countries have met both.

Progress on the specific health-related goals and targets, MDG 4, MDG 5 and MDG 6, has also been encouraging (see chapters 4 and 5). Globally, the HIV, TB and malaria MDG targets have been met. Child mortality has fallen by 53% and maternal mortality by 43%. Even though this is a cause for celebration, both declines fall well short of the MDG targets of two thirds and three quarters reductions from the 1990 levels. Regional progress has also been uneven, as can be seen in Table 1.1, and substantial inequalities remain within and across countries.[17] More detailed assessments of the progress made are provided in chapters 5 and 6.

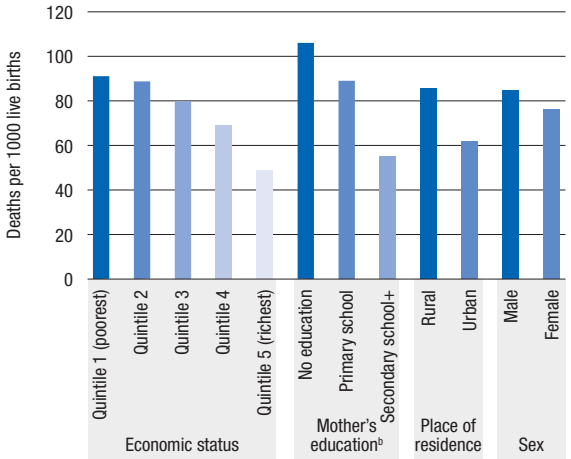
Strengths and limitations of the MDGs

The MDGs have been more influential than any other attempt at international target setting in the field of development. The rapid acceleration of global progress towards the poverty reduction, gender, health and education goals since 2000, and particularly since 2005, is just one example of their beneficial impact. The adoption of a simple, clear and time-bound framework that is compelling, easy to communicate and measurable has been one of the MDGs' great strengths, encouraging donor governments, international agencies and country decision-makers to focus attention on areas of need, and to measure the results of initiatives undertaken. And while it is hard to isolate specific causal effects, it seems reasonable to suppose that the intensity of focus (and investment) has been a key driver of innovation, enabling the scale-up of new interventions, such as antiretroviral therapy (ART), long-lasting insecticidal nets (LLINs), artemisinin-based combination therapies (ACTs), vaccines against pneumonia and diarrhoeal disease, and new and better diagnostic tests for multiple diseases.

The emphasis on measuring results has also had a positive impact on country data systems. A good example is the improvement in country data availability for a subset of 22 official MDG indicators between 2003 and 2014.[3] While in 2003, only 2% of developing countries had at least two data points for 16 or more of the 22 indicators, by 2014 this figure had reached 79%, reflecting the increased capacity of national statistical systems to address monitoring requirements. Development partners played an important role in boosting monitoring capacity, most successfully by providing long-term support to national health surveys, especially the United Nations Children's Fund (UNICEF) and the United States Agency for International Development (USAID). These surveys, mostly conducted by national statistical offices in collaboration with ministries of health, also generated data on inequalities in health, especially for reproductive, maternal and child health indicators.[18,19] One important benefit of increased monitoring was highlighting the importance of accountability involving a cyclical process of monitoring, review and remedial action. The importance of accountability has been underlined at all levels through, for instance, the recommendations of the Commission on Information and Accountability for Women's and Children's Health, and has not only improved monitoring, but is also gradually leading to more inclusive and transparent reviews of progress involving civil society, politicians and the media.[20,21]

Despite their overall success, the MDGs have not achieved unanimous approval.[8,22,23,24] For example, it has been pointed out that despite their pro-poor focus, the MDGs have, by employing almost exclusively aggregate targets and indicators, glossed over within-country inequalities, thereby undermining efforts required to improve conditions for the poorest and hardest-to-reach populations. Figure 1.1 offers an example of such disparities, showing the significant differences in mortality in children under five living in the poorest and richest households, children whose mothers were the least educated compared with the most educated, and between those living in urban compared with rural areas in 49 countries.

Figure 1.1
Under-five mortality in low- and middle-income countries[a] by multiple dimensions of inequality, 2005–2012[25]



[a] Median value of 49 selected countries.
[b] Data are not available for 10 countries.

The MDG framework has also been criticized for focusing attention and resources on the attainment of particular goals at the expense of others. This is, of course, in the nature of focusing, but the criticism raises important issues nonetheless. The focusing "problem" has been particularly apparent with regard to the health goals, where resources and effort have been directed at strengthening certain disease-specific or "vertical" programmes, often at the expense of broader, cross-cutting investments in health systems that can deal with all health issues in a more integrated manner. This emphasis on vertical approaches has often resulted in separate strategic plans, monitoring mechanisms, funding streams and implementation efforts, with only limited investment in harmonization and alignment across programmes. The MDGs focused on the ends (health outcomes), without offering major incentives to invest in the more broad-based means – i.e. health systems. This has often led to major progress in MDG health indicators, while leaving major deficiencies in health systems as a whole, such as weak country capacity to respond to challenges, for example infectious disease outbreaks (the West Africa Ebola epidemic is an obvious example) or a rapidly increasing burden of NCDs.

Doubts have also been expressed about the purposes to which the MDGs have sometimes been put. For example, the MDGs have been applied as one-size-fits-all development planning instruments with targets that every country can meet, even though the MDGs were never meant as targets for individual countries. Global targets are less useful for countries with a low starting point or in conflict situations. A greater degree of realism about each country's ability to attain them would have helped guide national policy development in certain instances.

SDGs

On 25 September 2015, the UN General Assembly adopted the new development agenda "Transforming our world: the 2030 agenda for sustainable development".[1] The agenda builds upon the outcome document of the UN Conference on Sustainable Development (Rio+20 conference),[26] which took place in June 2012 and led to the establishment of the Open Working Group on SDGs, a group of Member States tasked with preparing a proposal on the SDGs. The Open Working Group proposal was welcomed by the UN General Assembly in September 2014 and became the principal guideline for integrating SDGs into the post-2015 development agenda.[27] Further intergovernmental negotiation processes resulted in the final document for the Sixty-ninth UN General Assembly in 2014, which also included the outcomes of major global meetings such as the Sendai Framework for Disaster Risk Reduction 2015–2030[28] and the Addis Ababa Action Agenda,[29] as well as inputs such as the synthesis report of the Secretary-General on the post-2015 agenda, "The road to dignity: ending poverty, transforming all lives and protecting the planet", published in December 2014.[30]

The 17 goals (Table 1.2) of the new development agenda integrate all three dimensions of sustainable development (economic, social and environmental) around the themes of people, planet, prosperity, peace and partnership. The SDGs seek to continue to prioritize the fight against poverty and hunger, while also focusing on human rights for all, and the empowerment of women and girls as part of the push to achieve gender equality. They also build upon, and extend, the MDGs in order to tackle the "unfinished business" of the MDG era. The SDGs recognize that eradicating poverty and inequality, creating inclusive economic growth and preserving the planet are inextricably linked, not only to each other, but also to population health; and that the relationships between each of these elements are dynamic and reciprocal. For example, with regard to health, a fundamental assumption of the SDGs is that health is a major contributor and beneficiary of sustainable development policies.[26]

Table 1.2
The 17 SDGs

1	End poverty in all its forms everywhere
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3	Ensure healthy lives and promote well-being for all at all ages
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5	Achieve gender equality and empower all women and girls
6	Ensure availability and sustainable management of water and sanitation for all
7	Ensure access to affordable, reliable, sustainable and modern energy for all
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10	Reduce inequality within and among countries
11	Make cities and human settlements inclusive, safe, resilient and sustainable
12	Ensure sustainable consumption and production patterns
13	Take urgent action to combat climate change and its impacts[a]
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development

[a] Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

The SDGs aim to be universal, integrated and interrelated in nature. In order to take on such a wide range of cross-cutting issues, it will be necessary to achieve far greater intersectoral coherence, integration and coordination of efforts than has hitherto been in evidence. A revitalized global partnership for sustainable development, based on a spirit of strengthened global solidarity, informed by a readiness to reach across sectors and guided by clear and measurable objectives will be critical for the mobilization of the means required to implement the SDG agenda, focused particularly on the needs of the poorest and most vulnerable.

The health goal

Paragraph 26 of the 2030 agenda for sustainable development addresses health as follows:[1]

> *To promote physical and mental health and well-being, and to extend life expectancy for all, we must achieve universal health coverage and access to quality health care. No one must be left behind. We commit to accelerating the progress made to date in reducing newborn, child and maternal mortality by ending all such preventable deaths before 2030. We are committed to ensuring universal access to sexual and reproductive health-care services, including for family planning, information and education. We will equally accelerate the pace of progress made in fighting malaria, HIV/AIDS, tuberculosis, hepatitis, Ebola and other communicable diseases and epidemics, including by addressing growing anti-microbial resistance and the problem of unattended diseases affecting developing countries. We are committed to the prevention and treatment of non-communicable diseases, including behavioural, developmental and neurological disorders, which constitute a major challenge for sustainable development.*

One of the 17 goals has been devoted specifically to health, and is framed in deliberately broad terms that are relevant to all countries and all populations: "Ensure healthy lives and promote well-being for all at all ages". The health goal is associated with 13 targets, including four means of implementation targets labelled 3.a to 3.d. Overall, the SDGs have 169 targets.

Even though the 2030 agenda refers several times to the term "human right(s)" (rights to development, self-determination, an adequate standard of living, food, water and sanitation, good governance, and the rule of law), it does not specifically mention that health is a human right.

Table 1.3
Health targets in SDG 3

3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births
3.2	By 2030, end preventable deaths of newborns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-five mortality to at least as low as 25 per 1000 live births
3.3	By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, waterborne diseases and other communicable diseases
3.4	By 2030, reduce by one third premature mortality from noncommunicable diseases through prevention and treatment and promote mental health and well-being
3.5	Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
3.6	By 2020, halve the number of global deaths and injuries from road traffic accidents
3.7	By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
3.8	Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
3.a	Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate
3.b	Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all
3.c	Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least-developed countries and small island developing States
3.d	Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

The 13 targets that underpin the broad health goal are shown in Table 1.3. It is noted that the MDG goals on maternal mortality (3.1), child mortality (3.2) and infectious diseases (3.3) have been retained in the SDG framework, augmented by new and more ambitious targets for 2030, and expanded to include neonatal mortality and more infectious diseases such as hepatitis and waterborne diseases. The targets on access to sexual and reproductive health-care services (3.7) and access to vaccines and medicines (3.b) are also closely related to the MDG targets. Sexual and reproductive rights are addressed under MDG 5 on gender equality.

The SDGs include new targets on NCDs and mental health (3.4), substance abuse (3.5), injuries (3.6), health impact from hazardous chemicals, water and soil pollution and contamination (3.9) and the implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) (3.a). Target 3.d addresses reducing and managing national and global health risks, and health financing and health workforce issues in least-developed countries and small island developing states are addressed by Target 3.c.

UHC is also a new target (3.8), which provides an overall framework for the implementation of a broad and ambitious agenda in all countries. UHC is the only target that cuts across all targets of the health goals, as well as addresses linkages with health-related targets in the other goals. The issue of UHC in the SDGs is addressed in Chapter 3 where its importance for all health targets, including notably targets for NCDs, is outlined. A simple framework for organizing the health targets in a logical manner is proposed in Chapter 9.

Table 1.4
Examples of targets in other goals linked to the health SDG 3

1.3	Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable
2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
4.2	By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education
4.a	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all
5.2	Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation
5.3	Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation
5.6	Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking-water to all
6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
10.4	Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality
11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
16.1	Significantly reduce all forms of violence and related death rates everywhere
16.2	End abuse, exploitation, trafficking and all forms of violence against and torture of children
16.6	Develop effective, accountable and transparent institutions at all levels
16.9	By 2030, provide legal identity for all, including birth registration
17.18	By 2020, enhance capacity-building support to developing countries, including for least-developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts

Health in other goals

Health is linked to many of the non-health goals, reflecting the fact that health affects, and is in turn affected by, many economic, social and environmental determinants. Progress in health is dependent on economic, social and environmental progress. Well over a dozen targets in other goals can be considered health-related and should be given special attention in strategies, policies and plans to achieve the health goal and in monitoring progress (Table 1.4). Goal 17 is about means of implementation and links to the four means of implementation targets of the health goal.

One of the strengths of the SDGs is the breadth of their embrace,[31] which seeks to encompass communicable diseases, NCDs and injuries as well as determinants of health such as increasing urbanization, pollution and climate change. The SDG agenda emphasizes the close links between health and sustainable development. Health policy can contribute to sustainable development and poverty reduction if people have access to the information and services they need to promote and protect their health and are protected from catastrophic expenditure when they fall ill. Sustainable development, in turn, limits the adverse impacts of environmental degradation and climate change, which have the highest relative impact on the poorest countries and the least healthy and poorest groups within countries.

Policies made in all sectors can have a profound effect on population health and health equity. The health of people is not solely a health sector responsibility; it is also impacted by issues such as transport, agriculture, housing, trade and foreign policy. To address the multisectoral nature of health determinants requires the political will to engage the whole of government in health. The health sector should promote "Health in All Policies", an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies and avoids harmful health impacts in order to improve population health and health equity and address the social determinants of health.[32,33]

Follow-up and review

Tracking progress has been vital in maintaining momentum of the MDGs, as well as in identifying areas requiring greater efforts. It will be no less important in the context of the SDGs. The SDG declaration pays considerable attention to the systematic follow-up and review of implementation at national, regional and global levels. Globally, the High Level Political Forum on Sustainable Development will play a critical role in overseeing a network of review processes. The reviews will be informed by an annual report prepared by the UN Secretary-General in cooperation with the UN system.

Follow-up and review processes will be voluntary and country-led. The SDG resolution states that national governments should "set their own national targets guided by the global level of ambition but taking into account national circumstances".[1] How this will actually be done and what, for instance, the role of regional and global mechanisms will have to be worked out as part of the indicator framework.

The UN Statistical Commission will provide a proposal for a global indicator framework (and associated global and universal indicators) by March 2016 for subsequent adoption by the Economic and Social Council of the UN General Assembly.[34] Monitoring the progress of the 17 SDGs and their 169 targets will be a challenge, given the sheer number of targets and indicators. Furthermore, some of the new goals and targets have little track record in terms of data and monitoring.

Among the health agencies and countries, there is considerable agreement around the key indicators which should be selected from the existing, well-tested indicators, included in the Global Reference List of 100 Core Indicators.[35] However, less-established indicators may be required in some targets. One of the biggest challenges faced in developing meaningful indicators is the lack of data in many countries, even for well-established indicators such as those used to monitor cause-specific mortality. Domestic and international investments in robust health information and statistical systems, including civil registration and vital statistics systems, are thus urgently required.[36]

As the lead agency for the health SDGs, WHO should provide Member States with detailed annual updates of progress and inform the overall SDG monitoring process, coordinated by the United Nations Statistics Division, with regular updates on a small set of core indicators. Optimal fulfilment of this task will depend on close collaboration with other agencies such as UNICEF, the United Nations Office on Drugs and Crime (UNODC), the United Nations Population Fund (UNFPA) and the World Bank. The SDG health and health-related targets are closely related to many of the targets that have been adopted by the WHO Member States in the World Health Assembly (WHA). Dozens of targets already exist that correspond to the SDG health targets, and while some SDG health targets do not yet have corresponding, specific WHA health targets, the general adoption of the SDG framework makes these targets relevant for the WHA.

Monitoring the overarching health goal

There is a need to monitor the SDGs at the goal level. The overall health SDG is to, "Ensure healthy lives and promote well-being for all at all ages". WHO has considered several overarching indicators that might serve to monitor that goal, including life expectancy, number of deaths before age 70, and healthy life expectancy.[37,38] If it could be measured reliably, *healthy life expectancy* would be a suitable single indicator that captures both mortality and years of life lived in less than good health (i.e. with a disability). There is increasing interest in the accurate measurement of health, disability and well-being, especially given the context of ageing populations and the growing prominence of chronic diseases as causes of disability and premature mortality. There is some evidence that life expectancy in high-income countries is increasing faster than healthy life expectancy. The monitoring efforts being undertaken in the European Union are interesting in this regard, setting a target for Members States of achieving an additional two healthy life years by 2020.[39,40] However, while many attempts have been made to measure population health status in addition to the underlying causes of declines in health, challenges remain with regard to the availability of data on population level functional status that are comparable over time and across populations and collected through regular surveys.[41,42]

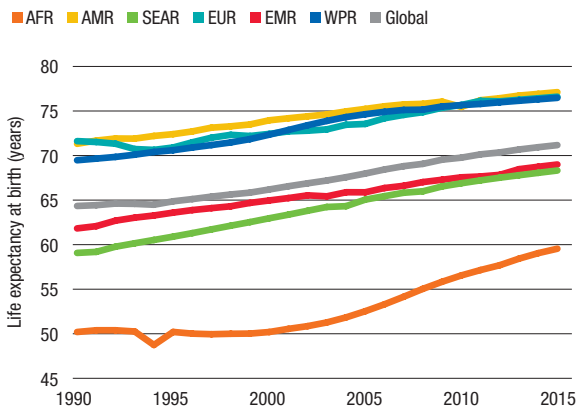
Despite the large gaps in coverage of global mortality information systems, mortality is more amenable to accurate measurement than disease or disability. Several cause-specific mortality targets are proposed for the post-2015 agenda, many focusing on reducing or ending "preventable" deaths.[43] *Life expectancy* is an attractive summary measure of mortality rates at all ages, and all health and health-related programmes contribute to it. Box 1.1 shows the dramatic improvements observed in life expectancy during the MDG era. WHO has estimated that achievement of the major SDG health targets for child, maternal, infectious diseases and NCDs would result in an increase of global average life expectancy of around four years by 2030. The gap between high- and low-income countries would narrow from around 17.5 years in 2015 to around 13–14 years.[41]

Also worthy of consideration is a proposal for a measure of premature mortality with a target of reducing the number of deaths before age 70 by 40% by 2030 globally and in every country.[44] Countries at different stages of development could achieve such gains by bringing down

Box 1.1
Life expectancy improvements during the MDG era

Overall trends in life expectancy at birth provide one partial, but important, summary of the health improvements since 1990 (Figure 1.2). Life expectancy increased at a faster rate in most regions from 2000 onwards and, overall, there was a global increase of 6.8 years in life expectancy from 1990 to 2015, with even larger increases of 9.3 years in the African Region and the South-East Asia Region. This corresponds to an average increase in global life expectancy at birth of 2.7 years per decade, which is faster than the increases in today's high-income countries over the past century.[45] The gap between African life expectancy and European life expectancy has narrowed by four years in the MDG period.

Figure 1.2
Trends in average life expectancy at birth, by WHO region and globally, 1990–2015[46]



All major causes of deaths contributed to these huge gains. For instance, WHO calculations indicate that compared to the numbers of deaths in 2012 that would have been expected if death rates in 2000 had applied, there were 42% fewer maternal and child deaths, 36% fewer deaths due to HIV, TB and malaria and around 7% fewer due to other causes, including the main NCDs and injuries.

mortality due to HIV, malaria, TB or child mortality or NCD deaths between ages 30 and 70 – depending on their relevant priorities. A 40% reduction in premature mortality by 2030 would be achievable by: averting two thirds of maternal and child deaths; two thirds of HIV, TB and malaria deaths; one third of premature deaths from NCDs; and one third of deaths from other causes (other communicable diseases, undernutrition and injuries). These challenging subtargets would halve under-50 deaths, avert one third of the (mainly NCD) deaths at ages 50–69, and so prevent 40% of under-70 deaths. Such a reduction would result in a global increase in life expectancy of five years, assuming mortality rates at age 70 and over also decline, as projected by WHO. Concerted action to reduce NCD deaths before age 70 is likely to also reduce NCD death rates for people age 70 and over.

The "promote well-being" component of the overall health SDG also presents an interesting monitoring challenge, as does health Target 3.5, which refers to "promote mental health and well-being". While health and *self-reported well-being* are intricately related (health status is a critical determinant of subjective well-being, for example) they are not synonymous.[47,48,49,50] Measurement of self-reported well-being shares many of problems encountered in the measurement of non-fatal health outcomes. The field of measuring subjective well-being is rapidly expanding and distinguishes different aspects including: (i) evaluative life satisfaction: a reflective assessment on a person's life or some specific aspect of it; (ii) affective or hedonic: a person's feelings or emotional states, typically measured with reference to a particular point in time; and (iii) eudemonic: a sense of meaning and purpose in life, autonomy and self-realization.[51] It may, however, be too early to adopt an indicator as part of the SDG monitoring.

Monitoring equity

Equity is at the heart of the SDGs, which are founded on the concept of "leaving no one behind". The overall health SDG calls for healthy lives for all at all ages, positioning equity as a core, cross-cutting theme, while SDG 10 calls for the reduction of inequality within and among countries, and Target 3.8 calls for the establishment of UHC, founded on the principle of equal access to health without risk of financial hardship. A movement towards equity in health depends, at least in part, on strong health and health financing information systems that collect disaggregated data about all health areas and health expenditures. This fact is recognized in Target 17.8, which calls for efforts to build capacity to enable data disaggregation by a number of stratifying factors, including income, gender, age, race, ethnicity, etc. Disaggregated data enable policy-makers to identify vulnerable populations and direct resources accordingly.

MDGs were focused on national progress and on specific populations, notably mothers and children and people affected by HIV, TB and malaria. In contrast, the health SDGs address health and well-being at all ages, including in newborns and children, adolescents, adult women and men, and older persons. Not only is the goal to be monitored much broader, but it is also extended over time, and will thus require a comprehensive, life course approach. Needless to say, such an approach will also be relevant in monitoring progress towards UHC.

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35 Global reference list of 100 core health indicators. Geneva: World Health Organization; 2015 (http://www.who.int/healthinfo/indicators/2015/en/, accessed 16 September 2015).

36 Measurement and accountability for health results: roadmap and five point call to action. MA4H summit, World Bank, Washington (DC), 9–11 June 2015 (http://ma4health.hsaccess.org/roadmap, accessed 16 September 2015).

37 WHO has organized two technical meetings to assess different options for high-level outcome measures of health: Post-2015 health outcome measures. Technical meeting, World Health Organization, Geneva, 11–12 December 2014.

38 Measurement of healthy life expectancy and well-being. World Health Organization, Geneva, 10-11 December 2012 (http://www.who.int/healthinfo/sage/meeting_reports/en/, accessed 16 September 2015).

39 Europe 2020 – for a healthier EU. Brussels: European Commission (http://ec.europa.eu/health/europe_2020_en.htm, accessed 16 September 2015).

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41 An overarching health indicator for the Post-2015 Development Agenda: brief summary of some proposed candidate indicators. Background paper for expert consultation, 11–12 December 2014. Geneva: World Health Organization; December 2014 (http://www.who.int/healthinfo/indicators/hsi_indicators_SDG_TechnicalMeeting_December2015_BackgroundPaper.pdf?ua=1, accessed 13 October 2015).

42 Another approach to measuring healthy life expectancy is to rely on extensive modelling of disease and injury sequelae prevalence and distribution, and to aggregate these to population levels in order to calculate health-adjusted life expectancy (HALE). However, because the approach relies heavily on statistical modelling and the use of predictive variables to produce estimates of disease incidence and prevalence with disability weights for a large number of conditions, it may be unsuitable for monitoring progress, especially at the country level.

43 These include Target 3.1 (maternal mortality), 3.2 (neonatal and child mortality), 3.4 NCD mortality (due to four leading causes of death), 3.6 (road traffic accidents).

44 Norheim OF, Jha P, Admasu K, Godal T, Hum RJ, Kruk ME et al. Avoiding 40% of the premature deaths in each country, 2010–30: review of national mortality trends to help quantify the United Nations Sustainable Development Goal for health. Lancet. 2015;385(9964):239–52 (http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2814%2961591-9/fulltext, accessed 16 September 2015).

45 Oeppen J, Vaupel JW. Demography: broken limits to life expectancy. Science. 2002;296(5570):1029–31 (http://www.sciencemag.org/content/296/5570/1029.full, accessed 16 September 2015).

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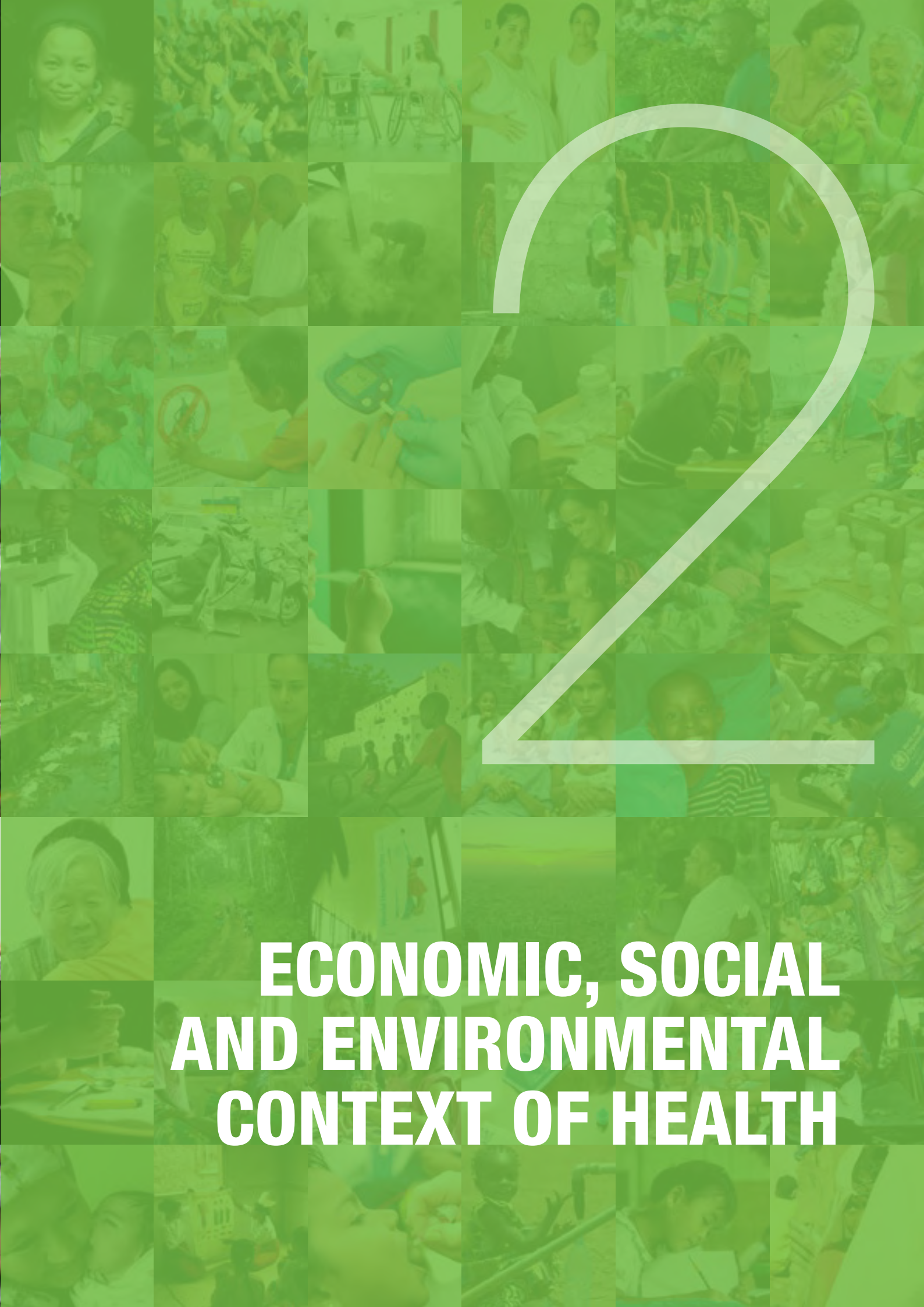
47 Dolan P, Fujiwara D. Valuing mental health: how a subjective well-being approach can show just how much it matters. London: UK Council for Psychotherapy; 2014 (http://www.psychotherapy.org.uk/UKCP_Documents/Reports/ValuingMentalHealth_web.pdf, accessed 16 September 2015).

48 Shields M, Wheatley Price S. Exploring the economic and social determinants of psychological well-being and perceived social support in England. J R Stat Soc Ser A Stat Soc. 2005;168(3)513–37 (http://onlinelibrary.wiley.com/doi/10.1111/j.1467-985X.2005.00361.x/full, accessed 16 September 2015).

49 Miret M, Caballero FF, Chatterji S, Olaya B, Tobiasz-Adamczyk B, Koskinen S et al. Health and happiness: cross-sectional household surveys in Finland, Poland and Spain. Bull World Health Organ. 2014;92(10):716–25 (http://www.who.int/entity/bulletin/volumes/92/10/13-129254.pdf?ua=1, accessed 16 September 2015).

50 Liu B, Floud S, Pirie K, Green J, Peto R, Beral V et al. Good health is strongly associated with happiness, but happiness does not cause good health: the Million Women prospective study. Lancet. In press.

51 See for instance: OECD Guidelines on measuring subjective wellbeing. Paris: Organisation for Economic Co-operation and Development; 2013 (http://www.oecd.org/statistics/guidelines-on-measuring-subjective-well-being.htm, accessed 16 September 2015).



2

ECONOMIC, SOCIAL AND ENVIRONMENTAL CONTEXT OF HEALTH

SUMMARY

The SDGs position health as a key feature of human development in a more integrated manner than was the case for the MDGs, emphasizing the fact that social, economic and environmental factors influence health and health inequalities and, in turn, benefit from a healthy population.

Major population trends impact health. Fertility rates have fallen substantially almost everywhere, but still remain high in the African Region. Close to 40% of the population growth in 2015–2030 will come from Africa, and more than one quarter of the world's children will live there by 2030. The population aged 60 and over will increase by 50% in the SDG era. This presents many opportunities but will also challenge existing social norms, require a re-aligning of health systems and challenge countries to provide sustainable social security and long-term care. By 2030, 60% of the world's population will live in urban areas.

Poverty eradication is still a priority. The world attained the MDG target – to cut the 1990 poverty rate in half by 2015 – in 2010. Despite positive trends, one in seven people in developing regions still lives on less than US$ 1.25 per day. In sub-Saharan Africa, more than 40% of the population still live in extreme poverty in 2015.

In 2013, total health spending reached US$ 7.35 trillion, more than double the amount spent in 2000. Development assistance for health increased dramatically since 2000, but is now flattening and likely to become less prominent in the SDG era. The greatest need – as well as the focus of much traditional development finance – will become increasingly concentrated in the world's most unstable and fragile countries.

Gender inequalities in education, employment and civil liberties not only deprive women of basic freedoms and violate their human rights, but also negatively affect health and development outcomes for societies as a whole. The SDGs expand the focus on gender equity across a range of goals, including health. The right to health has been re-emphasized in terms of the achievement of UHC, but is also closely linked to the realization of other human rights, particularly for women and vulnerable groups such as migrants and people with disabilities.

Education is strongly linked to better health and the MDG goal of universal primary education has been broadened with 10 SDG targets addressing all sectors of education. Just over half of countries achieved the MDG goal, and 70% have achieved gender parity for primary education, but fewer than half have achieved parity for the secondary level.

Environmental sustainability is a central concern of the SDGs and is addressed in goals for water and sanitation, energy, cities and climate change. Climate change will have increasing consequences for health, ranging from the immediate impact of extreme weather events, to the longer term impacts of droughts and desertification on food production and malnutrition, and the increased spread of infectious disease vectors for malaria and dengue. The poorest and most vulnerable populations are likely to be affected most.

Health is central to human development, both as an inalienable right in and of itself and as a key contributor to the growth and development of communities and societies. Health was central to the MDGs, and in the SDGs is positioned as a key feature of human development in a more integrated manner. One SDG is specifically focused on health and several others incorporate actions to improve health and to address its broader social, environmental and economic determinants. These determinants have an impact on health and, in turn, benefit from a healthy population.

While health is still considered an important factor for development, it now finds its place alongside many more development priorities than was the case during the MDG era. This reflects a number of new and growing challenges, including: (i) rising inequalities within and between states; (ii) profound demographic and epidemiological changes; (iii) spiralling conflict, violence and extremism; (iv) increased migratory flows; (v) depletion of natural resources; (vi) adverse impacts of environmental degradation; and (vii) the prospect of irreversible climate change. Needless to say, all of these challenges have profound implications for health, and the SDGs that seek to address them have health concerns woven into their fabric (Table 1.3). This chapter examines the principal trends, determinants and risks that impact health, including:

- population trends, including fertility decline and population growth, changing population structure and ageing, migration and urbanization;
- economic and development trends, including poverty eradication and equity, globalization and trade, and financing for development;
- social determinants such as gender, education and income;
- human rights and equity;
- environmental determinants and other risks, including climate change.

In each section, a brief overview is provided on how these determinants are reflected in the SDGs, and the possible implications for health actions in the coming 15 years are outlined.

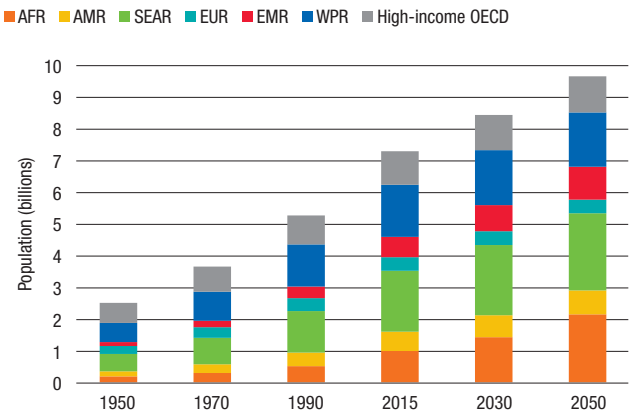
POPULATION TRENDS

Demographic trends fundamentally influence countries' economic, social and health conditions. Population growth, changes in fertility rates, and population structure, all have a profound influence, as do migration, which is increasingly a cross-border issue, and growing urbanization, which may spur economic growth, but also puts strains on food and water resources. The SDGs are more explicit about population issues than the MDGs. The SDGs outcome document references the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action,[1] and Target 5.6 refers directly to this programme of action, calling for efforts to: "Ensure universal access to sexual and reproductive health and reproductive rights...". There is one goal on cities (Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable) that addresses the challenges of rapid urbanization, and two targets specifically refer to migrants (SDG Targets 8.8 and 10.7).

Fertility and population growth

Fertility rates are falling globally and, as a consequence, population growth is slowing almost everywhere except Africa. In mid-2015, the world population reached 7.3 billion people – almost a tripling of the population in 1950 – of which 60% lives in Asia. Even as population growth rates continue to slow, the world population is projected to reach 8.5 billion by 2030.[2] Close to 40% of the growth in 2015–2030 will come from the African Region (Figure 2.1). The parts of the world where populations are growing fastest are, in many cases, also those most vulnerable to climate change. Rising populations may exacerbate some of the consequences of global warming, such as water shortages, mass migration and declining food yields.

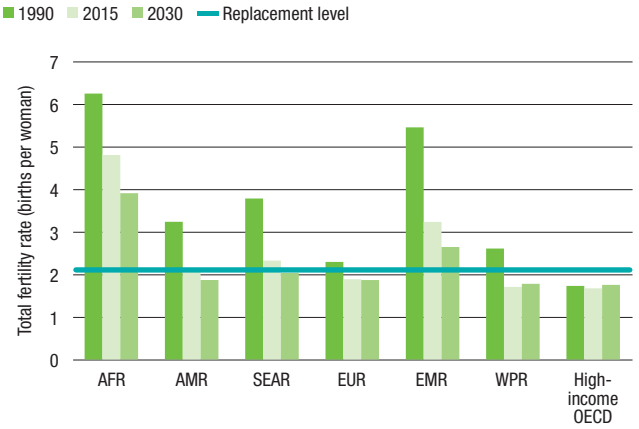
Figure 2.1
World population by region, 1950–2050[2,3]



Between 1990 and 2015, the average expected number of children per woman (total fertility rate) fell close to or below replacement level (2.1 children) in all regions except the African Region and the Eastern Mediterranean Region (Figure 2.2). The fertility rate is now at or below replacement level in 44% of countries, including Brazil, China, the Russian Federation and the United States of America. The total fertility rate for the African Region is projected to remain high until after 2030.[2]

Projections indicate that approximately 2.1 billion babies will be born worldwide during 2015–2030, an increase of almost 3% of the total number of births in the previous 15 year period. Half of these babies will be born in Asia and one third in Africa. Over the same period, the total number

Figure 2.2
Trends in fertility by region, 1990–2030[2,3]



of women of reproductive age is projected to increase by 9% and reach 2.0 billion in 2030. Even though the average births per woman is projected to decline in Africa, the number of reproductive age women is projected to increase by 47% by 2030, which yields a projected increase in numbers of births of 24%.[2]

High fertility has multiple consequences for health and health-related issues. Continued rapid population growth in low- and lower-middle-income countries, along with higher fertility rates in the poorest segments of the population, is likely to make it harder for those countries to eradicate poverty and inequality, combat hunger and malnutrition, invest in education and health, improve access to basic services, plan and develop cities, protect local ecosystems and promote peaceful and inclusive societies.

Global reproductive, maternal, newborn and child health programmes will remain focused on Africa and Asia, which together account for more than four fifths of global fertility. Especially in Africa, high fertility rates and rising numbers of women of reproductive age have considerable implications for the efforts to achieve the SDG targets for ending preventable child and maternal deaths. Investments in reproductive health, especially in family planning, are needed to ensure that all women and men can achieve their desired family size. In addition, reducing child mortality and poverty are critical to reducing fertility and accelerating the demographic and epidemiological transitions.

Interventions before school age have very substantial benefits for children throughout schooling and life.[4] The continued high fertility of Africa makes it more difficult to implement low-cost but effective early childhood development interventions for countries with limited financial and human resources.

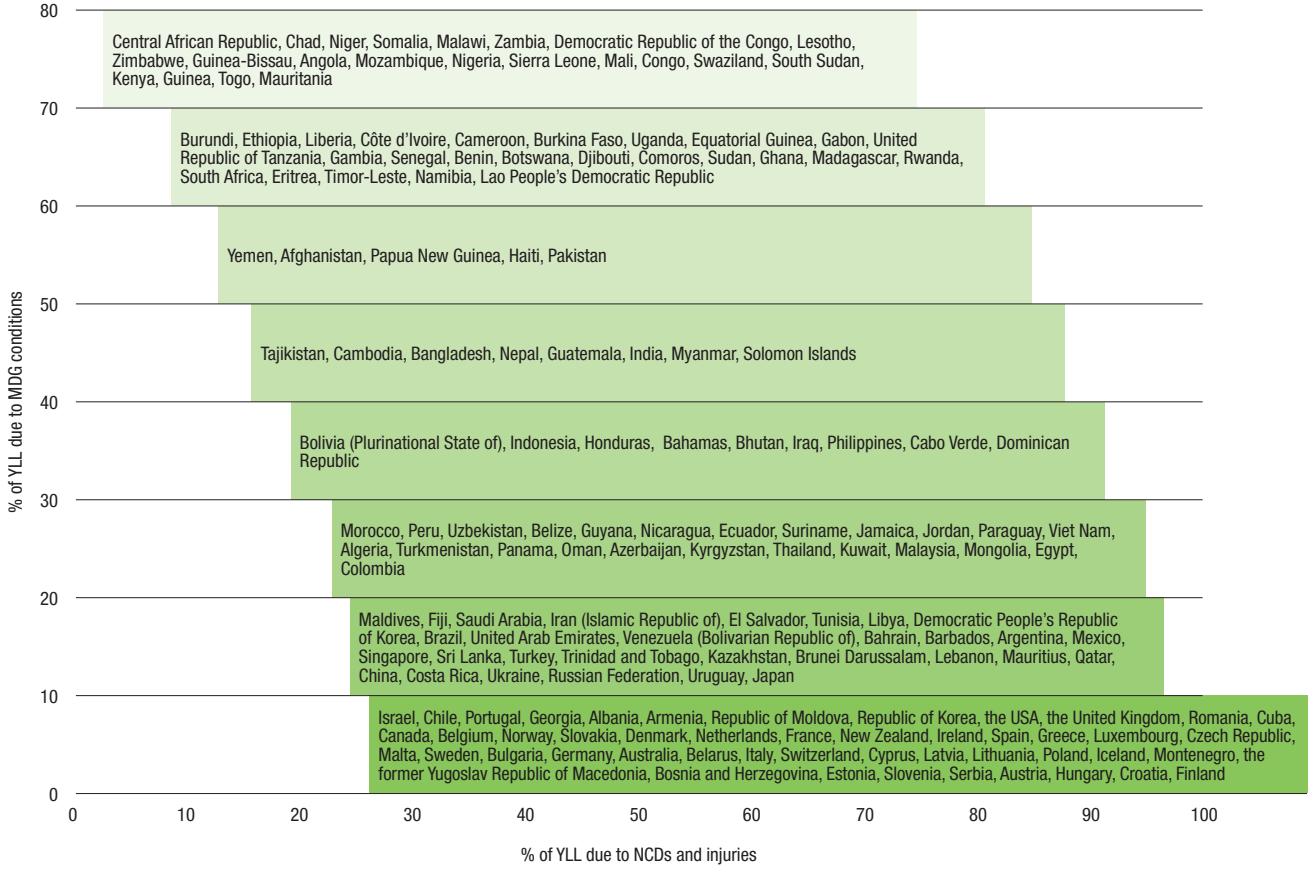
For countries in demographic transition, where age structures change rapidly, a reorientation of the health sector is critical. For example, in countries where fertility and mortality levels have fallen, progressively greater resources need to be committed to adult health and ageing populations as opposed to maternal and child health and to infectious diseases. The demographic transition is accompanied by an epidemiological transition where NCDs, mental health disorders and injuries become much more prominent as a cause of death and disability than infectious diseases. Figure 2.3 shows where countries are in the epidemiological transition, using years of life lost (YLL) due to reproductive, maternal, child health and undernutrition and infectious diseases – the MDG conditions – on the one hand (y-axis), and NCDs and injuries on the other hand (x-axis). At the top, there are 22 African countries where the poverty-related conditions are still responsible for more than 70% of all YLL. At the other end of this epidemiological shift, there are 48 countries where NCDs and injury-related conditions cause at least 90% of all YLL.

The youth bulge

Globally, the total number of young people is at an all-time high, with 1.8 billion people between the ages of 10 and 24 in 2015 and nearly 2.0 billion projected by 2030. The number of adolescents and youth between ages 10 and 24 in the African Region will increase from 315 million in 2015 to 453 million in 2030.[2]

The youth bulge, where a large proportion of the total population is youths or adolescents between ages 10 and 24 or 15 and 24 (showing a "bulge" in the population pyramid),

Figure 2.3
Countries at different stages of the epidemiological transition from MDG conditions to NCDs and injuries as the main causes of years of life lost (YLL), 2012[5]

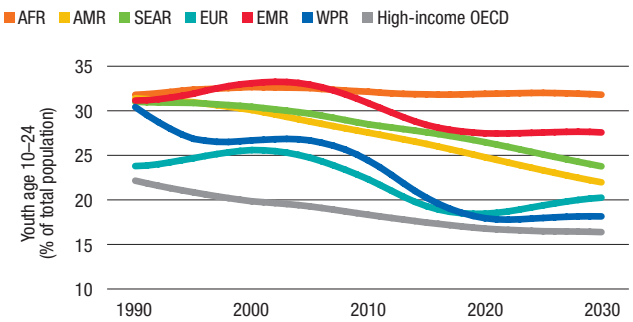


has been a common phenomenon in many countries during the MDG period (Figure 2.4). High fertility and, to a lesser extent, declines in child mortality are the main causes. A rapid fertility decline, such as occurred in the Western Pacific Region, may also give rise to a temporary increase of the youth bulge. In the African Region, more than 30% of the population is between ages 10 and 24, and this proportion will not change much in the coming 15 years. The youth bulge is projected to decline in the Eastern Mediterranean Region, although the proportion of the population between ages 10 and 24 will still be over 30% in 2030 for several countries, including Afghanistan, Iraq, Somalia and Yemen.[2]

In a country with a youth bulge, if most young adults entering the workforce can find productive employment, then the level of average income per capita should increase, producing a "demographic dividend". However, if many young people cannot find employment or earn a satisfactory income, then the youth bulge may become a potential source of social and political unrest,[6] while young people themselves may become more susceptible to mental disorders such as depression. Globally, the youth unemployment rate is nearly three times higher than the adult rate, and highest in the Middle East.[7]

The prominence of youth in the population and the importance of improving health behaviours and services for adolescents needs much more attention in many countries. This includes extending the improvements in maternal and child health to adolescents, a focus on health promotion and preventive measures, and on intersectoral approaches.[8] For example, reducing road injuries, the top cause of mortality in 10–19-year-olds, will require action across a range of services, from education to transportation. Furthermore, investing in health during adolescence can have critical benefits for health throughout the life course, influencing, for example, behaviours associated with an increased risk of NCDs.

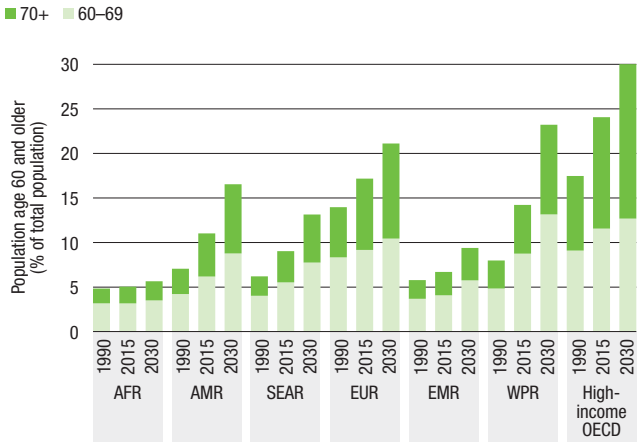
Figure 2.4
Trends in proportion of youth age 10–24, by region, 1990–2030[2,3]



Ageing

Populations around the world are rapidly ageing.[9] These older populations are a significant human and social resource, and this demographic transition therefore presents enormous opportunities to society. However, it will also be accompanied by a number of serious challenges. Global life expectancy increased, from 64 to 71 years between 1990 and 2015, an unprecedented rate of increase (see Chapter 1, Box 1.1). The number of people 60 and older reached 901 million in 2015 and will increase by 56% in the SDG era to around 1.4 billion people in 2030, of whom over 650 million will be 70 or older.[2] The dramatic increases will occur in all regions except the African Region, where a modest increase can be expected (Figure 2.5). By 2030, 71% of older people will live in low- and middle-income countries. China will have almost the same proportion of older people as the United States.

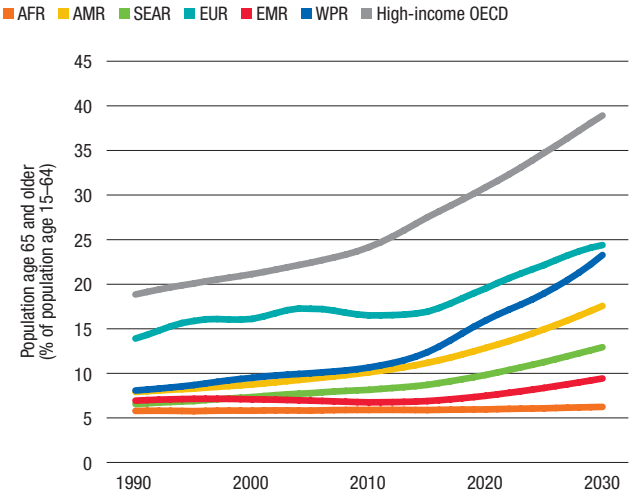
Figure 2.5
Trends in proportion of population age 60 and older, by region, 1990–2030[2,3]



Population ageing will increase the proportion of the older population relative to the younger population, and will challenge the traditional framing of the life course around a defined working age, followed by retirement. The projected trends of the ratio of people over age 65 compared to those aged 15–64 years show the large differences in population age structure between regions. During the MDG period, the ratio increased only slightly or not at all in most developing regions (Figure 2.6). However, the situation is projected to change drastically during the SDG period, with substantial increases in the ratio in all regions except in the African Region.

Despite the fact that many middle-income countries and even some low-income countries have expanded pension coverage through a mix of contributory and non-contributory schemes, nearly half of all older people do not receive any form of pension and, for many of those who do, the level of support is inadequate.[10] Large numbers of older people are entering retirement age in countries where significant social support systems have yet to be put in

Figure 2.6
Trends in the population age 65 and older as a percentage of the population age 15–64, by region, 1990–2030[2,3]



place. There is thus an urgent need to expand coverage, both in countries that have yet to put systems in place and in countries that already have such systems. Clearly, this presents fiscal challenges. However, inadequate social protection constitutes a major obstacle to sustainable development, as it is associated with high and persistent levels of poverty and inequality.

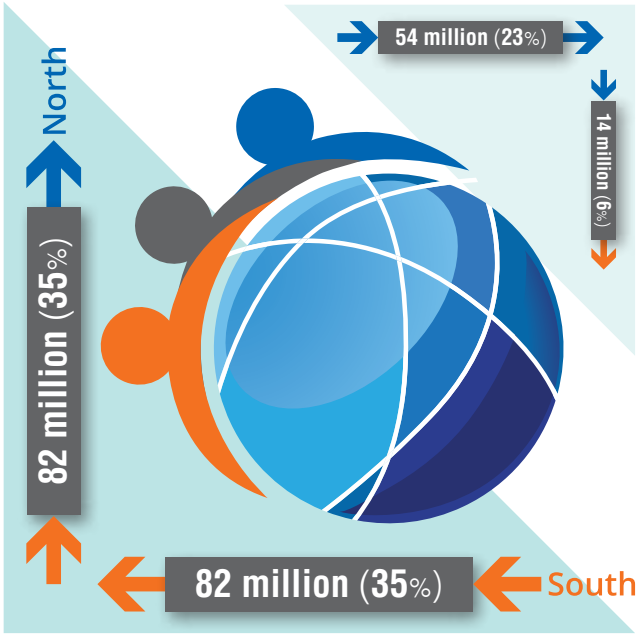
Declining mortality rates at older ages in the last three decades suggest that with appropriate interventions it is possible to sustain longevity gains in all countries.[11] However, it is not at all clear if these gains in life expectancy at older ages have been coupled with increasing years of life gained in good health, mainly because of chronic NCDs such as musculoskeletal conditions and dementia.[12] A recent analysis shows that patterns of limitations in functioning vary across countries and within countries over time to a significant extent, with some suggestion in high-income countries that subsequent generations may live longer in better health than those preceding them.[13] However, recent studies from high-income countries have raised questions regarding these health gains, given rises in obesity and related risk factors in the baby boomer cohort.[14,15,16,17] While health declines as we grow older, this fall is even more significant in the oldest group, the most rapidly growing segment of the older population. The health status of this group is worse in poorer countries, among women, those with lower education and those with lower levels of income across all countries.

The health SDG of ensuring healthy lives and promoting well-being for all at all ages cannot be achieved without attention to the health of older adults, which is now an important agenda for all countries. This will require major shifts in the way health systems are designed. The strategy should include a focus on primary prevention as well as on managing declines in functioning. Poor health is not an inevitable outcome of ageing, and many of the health problems that confront older people are associated

with chronic conditions that can be prevented, delayed or managed. Increasingly, medicine and technology also provide assistive devices that compensate for sensory and motor disabilities. Environmental interventions can ensure that even those with significant losses in capacity can still get where they need to go and do what they need to do.

In general, health systems will need to find effective strategies to extend health care and respond to the needs of older adults. In order to meet the target on UHC, the specific needs of older adults, often with complex, multiple chronic health conditions, will have to be addressed by health systems.[18,19] This will also require financial protection against catastrophic health spending to ensure that health interventions produce equitably distributed health gains. All societies also need sustainable models of long-term care and support that allow everyone to maintain lives of dignity and meaning, even in the presence of significant losses in functioning. The number of people requiring long-term care and support is forecast to double by 2030.[9]

Figure 2.7
South–South migration is as common as South–North migration[a,20,22]



[a] Based on migrant stock data, 2013; North: developed regions; South: developing regions

Migration

We live in an era of great human mobility, with more people on the move today than ever before. The total number of international migrants is estimated to be 232 million or 3.2% of the global population for 2013. Half of international migrants who were born in the developing regions (the "global South") moved to the developed regions (the "global North") in 2013 (Figure 2.7).[20]

While no substitute for development, migration can be a positive force for development when supported by the right set of policies. For example, migration could help harmonize the very different economic and demographic conditions across countries as the world moves towards its peak population. At the same time, the emigration of highly skilled workers such as doctors and nurses can have considerable negative impact.[21]

Migration could also re-emerge as both a cause and result of conflict within and between countries. Some high-income countries are already drastically limiting the rights of refugees to seek asylum. The rise in global mobility, the growing complexity of migratory patterns and their impact on countries, migrants, families and communities have all contributed to international migration becoming a priority for the international community.

The factors promoting cross-border migration are likely to remain strong or intensify and international migration is set to grow even faster than it did in the past quarter-century.[23] Determinants of migration levels include disparate age structures and income inequalities between richer and poorer countries, easier transportation at lower cost, the presence of migrant networks that link sending and receiving countries, and improved communications. Internal migration affects much larger numbers of people, and generally takes the form of rural to urban migration in low- and middle-income countries.

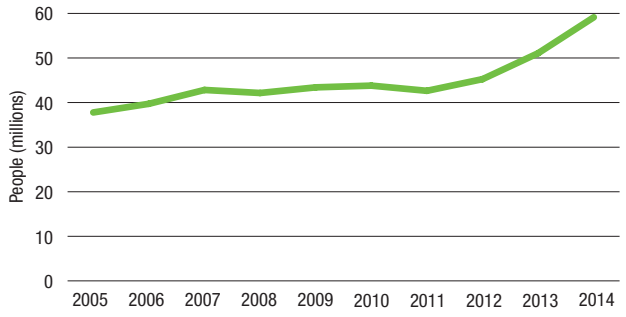
Conflict and persecution also drive migration and, in 2014, the total number of people displaced by war, conflict or persecution reached a record high of nearly 60 million globally, an increase of 8.3 million from the previous year[24] (Figure 2.8). Of these 60 million displaced persons, almost 20 million are refugees, 38 million are displaced inside their own countries and 1.8 million are awaiting the outcome of claims for asylum. The global number of refugees, asylum seekers and internally displaced people had ranged between 38 and 43 million for most of the past decade, but started to increase in 2012, due to conflicts in the Central African Republic, Iraq, South Sudan, the Syrian Arab Republic and Ukraine among others.

In some countries, towards the end of the SDG timeframe, environmental factors and climate change may play a greater role as a driving force, as they will almost certainly have greater adverse impacts in poorer countries of Africa and Asia.

Many migrants, especially victims of human trafficking, run increased health and mortality risks. For instance, over 2700 migrant deaths have been recorded in the first half of 2015, the majority of these in the Mediterranean Region.[25] Migrants often have little or no access to health and social services, although they have much greater health risks related to exploitation, dangerous working circumstances and substandard living conditions. Eliminating human trafficking is a priority task for the global community.

The recent influx of refugees into Europe is a vivid reminder for all countries of the importance of preparedness. All countries will need to have measures in place to minimize the potential adverse health consequences of migration, including protective laws and policies and health services in refugee settings. Health issues associated with migration present key public health challenges faced by governments and societies, as was reflected in a resolution on the health of migrants that was endorsed by the Sixty-first World Health Assembly in May 2008.[26] Many migrants do not have access to health care and longer-term migrants may also face difficulties in getting legal identity and citizenship. It will be important to ensure that UHC is interpreted as relating to all de facto residents, not just citizens.

Figure 2.8
Trends in number of people displaced by conflict, 2005–2014[24]

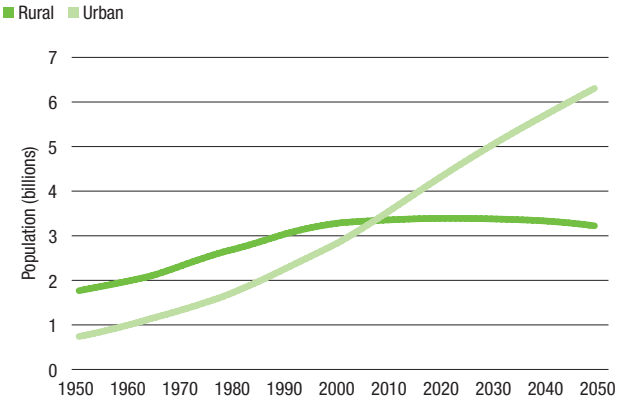


The SDGs include several targets relating to migration generally (8.1, 10.7, 10.c) as well as one (3.c) explicitly relating to the health worker "brain drain" from low- and middle-income countries to high-income countries, a phenomenon that has increased with globalization. The 2010 WHO Global Code of Practice on the International Recruitment of Health Personnel[27] highlighted these issues, drawing attention, in particular, to the problem of richer countries recruiting from poorer nations that are struggling with health worker shortages. The Code was voluntarily adopted in 2010 by all of the then 193 WHO Member States, but thus far implementation has been disappointing. Greater collaboration among state and non-state actors is needed to raise awareness of the Code and reinforce its relevance as a potent framework for policy dialogue on ways to address the health workforce crisis.[28] The Code links directly with SDG Target 3.c.

Urbanization

Since the MDGs were adopted in 2000, urban areas have grown by more than 1 billion new inhabitants. The urban proportion of the global population increased from 43% in 1990 to 54% in 2015, and it is projected that by the time the SDG draw to a close in 2030, 60% of the world's population will live in urban areas. The world's rural population is expected to reach its peak in a few years and will gradually decline to 3.2 billion by 2050 (Figure 2.9).[29] This leaves virtually all of global population growth in the projectable future in urban areas. This is still due in greater part to cities' natural growth, where fertility outpaces replacement level,[30] but is also explained by migration. More than 1 billion people on the planet are, or were migrants, the majority of which settle in urban areas.[31]

Figure 2.9
Trends in urban and rural population of the world, 1950–2050[29]



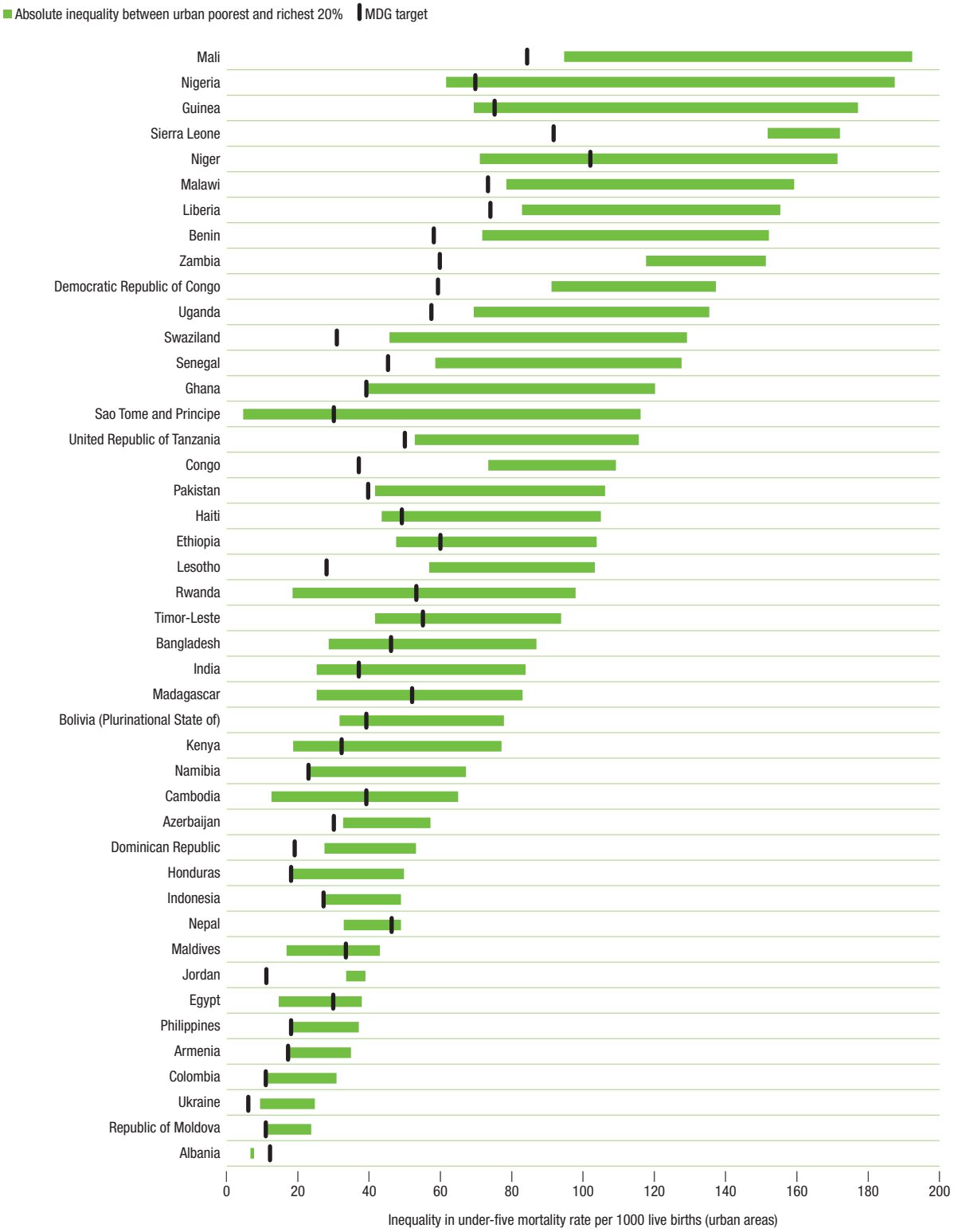
Urbanization is occurring across all world regions. Africa and Asia, where urbanization is just below 50%, are projected to experience the most rapid urbanization in coming years. The number of cities with a population of 1 million or more increased from 270 to 501 during the MDG period, and is projected to increase to 662 by 2030. The number of mega cities of more than 10 million people will increase from 29 in 2015 to 41 in 2030, and more than half of these cities will be in Asia.[29]

Urbanization has been accompanied by an increase in urban slums. Slums are characterized by overcrowding, poor access to safe drinking-water or sanitation, poor housing conditions and lack of secure tenure. In 2000, the number of slum dwellers in developing countries was estimated to be 767 million; by 2010 it rose to an estimated 828 million, and by 2020 is projected to reach 889 million. More than 60% of sub-Saharan Africa's urban inhabitants and more than 30% of urban populations of Southern Asia and South-East Asia live in slums.[32]

Urban health inequalities are a growing concern.[33,34] For example, Figure 2.10 shows that in urban areas of selected 46 countries, children in the poorest quintile were more than twice as likely to not survive till their fifth birthday compared to children in the richest quintile. In only one country was the national MDG target for reducing under-five mortality achieved for children in the poorest wealth quintile.

About half of urban dwellers live in smaller cities of less than half a million. It is in these cities that most urban growth will occur as they expand along highways and coalesce around crossroads and coastlines, often without formal sector job growth and without adequate services.

Figure 2.10
Socioeconomic inequality in under-five mortality between richest and poorest 20% of households in urban areas[35]



The provision of health services for the urban poor is a critical part of the SDG health targets, including UHC, and of SDG Target 11.1: "By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums". Urbanization brings opportunities for health, through the concentration of people, resources and services, which results in better access to health services and more scope for public health interventions. However, rapid unplanned urbanization may also increase the risks of infectious disease transmission, promote adverse trends in NCD risk factors such as obesity and increase the risks of road injury and violence, and exacerbate environmental degradation with impacts on health such as air pollution, poor water quality, and unavailable sanitation. Therefore, special attention will need to be given to better monitoring of the health situation of the urban poor, and to establishing

and implementing policies and programmes that reduce the risks of illness and death due to unsafe water and sanitation, violence and injuries, poor housing conditions and air pollution. Strong health promotion (e.g. for HIV and NCDs) and affordable health services will be an important part of any response, and need to be driven by local governments and communities.

ECONOMIC DETERMINANTS OF HEALTH AND FINANCING FOR DEVELOPMENT

The MDGs mobilized the collective efforts of countries and the development community to end extreme poverty, reduce hunger, promote gender equity and improve education and health. Despite substantial progress in reducing the numbers of people living in extreme poverty, many millions of people around the world continue to suffer from deprivation. Some countries, especially those affected by conflict and civil strife, remain trapped in a vicious spiral of underdevelopment, inequity and grinding poverty.

The social gradient in health that runs from top to bottom of the socioeconomic spectrum is a global phenomenon that is seen in low-, middle- and high-income countries. Specific examples of this phenomenon, relating to child and maternal health outcomes, are presented in Chapter 4.

The world has changed, and no longer consists of a large group of poor countries and a small group of rich ones. Today, many low-income countries have "graduated" from the World Bank Group's low-income classification group to reach middle-income status. In fact, between 2000 and 2013, the number of low-income countries fell from 63 to 34 such that there are now 105 middle-income countries. This group of countries are very diverse and include populous countries such as China and India and many small island states, as well as countries with stable economies and countries in conflict.[36] Moreover, progress for many socioeconomic development targets in relation to health and development vary widely across these countries. This means that extreme poverty is no longer concentrated in poor or fragile states but in richer middle-income countries. While only relatively few countries are the main contributors to levels of extreme poverty (i.e. India, Nigeria, China, Bangladesh and the Democratic Republic of Congo) – poverty also continues to persist among the most disadvantaged within several high- and middle-income countries. As a result, around three quarters of the world's absolute poor live in middle-income countries that are today less dependent on (and no longer eligible for) development assistance.[37]

As such, an approach to poverty reduction based on externally financed development is becoming rapidly outdated. Rather than thinking about poor countries perhaps the approach should focus on poor individuals. In other words, attention to reducing poverty in low-income countries should be expanded to middle-income countries and concerns for the distribution of poverty internationally should consider the distribution of poverty *within* national boundaries. In addition, provision of "traditional" aid in the form of transferring resources could increasingly adapt to today's global context and take the form of supporting the development of national policies and institutional structures to use available resources well, regardless of the source.

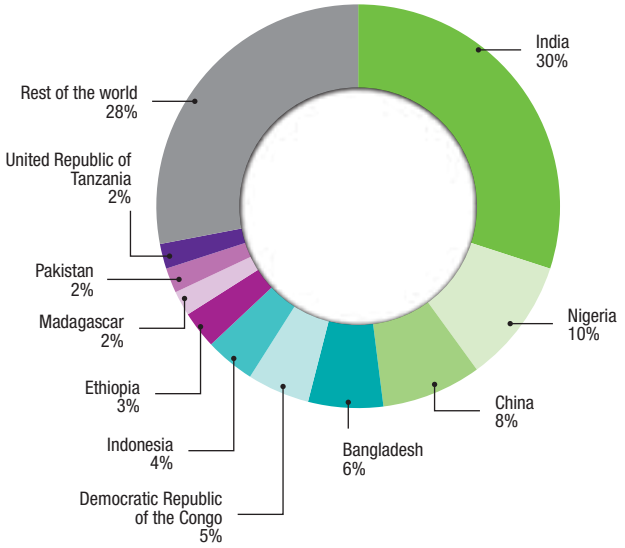
The SDGs reflect this change by emphasizing a much broader approach to poverty reduction strategies to improve not only health, but also to enhance progress across the full range of SDGs relating to health and nutrition, education, governance, economic reform, marginalized populations, gender discrimination, and violence and conflict. The first MDG was to eradicate extreme poverty and hunger, and had three targets, including one on nutrition. In contrast, there are several SDG targets that focus directly on eradication of poverty and hunger, and many other targets that will also contribute to poverty reduction and development. Moreover, inequality is more central in the SDGs than in the MDGs, especially in SDG 10, which calls for efforts "to reduce inequality within and among countries". Similarly, while globalization and trade-related issues were addressed as part of MDG 8, they have a more prominent position in the SDGs, reflected in the multiple targets on economic, social and environmental issues (e.g. Target 17.10 on trade and Target 3.b on research and access to essential medicines and vaccines).

This next section focuses on poverty eradication and income inequality, globalization and trade, and global financing for health and development.

Poverty eradication and income inequality

The world attained the MDG target – to cut the 1990 poverty rate in half by 2015 – in 2010, and the target was met in all regions, except sub-Saharan Africa. In 2015, 836 million people globally live on less than US$ 1.25 per day, compared with 1.9 billion in 1990. In the developing world, 14% of the population live on less than US$ 1.25 per day in 2015, down from 47% in 1990.[38] Progress has been harder won at higher poverty lines, such as US$ 2 per day. The world's most populous countries, China and India, have played a central role in the global reduction of poverty (although India still has 30% of the world's extreme poor; Figure 2.11) and most of that reduction is related to growth in labour-intensive sectors of the economy. Direct income transfers to the poor, remittances and changes in demographic patterns have contributed much less.[39] Despite positive trends, about one in seven people in developing regions still lives on less than US$ 1.25 per day. In sub-Saharan Africa, more than 40% of the population still lives in extreme poverty in 2015.[38] Middle-income countries are home to 73% of the world's poor people.[40]

Figure 2.11
Top 10 countries with largest share of the global extreme poor,[a] 2011[41]



[a] People living on less than US$ 1.25 per day.

Poor people become "trapped" in poverty for a number of reasons, including the inability to access credit or own land, governance failures, and because low levels of education, skills or health hinder their ability to seize opportunities arising from a general expansion of economic activity. The poor also tend to be more vulnerable to economic "shocks" – mainly due to health events as well as weather-related natural disasters and broad economic crises – that push households below the poverty line and keep them there.[42] While globalization is associated with increasing average incomes in many countries, there is concern that it is also causing widening income inequality between and within countries.[43,44,45] Income inequality affects all countries around the world, and there is clear evidence that people with lower income have worse health outcomes across a broad range of indicators.[46,47] In developed and developing countries alike, the poorest half of the population often controls less than one tenth of the country's wealth.[48] Failure to address income inequality is likely to reduce the sustainability of economic growth, weaken social cohesion and security, and increase risk of conflict.

MDG Target 1.C, which called for a halving of the proportion of people who suffer from hunger was almost achieved, with a reduction from 23.3% in 1990–1992 to 12.9% in 2014–2016 (projected).[38] This occurred despite major global challenges such as natural disasters and adverse weather events, volatile commodity prices, higher food and energy prices, rising unemployment and economic recessions in the late 1990s and in 2008–2009. There has also been significant progress on the child nutrition indicators (underweight and stunting in children under five years), an issue that is presented in Chapter 4. The current trends and projections indicate the importance of continued targeting of programmes for the poor, whether directed at the poorest countries, poorest regions or poorest populations within countries. Progress needs to be measured based on disaggregated health and nutrition indicators.

The 2001 report of the Commission on Macroeconomics and Health made a valuable contribution to global and country dialogues regarding the economic benefits of better health and the costs of achieving it,[49] showing, among other things, the large economic returns to be derived from investing in health. It is estimated that reductions in mortality account for about 11% of recent economic growth in low- and middle-income countries as measured by their national income accounts.[50] Subsequently, the 2008 report of the Commission on Social Determinants of Health complemented this message, by adding to evidence on the health returns, in particular in relation to reducing health inequalities from optimizing policies in other sectors.[51] A common theme related to optimizing policies in other sectors was to address inequalities in power, money and resources, which was one of the three overarching recommendations. It is estimated that health gains from policies in other sectors have been considerable. Of improvements in child under-five mortality rates between 1990 and 2010, 50% were attributed to non-health sector investments.[52] Also, reducing inequalities in NCDs requires substantial non-health sector investments, especially for cardiovascular diseases and lung cancer.[53] Policies and programmes addressing income inequalities, such as cash transfers and active labour policies, have demonstrated benefits for health and the economy.[54]

Ensuring that investing in health is perceived as a necessary and effective way to combat poverty and ensure economic progress requires an ongoing dialogue between health and finance executive bodies. One way to open and maintain

that dialogue is to demonstrate an awareness of fiscal constraints to establish credibility by generating and using evidence to show that we can make efficient use of resources to deliver optimal services. To deliver, in other words, "more health for the money".[55]

Globalization and trade

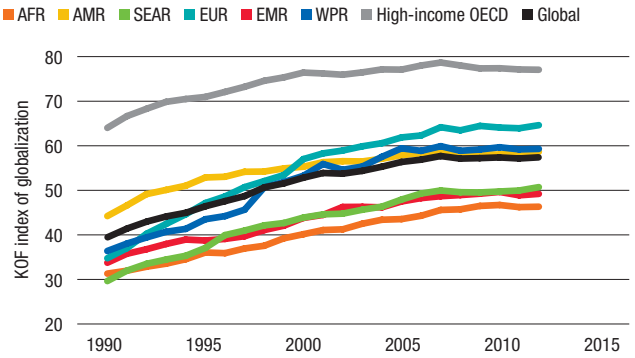
In the past few decades, and in all parts of the world, there has been an increase in global economic, financial, political and social integration and cooperation, as attested by the KOF index of globalization, which combines a set of relevant economic, social and political indicators in a synthetic index on a scale of 0 to 100 (Figure 2.12).[56,57] High-income OECD countries have experienced the highest levels of globalization, and the African Region and Eastern Mediterranean Region the lowest.

Increasing global economic integration is associated with the development of global forms of governance related to trade and intellectual property, as well as transnational standards and actions in the political, social, human rights and environmental spheres. Globalization comprises, among other things, growing integration of markets and nation states, receding geographical constraints on social and cultural arrangements, broader dissemination of ideas and technologies, growing threats to national sovereignty by transnational actors and the transformation of the economic, political and cultural foundations of societies.

Globalization has both positive and negative implications for global health. It is likely that the growth in world trade has also led to job and income growth, and has stimulated the growth in labour-intensive sectors of developing country economies that have been responsible for much of the progress in poverty reduction. On the other hand, global connectedness helped spread the impact of the global financial and economic crisis of 2008–2009 to countries that had nothing to do with it. Many governments underwent expenditure contractions, which dragged down economic growth prospects and cast doubts on the ability of markets to generate new and decent jobs.[59] In 2014, 201 million people were unemployed worldwide; this is 31 million more people than before the global crisis in 2008. Global unemployment is expected to continue to increase by 3 million in 2015 and another 8 million over the next four years.[60] Youth unemployment is a matter of particular concern (see also the section on population trends in this chapter), and prominent in SDG 8 on sustained inclusive growth and employment.

The new century has also seen a transformation in the relative power of the state on the one hand, and markets, civil society and social networks of individuals on the other. The role of the private sector as an engine of growth and innovation is not new, often transcending borders through multinational companies. Governments retain the power

Figure 2.12
Trends in index of globalization, by region and globally, 1990–2012[3,58]



to steer and regulate, but it is now difficult to imagine significant progress on issues of global importance, such as health, food security, sustainable energy and climate change mitigation, without the private sector playing an important role. Similarly, in low-income countries, resource flows from foreign direct investment and remittances far outstrip development support and, in the case of remittances, have often proved to be more resilient than aid in the face of an economic downturn.[61]

Globalization also has implications for epidemiology, notably by facilitating the spread of communicable diseases and associated risks due to increased movement of people and goods around the globe – for example, through international travel and migration and trade in animals and goods. In addition, the globalization of markets (and marketing) supports the spread of NCDs by changing diets and lifestyles. Globalization may also have mixed impacts on health and health systems. For instance, low-income countries may lose health workers, but globalization may enable faster, coordinated action against health threats.

The World Trade Organization (WTO) was established in 1995 to govern global trade, including areas that have direct and indirect implications for public health. Around the same time, the emerging agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) established minimum standards of protection for each category of property rights and stimulated debate on pharmaceutical patents. In 2001, the Doha Ministerial Declaration on the TRIPS Agreement and Public Health granted increased flexibility for Member States to take measures to protect public health and promote access to medicines in certain circumstances.[62]

In 2003, the World Health Assembly expressed concerns about access to medicines in developing countries and the implications of the current patent protection system, and urged Member States to adapt national legislation to exploit the flexibilities contained in the TRIPS Agreement. In 2004, Member States were further encouraged to ensure that bilateral trade agreements take into account the flexibilities contained in the WTO TRIPS Agreement as recognized by the Doha Declaration.

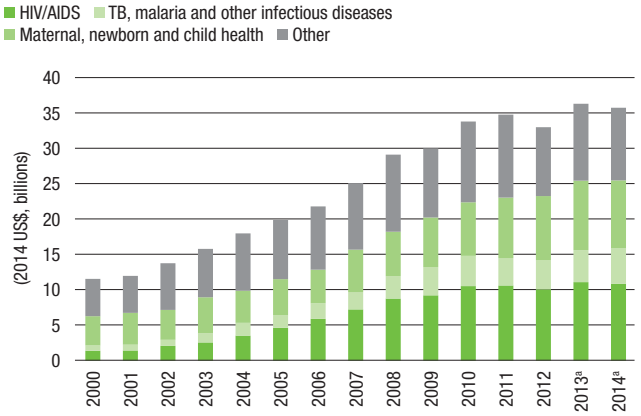
The main outcome of these various initiatives and discussions was a significant drop in the price of certain drugs. For example, the 100-fold reduction in the price of antiretroviral medicines against HIV/AIDS since 2000 and the global effort to increase access to such therapies, notably in sub-Saharan Africa, was made possible by the successful implementation of the TRIPS Agreement, including the production of much cheaper but nevertheless high-quality generics (see Chapter 5). However, the failure to complete the Doha Round, and the increase in mega-regional trade agreements such as the Trans-Pacific Partnership (TPP) and European Union–United States agreements, could strengthen intellectual property protection in ways that could undermine access to medical products.

Within the SDG health goal, Target 3.b reiterates the importance of access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health. Reducing the costs of essential medicines, vaccines and technologies in developing countries continues to be a major priority as globalization and trade liberalization continue.

Development assistance for health

Much of the improvement in the availability and use of services and in health and development outcomes since 2000 was facilitated by a substantial increase in development financing, including for health. In 2013, total health spending reached US$ 7.3 trillion, more than double the amount spent in 2000[63] and the increase in development assistance for health has been one of the features of the MDG era. Disbursements for development assistance for health tripled after 2000 (Figure 2.13), growing at a faster rate than domestic health spending, although the rate of growth has slowed since the financial crisis of 2008–2009. This external financial support for health was targeted particularly at initiatives related to the three health goals highlighted in the MDGs, representing an estimated 61% of all development assistance for health disbursed from 2000 to 2014.

Figure 2.13
Development assistance for health by health focus area, 2000–2014[64]



[a] Preliminary estimates.

Domestic spending – both government and private – also increased substantially and, despite growing more slowly than development assistance for health, remains the dominant source of health financing even in low-income countries, where it represented 75% on average in 2013. This growth in domestic spending was facilitated by continued strong economic growth in most low- and middle-income countries despite the economic crisis.

Nevertheless, total health spending from domestic and external sources combined remained below a proposed target of US$ 86 per capita[65] in 39 countries in 2013, and included six countries that spent less than US$ 20 per capita.[63] On the other hand, the dependence of health systems on out-of-pocket spending has also fallen during this period. At the population-level, this facilitates people's ability to use needed health services and reduces financial catastrophe and impoverishment. However, this spending remains high for many individuals in many countries, so still constitutes a barrier to access for many, and poses a risk of impoverishment and long-term financial problems for those who do get care.

The contributions from public–private partnerships, such as GAVI and the Global Fund, and nongovernmental organizations (including foundations) have expanded.[66] This has brought in new funding, while also supporting innovative approaches and the large-scale introduction of new technologies into routine systems at affordable prices; but it has also focused resources on vertical disease programmes, in some instances unbalancing and fragmenting health systems, leaving multiple gaps such as weak disease surveillance and response systems – as were exposed by the recent Ebola epidemic in West Africa – or inadequate resources to meet the rapidly growing NCD epidemic.

The SDGs present an opportunity for a shift in emphasis away from the funding of vertical programmes towards more system-wide, cross-cutting support, consistent with the aim of UHC. For example, health Target 3.c specifically calls for efforts to "substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing states". There are also multiple targets under other goals that are relevant in this context that encourage states to commit funds according to their own priorities such as Target 10.b to "encourage ODA and financial flows, including direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes". Other references, such as Target 17.2, encourage high-income countries to maintain their commitment to ODA.

One of the challenges we face as we move into the SDG era is the increasingly complex and fragmented institutional global health landscape; and incentives that favour the creation of new organizations, financing channels and monitoring systems over the reform of those that already exist risk exacerbating tendencies to overlap, duplicate and interfere.

Financing for development is also diversifying beyond ODA, and sources of development financing of growing importance include funds and foundations, nongovernmental organizations, civil society organizations and direct giving platforms. For instance, the contribution of philanthropic organizations to development increased by a factor of 10 between 2003 and 2012, notably among them the Bill & Melinda Gates Foundation. In the context of the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action, health has had a combined leadership and tracer role. It was also demonstrated, through initiatives such as the International Health Partnership and related initiatives (IHP+)[67] and Harmonization for Health in Africa, that despite the many different players, coordination around national health strategies can be improved. Such approaches extend beyond the UN to include bilateral development agencies, development banks and nongovernmental organizations, and can show increases both in efficiency and in health outcomes.

Global revenue flows for health financing are likely to continue to change[50] as the principles underlying development aid shift from an emphasis on donor–recipient relations based on financial contributions to reflect concepts of cooperation and partnership, involving diverse types of support and exchanges.[68] After a period of dramatic growth in development assistance since 2000, it is possible that the lower growth rates evident since 2009 will continue. More importantly, the economic growth in many low- and middle-income countries has provided, and will continue to provide, major opportunities for increasing domestic health investments. Increased domestic efforts to mobilize more government revenues and increase the priority for health in public resource allocation, alongside efforts to improve efficiency in the use of funds, would accelerate this progress.

As part of the Addis Ababa Action Agenda,[69] countries agreed on a broad package of over 100 measures that draw upon all sources of finance, technology, innovation, trade and data to support the implementation of the SDGs. Notable among these measures are the promotion of more efficient government revenue collection and a reduction in tax avoidance and illicit financial flows. These measures are essential for expanding the fiscal space and thus vital to making progress on the health goal and targets in the SDGs, and in particular UHC. Strengthening domestic resource mobilization in low- and middle-income countries should enable ODA to be focused on mainly the poorest countries.[68] However, for other low- and some lower-middle-income countries, the need for external financial assistance will not be eliminated.

The composition of development assistance for health also needs to adapt to the rapidly changing epidemiological transition away from infectious diseases towards NCDs and injuries, and the complex socioeconomic patterns of disease and risk factors that appear in different countries. It also needs to address emerging global threats such as antimicrobial resistance, emerging infections and climate change. The world must ensure that global public goods such as health research and development for diseases that affect developing countries and the setting of global norms and standards are adequately financed.[50]

Many of the world's poorest people will remain dependent on external financial and technical support. It is, therefore, likely that the greatest need – as well as the focus of much traditional development finance – will become increasingly concentrated in the world's most unstable and fragile countries, which are often unpopular with donors in terms of fiduciary risk. As a result, donors are likely to favour their own parallel systems over national ones and thus limiting their contribution to strengthening national capacity. This also raises important questions about how the work of the UN in other, less poor, countries will be financed. The Busan Partnership for Effective Development Co-operation, which was formed after the meeting on development in the Republic of Korea in 2011, signalled that a framework based on "aid" has given way to a broader, more inclusive, international consensus that emphasizes partnership approaches to cooperation, particularly South–South and triangular relationships.[70]

SOCIAL DEVELOPMENT

In addition to the direct continuation of MDGs 2 and 3 in the SDGs 4 and 5, on education and gender equality, respectively, the SDGs also give much greater weight to human rights and to equity – particularly with Goal 10 to reduce inequality – than was the case with the MDGs.

Gender equality and rights

Gender inequality is expressed in a variety of ways, including mistreatment of one sex by another, differences in power and opportunities in society, and differences in access to health services. Gender inequalities in education, employment and civil liberties carry a cost. They not only deprive women of basic freedoms[71] and violate their human rights, but also negatively affect development outcomes for societies as a whole. Gender inequities have adverse impacts on health, especially for women. In many countries and societies, women and girls are treated as socially inferior. Behavioural and other social norms, codes of conduct and laws perpetuate the subjugation of females and condone violence against them. Unequal power relations and gendered norms and values translate into

differential access to and control over health resources, both within families and beyond. Across a range of health problems, girls and women face differential exposures and vulnerabilities that are often poorly recognized.[72]

The MDGs included a gender equality goal focused on gender disparity in education, although it also included indicators for female workforce participation and female representation in parliament. The SDGs also target gender equality (Goal 5) and gender equality is specifically referred to in several targets of other goals, including education, economic and other rights, as well as targets related to violence against women (see Chapter 8) and sexual and reproductive rights (see Chapter 4).

During the MDG era, substantial gains were been made on several fronts. Gender parity in school enrolment for primary education in the developing regions as a whole was reached by 2015. Women's access to paid employment in non-agricultural sectors increased globally from 35% in 1990 to 41% in 2015, with increases, although unequal, observed in almost all regions. The average proportion of women in parliament has nearly doubled over the past two decades, but still only one in five members is a woman.[38] Despite these gains, much remains to be done as we move forward into the SDG era, as was underlined by the Commission on the Status of Women in 2015, which concluded that progress since the 1995 Beijing Declaration and Platform for Action had been slow and uneven, with major gaps remaining.[73] Similar conclusions were reached by the Commission on Population and Development in a 2014 review of the implementation of action of the International Conference on Population and Development.[74,75]

The strong relationship between the status of women and health forms the basis for integrated action. Actions for the health sector include:

- *Enhancing data and statistics*: Disaggregation of key statistics by gender is critical for monitoring progress, identifying key gaps, targeting, etc.,[76] including health data.[72] This includes targets on infectious diseases (3.3), NCDs and mental health (3.4), substance abuse and harmful use of alcohol (3.5), injuries (3.6) and UHC (3.8).

- *Increasing access to quality health care*: Comprehensive strategies to target gender inequality in health care and put into practice policies to ensure equal access for women, adolescents and youth to affordable and adequate health-care services, including primary health care and basic nutrition.

- *Supporting caregiving roles*: Approaches to strengthen human resources for health must acknowledge the critical role played by women as informal caregivers in the home and community, whether it concerns HIV/AIDS in low-income countries or elderly care in high-income countries.[72]

- *Eliminating harmful practices*: Policies and strategic actions that transform discriminatory social norms and gender stereotypes, and eliminate harmful practices including, child, early and forced marriage, honour crimes and female genital mutilation.

- *Combating violence against women*: Violence against women remains a substantial obstacle to reaching gender equality, and the health sector plays a key role in violence prevention and in treating the consequences of violence.

- *Introducing gender-sensitive policies*: Improvement and strengthening of gender responsive national policies, programmes and strategies.

Human rights

The *right to the enjoyment of the highest attainable standard of physical and mental health* was first articulated in the 1946 Constitution of WHO,[77] and has been echoed in many other legally binding human rights conventions.[78,79] In 2000, the United Nations Committee on Economic, Social and Cultural Rights adopted a General Comment on the Right to Health, stating that this right extends beyond timely and appropriate health care to the underlying determinants of health, such as: access to safe drinking-water and sanitation; adequate supply of safe food, nutrition and housing; health occupational and environmental conditions; and access to health-related education and information, including sexual and reproductive health.[80]

Most recently, the right to health has been re-emphasized in terms of the achievement of UHC (see Chapter 3), while the SDG declaration stresses the importance of the Universal Declaration of Human Rights (as well as other international instruments relating to human rights and international law) in a number of places, as a key underlying principle. The right to health is closely related to and dependent upon the realization of other human rights, as contained in the International Bill of Rights, such as the right to food, housing, work and education. Human rights, including the right to health, are especially important for vulnerable groups, such as women, migrants or people with disabilities, who may be more likely to face discrimination, stigma and/or socioeconomic hurdles.

People with disabilities are a particular matter of concern, often facing discrimination and barriers that restrict them from participating in society on an equal basis. WHO estimates that about 1 billion people worldwide live with disability or impairment with a larger proportion living in low- and middle-income countries.[81] Disability was not mentioned in the MDGs, but is implicitly included in SDG Goal 3, which is concerned with the health and well-being for all, at all ages. Disability is also specifically mentioned in other targets on education (4.a), social, economic and political inclusion (10.2), sustainable cities (11.7), and equity monitoring (17.18). In addition, people with disabilities are obviously included in the UHC target, since people with disabilities are more likely to have higher health-care expenditures with higher out-of-pocket payments.[82] The explicit recognition that people with disabilities need to have access to appropriate health interventions, including interventions for rehabilitation and assistive health technologies and products, as part of the goal of moving towards UHC provides a major impetus for disability-related health initiatives.

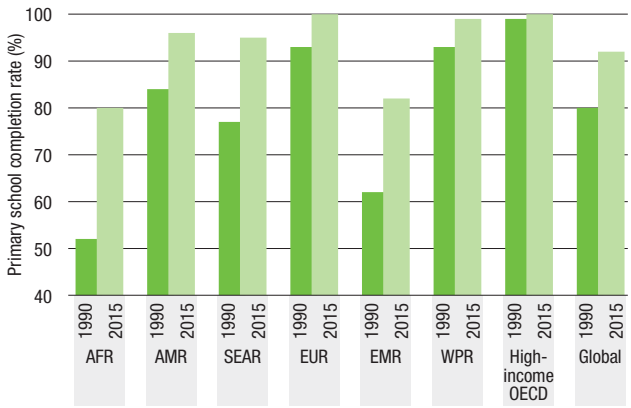
The main strategy going forward is to accomplish the objectives of the WHO Global Disability Action Plan 2014-2021 as agreed by all countries and implement the actions required.[83,84] The objectives of the action plan are threefold: (i) to remove barriers and improve access to health services and programmes; (ii) to strengthen and extend rehabilitation, assistive technology, assistance and support services, and community-based rehabilitation; and (iii) to strengthen the collection of relevant and internationally comparable data on disability and support research on disability and related services.

Education

Education is strongly linked to health and other determinants of health, contributing directly and indirectly to better health.[54] For example, education has an independent and substantial causal effect on adult mortality and morbidity,[85] and also affects health indirectly through proximate determinants such as nutrition, sanitation and prevention and treatment practices. Reciprocally, good health permits people to fully benefit from education, while poor health is directly associated with poor educational attainment. Female education is one of the strongest determinants of child survival in all societies.[86,87,88] Female education is thus a key strategy for ending preventable maternal and child deaths, as well as reducing fertility and improving child, adult and family health and nutrition.

The completion of basic education is also widely regarded as essential to literacy, numeracy and informed citizenship. The participation of at least some proportion of adults at the more specialized upper secondary and tertiary levels is also critical for promoting individual opportunity, economic development and societal well-being. Recent evidence also shows some direct links between secondary education and health, such as protection against HIV risk.[89]

Figure 2.14
Primary school completion rate by region and globally, 1990 and 2015[3,90]



The MDGs contained a single target to achieve universal primary education. Primary school net enrolment rate in developing regions reached 91% in 2015, up from 80% in 1990, which means that more children than ever are attending primary school. However, just over half of all countries have achieved universal primary enrolment by 2015; with 10% close and the remaining 38% far or very far from achieving it. This leaves 57 million children out of school globally and almost 100 million adolescents in low- and middle-income countries not completing primary education in 2015. A lack of focus on the marginalized has left the poorest five times less likely to complete a full cycle of primary education than the richest. A high and growing proportion of out-of-school children live in conflict-affected zones. As a result, completion rates (Figure 2.14) and the quality of primary education are regarded as unsatisfactory in large parts of the world.[4,38]

Gender parity has been achieved at the primary level in 69% of countries by 2015. At the secondary level, only 48% of countries will reach the goal. Child marriage and early pregnancy continue to hinder girls' progress in education. Girls remain less likely than boys to ever enter school,

this is even more the case among girls from poor families. By contrast, in many wealthier middle- and high-income countries, in Europe and the Americas, girls outperform boys in some subjects, and boys are at higher risk of failing to complete a cycle of secondary education.[4]

By 2015, lower secondary enrolment increased by 27% globally and more than doubled in sub-Saharan Africa compared with the levels in 1999. Nonetheless, one third of adolescents in low-income countries will not complete lower secondary school in 2015. If current trends continue, universal lower secondary completion will only be achieved towards the end of this century.

While globally the percentage of illiterate adults fell from 18% in 2000 to 14% in 2015, this progress is almost entirely attributed to more educated young people reaching adulthood. Women continue to make up almost two thirds of the illiterate adult population. Half of sub-Saharan African women do not have basic literacy skills.

The SDGs have substantially expanded the focus on education, with nine targets addressing not only primary education and literacy, but also access to quality early childhood development, care and pre-primary education, secondary and tertiary education and vocational training, improved access for marginalized groups, and teacher supply. The agenda is ambitious, not just in terms of finding the resources to meet the additional costs, but also in terms of feasibility, given current rates of progress. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has estimated that an extra US$ 22 billion per year is needed on top of already ambitious government contributions in order to achieve the new SDG education targets for quality pre-primary and basic education for all by 2030.[4]

ENVIRONMENT AND CLIMATE CHANGE

The environment is under pressure from human activity and the climate is changing. Driven largely by economic activity and population growth, anthropogenic greenhouse gas emissions have increased since the pre-industrial era, leading to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800 000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to be the dominant cause of the observed warming since the mid-20th century.[91] In many parts of the world, climate change will jeopardize the fundamental requirements for health, including clean air, safe and sufficient drinking-water, safe excreta management, decent work, a secure and nutritious food supply, protection from extreme weather events and adequate shelter. Addressing the relationship between health, climate change and other major environmental factors, such as air pollution, will be of growing importance in the coming years.[92,93]

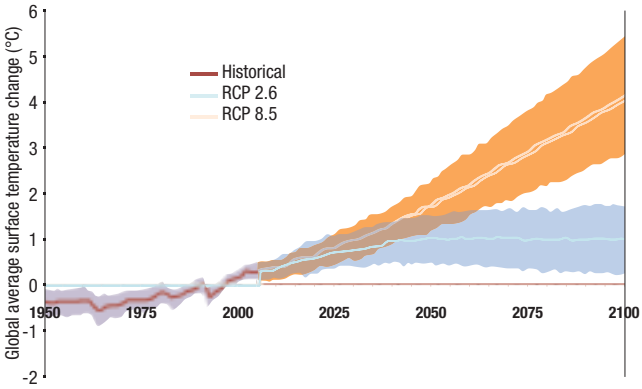
MDG 7 addressed sustainable development and had one environmental target that was specific to human health – the halving of the proportion of the population without sustainable access to safe drinking-water and basic sanitation. The target on drinking-water has been met, although disparities persist within and between countries. With regard to basic sanitation, however, 2.4 billion people still lack access to improved sanitation facilities.[94]

The SDGs include several targets relating to environmental sustainability and human health, notably Target 3.9 "By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination", targets relating to water and sanitation (SDG 6), energy (SDG 7), exposure to chemicals and all wastes (SDG 12), and natural disasters and climate change (SDG 13). Environmental determinants of health also have a bearing on a number of other SDGs. For example, they are an important consideration in the poverty/hunger goal (SDG 1) given that environmental risks, such as use of solid fuels for cooking or unsafe water and sanitation disproportionally affect the poor. The same is true regarding gender inequality (SDG 5) since women and girls are the ones most likely to be doing the cooking. Those already vulnerable to food insecurity will be at increased risk of reduced crop yields linked to climate change (SDG 2). The link between decent work (included in SDG 8) and occupational health and safety is another example and, finally, SDG 11 addresses the safety and sustainability of cities and settlements, which is related to environmental health determinants such as access to safe water and sanitation, road traffic, air pollution and physical activity. The following section addresses climate change and other environmental risks to health not already covered in dedicated sections. Safe water and sanitation are addressed in Chapter 5, air pollution in Chapter 6, and natural disasters in Chapter 8.

Climate change

According to a growing body of evidence, the climate is warming. The globally averaged combined land and ocean surface temperature data show a warming of 0.85 °C (from 0.65 to 1.06) from 1880 to 2012. In the northern hemisphere, the 30-year period from 1983 to 2012 was likely the warmest of the last 1400 years.[95] It is extremely likely that human activity has been the dominant cause of the observed warming since the mid-20th century. Models now reproduce observed continental-scale surface temperature patterns and trends over many decades, including the more rapid warming since the mid-20th century and the

Figure 2.15
Global average surface temperature change under two scenarios for turning around global greenhouse gas emissions, 1950–2100[96]



RCP: representative concentration pathway

cooling immediately following large volcanic eruptions. The Intergovernmental Panel on Climate Change's (IPCC) most recent projections cover a range of scenarios for future greenhouse gas emissions, known as representative concentration pathways (RCP). These range from RPC 2.6, which assumes that global greenhouse gas emissions will peak between 2010 and 2020 and decline substantially after 2020, to RCP 8.5, in which greenhouse gas emissions continue to rise throughout the 21st century. Intermediate scenarios RCP 4.5 and 6.0 assume emissions peak in 2040 and 2080, respectively.[96]

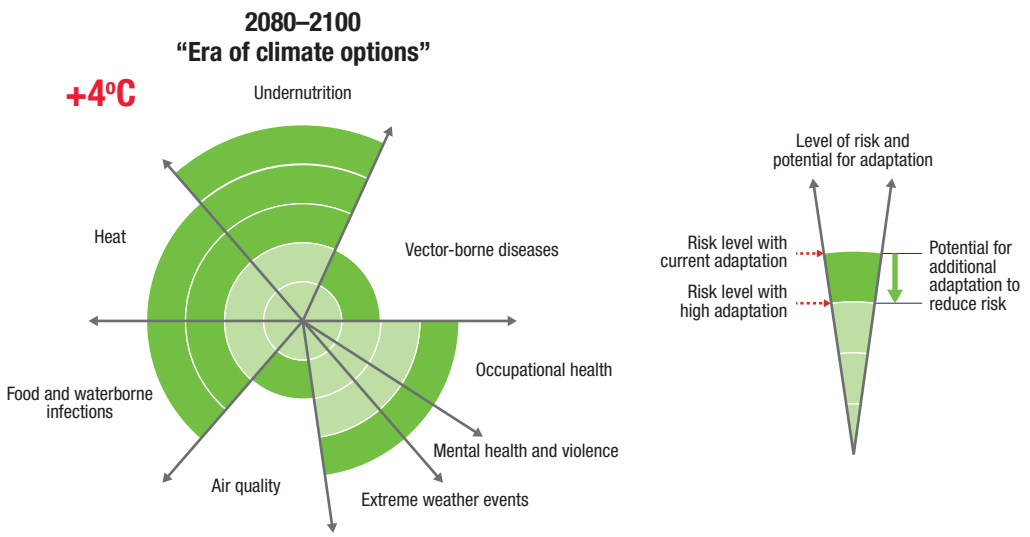
The global mean surface temperature change for during 2016–2035 relative to 1986–2005 will likely be in the range from 0.3 °C to 0.7 °C. The increase of global mean surface temperatures for 2081–2100 relative to 1986–2005 is projected to range from 0.3 °C to 1.7 °C (RCP 2.6) to 2.6 °C to 4.8 °C (RCP 8.5) (Figure 2.15). The Arctic region will warm more rapidly than the global mean, and mean warming over land will be larger than over the ocean. Across all RCPs, global mean sea level is projected to rise from 0.26 to 0.82 metres by the late 21st century.

It is virtually certain that there will be more frequent hot and fewer cold temperature extremes over most land areas on daily and seasonal timescales as global mean temperatures increase. It is very likely that heat waves will occur with a higher frequency and duration. Occasional cold winter extremes will continue to occur.

Climate variability and climate change has important consequences for health, ranging from the immediate impact of extreme weather events, to the longer term impacts of droughts and desertification on food production and malnutrition, and the increased spread of infectious disease vectors for malaria and dengue.[97] Long-term climate change threatens to exacerbate today's problems, while undermining tomorrow's health systems, infrastructure, social protection systems and supplies of food, water and other ecosystem products and services that are vital for human health. The poorest and most vulnerable populations are likely to experience the most severe impacts. These may be worsened by rapid and unplanned urbanization, the contamination of air and water, and other consequences of environmentally unsustainable development.

Successive assessments by WHO[98] and the IPCC[96] have concluded that climate change presents significant risks to health, but that much of the potential burden could be averted through reinforcement of key health system functions, including improved management of environmental determinants of health such as water and sanitation and food security, improved disease surveillance and preparedness and response for extreme weather events (Figure 2.16).

Figure 2.16
Primary prevention is key to protecting from climate risks[102]



IPCC assessment of the expected increase in the various health risks from climate change by the end of the century. The size of each wedge is roughly proportional to the expected size of the specific impact. The dark shaded part is the proportion that is assessed as avoidable through strengthening and adaptation of health protection measures.

There is increasing evidence that actions to mitigate climate change could also bring immediate health benefits, most notably through reductions in the burden of air pollution. These include moving towards cleaner sources for household energy and electricity generation as well as promoting safe public and active transport.[99]

During the MDG era, climate change risks have become a key consideration in the global health agenda. For example, WHA resolution 61.19 (2008)[100] calls for measures to assess the implications of climate change for health and health systems, and put in place appropriate response measures. This has been reinforced through frameworks for action in all WHO regions, the development of health sections within national adaptation plans and large-scale adaptation projects in low- and middle-income countries. WHA resolution 68.8 (2015)[101] states that there are meaningful opportunities to simultaneously improve air quality and reduce emissions of climate-altering pollutants.

According to WHO estimates, climate change will cause an additional 250 000 deaths per year between 2030 and 2050.[97] Most will likely perish from malaria, diarrhoeal diseases, heat exposure and undernutrition. With regard to the last, the greatest impact is expected in Africa and Asia, where most lower and lower middle-income countries are, and by children, the elderly and vulnerable populations. Undernutrition already contributes to almost half of all child deaths each year,[103] and rising temperatures and more variable rainfall patterns are expected to reduce crop yields, further compromising food security. Climate change-driven migration is also most likely to affect Africa and Asia because of dependence on agriculture in those regions.

Financial support for adaptation to climate change remains much lower than is required by agreed targets or needs, and less than 1.5% of multilateral climate adaptation funds have gone to health projects.[104] In addition, the potential health gains from climate mitigation policies are rarely included in policy evaluation or design.

Pollution and contamination

SDG Target 3.9 aims to substantially reduce the number of deaths and illnesses from hazardous chemicals, and air, water and soil pollution and contamination. Indoor and outdoor air pollution are jointly responsible for about 7 million premature deaths annually.[105] Chapter 6 provides further discussion on the consequences of air pollution for health. In some areas there has been progress in the past 15 years. For example, since 2002, the number of countries using leaded gasoline for vehicles has dropped from 82 to 6, including the phase-out of leaded gasoline in 48 sub-Saharan African countries between 2002 and 2005. Lead is a cause of reductions in intelligence and of neuropsychiatric disorders, particularly in children, and causes an increased risk of cardiovascular diseases. In sub-Saharan Africa alone, unleaded gas has been estimated to result in nearly US$ 100 billion of health benefits.[106]

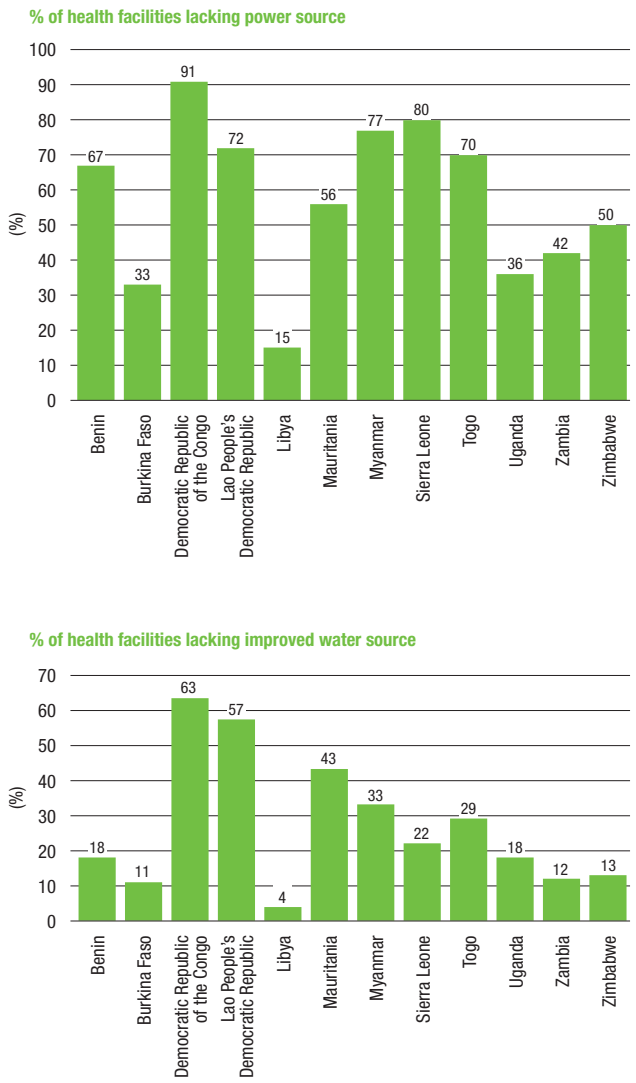
The main health impact of water pollution and contamination are associated with increased levels of mortality due to waterborne diseases, most notably diarrhoeal diseases which are associated with 1.5 million deaths every year. More than half of that burden, or 842 000 deaths per year, are attributable to unsafe water supply, and lack of sanitation and hygiene.[107] Chapter 5 deals with waterborne diseases in greater detail. The burden of disease due to hazardous chemicals and soil pollution and contamination is less well known than that due to water and air pollution. In 2001, the legally binding Stockholm Convention on Persistent Organic Pollutants (POPs), was adopted by most countries to protect health and the environment from POPs by reducing or eliminating their release. POPs are chemicals of global concern due to their negative health impacts, their persistence in the environment, potential for long-range transport and dispersal, and capacity to accumulate in ecosystems. As part of the WHO and the United Nations Environment Programme (UNEP) collaboration for the global monitoring plan under the Stockholm Convention, human milk surveys provide results that indicate success in eliminating certain persistent pesticides, such as aldrin, dieldrin, mirex and toxaphene, but also the ubiquitous presence of unintentional by-products.[108]

Within the health sector, priority concerns will be ensuring access to clean energy for health facilities and lowering the climate footprint of the health sector in developed countries, for example by reducing energy consumption, reducing toxic waste, using safer chemicals and purchasing eco-friendly products.

Occupational health

The SDGs have no specific target on occupational health. Target 8.8, however, refers to "Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment". In 2007, Member States endorsed WHA resolution 60.26 Workers' Health: Global Plan of Action to cover all workers with essential interventions and basic occupational health services for primary prevention of occupational and work-related diseases and injuries. A framework for the development, implementation and evaluation of healthy workplace programmes in different sectors and sizes of companies ensures the protection and promotion of the health of workers. The Minamata Convention[109] was signed in October 2013, its main objective being to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The Convention includes an article dedicated to health aspects. While initiatives are being undertaken to improve environmental conditions in the workplace generally, many

Figure 2.17
Proportion of health facilities lacking power source or improved water source,[a] 2010–2015[110]



[a] Data from most recent survey in each country.

health facilities in low- and lower-middle-income countries continue to lack safe water and basic sanitation or, for that matter, access to electricity (Figure 2.17). This affects the risks of infection for both service providers and clients, as well as the quality of services.

Intersectoral action

Addressing the issue of environmental determinants of health requires a concerted, intersectoral response, involving, at the very least, transport and urban development. The main strategy for managing the health risks associated with disasters in the post-2015 era is supported by the Sendai Framework for Disaster Risk Reduction 2015–2030[111], which is discussed in Chapter 8. It provides general guidance for the reduction of risk and loss through integrated and multisectoral actions to prevent new disasters, mitigate existing disaster risk, reduce hazard exposure and enhance preparedness for response and recovery. In line with the Sendai framework, WHO and others should aim to position health as a central concern in climate policy, and a prime object of technical and financial support mechanisms. More generally, climate must be brought into the development discourse. The SDGs have made a first step in that direction.

Progress in this area will require support for a comprehensive approach to building health system resilience to climate change, including technical support for development of the health components of national adaptation plans, an operational framework to build climate resilience into the core building blocks of health systems, and large-scale projects, for example, focusing on integrating climate change and health into water and sanitation investments. Surveillance systems for climate-sensitive infectious diseases such as malaria and cholera also need to be strengthened. Countries should make better use of early-warning information to predict the onset, intensity and duration of epidemics. Such predictions allow health officials to pre-position medicines and vaccines, which can reduce the death toll.

Intersectoral actions need to take appropriate account of health effects in policies, for example, in the provision of fossil fuel subsidies, the reduction of which would be expected to significantly reduce both air pollution deaths and emissions of greenhouse gases.[112] More targeted policies, for example, reducing emissions of short-lived climate pollutants such as black carbon and methane through cleaner electricity generation, household energy and transport policy, would slow the rate of global warming, while also saving nearly 2.5 million lives per year.[113] Sustainable, low-carbon urban transport – such as cycling or walking – could further lead to reductions in heart disease, stroke, breast cancer and other ailments. The importance of intersectoral action for health has been supported by WHO since the 1978 Declaration of Alma-Ata.[114] More recently, the 8th Global Conference on Health Promotion in Helsinki stressed the importance of taking health into account in other policies, what has come to be termed Health in All Policies.[115,116] Going forward, it seems clear that strategies based on such policies will play an important part in advancing the SDG agenda in this crucial area.

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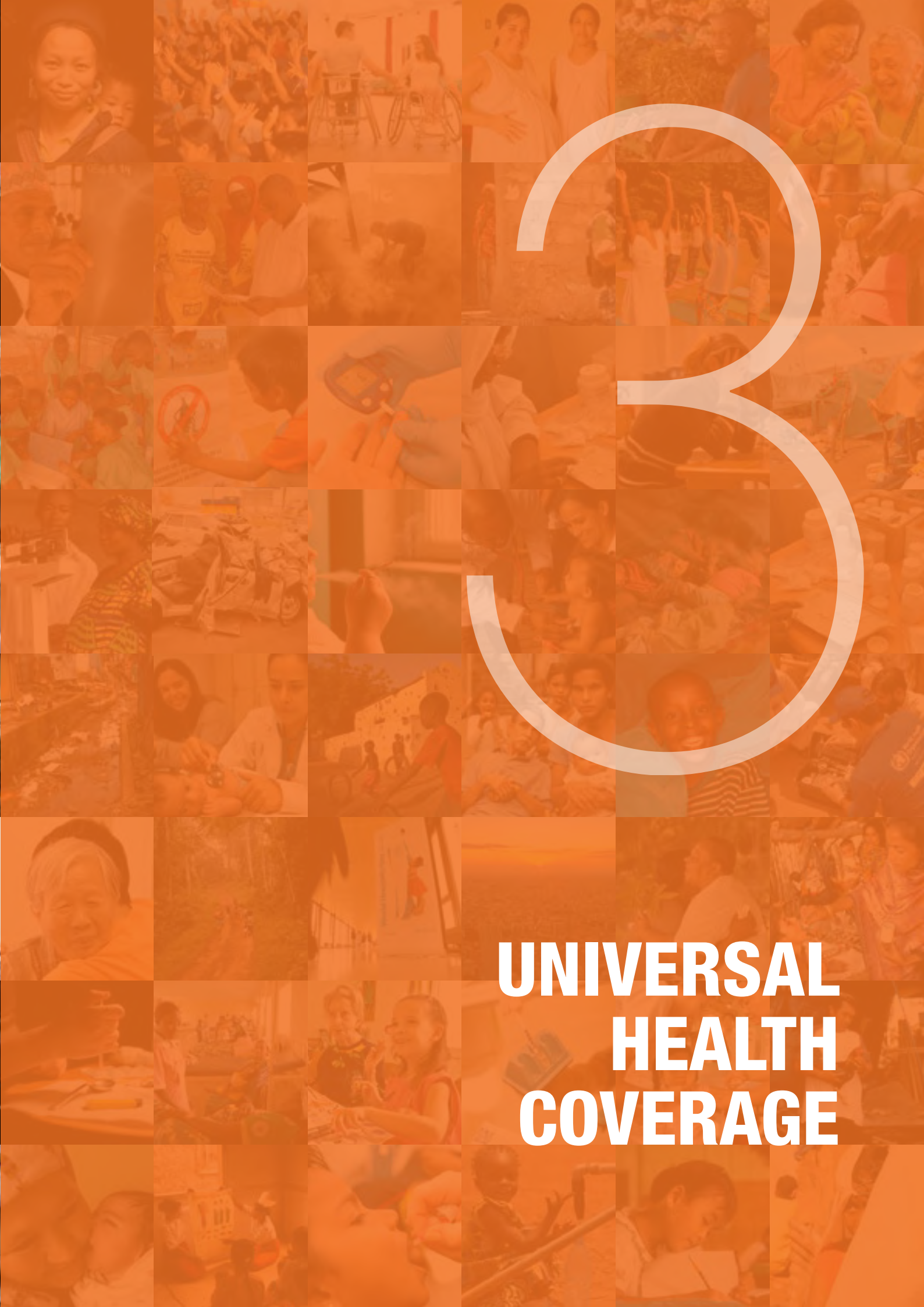


3

UNIVERSAL HEALTH COVERAGE

SUMMARY

Universal health coverage (UHC) is defined as ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship. UHC is prominent in the SDG declaration and has a specific target under the health goal. It is the only target that underpins, and is key to the achievement of, all the others.

During the MDG era, much progress was made in the coverage of key interventions for maternal and child health and against infectious diseases. Coverage gaps between the rich and the poor for these interventions were reduced in many countries. Per capita government expenditure on health went up by about 40% in real terms between 2000 and 2013, and out-of-pocket spending decreased slightly from 35% to 31% of total health spending.

Country actions supported by global agencies and partnerships and the scaling-up of innovative interventions for diagnosis (e.g. rapid tests for malaria and HIV), prevention (e.g. vaccines) and treatment (e.g. ART and ACTs) have contributed to improved service provision and performance.

Major health system weaknesses remain. Many countries lack sound health financing, leading to high out-of-pocket payments and financial catastrophe or impoverishment for families, and have major inadequacies in health workforce and infrastructure (especially in the rural areas), medical products (poor access, inappropriate use and reports on substandard, spurious, falsified, falsely labelled and counterfeit (SSFFC) medicines entering the supply chain), service quality and information and accountability. Weak health systems also leave major gaps in the national, regional and global defences against outbreaks of infectious diseases, such as Ebola virus disease and influenza epidemics.

While the MDG focus on specific diseases and health issues encouraged a tendency to reinforce programme silos set up to deliver selected interventions, all countries now face a much broader spectrum of health challenges, including the rapid rise of NCDs, the challenges of injuries and health security. Strong health systems are required to sustain and expand the unfinished MDG agenda, make major progress toward UHC and ensure resilience against epidemic diseases and disasters.

The SDG targets include a comprehensive set of health targets that address the unfinished and expanded MDG agenda, as well as major challenges related to NCDs, injuries and environmental issues. The target on UHC underpins all other targets and provides an opportunity to refocus efforts on a more sustainable approach through system-wide reform, based on the principles of efficiency and health service integration and people-centred care. The SDGs also fundamentally call for intersectoral action, acknowledging that attainment of health goals is dependent not only on actions within the health sector, but also on economic, social, cultural and environmental factors. Making progress towards UHC depends to a considerable extent on the broader policy context within which health systems operate and on levels and differentials in socioeconomic development.

UHC is coverage that provides people with the health services they need while protecting them from exposure to financial hardship incurred in obtaining care.[1] In this definition, health services are broadly defined to include health promotion initiatives (such as anti-tobacco policies or emergency preparedness), disease prevention activities (such as vaccination) and the provision of treatment, rehabilitation and palliative care (such as end-of-life care) of sufficient quality to be effective. The MDGs made no reference to UHC, which has gained renewed momentum as an idea and an aspiration following the 2005 World Health Assembly call for countries to plan for the transition to UHC.[2] This was followed by the 2008 World Health Report on primary health care,[3] the pivotal 2010 World Health Report on health financing for UHC,[1] a 2011 World Health Assembly resolution[4] and a 2012 UN General Assembly resolution on UHC.[5] In contrast to the MDGs, the SDGs refer to UHC both directly and indirectly, thus reflecting an emerging consensus regarding the importance of UHC. The preamble (point 26) of the final text of the 2030 agenda for sustainable development states: "To promote physical and mental health and well-being, and to extend life expectancy for all, we must achieve universal health coverage and access to quality health care. No one must be left behind".[6]

SDG Target 3.8 calls upon countries to: "Achieve UHC, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all." Two additional SDG targets directly relate to health systems strengthening in developing countries; building upon MDG Target 8, SDG Target 3.b is formulated as:

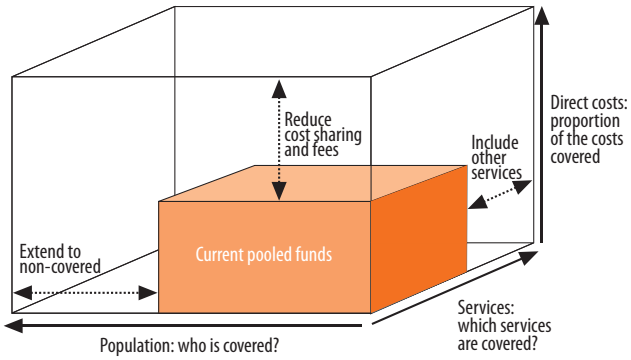
> *Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.*

SDG Target 3.c focuses on health financing and the workforce in developing countries:

> *Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least-developed countries and small island developing States.*

There are also a number of SDG targets that address non-health sector issues that nevertheless have important implications for health and thus relevance for UHC. For example, coverage targets for safe water and sanitation have a significant bearing on universal coverage of disease prevention, and the same is true of targets relating to road traffic deaths and urban development. Similarly, the labour markets in health (and other social sectors) can stimulate economic growth, productive employment, youth employment and decent work (Goal 8). Specific linkages between health services and a number of other SDGs are also clear, including the health service-poverty linkage (Goal 1); gender equity in service delivery (Goal 5); water and sanitation in health facilities (Goal 6); service delivery in slums (Goal 11); and the use of institutional health partnerships for capacity building (Goal 17). Indeed, the SDGs provide a basis for forging strategic partnerships for action at the country level on health service delivery.

Figure 3.1
Three dimensions of UHC[1]



Because UHC is cross-cutting and linked to the achievement of all health SDG targets, it offers a platform for the integration of health and related targets and, taken together with a Health-in-All-Policies approach, may serve as a powerful focus for reflection and policy development.

UHC comprises two components – health service coverage on the one hand and financial protection coverage on the other – both of which need to be assessed at the level of the whole population. Thus, three dimensions – health services, finance and population – are typically represented in what has come to be known as the "coverage box" (Figure 3.1). Through their health system reforms, all countries struggle to fill the box (i.e. to extend coverage of quality services with financial protection), including high-income countries with long established institutional arrangements for health systems that may, for example, be fighting to maintain their levels of coverage in the face of rising costs. Demographic (e.g. population ageing) and epidemiological (e.g. rising chronic diseases) changes play an important role with technological advances and changes in people's patterns of service utilization. It is for this reason that the UHC endeavour is generally referred to as a journey rather than a destination, a progressive or dynamic process rather than a once-and-for-all solution that can be "achieved".

Lessons learned from the Ebola virus disease outbreak in West Africa are a reminder of the importance of strong health systems with robust primary care services and capable public health surveillance and management functions.[7,8,9] Within this framework, focused efforts in public health information systems, supply chain, workforce, safe services (including infection prevention and control), financing and governance will also be core to sustainable efforts to prevent, detect and respond to emerging health security threats. Resilience is a key attribute and indicator of strong well-performing health systems. It implies that countries and communities are capable of effectively minimizing the consequences of emergencies by reducing the likelihood of the disaster happening (where possible), reducing their vulnerability to the event itself and strengthening their capacity to respond and recover.

TRENDS

Although the MDGs included no explicit goal for UHC, they did address services that are generally identified as priorities in countries with a UHC-oriented reform agenda, including reproductive, maternal, newborn and child health (RMNCH), and the high-burden infectious diseases HIV/AIDS, malaria and tuberculosis (Figure 3.2). In contrast, NCDs – a priority concern in countries with commitments to UHC – were passed over in the MDGs, and have seen much more limited improvement in the past 15 years (NCDs are discussed in detail in Chapter 6).

There is evidence that socioeconomic disparities in coverage of UHC health services have declined slightly in many countries as a result of faster improvements among disadvantaged subgroups. For instance, based on data from 28 low- and middle-income countries during 1995–2013, the median composite coverage index of eight RMNCH indicators in four intervention areas – family planning, maternal and newborn care, immunization, and treatment of sick children – had an increase of 11 and 4 percentage points in the poorest and the richest wealth quintiles, respectively, resulting in the reduction of wealth-related inequality. The same index increased 10 and 5 percentage points in rural and urban areas, respectively, narrowing down place-of-residence inequality (Figure 3.3). Broadly speaking, however, inequity in access to quality health care both within and between countries continues to be a major concern.

Figure 3.2
Global levels and trends of health MDG-related UHC tracer indicators, 2000–2015[10]

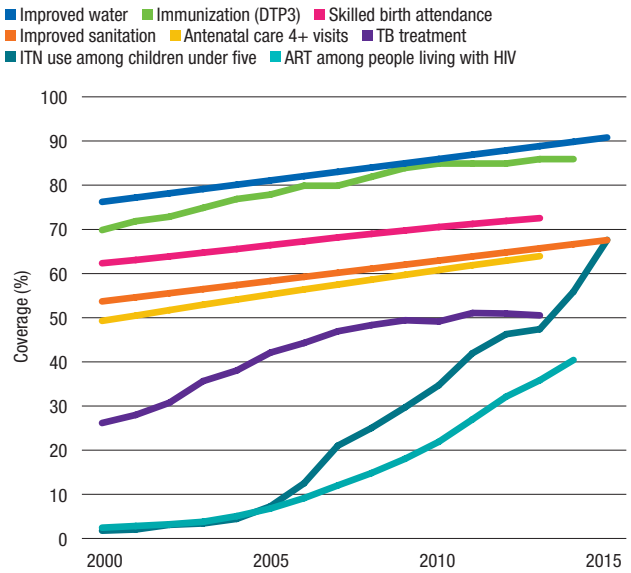
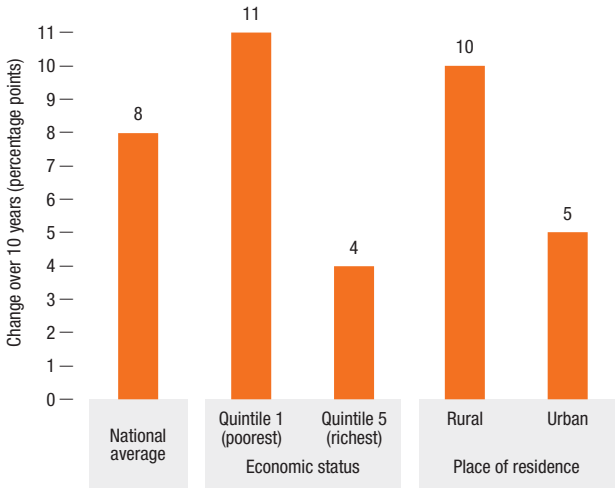


Figure 3.3
RMNCH composite coverage index, change over time in national average and in population subgroups in low- and middle-income countries,[a] 1995–2013[11]

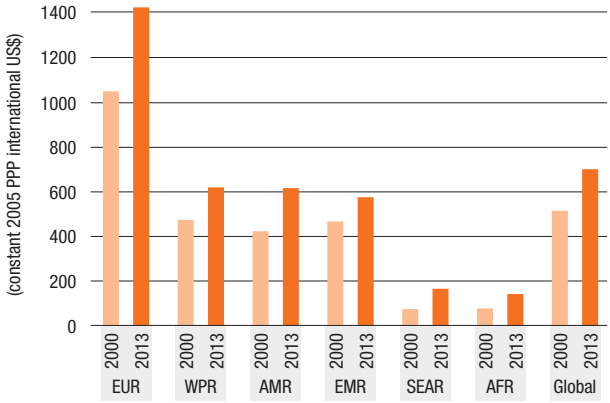


[a] Median value of 28 selected countries.

UHC-related efforts must address not only health service coverage, but also health service quality and financial protection. Key to delivering quality, people-centred integrated health services is the establishment of efficient, decentralized, integrated health systems staffed by well-trained, motivated professionals, offering and ensuring appropriate use of the full range of quality-guaranteed essential medical products (including medicines, blood and medical devices), financed in ways that guarantee predictable adequate funding for the system while at the same time offering financial protection to the users.[1]

In some of these areas a few encouraging trends have emerged in the past 15 years such as the development of hospital accreditation[12,13] and the move away from inpatient-centric health services towards outpatient, decentralized, integrated health systems that deliver health care across the full spectrum of available services that is seamless and easy to navigate.[14] Key to delivering such services is an emphasis on primary health care centres that take greater responsibility for health-care coordination.[15,16] In terms of specific medical interventions, there is evidence of progress in reducing the number of unsafe injections in low- and middle-income countries, achieved largely through

Figure 3.4
Per capita government health expenditure,[a] by WHO region and globally, 2000 and 2013[18]



[a] Values are unweighted averages; PPP: purchasing power parity.

a reduction in the reuse of injection devices. The average number of injections per person per year has declined from 3.4 to 3.0 during 2000–2010, while the proportion of reuse of injection devices dropped from 40% to 6%.[17] In other areas, however, there is little large-scale evidence of improvements of the quality of care and reductions in medical care-associated complications, even from high-income countries.

Health service financing has also improved, not just in terms of the amount of money going into health, but also the way it is raised and spent. Per capita government health expenditure globally increased by about 40% in real terms between 2000 and 2013 (Figure 3.4) with major increases in all regions. This reflects economic growth and, in several countries, the increased priority for health that governments are making in their budget allocations (Figure 3.6). On average across countries, global out-of-pocket health spending is down slightly (from 35% of total health spending in 2000–2004 to 31% in 2010–2013) (Figure 3.5), which suggests an improvement in financial protection, but average levels, particularly in low-income countries (42%) remain high.

On the workforce front there has also been some improvement, but it has been piecemeal. For example, some countries affected by major health worker shortages have reported improvements in the availability of skilled health professionals.[19] This includes improved rural retention of health workers through changes in national policies. The world market for medicines and technologies continues to grow (estimated at almost US$ 11 trillion) but reliable data on the availability and quality of medicines and technologies are generally limited. A survey in 26 low-income and lower-middle-income countries, using the standardized WHO/Health Action International (HAI) methodology,[20] showed that generic medicines were available in 58% and 67% of public and private sector health facilities, respectively, with large variation between countries.[21] The availability of donated blood has improved somewhat with donations increasing 25% since 2004,[22]. On the other hand, promising eHealth initiatives, such as eLearning for health workers or electronic health records, have not yet achieved their full demonstrable and documented impact.[23,24]

There has been a marked improvement in our ability to monitor progress on key health indicators, especially through household health surveys allowing for the collection of data on mortality, fertility and MDG-related intervention indicators. International household survey programmes such as the USAID Demographic and Health Survey (DHS) and the UNICEF Multiple Indicator Cluster Sample Survey (MICS) have been instrumental, reaching well over 100 countries with multiple surveys. In recent years, more countries are conducting surveys that also collect data on NCD-related risk factors.[25] Many surveys now also collect biological and clinical data such as anthropometry, blood pressure or HIV testing. In addition, there were improvements in other types of data such as tracking of health spending through national health accounts.[26]

POSITIVE DEVELOPMENTS

UHC is a multifaceted and complex endeavour and many factors contribute to its successful development. Key lessons learnt include: (i) the centrality of country leadership and political commitment to the concept of UHC; (ii) the important role played by partnerships, including cross-sectoral action and community and civil society mobilization; and (iii) the need for support from development partners in low- and lower-middle income countries. The substantial increases in both domestic and external funding, even if mainly targeted at disease-specific interventions, have stimulated progress. However, sustaining and enhancing progress will be difficult without taking a more holistic approach to health system strengthening.

Country actions: These include high-level political commitment, coordinated national strategies and plans, implementation of innovative approaches and scaling-up of proven interventions.

- Many countries have developed unified national health policies, strategies and plans. For example, national health workforce strategies and plans increasingly address overall quality and performance orientation and are designed to tackle issues related to health workforce recruitment, training, retention and migration. In many cases, strategies to reinforce health worker motivation to promote the delivery of priority health services have been supported by specific incentives introduced through health financing reforms.[27] Several countries have established comprehensive health sector results frameworks that focus on UHC and ensure regular monitoring and inclusive review of progress.[28]

- Over 70 countries have established hospital accreditation schemes to improve quality of care. Some 140 countries have defined national essential medicines lists to guide purchasing decisions. The incorporation of good manufacturing practices into national medicines laws in more than 100 countries is another example of country efforts to strengthen health services.

- The greatest progress towards UHC has been made in countries that have made special efforts to make health services accessible and affordable to the poor.[11]

Global partnerships and actions: Multiple global declarations and partnerships have put health systems strengthening and UHC on the agenda of countries, development partners, civil society and others with variable success. Through the World Health Assembly, countries have adopted several resolutions related to health systems strengthening and UHC.[29,30] Furthermore, the UN General Assembly adopted a resolution on UHC in 2012.[5] Some of these declarations and partnerships have been short-lived and have lacked resources, others have given rise to overlapping agendas, yet some have made a significant impact. Examples include:

- Efforts related to improve aid effectiveness such as the Paris Declaration on Aid Effectiveness, the Accra Agenda for Action[31] and, in 2011, the Busan Partnership for Effective Development Co-operation.[32] The IHP+ was established in 2007 and currently brings together in a collaborative endeavour 65 developing countries, bilateral donors, international agencies and foundations.[33] It achieves results by encouraging national governments, development agencies, civil society and others to align their efforts with a single, country-led national health strategy and plan.

- Some partnership strategies have been directed to strengthening specific aspects of health systems. Examples include the Global Health Workforce Alliance, created in 2006 as a common platform to address the health workforce crisis,[34] the Commission on Information and Accountability for Women's and Children's Health,[35] the Countdown for Maternal, Newborn and Child Survival that tracks progress in key indicators of RMNCH,[36] the Health Metrics Network that focused on building country health information systems;[37] and the patient safety initiative focused on ensuring quality of care.[38]

- Other strategies and partnerships have taken a broad-based, systemic approach to health systems. These include: Providing for Health (P4H),[39] a global network of development partners active in supporting country reforms related to UHC and social health protection; the regional initiative on Harmonization for Health in Africa,[40,41] focusing on health system strengthening; and Health Systems Global, a society led by researchers, policy-makers and implementers to develop the field of health systems research.[42] These partnerships have generated momentum for UHC and progress towards consensus around specific issues such as the need to reduce dependence on out-of-pocket spending.

- In addition, there are examples of multicountry efforts that have contributed to an accumulating body of policy and technical guidance to support country efforts to make progress towards UHC.[43,44] For instance, the World Health Report 2010 on health financing for UHC was instrumental in raising the profile of UHC and related technical and policy support to countries have enabled the lessons of experience to be disseminated widely. Another example is the WHO prequalification programme which helps to make quality priority medicines available to all countries.

Innovative approaches: The impact of new technologies including information and communication technologies (ICT) on improved service provision and system performance has been dramatic in many settings. New therapies, including ART, and ACTs and hepatitis C treatment, have greatly enhanced access to treatment across all socioeconomic groups. New diagnostic techniques and testing methods now permit early detection and the application of simplified therapeutic decision-making, not only in relation to infectious diseases, such as HIV and malaria, but also with regard to cancers (notably cancer of the cervix), and chronic conditions such as anaemia, diabetes and hepatitis. The use of ICT in health, often referred to as eHealth and mHealth, has tremendous potential to enhance communications between health-care workers and individuals and communities and there are numerous examples of success in improving adherence to treatment regimens as well as facilitating access to emergency care. Moreover, eHealth/mHealth is helping to increase the emphasis on performance measurement and accountability by facilitating data collection, management, sharing and dissemination.

CHALLENGES

Health system weaknesses: Despite increases in domestic (government and private) and external expenditures on health, in many countries health systems remain underfunded and struggle to provide even basic health service coverage to their populations. Access to services is still low for rural and the poorest populations and many facilities deliver substandard care due to inefficient management and inadequate technical and managerial capacities. Many countries lack critical resources in multiple areas.

Health financing: Every year, some 100 million people fall below the poverty line as a result of out-of-pocket expenditures on health, and a further 1.2 billion, already

living in poverty, are pushed further into penury for the same reason.[1] Other challenges include system-wide inefficiencies arising from vertical, disease-specific structures set up in low- and middle-income countries that are a legacy of the response to the health MDGs and supported by global financing mechanisms. Finally, the understandable focus on raising more money to enable greater progress towards UHC risks making it solely a funding issue. At least equal attention should be given to addressing system inefficiencies and improving quality coverage of services for all population groups.[45]

Inadequate human resources: Despite the modest improvements cited, many countries still face major shortages, especially in rural areas.[19] Implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel has been inconsistent across countries and the number of skilled health professionals who choose to migrate continues to increase year-on-year.[46] Major inequalities in the distribution of health workers within countries persist, health workforce education may be poor and outdated, and often not competency-based, and despite health worker salaries representing a significant share of total health expenditure there is an unacceptably low level of transparency and quality on health workforce data[47] in many countries.

Inadequate medical products: There has been uneven progress in providing access to affordable essential medicines,[48] while in many countries SSFFC drugs are found in the supply chain, risking people's health and undermining the credibility of health services.[49] The complexity of new medicines and medical products and the internationalization of production and distribution of medical products pose increasing challenges to regulatory systems. In the case of antimicrobials, inappropriate prescription and use of medicines also leads to growing problems with resistance. On the blood products front, the global imbalance between donations and need is an ongoing concern, with approximately half of the donations collected in the high-income countries, which are home to less than one fifth of the world's population.[22]

Service quality: Regarding health service quality, while a number of countries are embracing accreditation as a way to raise standards in hospitals,[50] and working on system integration as a way to deliver people-centred care,[51] many are still delivering substandard care characterized by high levels of medical error[52,53] through health systems skewed towards hospitals that have little connection with the health-care system around them or the communities they are supposed to serve.[54] Accreditation of primary health-care clinics is virtually non-existent.[12,55] Systems to monitor and improve performance are weak in most countries.

Weak governance: In general, governance of the health sector in many countries remains weak, while the rapidly increasing share of private health service provision is often poorly regulated, leading to potential distortions in the type, quantity, distribution, quality and price of health services.[56] Other aspects of health governance such as enhanced participation, transparency and accountability, although improving, are often still limited. Furthermore, systems to monitor and improve performance are inadequate in many countries.

Inadequate information and accountability: There are major data gaps in almost every area affecting planning, targeted implementation, performance improvement and accountability to civil society, parliament, development partners, etc. For instance, most low- and lower-middle-income countries lack civil registration and vital statistics (CRVS) systems, well-functioning health facilities and community information systems, disease surveillance systems, health workforces and health financing accounts.

Fragmentation: One of the unintended consequences of the MDGs focus on specific diseases and health issues was a tendency to reinforce programme silos set up to deliver selected interventions. This often resulted in duplicate, parallel structures that added to overall system costs and posed obstacles to the coherent governance of the health system. All countries now face a much broader spectrum of health challenges, including the rapid rise of NCDs, and there is broad acknowledgement that the SDG health targets – including the target for UHC – are an opportunity to refocus efforts on a more efficient approach via system-wide reform, based on the principles of health service integration and people-centred care,[57,58,59] and unification of underlying support systems (e.g. information, procurement, supply chain). The global drive for results linked to disease-specific funding, however, continues to present a major challenge that requires creative solutions at the national level.

Lack of health systems resilience: Weak health systems are associated with diverse health security risks, including spreading epidemics, and are incapable of responding when health emergencies occur. This was glaringly apparent in West Africa where Guinea, Liberia and Sierra Leone all struggled in the face of the Ebola crisis because of the poor health system infrastructure and resources in addition to lack of preparedness.[7] In other settings, preparation and management of emergencies resulting from disasters (natural and man-made) as well as conflicts have often proved inadequate. Health systems resilience comprises the capacity to prepare for and effectively respond to crises, and to maintain or adapt core health system functions when a crisis hits.[9] Resilience is built on sound legal, regulatory and policy foundations (at both the country and global levels). The International Health Regulations (IHR) provide a global framework for enhancement of collective health action, and IHR core capacities mirror health system components such as quality surveillance and laboratory capacity, response

capacity with good linkages to the community and a well-trained health workforce.[60] The IHR implementation, however, has been far from satisfactory (see Chapter 5).

Inadequate investments in research and development (R&D): Structural imbalances persist in terms of investments in and access to innovative diagnostics, vaccines, treatments and medical products. There is much more to be done to expand technology transfer for expanded access to medical products in low- and middle-income countries. With regard to medical devices, increased use of systematic health technology assessment[61] is helping some (mostly high-income) countries buy the right products for their needs, while frugal innovation offers the prospect of devices that are not only cheaper, but also better adapted to local conditions.[62] Indeed, the opportunity for reverse innovation – south to north transfer – is being increasingly explored.[63] Similarly, there are major gaps in health systems, policy and implementation research that need to be addressed to make health systems more efficient and effective.

R&D for new medicines, vaccines and other medical products for neglected diseases remains insufficient. Only 4% of new products registered during 2000–2011 were for neglected diseases[64] and only about 1% of R&D investments in 2010 were made for neglected diseases.[65] The private sector invests little due to lack of profit prospects, and public funding and special initiatives – although increasing and starting to give results – are not yet covering the full spectrum. Numerous new initiatives and approaches to tackle this gap have been debated and also led to the adoption of a WHA resolution.[66]

STRATEGIC PRIORITIES

Even though health system strengthening for UHC was not an explicit focus during the MDG era, multiple investments were made by countries and global partners in specific components of health systems that led to improvements in key areas. Several countries also developed robust pro-poor policies that supported progress towards UHC targets. Such efforts provide an important foundation for UHC going forward. Similarly, the strategic agenda in support of the SDG target for UHC can build upon the multiple resolutions focused on health systems and UHC that have been adopted by countries in the World Health Assembly and UN General Assembly since 2005, including health workforce (seven resolutions), medicines and technologies (18 resolutions), health financing and UHC (three resolutions), health information (one resolution), policy dialogue (one resolution) and many others in regional fora. These resolutions are not just a reflection of country debates and policies, but can also be used to influence country policies, strategies and plans. In some cases, resolutions also serve to enhance monitoring of progress

through focused data collection, reporting and progress reviews. At the same time, the large number of specific resolutions on aspects of health systems appears to have stimulated a greater interest at the global and regional levels in integrated people-centred health services.

Goal 3 has nine substantive targets and four additional points which are also targets but are listed as means of implementation. The section on the new agenda in the SDG declaration states:

> *To promote physical and mental health and well-being and to extend life expectancy for all, we must achieve universal health coverage and access to quality health care. No one must be left behind. We commit to...*

This places UHC as the target that underpins and is key to the achievement of all the others. Without UHC as the underpinning approach, there is a risk that pursuing the individual targets separately will lead to more fragmentation and confusion in countries. UHC, rather than being one target among many therefore needs to be seen as having an integrating role, underpinning a more sustainable approach to the achievement of the other health targets and creating a balance among them.

Because of the cross-cutting nature of the health system development actions needed for progress towards UHC, it can be viewed as the most efficient platform for the

integration of all SDG health targets, while also having strong links to the health-related targets in other SDGs (including education, employment, gender, nutrition, poverty and others). Moreover, the UHC agenda has relevance for all countries, since all countries have room for improvement on the goals embedded in the definition of UHC. Specific SDG targets relate to medicines and vaccines, and health financing and health workforce in the least-developed countries, but system-wide strengthening is a *sine qua non* for sustaining progress towards UHC, supported by increased reliance on compulsory pooled financial resources (i.e. from taxes and other contribution mechanisms mandated by law) as described in the World Health Report 2010,[1] and monitored using the kind of framework proposed by the WHO/World Bank in their recent, jointly constructed monitoring framework for UHC.[67]

UHC-oriented reforms should address a wide range of issues. The prioritization of these issues depends on the country situation.

People-centred and integrated health services: While each country is different, it is essential that UHC agendas prioritize quality of health service delivery. To support that agenda, and to address core health system challenges, WHO is preparing to launch a global strategy on integrated people-centred health services,[68,69] which is based on five strategic directions, including reorienting the model of care away from care delivery silos and towards integrated health services that are coordinated across the care continuum. This applies to all stages of the life course, including older ages, where health systems need to deal with people with multiple pathologies and to define success in terms of continued functioning and autonomy rather than the absence of particular diseases.[70] The strategy also focuses on empowering and engaging people and strengthening governance and accountability.

An adequate health workforce: The WHO Global Strategy on Human Resources for Health: Workforce 2030 will be submitted to the World Health Assembly in May 2016. It considers the health workforce a key lever for change and progress towards the SDGs, as the health sector is a major employer (public, private and other) and a driver of economic growth. The four objectives of the new strategy are to: (i) optimize the impact of the current health workforce towards UHC, SDGs and global health security; (ii) align human resources for health (HRH) investment frameworks to the future needs of health systems and demands of the health labour market, maximizing opportunities for employment creation and economic growth; (iii) build the capacity of national and international institutions for an effective leadership and governance of HRH; and (iv) ensure that reliable, harmonized and up-to-date HRH data, evidence and knowledge underpin monitoring and accountability of HRH efforts at national and global levels.[47,71] It is also important to refocus attention on the WHO Global Code of Practice on the International Recruitment of Health Personnel to address the issue of worker migration, while acknowledging the importance of employment on economic growth.[72] For the latter, WHO will coordinate, under the auspices of the UN Secretary-General, a Commission on Future Health Employment and Economic Growth, to report in 2016.

Medical products: Multiple resolutions and international agreements allow the identification of a few key areas of strategic interest, including the strengthening of national policy and regulatory authorities,[73] R&D for diseases that disproportionally affect developing countries (see also SDG 3.b) and expanding access to essential medicines, vaccines and diagnostics in the context of UHC.[74] The latter means: (i) continuing to support improving access to interventions for priority diseases, using effective prequalification; (ii) appropriate selection of essential medicines and other medical products including the use of health technology assessments and policies to achieve affordable pricing (iii) improving medical product coverage for NCDs; (iv) ensuring appropriate use of medicines; (v) addressing antimicrobial resistance and responsible use of medicines; and (vi) addressing underserved clinical areas, for example, by promoting technology transfer.

Health information and accountability: A roadmap and call to action for measurement and accountability for health results outline the main priorities during 2015–2030.[75] The focus of this roadmap is on low- and middle-income countries. The main drivers are the new challenges related to monitoring the health SDGs, which are much broader than the MDGs, and the new opportunities presented by the data revolution. The goal is that all countries have well-functioning health information and accountability systems that meet country demands and allow SDG progress monitoring through greater and more efficient investments, focus on institutional capacity strengthening, addressing population health data gaps (especially strengthening of CRVSs), effective transparent health facility and community information systems, and inclusive accountability mechanisms.

Health research: The World Health Report 2013 has set out priorities for research for UHC that require national and international backing. Systems are needed to develop national research agendas to raise funds, strengthen research capacity and make appropriate and effective use of research findings.[76] Going forward, the context-specific nature of UHC challenges and opportunities – especially those related to services delivery and financing – will require research approaches that fully reflect conditions on the ground, such as implementation research.[77] It is for this reason that global networks and partnerships have made implementation research a priority field.[78] R&D of new products that meet people's health needs in all countries is required. Investments in health research and development should be aligned with public health demands.[65]

Health financing: The World Health Report 2010 and subsequent reports and resolutions regarding health finance provide a sound conceptual basis for the main financing reforms needed. Reducing out-of-pocket health spending is a strategic priority everywhere and moving towards predominant reliance on compulsory/public funding sources for the health system is required. Thus, efforts to increase public spending on health are needed in those countries in which government health spending is still quite low. More specifically, this means greater attention must be given to increasing the level of government budget revenues for health by strengthening domestic tax systems and/or increasing the share of public spending devoted to health. However, simply raising more money for the health system will not be enough. Reforms to enhance the redistributive capacity of these funds (by reducing fragmentation in pooling) and to promote greater efficiency in the use of health system resources (by increasing use of strategic purchasing mechanisms) are also required.

Intersectoral collaboration: The attainment of health goals is dependent not only on actions within the health sector, but also on economic, social, cultural and environmental factors. Achieving UHC depends to a considerable extent on the broader policy context within which health systems operate and on levels and differentials in socioeconomic development. Intersectoral action contributes to enhanced health outcomes and minimizes the adverse effects of crises and emergencies. Public policy is an essential instrument for the removal of socioeconomic disparities that adversely affect health. Public policies must be shaped in such a way to have the potential to influence exposure to risks, increase access to care and mitigate the consequences of ill-health. Cross-sectoral action is thus essential for the implementation of strategies to promote and protect health, including anti-tobacco policies, environmental protection, food security and safety, safe water and sanitation. Access to education, safe employment and poverty reduction measures enable people to achieve and maintain good health and benefit from UHC. The SDGs provide an opportunity to tackle health and development in a holistic manner, providing a critical starting point for tracing the links between the goals.

Improved governance: Managing the complexity of each of the above elements of health systems strengthening is challenging, and demands strong governance capacity to lead a unified national health system, guided by strong information and financial management systems that can ensure transparency, accountability and adaptability to new challenges. Good governance also depends on adequate regulatory and legal frameworks to ensure sustainability, effective intersectoral collaboration, dealing with the donor community, and the monitoring of performance.

Resilient health systems: The Ebola virus disease outbreak in West Africa and other recent outbreaks such as the MERS outbreak in the Republic of Korea have underscored the importance of strong health systems with capable public health surveillance and management functions in order to prevent, detect and respond to emerging health threats. This requires reinforcing systems of infection prevention and control, developing real-time surveillance integrated with broader health management information systems, ensuring access to high quality essential services, addressing immediate public health workforce issues and enhancing community mobilization.[79] It also needs strengthening of governance, management and accountability systems as well as cross-border and subregional/regional actions in support of the countries' and their neighbours efforts.

GOVERNANCE

Governance in the health sector concerns actions and means adopted by a society to organize itself in the promotion and protection of the health of its population of which the performance can be assessed in a systematic manner.[80,81,82] Governance involves ensuring that a strategic policy framework (that covers both public and private sectors) exists and is combined with effective oversight, coalition building, regulation, attention to system design and accountability. Robust and realistic national health policies, strategies and plans are key for the strengthening of health systems and advancing towards UHC. The effectiveness of health policies and plans is greatly enhanced if developed in collaboration with other sectors, taking into account the broader socioeconomic, environmental and cultural contexts within which the health sector functions. This brief overview focuses primarily on developing countries (low- and lower-middle-income countries).

TRENDS

Many countries have invested in rationalizing and bringing coherence to fragmented health systems characterized by diversity of key stakeholders (e.g. public providers, private-not-for-profit, and private-for-profit firms and corporations) and complexity of demand by individuals and communities. As a consequence, there has been a renewed interest in developing regulatory capacity[83] and strengthening policy instruments to develop, negotiate and implement more robust and responsive national health policies, strategies and plans.[30] In 2014, 134 countries could be identified with a national health policy, strategy or plan to guide their work in achieving better health outcomes for the population.[84]

A recent review of national health planning in 24 low- and lower-middle-income countries reported that: (i) the predictability of national public funding had improved with nearly 70% of countries executing at least 85% of the budgeted amount for health; (ii) 19 out of 24 ministries of health reporting having a medium-term expenditure framework or rolling three-year budget in place; and (iii) an increasing number of countries have a jointly assessed national health sector strategy that includes targets and budgets.[85]

Beyond the health system, governance means collaborating with other sectors as well as the private sector and civil society, to promote and maintain population health in a participatory and inclusive manner. Civil society organizations have a particularly important role to play, and it is encouraging that 16 of the 17 low- and lower-middle-income countries with data involved such organizations in coordination meetings and technical working groups, while all involved civil society in joint annual health sector reviews.[85]

Increasingly, countries also have a comprehensive health sector results framework in place, and development partners are aligning their support with those frameworks, although alignment varies from 21% to 98% of total funding. Mutual accountability processes (through which concerned stakeholders such as the government, the private sector, the civil society and development partners hold each other to account on progress made against commitments to support the national health strategy), are also being introduced with 71% of countries reporting a mutual assessment review.[85]

POSITIVE DEVELOPMENTS

National policy dialogue: The importance of strategic plans and mutual accountability has received more attention, as exemplified in resolution WHA64.8 on strengthening national policy dialogue to build more robust health policies, strategies and plans, endorsed in 2011.[30] In several countries, national policy dialogues involved more stakeholders and included more cross-sectoral contributions to health policies. There were also increased commitments from the international community in funding the development, monitoring implementation of national strategies.[86,87]

Regulation: Many high-income countries that have made significant progress towards UHC have also succeeded in strengthening regulation mechanisms. Resolution WHA63.27 identified the significance of private providers in the delivery of health care and the need to strengthen regulatory mechanisms, which is gradually receiving more attention in countries.[88]

Global partnership: International development agencies and countries have committed to improving the efficiency and impact of development cooperation through a series of agreements – the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action[31] and, in 2011, the Busan Partnership for Effective Development Co-operation.[32] IHP+ was established in 2007 and currently involves 65 developing countries, bilateral donors, international agencies and foundations.[33] IHP+ achieves results by mobilizing national governments, development agencies, civil society and others to support a single, country-led national health strategy.

Accountability: Defined as a cyclical process of monitoring, review and remedial action for the implementation of national plans received greater emphasis. The framework of the Commission on Information and Accountability for Women's and Children's Health was implemented in 63 countries.[89] Mutual accountability between government and donors was promoted through the IHP+; partners which sign up to IHP+ commit to holding each other to account.

Link with investments: The launch of multiple global health initiatives and the growing influence of private foundations had important implications for governance at local and national levels. For example, investments by GAVI and the Global Fund in immunization, HIV, tuberculosis and malaria programmes have been accompanied by requirements linked to strengthening and establishing specific governance structures at the country level.

Increased participation: The global health governance conversation is no longer confined to a select group of governments and actors, but rather includes a wide range of stakeholders, including public-private partnerships, philanthropic organizations, private industry, nongovernmental entities, professional associations, academic institutions and other civil society organizations. While this expanding field has served to enhance inclusive, participatory processes, it has also brought increased complexity to the global governance stage.

CHALLENGES

Increased complexity: Countries are faced with increasingly complex health sector governance "space", in which central government, local government, non-governmental agencies and private sector are all playing a role. This poses significantly more challenges for a national government trying to exercise overall stewardship over the health sector and requires governments to adapt its policies and strategies.

Financial management concerns: In low- and lower-middle-income countries, there is stagnation or decline in use by development partners of national financial management systems and in the predictability of funding.[85] Additionally, there is no clear improvement in the amount and quality of public financial management in the health sector, as assessed by the World Bank country policy and institutional assessment process.[90]

Regulation: despite more attention for regulation as a key tool for governments to support the implementation of national health strategies, many countries face challenges with their capacity and capability to develop and implement effective regulation. These challenges include a lack of human resources with relevant legal expertise, a dearth of evidence base on effective regulations and regulatory challenges posed by entrepreneurial behaviour in the health system (from both private and public providers).

Box 3.1
IHP+ seven behaviours[91]

- Agreement on priorities that are reflected in a single national health strategy and underpinning subsector strategies, through a process of inclusive development and joint assessment, and a reduction in separate exercises.
- Resource inputs recorded on budget and in line with national priorities.
- Financial management systems harmonized and aligned; requisite capacity-building done or under way, and country systems strengthened and used.
- Procurement/supply systems harmonized and aligned, parallel systems phased out, country systems strengthened and used with a focus on best value for money. National ownership can include benefiting from global procurement.
- Joint monitoring of process and results is based on one information and accountability platform, including joint annual reviews that define actions that are implemented and reinforce mutual accountability.
- Opportunities for systematic learning between countries developed and supported by agencies (south–south/triangular cooperation).
- Provision of strategically planned and well-coordinated technical support.

STRATEGIC PRIORITIES

The SDG declaration pays considerable attention to the importance of governance for sustainable development and effective implementation. For instance, under the means of implementation targets under policy and institutional coherence Target 17.15 refers to "Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development"[6]. Priorities for improving governance in health include:

- Strengthen budget process and financial management to enable predictable funding for health services, a core requirement for effective service delivery.
- Build up capacity for data collection and analysis through developing strong monitoring, information and accountability plans and capacity, with coordinated support from international partners.
- Continue promoting and enabling participation by multiple stakeholders in sector processes, for accountability and to ensure effective planning and implementation – civil society, private sector health care providers, parliamentarians as well as international partners.
- Strengthen governance institutions and mechanisms aiming at improving quality integrated health services including inspection and supervision.
- Provide evidence-based guidance documents and tools on governance to enable countries make progress towards UHC.

In many countries, health system reforms to progress towards UHC will need to be implemented through national laws dealing with matters including access, equity, cost and quality. In order to achieve this, several actions will be taken, including to:

- Provide direct legal and policy support for countries states wishing to develop laws and legal frameworks to enable UHC.
- Develop an up-to-date evidence base of legislation, case studies, and other research to inform future work on legal frameworks for UHC.
- Build strategic partnerships and alliances with individuals and organisations to advocate for and support the implementation of effective legal frameworks for UHC.

Faster progress to achieve results requires governments, civil society organizations, private sector and especially international development partners to take action. IHP+ has developed the most critical areas for action for development partners (Box 3.1). Recent meetings of global health leaders have strongly supported renewed action on these seven behaviours, which, if implemented, would bring visible results.

HEALTH FINANCING

A country's health financing arrangement is an important determinant of the overall performance of the health system, including a country's progress towards UHC.[1] Over the past 20 years, many countries have taken steps to improve their health financing systems in line with their available resources, but important challenges remain. Several important lessons have been learnt about both promising directions for reform as well as pitfalls to avoid.

TRENDS

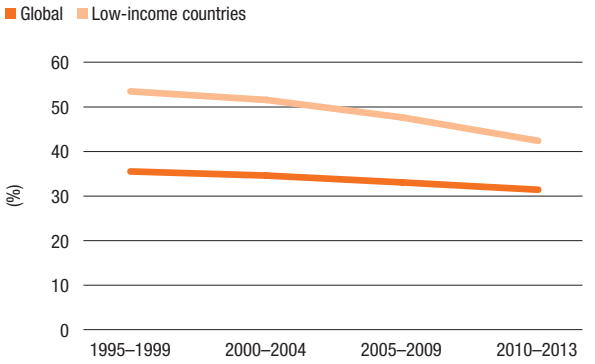
Between 1995 and 2013, there has been a steady decline in the share of total health expenditure in the form of out-of-pocket spending at the time of use, particularly in low-income countries (Figure 3.5). This is important because out-of-pocket spending is both a barrier to needed service use for those unable to pay and pose a threat to financial risk protection.[92]

In general, the greater the level of health spending from public/compulsory sources, the lower the dependence of systems on out-of-pocket spending. And indeed it appears that, as part of improved health financing policies more generally, an important reason why out-of-pocket spending has declined has been a growth in public spending on health (Figure 3.6).

Globally, and especially in low-income countries, the data reveal that behind this growth in public spending has been an increased commitment to the health sector by governments (Figure 3.7), although in many cases this has been strongly supported by external funds that flow through government systems.

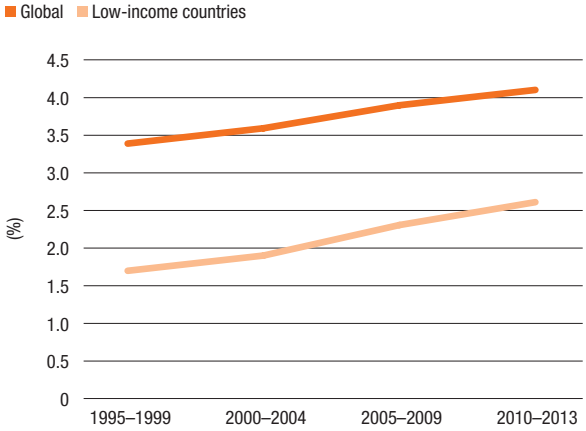
Despite this progress, out-of-pocket spending remains high, and millions of people globally are at risk of financial harm (including impoverishment) as a consequence of paying for health services.

Figure 3.5
Out-of-pocket spending as a percentage of total health spending,[a] 1995–2013[18]



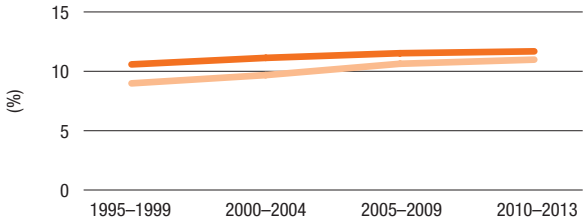
[a] Values are unweighted averages.

Figure 3.6
Public expenditure on health as a percentage of GDP,[a] 1995–2013[18]



[a] Values are unweighted averages.

Figure 3.7
General government expenditure on health as a percentage of total general government expenditure, 1995–2013[18]



[a] Values are unweighted averages.

POSITIVE DEVELOPMENTS

Convergence on core principles: While there is no single "best model" of health financing, common core principles are reflected in the reforms of countries that have made progress, and there has been a similar convergence in the approaches supported by international agencies such as WHO[1,93] and the World Bank.[94,95] These can be viewed as *desirable attributes* for any country's health financing arrangements in order to promote progress towards UHC, and specifically include efforts to move towards predominant reliance on compulsory (i.e. public) funding sources[96] for the health system, reduce fragmentation in pooling arrangements,[97,98,99,100] and increasingly link the payment of providers[101,102,103] to information on their performance and the health needs of the populations they serve. These are reflected in the following points.

Country actions focusing on the poor: Many countries have made comprehensive changes in the way they finance health, including changing the mix of revenue sources, restructuring pooling to enhance the redistributive capacity of these funds and aligning policies on benefits with purchasing mechanisms to transform the promise of declared entitlements into a reality. In several countries, this approach has involved making explicit use of general budget revenues to expand coverage for the poor, people in the informal sector or for the entire population.[104,105,106,107,108,109,110]

Performance focus: Another important development is the shift of focus from simply raising the level of funding to reforming provider payment methods to create an incentive environment that drives efficiency gains and encourages providers to increase the quantity and quality of services delivered. The so-called "performance-based financing movement" in Africa[27] is of particular interest in this regard, as is the growing evidence of countries adapting strategic purchasing techniques to their own context.[102,111] The transition from paper to electronic systems has been a critical enabling factor in the diffusion of provider payment reforms.

CHALLENGES

Increasing government budget revenues: Fiscal pressures on public revenues combined with ongoing technological advances that drive up both demand and cost will likely increase political and technical challenges for health systems.

Verticalization: Another important challenge is a legacy of the response of the international community to the health MDGs, addressing the system-wide inefficiencies that to some extent arise from vertical, disease-specific structures set up in low- and middle-income countries.

Narrow approach to sustainability: Increased attention being given by funding agencies to a "transition to domestic financing" risks framing sustainability as solely a revenue issue; at least equal attention should be given to addressing system inefficiencies.[45] Sustaining current and improved levels of coverage will require a focus on addressing these inefficiencies and not merely a focus on generating new revenues. In the World Health Report 2010,[1] it was estimated that between 20% and 40% of all health spending is currently wasted through inefficiency. The potential health gains from redirecting the resources to improve population health would be enormous in all countries as health is one of the world's biggest economic drivers, with US$ 7.1 trillion spent annually (2012 figure) and an annual expenditure growth rate of 6.7% over the past decade.

STRATEGIC PRIORITIES

The SDG include two targets related to health financing. Target 3.8 on UHC refers to financial protection and Target 3.C includes "Substantially increasing health financing … in developing countries, especially in least developed countries and small island developing States". Multiple resolutions in the UN General Assembly and World Health Assembly have addressed UHC, but much still needs to be done to ensure that UHC becomes the integrative platform underpinning all health targets.

Looking to the immediate future, several priorities emerge from what has been learnt about health financing for UHC, particularly in the context of low- and middle-income countries.

Given the context of high informality, its fiscal implications and the recognized weaknesses of voluntary prepayment,[112,113,114,115] it is evident that greater attention must be given to increasing the level of government budget revenues for health, by both strengthening domestic tax systems and increasing the share of public spending devoted to health. Without this, systems will be more dependent on private funding sources, with both out-of-pocket spending and voluntary health insurance associated with inequity and poor financial protection. Furthermore, governments will not have the purchasing power to manage cost growth in the private provision sector. Thus, failure to increase the share of total health spending coming from public sources will have harmful efficiency consequences as well.

While increasing public spending on health is necessary for progress in most countries, simply throwing more money at the system will not be adequate. Funds must be utilized efficiently if progress towards UHC is to be sustained. Reform experience suggests that a key direction for change is to enable strategic purchasing techniques to be applied to general budget revenues.[116]

Greater attention must be given to enhancing productive dialogue between a country's health and finance ministries (or their equivalent) on both the level of funding for health as well as aligning financing reform strategies with public finance management rules to enable systems to take real steps towards results-oriented accountability rather than merely a focus on input control and budget implementation.

Finally, there remains an important gap to fill: better understanding the demand-side barriers to use of needed services beyond the need to pay for health services including transport to health facilities or the potential of lost income associated with care seeking. Policy responses to these challenges do not necessarily involve financing, but instead may be more in the realm of innovative service delivery. Thus, going forward, it is essential to ensure a balanced, nuanced approach involving both service delivery and financing in the diagnosis of problems and development of reform solutions.

HEALTH WORKFORCE

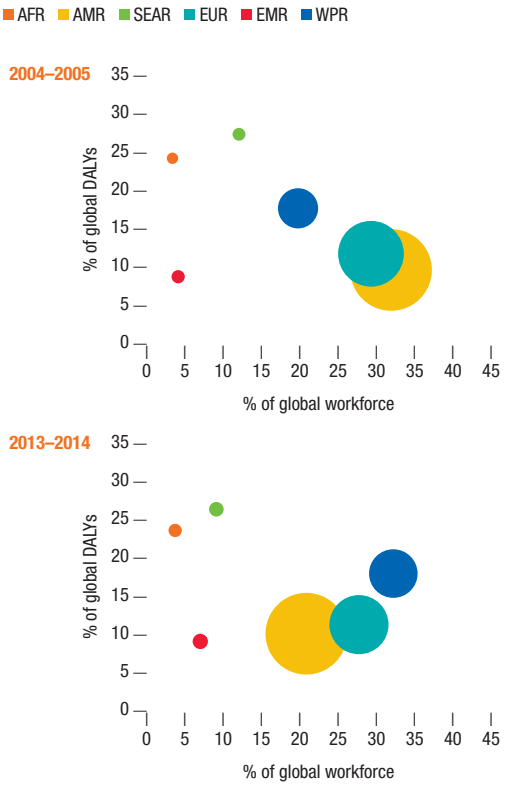
Health systems and services depend critically on the size, distribution, competencies and performance of the health workforce. Typically, the health workforce is discussed in terms of four dimensions: availability, accessibility, acceptability and quality.[19] Availability is a measure of the supply of health professionals coming through the training pipeline, plus the pool of trained health professionals already providing health care. Accessibility is a measure of how easily people in need of care can get to see a health professional. Both dimensions have a bearing on the extent to which a health-care system covers the needs of the general population. Acceptability and quality, meanwhile, relate to the nature of the health care provided.

TRENDS

The 2006 World Health Report identified an estimated global deficit of 2.3 million skilled health professionals (e.g. midwives, nurses and physicians) and over 4 million health workers overall.[117] Countries with the greatest burden of disease have the smallest skilled health professional workforce, often concentrated in urban populations. The situation has changed very little since then (Figure 3.8).

The assessment of the trend in densities of health workers in urban and rural areas within countries is hampered, for instance, by a lack of reliable and comparable data over time. In general, however, there appears to be evidence for a modest improvement in national densities of skilled health professionals in just over half of the countries affected by severe shortage.[19]

Figure 3.8
Distribution of skilled health professional by level of health expenditure and burden of disease,[a] by WHO region (2004–2005 versus 2013–2014)[118]



[a] The size of bubble indicates level of health expenditure as % of global health expenditure.

POSITIVE DEVELOPMENTS

Global advocacy and mobilization: The World Health Report 2006 drew attention to the global health workforce crisis that threatened the attainment of the health-related MDGs and prompted national, regional and global responses.[119,120,121] The Global Health Workforce Alliance was created in 2006 as a common platform to address the workforce crisis.[34] Three global forums on human resources for health were convened in 2008, 2011 and 2013 to mobilize all relevant actors, share experiences and galvanize action. Seven resolutions, specific to the workforce agenda were adopted by the World Health Assembly.[119,120 ,122,123,124,125,126]

WHO Global Code of Practice on the International Recruitment of Health Personnel:[127] In 2010, the Code was adopted by the World Health Assembly and encourages information exchange on issues related to health personnel and health systems in the context of migration and stipulates regular reporting every three years on measures taken to implement the Code. Implementation of the Code was assessed in 2015 after its first five years of implementation. The review stipulated the continuing relevance of the Code, but called for extra measures among stakeholders to bolster its effectiveness. A second round of national reporting is due in 2016.[128]

Country actions: A number of countries have produced new or revised national HRH strategies aligned with their MDGs and national health objectives. As a result, many have focused on ensuring equitable access to care, and in some countries effective coverage has improved; in particular, there has been an increased focus on the availability, accessibility, acceptability and quality of all types of health workers, including community-based, mid-level and advanced practitioners, as well as the services they provide.[19]

New approaches: Strategies that put health professionals closer to the communities they serve and backed by new normative guidance from WHO (e.g. on education,[129] retention[130] and nursing and midwifery[131]) are making services and health workers more accessible and acceptable. Other policy tools that have been effective in improving health worker distribution include: financial incentives; continuing professional and career development opportunities; prolonging the residency period; introducing periods of training in rural areas; and other non-financial incentives such as free housing, security and free access to health care.[19] New analyses on the potential impact and cost-effectiveness of community-based practitioners warrants further exploration and the development of an improved evidence base to guide national decision-making.[132,133]

Improving the quality of health professional education has been a specific focus for some countries, including Brazil, Cambodia, Mexico and Norway.[19]

CHALLENGES

Underinvestment: In many low- and middle-income countries, underinvestment in the education, deployment and retention of health professionals has been the most significant barrier to meeting the health-related MDGs. [47,134,135]

Continuing and projected shortages: The shortages are large in many countries and involve existing and emerging categories of the health workforce. The increasing workforce feminization globally, particularly among physicians, may have an impact on, for instance, the availability of primary health care services, although this is likely to be small.[136,137] The drivers of observed differences between male and female primary care physicians are complex and nuanced. Additional research examining gender differences in practice patterns, scope of work and the impact for national health workforces and health systems is warranted. Further challenges are anticipated from an ageing health workforce and too few new recruits to replace retirees – for example, the retirement bulge in the coming years may drastically shrink the health workforce in high-income countries.[138]

Inequalities: Pronounced inequalities of distribution and access within countries attributed to differentials of environments, motivation levels, productivity and performance. Skill-mix imbalances, such as too many physicians and too few nurses in some countries, persist alongside underutilization of skilled personnel.

Poor education: Health workforce education limited by outdated academic, content-oriented curricula as opposed to, for example, competency-based education.[139]

Poor data: Despite good progress in HRH information and improvements of data availability, the challenge of fragmented, underresourced and underutilized data remains. The majority of countries are lagging behind in their capacity to estimate future needs and formulate the relevant policies to meet them.

Resistance to new models of care: Professional associations and institutions may resist new models of service delivery such as task shifting, home care and the use of ICT.[140]

STRATEGIC PRIORITIES

The WHO Global Strategy on Human Resources for Health: Workforce 2030,[71] which is to be submitted to the World Health Assembly in May 2016, puts forward a vision of how countries can respond to today's needs, while anticipating tomorrow's expectations and future opportunities. At the core of the new strategy is the emerging consensus that the creation of employment opportunities (public, private and other) in the health and social sectors is a driver of economic growth and a major contributor to female participation in the labour force. Taken together with the likely beneficial effects on health outcomes, and the improved capacity to detect and respond to disease outbreaks, these benefits make the health workforce a key lever for change and progress towards the SDGs (e.g. addressing poverty, education, employment, gender and health).[141]

Elements that inform the new strategy include:[47]

- planning guided by a thorough understanding of health labour markets;
- investment in data and evidence for sound planning and decision-making;
- leadership and governance for effective stewardship of HRH development;
- education and training in line with integrated people-centred service delivery;
- mobilizing financial resources and securing their strategic use;
- transforming education, deploying health workers where they are needed, and maximizing quality, performance of existing health workers;
- promoting self-reliance in communities;
- harnessing the private sector capacity for public sector goals.

An emerging consensus informing the new strategy is that the creation of employment opportunities (public, private and other) in the health and social sectors is a driver of economic growth and a major contributor to female participation in the labour force. The establishment of a Commission on Future Health Employment and Economic Growth, under the auspices of the UN Secretary-General, will be tasked to consolidate evidence and policy recommendations, from a multi-sectoral and multi-constituency perspective, on how investment in human resources for health will contribute to the attainment of health and broader economic development objectives within the SDGs. Taken together with the likely beneficial effects on health outcomes and the improved capacity to detect and respond to disease outbreaks, these benefits make the health workforce a key lever for change and progress towards the SDGs (e.g. addressing poverty, education, employment, gender and health).[141]

The global strategy includes a specific focus on reducing data gaps through the adoption of national health workforce accounts[142] as a harmonized, integrated approach for annual and timely collection of health workforce information. Its purpose is to standardize the health workforce information architecture and interoperability, tracking of HRH policy performance towards UHC and monitoring the implementation of global health policy instruments such the WHO Global Code of Practice on the International Recruitment of Health Personnel and the IHR (2005).

MEDICAL PRODUCTS

Access to quality essential medical products – including medicines, vaccines, blood and blood products, and medical devices – is critical to achieving UHC. In all four areas, it is possible to point to some positive trends in the past 15 years, in terms of access and use in health service delivery. However, major challenges remain.

TRENDS

Improving access to essential medicines is part of MDG 8 and progress was monitored by the MDG gap task force. Medicines expenditures account for 10% of health spending in high-income countries, and for up to 50% of health spending in low- and middle-income countries; between 50% and 80% of medicines spending in LMIC is out-of-pocket payments. Based on data from 26 surveys in low-income and lower-middle-income countries, using the standardized WHO/HAI methodology,[20] generic medicines were available in 58% and 67% of public and private sector health facilities,[48] respectively, with large variation between countries.[21] Access to vaccines and rapid diagnostics such as malaria and HIV tests also greatly improved.

In 2012, 108 million blood donations were collected globally, an increase of almost 25% from 80 million donations collected in 2004.[22] Seventy-three countries reportedly collect over 90% of their blood supply from voluntary unpaid blood donors. An increase of 8.6 million blood donations from voluntary unpaid donors was reported from 2004 to 2012.[22]

POSITIVE DEVELOPMENTS

Better policies and regulation: National medical product quality begins with a national policy designed to ensure the continuous provision of appropriate, quality products in adequate quantities and at affordable prices.[143] Currently, more than 140 countries have defined national essential medicines lists to guide their purchasing decisions. Increasingly countries are developing and implementing comprehensive national medicines policies and strengthening their governance frameworks in the pharmaceutical sector.[143] Also, 70% countries had a national blood policy in 2012, compared with 60% of countries in 2004.[22]

Innovation: Pharmaceutical innovation continues to drive improvements in health outcomes. Meanwhile the frugal innovation movement is discovering ways to adapt technologies developed for high-income countries for use in low- and middle-income countries.[144]

Increased access to medical products: The rise of the global market in generic drugs has brought down costs and increased access to essential medicines.[145] Procurement agencies use the WHO prequalification programme, which was first established in 1989 for vaccines, and since then has been expanded to cover around 250 medicines for priority diseases.

Access: Accessibility of vaccines, diagnostics and treatments has greatly benefited from global efforts such as GAVI, Global Fund and HIV, TB and malaria partnerships and initiatives.

Quality improvement: Since its inception, more than 100 countries have incorporated the good manufacturing practice provisions into their national medicines laws, and many more have adopted its provisions and approach in defining their own national good manufacturing practice requirements.[146]

Rational and effective use: National programmes have been implemented to improve the use of medicines (including antibiotics), to enhance good surgical and anaesthetic techniques, and, in case of blood, to reduce blood loss and use alternatives to whole blood for volume replacement.[22]

CHALLENGES

Weak policies: National policy development and implementation needs to be supported by sound health technology assessment to guide research, innovation and procurement and use.[147]

Regulatory deficiencies: The complexity of new medicines and medical products and the internationalization of the production and distribution of medical products pose increasing challenges to country and regional regulatory systems.

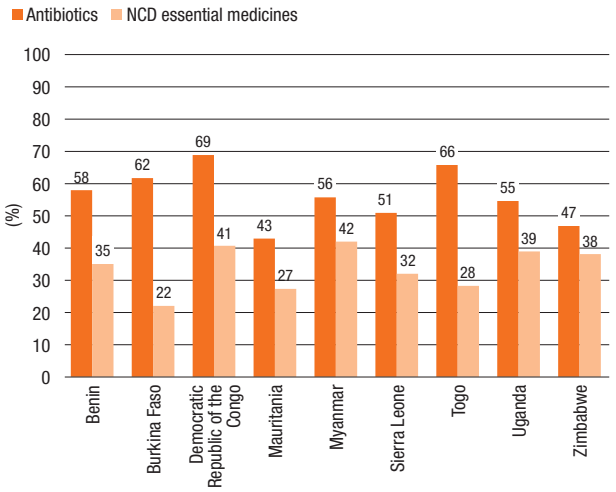
Medicines and technologies access: Many people still lack regular access to essential medicines and technologies.[20] For instance, access to NCD drugs is still very poor in many low- and lower-middle-income countries (Figure 3.9).[148,149] Similarly, in a survey, 25 countries reported being unable to screen all donated blood for one or more of HIV, hepatitis B, hepatitis C and syphilis, with the lack of test kits as the most commonly cited reason.[22] Inappropriate use of medicines remains widespread, compromising treatment success, promoting antimicrobial resistance and leading to waste of resources.

Quality problems with medical products: The number of reports on SSFFC medicines is growing, especially from low- and middle-income countries, and have led to serious problems including deaths. Their occurrence is a threat to patient safety and undermines the credibility of health systems.

Neglected diseases: The profit motive for innovation has provided inadequate incentives for research and development (R&D) into the medical products needed to prevent and treat the diseases that especially afflict the poor.[64] Tensions remain between the system of intellectual property protection for pharmaceutical products on the one hand and international human rights obligations and public health requirements on the other.

Drug prices: In a survey in 26 countries, patient prices for lowest-priced generics were, on average, 2.9 times higher than international reference prices in public sector facilities and 4.6 times higher in private sector facilities.[150] Patients buying medicines in the public sector of the low-income countries paid on average 2.4 times international reference prices, whereas patients paid 3.4 times international reference prices in lower-middle-income countries. A similar picture was seen in the private sector.[48] The price of new vaccines is a source of concern in many countries. Many new medicines, such as cancer and hepatitis C medicines, are largely unaffordable while under patent, even for many high-income countries.

Figure 3.9
Availability of antibiotics and NCD essential medicines in selected countries,[a] 2013–2015[149]



[a] Unweighted mean availability of 12 antibiotics and 17 NCD essential medicines on the day of the survey, among health facilities that offered NCD services. Data are from most recent survey in each country.

STRATEGIC PRIORITIES

The SDG Target 3.b states:

> *Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.*

The World Health Assembly has adopted multiple resolutions that have laid out the key areas of strategic interest and are closely related to SDG Target 3.b:

- strengthening national policy and regulatory authorities;[73]
- expanding access to essential medicines, vaccines and diagnostics in the context of UHC:[74]
  - continuing to support improving access to interventions for priority diseases, maintain an effective prequalification;
  - selection of essential medicines and other medical products, including using health technology assessments and pricing policies aimed at affordability;
  - improving medical product coverage for NCDs;
  - ensuring appropriate use of medicines and other medical products;
  - addressing antimicrobial resistance (discussed in Chapter 5) and responsible use of medicines;
  - national policies on production of medical products that put access first, addressing underserved clinical areas, e.g. by promoting technology transfer;
- developing new models for innovation for underserved clinical areas and technology transfer for expanded access in low- and middle-income countries, following up on the report of the Consultative Expert Working Group on Research and Development.[151]

HEALTH INFORMATION

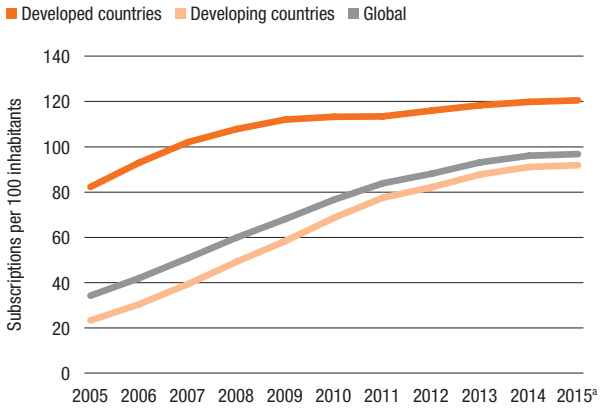
Health information systems are the foundation of health systems, providing critical information for planning, targeting and monitoring. Many countries are gradually improving their information systems, but major gaps in data availability, quality and use remain. Focus on performance measurement and value for money, as well as greater accountability, defined as a cyclical process of monitoring, review and remedial action, of all stakeholders are considered increasingly important in all countries.

TRENDS

The availability of health data has improved considerably, mainly due to international health survey programmes. More than 500 national surveys in low- and middle-income countries have been supported through the DHS programme,[152] primarily funded by the United States Government, and the UNICEF MICS programme.[153] The survey programmes have provided critical data for monitoring the MDG health indicators[154] and on the coverage of interventions for maternal, newborn and child health.[155] Disease surveillance for HIV, TB, malaria and other diseases also improved during the past two decades. Many countries have taken steps to improve the availability and reliability of data derived from health facilities that are often the main source of information to guide decision-making and resource allocation at local and district levels. More countries are conducting regular national health accounts exercises, and increasingly with subaccounts on specific programmes. In addition, 91% of countries took part in the 2010 round of censuses, up from 84% in the 2000 round.[156]

Other areas of progress and greater investment include work on global health estimates through UN agencies and academic institutions,[157] the availability of disaggregated data to assess inequalities within populations[158] and more emphasis on accountability for health, including data sharing, transparency and use of data to track resources and document results.[159]

Figure 3.10
Number of mobile-cellular telephone subscriptions per 100 inhabitants, 2005–2015[172]



[a] 2015 values are estimates.

POSITIVE DEVELOPMENTS

More investment: The continuous investments of global agencies in international survey programmes, both financially and technically, have greatly improved the standardization of data collection and quality of health surveys. DHS is already in its fourth decade. MICS has completed its second decade of support.

Better measurement: Methods of data collection have improved in several areas, including the standardization of measurement of economic status. There are ongoing efforts to harmonize data collection instruments such as DHS and MICS and to identify the most effective and efficient ways of soliciting valid information from survey respondents, in particular, with regard to service use.[160] The addition of biological and clinical data collection to household surveys is greatly enhancing public health information.[161] Examples include anthropometry, measuring blood pressure and testing blood for HIV or malaria parasites.

Political mobilization: The 2010 round of censuses was a success because all countries through the UN Statistical Commission and regional bodies threw their weight behind it.[162]

Global collaborations: The report of the Commission on Information and Accountability for Women's and Children's Health,[163] the work by IHP+,[164] the Countdown for Maternal, Newborn and Child Survival,[155] global and local civil society action in, for instance, the field of HIV/AIDS and other initiatives were all supportive of greater emphasis on information and accountability within countries and globally. Examples of concrete products of collaborations include alignment of health surveys between DHS and MICS and the global reference list of 100 core health indicators.[165] Multiple interagency, reference groups and academic institutions have advanced the field of measurement and estimation for key mortality and health indicators.[166]

Digital revolution: While many innovative approaches are still in the early stages, several have gone to scale, such as the use of web-based reporting systems for health facility data (e.g. DHIS 2[167]), open source data systems for electronic health records (e.g. Open MRS[168]) and active disease surveillance through portable devices. The number of mobile-cellular telephone subscriptions (Figure 3.10) and households with Internet access at home have increased dramatically in the last decade.[169]

Spread of national policy: A WHO assessment indicated that over 100 countries have developed eHealth policies and strategies.[170] According to a recent OECD survey, 22 of 25 reporting high-income countries have a national plan or policy to implement electronic health records, while 20 reported starting implementation.[171]

CHALLENGES

Data gaps: Most low- and lower-middle-income countries (Figure 3.11) do not have reliable data on mortality by sex, age and cause of death. Only 50% of countries reported cause-of-death data to WHO in 2014 (45% in 1990). Major gaps exist because the key data sources are not functioning well, including CRVS systems, health facility and community information systems, disease surveillance systems, health workforce and health financing accounts.

Limited data use: Analytical capacity is limited in many developing countries, there are no well-established public health institutions and data are not translated into action. Improving accountability is still in its early stages, needs considerable work in the coming decade and will require greater involvement of civil society, politicians and the media.

Insufficient investment: Global investments in health information will continue to be critical in low- and lower-middle-income countries. Fragmentation along programme-specific lines results in reduced efficiency of such investments when it comes to country health information system strengthening. The same applies to ICT innovations which often results in uncoordinated, piecemeal efforts.[173,174]

Lack of data standards: Even where countries collect data, problems arise. Fewer than half of countries participating in a recent OECD survey reported having succeeded in implementing a system where all electronic health records have key data elements that are structured and follow a clinical terminology standard.[171]

Data privacy: Increased data collection and connection has implications for privacy. Resolving this issue will require the development of patient health data privacy and security standards, and the development and adoption of national regulations governing the collection, storage and use of patient health data.[171,176]

Box 3.2
From digital to data revolution

- Active diseases surveillance and response systems through portable devices;
- Digital information systems from health facility to the national level;
- Digital tracking systems for expenditure and resource flows;
- Digital health workforce registries with individual level data;
- Digital registers and databases with individual level patient data;
- Digital health records for individuals with patient data-based aggregate systems;
- Comprehensive health examination surveys using mobile devices and biological and clinical data collection;
- Longitudinal individual-based tracking systems;
- Interoperable databases for medical care, including logistics, lab and patient care;
- Big data analytics;
- Geospatial analysis for many health indicators;
- Electronic dashboards for managers.

STRATEGIC PRIORITIES

The importance of disaggregated data, monitoring and accountability is highlighted in the SDG under the means of implementation targets. For instance, Target 17.18 states:

> *By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing states, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.*

The global strategy for low- and middle-income countries is captured in a recent roadmap and call to action for measurement and accountability for health results during 2015–2030.[75] The focus of this roadmap is on the five points of the call to action:

1. Increase the level and efficiency of investments by governments and development partners to strengthen the country health information system in line with international standards and commitments.

2. Strengthen country institutional capacity to collect, compile, share, disaggregate, analyse, disseminate and use data at all levels of the health system.

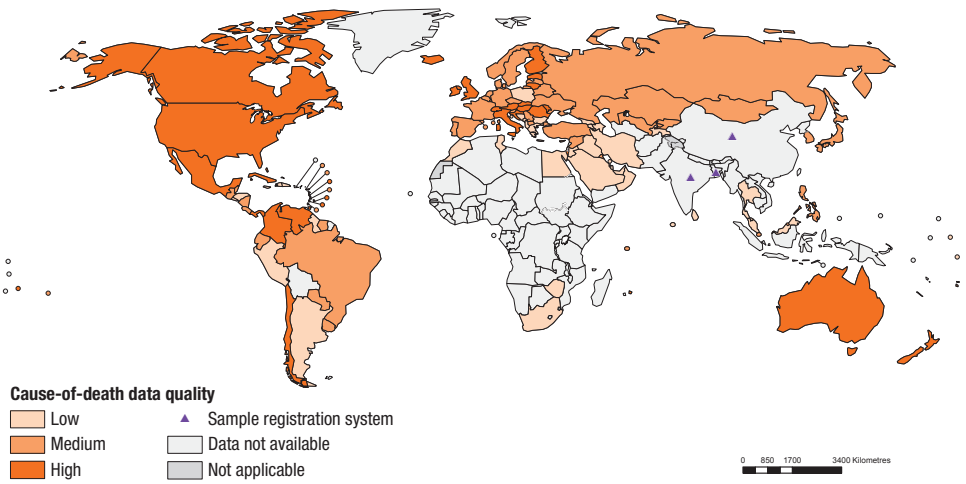
3. Ensure that countries have well-functioning sources for generating population health data, including CRVS, census and health survey programmes tailored to country needs, in line with international standards.

4. Maximize effective use of the data revolution, based on open standards, to improve health facility and community information systems, including disease and risk surveillance, financial and health workforce accounts, and empowering decision-makers at all levels with real-time access to information.

5. Promote country and global governance with citizen participation for accountability through monitoring and regular inclusive transparent reviews of progress and performance at facility, subnational, national, regional and global levels, linked to the health-related SDGs.

The digital revolution provides many opportunities for health information systems (Box 3.2), and should greatly contribute to a data revolution. A data revolution for sustainable development entails integration of these new data with traditional data to produce high-quality information, the increase in the usefulness of data through much greater openness and transparency and, ultimately, more empowered people, better policies and decisions and greater participation and accountability.[177]

Figure 3.11
Cause-of-death information by country, 2014[175]



SERVICE DELIVERY

In order to achieve UHC, health services should be based on a primary health care approach that is people-centred, integrated and responsive. To achieve this goal, the availability, quality and safety of health services must be improved. In many countries, health services are poorly organized and managed, understaffed and crowded with long waiting times, and unresponsive to people's cultural, ethnic or gender preferences. Even when services are accessible, they can be of poor quality, endangering the safety of patients and compromising health outcomes.

TRENDS

There have been significant gains in terms of access to services for infectious diseases, HIV/AIDS, malaria and tuberculosis, as well as marked improvement in MDG-target areas such as RMNCH, including immunization.[178] These gains have occurred in all population groups and are often largest in the poorest populations.[11]

Despite the growth of quality improvement initiatives, it is difficult to ascertain on a global or even national scale whether and how much the quality and safety of services have improved as comparable data are limited, even for high-income countries. Progress has been made in the implementation of a number of interventions to improve the quality of services such as accreditation of facilities, improvements in the numbers, distribution and performance of the health workforce,[19] specific interventions such as surgical safety[179] and combating health-care associated infections,[180] and the greater decentralization of services to primary care providers.

POSITIVE DEVELOPMENTS

Increased accreditation: Hospital accreditation has greatly increased since 1995 and is now an integral part of health systems in over 70 countries, with documented impact in some countries.[12] Most recently, accreditation has been adopted in a number of low- and middle-income countries, often as a strategy to improve basic health service quality.[50]

Global campaigns to promote quality and safety: There have been a number of global and regional initiatives, including the WHO "Clean care is safer care" and the "Safe surgery saves lives" campaigns.[179] To support widespread recognition of the importance of patient safety, WHO established the World Alliance for Patient Safety in 2004, renaming it the Patient Safety Programme in 2009. The linkage of a global movement and local action on patient safety was pivotal to improvement efforts. In particular, the role of institutional health partnerships in service delivery improvement has been highlighted.[181]

Primary health care emphasis: Many countries have continued or strengthened their efforts to develop better integrated health systems, with primary health care clinics taking a greater role in health-care coordination,[15] acting as gatekeepers to the specialized health-care space.[16] In many high-income countries, hospitals are being reassigned a narrower, specialist role, and being called on to support the systems around them.[182] Several countries also aim to increase community involvement in planning and goal setting, as well as the provision of community-based services.[183,184,185]

Digital revolution: Over the past 15 years, the rapid expansion of ICT has begun to change the way health services are delivered with potentially positive effects on outcomes of care or population health.[23] A number of countries are working on ICT-based applications to monitor health services quality.[186,187]

CHALLENGES

Fragmented health services: In all countries, there is room for improvement in how health-care services are organized in order to improve access to primary care and manage patients in the community so as to minimize hospital-based treatments. While a number of countries are embracing health services integration as a way to deliver people-centred care,[51] many are still relying on hospitals and specialist medicine that have little connection with the health-care system around them or the communities they are supposed to serve.[12]

Lack of access and infrastructure: In several cases, national intervention coverage already surpasses 80%. However, there is still a long way to go on the road to UHC. It is estimated, for example, that at least 400 million people do not have access to at least one of six essential services such as family planning or child immunization and major inequalities still persist across subgroups within countries (Figure 3.12).[11,178] Also, access to emergency and essential health services is extremely limited in low- and middle-income countries, where surgical care is concentrated in urban centres.[188]

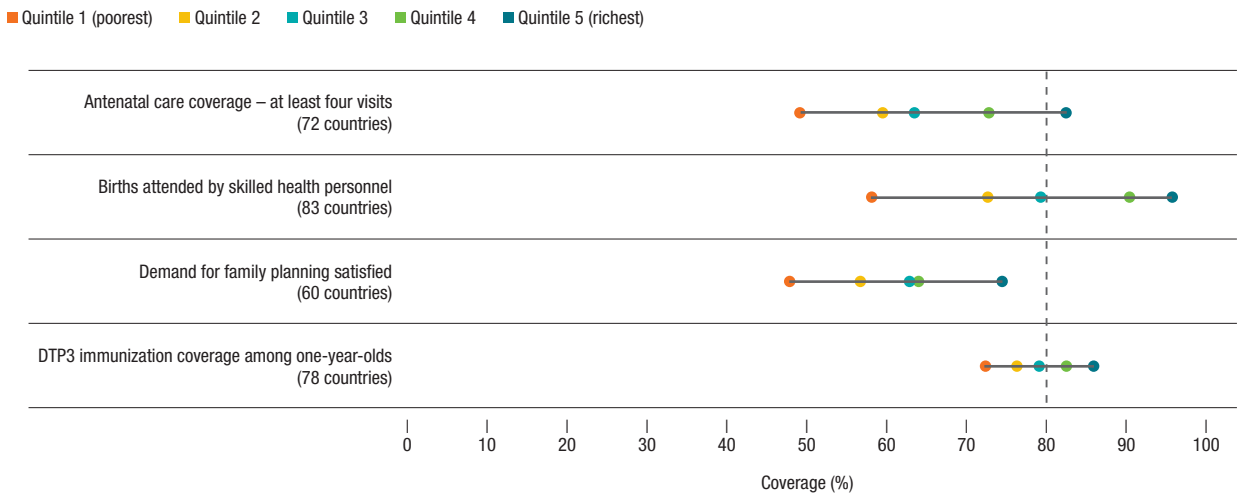
NCD epidemic with an ageing population: An overwhelming challenge facing health services in all countries is the explosion of chronic diseases as the primary driver of health-care utilization and costs. There is a need for continuity of integrated care over time and for both preventive and long-term treatment interventions. Serving a patient population that is increasingly older with multi-morbidities creates challenges in terms of care, home- or facility-based; requiring new models of care provision.

Persistent disease-oriented approach: The drive to produce results for programme-oriented MDGs led many stakeholders to focus on a single priority. There is broad acknowledgement,[57] however, that this approach has limitations and that even these disease-oriented objectives cannot be sustainably achieved without concrete health system strengthening and a more integrated approach.[58,59]

Lack of data: In many countries, data on service delivery are neither captured nor used effectively, either to inform patient care or to underpin service management and resource allocation. There is need for investment in service delivery metrics to complement disease-oriented indicators with clearly defined service delivery targets so that countries can shift their resources towards sustainable improvements in health systems. Measurement of service delivery processes provides a method to monitor progress so that policy-makers, managers and providers may make informed decisions to improve service delivery.

Lack of scaling-up for improvement initiatives: Initiatives for quality improvement have been developed in many countries, but few have achieved their objectives at scale, remaining limited to small-scale and context-specific projects that are usually not embedded in broader health system transformation strategies.

Figure 3.12
Median coverage of selected interventions by wealth quintile, in low- and middle-income countries, 2005–2013[178]



CHALLENGES cont.

Poor quality of care: This remains a key challenge in all countries. Moving forward with UHC reforms without placing quality as a precondition will jeopardize outcomes as well as the reputation and utilization of health services. High levels of medical error are reported across the full range of health services.[53,189] Investments in information and performance improvement systems to assess and improve the quality and effectiveness of care have been limited in developed countries and non-existent in developing countries.

STRATEGIC PRIORITIES

The SDG target most relevant to service delivery is Target 3.8 on UHC. Effective delivery of promotive, preventive, curative, rehabilitative and palliative services is also critical for the health goal overall and most of the specific health targets. It is essential to ensure that national health system reforms for UHC position quality of care as integral to expanding population coverage. Aligning global and national efforts to support robust, evidence-based approaches to providing safe, quality health-care services to populations within the context of UHC will thus be critical, including improved measurement of quality and safety of care.

WHO has launched the global strategy on people-centred integrated health services.[68] The strategy is designed to help countries progress towards "a future in which all people have access to health services that are provided in a way that responds to their life course needs and preferences, are coordinated across the continuum of care and are safe, effective, timely, efficient and of acceptable quality" and focuses on five strategic directions that each offer evidence-based interventions that countries can consider when seeking to redesign the service delivery model:

- empowering and engaging people;
- strengthening governance and accountability;
- reorienting the model of care;
- coordinating services across the continuum of care;
- creating an enabling environment that supports health services transformation.

To improve the major gap in access and quality of surgical services a resolution was adopted by the World Health Assembly to promote the integration of safe, quality and cost-effective surgical care into the health system as a whole.[190] The resolution highlights the importance of both expanding access and improving the quality and safety of services; strengthening the surgical workforce; improving data collection, monitoring and evaluation; ensuring access to safe anaesthetics such as ketamine; and fostering global collaboration and partnerships.

RESEARCH FOR UHC

Research evidence is vital in developing the technology, systems and services needed to achieve UHC. Of paramount importance in both understanding and overcoming barriers to the delivery of health services in the face of often stringent resource constraints, research informs strategies aimed at improving quality health care and promoting equity. Finally, research and the evidence it generates is also needed to ascertain how to optimize the coverage of existing interventions and how to select and introduce new ones to further the UHC endeavour.[76]

TRENDS

New products: The past 15 years has seen a range of new products for prevention and treatment of public health priorities, such as the new vaccines, rapid diagnostics and treatments. This also includes simplifications of treatment regimens and the use of combination therapies.

Improved research activity/production: Globally, there has been a marked increase in research activity and capacity in the wake of the 1990 report of the Commission on Health Research for Development.[191] Notable developments include: augmented research capacity to address key questions about health, and greater guidance for, and adherence to, good practices in the design, conduct, ethics and reporting of results; and improved setting of research priorities, evaluation of disease burden, conducting of primary studies and systematic reviews of evidence (Figure 3.13).

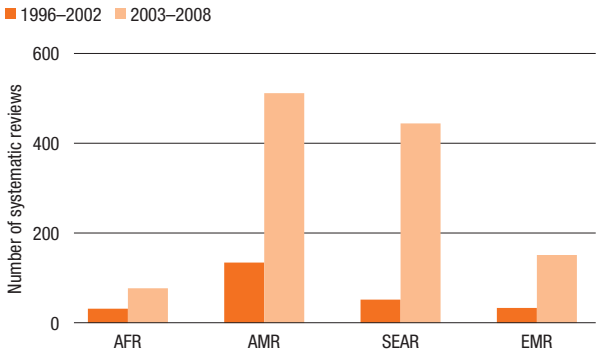
Improved dissemination and use of results: Important progress has also been made in research dissemination (including increased open access publishing), knowledge management and support for evidence-informed policy- and decision-making processes.

More systematic research assessment and use: More systematic approaches are now used to facilitate the assessment and use of research, a notable example being the GRADE (Grading of Recommendations Assessment, Development and Evaluation) system to assess the quality of evidence and strength of recommendations on the basis of existing knowledge.[192]

Greater accountability/transparency: Improvements have also been made in the accountability and transparency of research, key initiatives, including WHO establishing the International Clinical Trials Registry Platform (ICTRP) that now contains records of nearly 300 000 trials.[193] Several countries have also established national registries (e.g. Brazil, China, India, Pan African registry), in addition to strengthening the ethical conduct of research, with guidance from institutional review boards.

Greater access to knowledge: The global volume and access of research publications has grown dramatically. For instance, the WHO evidence-based guidelines present a major global use of research outputs for policy and programme guidance. Enhanced dissemination of research and related publications through the HINARI programme, has resulted in much greater access to scientific journals, databases and eBooks to more than 100 low and middle-income countries until 2020, and possibly beyond.[194]

Figure 3.13
Conducting systematic reviews by selected WHO region, 1996–2002 and 2003–2008[76]



POSITIVE DEVELOPMENTS

Increased awareness of need: The 1990 report of the independent Commission on Health Research for Development exposed the mismatch between investment in health research in low- and middle-income countries and the disease burden they carry, a mismatch later characterized as the 10/90 gap (i.e. less than 10% of global spending on research is devoted to diseases and conditions that account for 90% of the burden of ill-health).[195]

Increased funding: More funding has been allocated to health research. Total investment in health research reached US$ 240 billion by 2009.[65]

Increased health policy and systems research: Support for health policy and systems research has grown significantly,[196] and many countries now have a national health research policy and give higher priority to research for health system development, strengthening links between scientific evidence and the development of health policy.[197]

Increased global collaboration: Multiple global collaborations and partnerships exist, including Health Systems Global,[42] the Alliance for Health Policy and Systems Research,[198] and the Council on Health Research for Development (COHRED),[199] among others, which advocate for greater research investments and facilitate capacity strengthening in low- and middle-income countries.

CHALLENGES

Persistent 10/90 gap: Progress in generating research evidence to support UHC has been uneven, and low-income countries have yet to see a significant increase in research production (Figure 3.14). Even today, a mere 10% of health policy and systems research globally is conducted on low- and middle-income countries.[200]

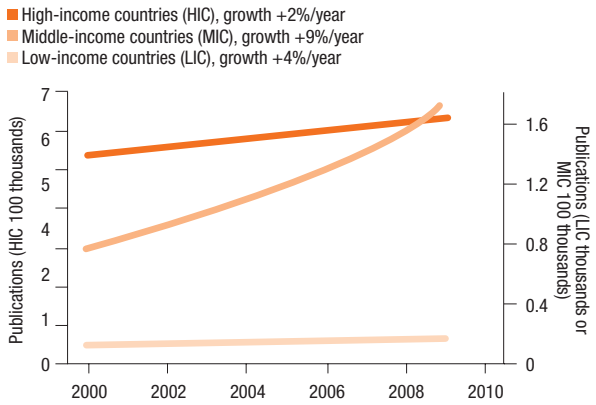
Fragmented research: Despite increased global collaboration, poor coordination and fragmentation of health research are still major issues, in addition to lack of prioritization, low quality in conducting and reporting research, and duplication and waste of research effort.[201]

Lack of funding: In spite of a positive trend, health policy and systems research still accounts for only a small fraction of health research funding in both low- and middle-income countries and high-income countries. Furthermore, health research is still largely focused on biomedical and clinical interventions, while health policy and systems research remains underfunded.[202]

Inadequate use of evidence: Even though the importance of linking knowledge generation and decision-making is widely recognized, these remain largely separate processes. Because of the importance of context in the development of UHC systems, there is a need to go beyond models that call for the linear use of evidence in decision-making, recognizing that knowledge is broader, contextualized and informed by a number of factors other than empirical evidence.

Inadequate ethics: Application of the highest ethical standards in research remains a critical issue everywhere.

Figure 3.14
Research publication by income group, 2000–2010[76]



STRATEGIC PRIORITIES

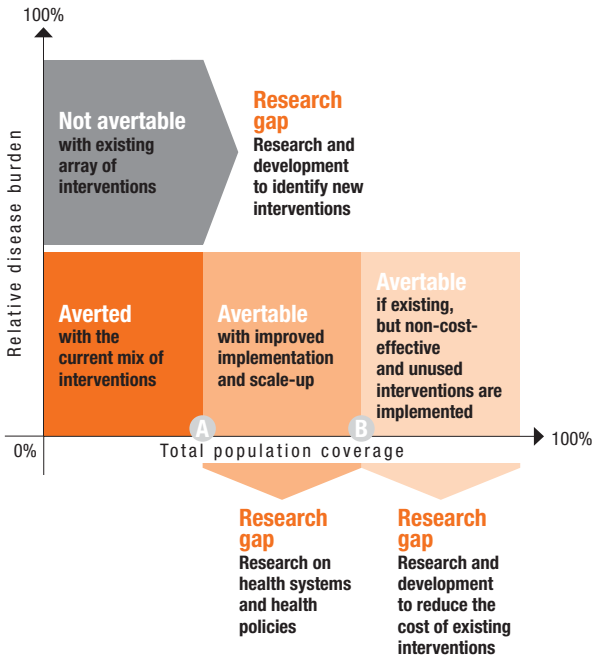
The World Health Report 2013 has set priorities for research for UHC that require national and international backing. Systems are needed to develop national research agendas, raise funds, strengthen research capacity and make appropriate and effective use of research findings.[76] Going forward, the context-specific nature of UHC challenges and opportunities – especially those related to services delivery and financing – will require research approaches that fully reflect conditions on the ground. Health policy and system research offers great potential in this regard, allowing for multiple methods to address challenges of implementation and, crucially, scale-up (Figure 3.15).[77] It is for this reason that global networks and partnerships have made implementation research a priority field.[203]

In addition, there is a need for greater integration of research into decision-making processes and for the production of demand-driven research as an integral part of programme planning and implementation.[204] Integrated or embedded research should be prioritized as a means to foster evidence-informed policy- and decision-making processes.

Greater efforts also need to go into ensuring that the research undertaken is aligned with need. The R&D inequalities and challenges are described in the overview section and the section on medical products in this chapter. The development of the Global Health R&D Observatory, mandated by resolution WHA66.22,[206] is notable in this regard as its main focus is the monitoring and analysis of relevant information on health R&D, building on national and regional observatories (or equivalent functions) and existing global data collection mechanisms to identify gaps and opportunities for health R&D. It will be launched in 2016.

Finally, the development of research capacity in support of UHC will depend on teaching health policy and systems research in both schools of public health and schools of public policy. Collaborative networks of research centres and learning-by-doing opportunities are also important in this regard.

Figure 3.15
Identifying research needs to achieve UHC[205]



A Population coverage with current mix of interventions.
B Maximum achievable coverage with a mix of available cost-effective interventions

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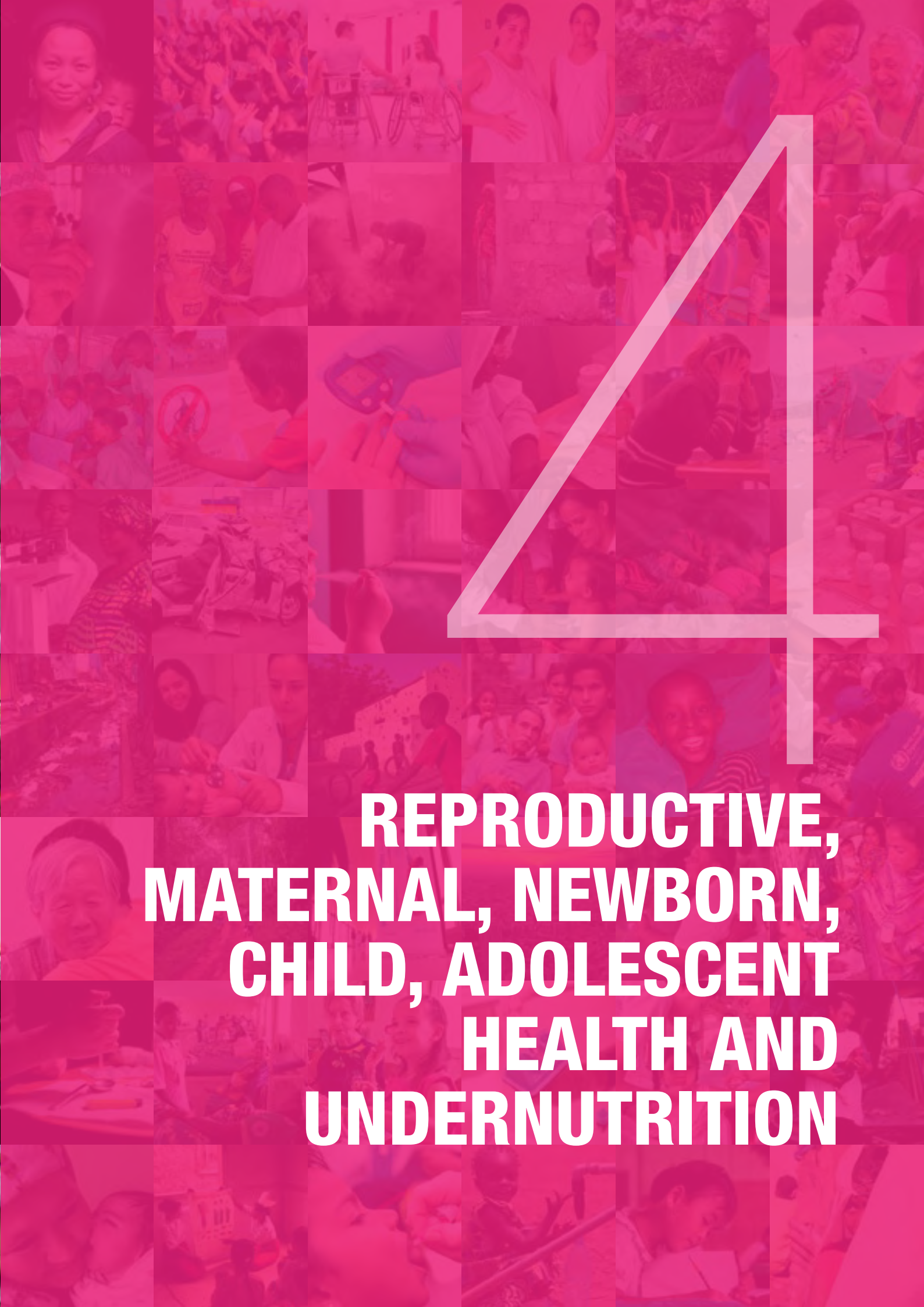


4

REPRODUCTIVE, MATERNAL, NEWBORN, CHILD, ADOLESCENT HEALTH AND UNDERNUTRITION

DETECTO
DETECTO

SUMMARY

Deaths among pregnant women, children and adolescents account for more than one third of the global burden of premature mortality, despite the fact that the vast majority of these deaths are preventable. Rates of maternal mortality are 19 times higher in developing countries than in developed, and children in developing countries are eight times more likely to die die before they reach five years.

Despite substantial progress on maternal and child mortality, neither MDG 4 nor MDG 5 targets will be met. The global under-five mortality rate (U5MR) fell by 53% between 1990 and 2015, short of the targeted two thirds reduction, and the global maternal mortality ratio (MMR) declined by 44%, well short of the targeted 75% fall.

It is estimated that 5.9 million children under five will die in 2015, and there will be 303 000 maternal deaths. The African Region and South-East Asia Region account for a disproportionate share of maternal, newborn and child deaths.

Major efforts to eradicate polio have led to dramatic decreases in the number of countries with endemic transmission to just two, and a fall in wild poliovirus cases from about 2000 in 2005 to 359 cases in 2014. The prevalence of underweight among children under five years declined from 25% to 14% between 1990 and 2015, nearly reaching the MDG 1.C target of a 50% reduction.

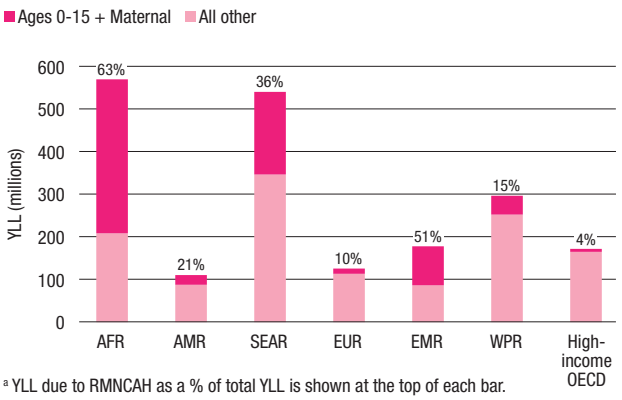
Global, regional and national political commitment, global partnerships and funding – some of which have come only recently – contributed to the achievements, as did improvements in socioeconomic conditions, education, gender equality and the environment. Many countries achieved major increases in the coverage of family planning, antenatal care, skilled attendance at birth and child immunization and successfully scaled up new interventions such as insecticide-treated mosquito net (ITN), treatment with antimalarials and prevention of mother-to-child HIV transmission since 2000.

A comprehensive set of targets for addressing the health and well-being of women, children and adolescents has been adopted under the SDGs, including the targets under the health goal and other relevant goals, such as on hunger (SDG 2). Ambitious targets are set to end preventable maternal and child deaths and achieve universal access to reproductive health-care services. Newborns are explicitly included.

The UN Secretary-General's new Global Strategy for Women's, Children's and Adolescents' Health 2016–2030, released at the same time as the adoption of the SDG declaration, provides a broad multistakeholder framework for the implementation, follow-up and review of progress towards the relevant health and related targets.

While not all MDG targets will be met, important progress has been made in recent years in reducing maternal and child mortality, as well as child undernutrition, with substantial improvements across key indicators since 1990. The least-developed countries continue to face the greatest challenges in improving maternal and child health, struggling with a combination of poor coverage and quality of health care services and public health interventions, inadequate water and sanitation, poor infrastructure, low food security, and limited education and economic opportunity. These same countries also often face obstacles in ensuring universal access to sexual and reproductive health services, as well as safe-guarding the health of adolescents – challenges that are shared by most world regions.

Figure 4.1
Years of life lost (YLL) due to RMNCAH causes and other causes by region,[a] 2012[1]



[a] YLL due to RMNCAH as a % of total YLL is shown at the top of each bar.

Globally, in 2012, 37% of YLLs was due to deaths from maternal causes or deaths among those younger than 15 years (Figure 4.1). The difference in the fraction of YLLs accounted for by reproductive, maternal, newborn, child and adolescent health (RMNCAH) between the African Region and high-income OECD countries is a stark reminder that many of these deaths are avoidable. In high-income OECD countries, only 4% of total YLLs occurs among pregnant women and children under 15 years of age, compared to 63% in the African Region, 51% in the Eastern Mediterranean Region and 36% in the South-East Asia Region. Some of this divergence can be explained by differences in age structure, but it is clear that MDGs 4 and 5 constitute two parts of a far-from-finished agenda.

Fortunately, the SDGs will keep the spotlight on the unfinished agenda of ending preventable maternal, newborn and child mortality. SDG 3.1 aims to reduce the global MMR to less than 70 per 100 000 live births by 2030, and to have no country with an MMR above 140 – significantly below the current global MMR of 216 per 100 000. About 303 000 women are expected to die in 2015 due to maternal causes,[2] which makes maternal mortality the second leading cause of death among women age 15–49, after HIV. Globally, women face a 1 in 180 lifetime risk of dying due to maternal causes, which are dominated by haemorrhage, hypertensive disorders, sepsis and abortion (Figure 4.2).[3] In the African Region, however, the MMR is still running at 540 per 100 000 live births, which, combined with the high levels of fertility, translates into a lifetime risk of dying from maternal causes of 1 in 37.

The SDGs also contain ambitious targets for child mortality, with SDG 3.2 seeking to end preventable deaths of newborns and children under five. These include national targets of a U5MR of no more than 25 deaths per 1000 live births, and a neonatal mortality rate (NMR) of no more than 12 per 1000 live births. This compares with a global U5MR of 43 per 1000 live births in 2015 (5.9 million children under-five deaths), and a NMR of 19 per 1000 live births (2.7 million deaths the first 28 days of life). The major causes of newborn mortality in 2015 are prematurity, birth-related complications (birth asphyxia) and neonatal sepsis, while leading causes of child death in the post-neonatal period are pneumonia, diarrhoea, injuries and malaria (Figure 4.2). Target 4.2, which calls for efforts to ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education (as part of the broader education goal) is also likely to have an impact on child mortality, while also improving children's chances of living long and rewarding lives.

Figure 4.2
Global major causes of maternal and under-five child mortality, 2015[3,4]

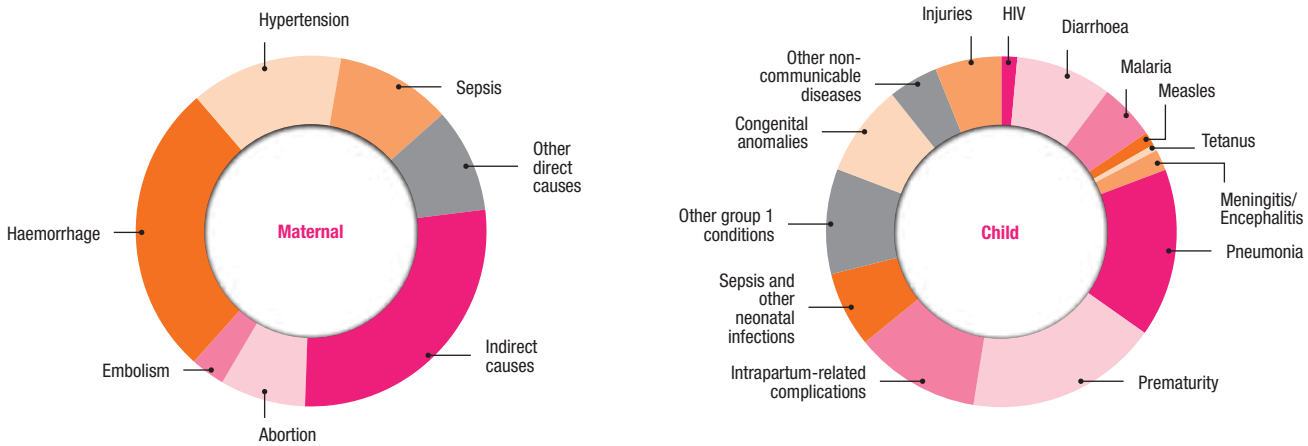


Figure 4.3
MDG and SDG targets related to reproductive, maternal, newborn, child and adolescent health and malnutrition

MDG

MDG Target 1.C
Halve, between 1990 and 2015, the proportion of people who suffer from hunger

MDG Target 4
Reduce by two thirds, between 1990 and 2015, the under-five mortality rate

MDG Target 5.A
Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio

MDG Target 5.B
Achieve, by 2015, universal access to reproductive health

SDG

SDG Target 2.2
By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons

SDG Target 3.1
By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births

SDG Target 3.2
By 2030, end preventable deaths of newborns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-five mortality to at least as low as 25 per 1000 live births

SDG Target 3.7
By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes

Reducing malnutrition is key to improving health, including the health of children and pregnant women. As part of Goal 2 on ending hunger, SDG 2.2 is, therefore, as critical as it is expansive, aiming to end all forms of malnutrition by 2030, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five, and addressing the nutritional needs of adolescent girls, pregnant and lactating women, and older people. In 2015, one in four children (156 million) is estimated to be affected by stunting, and one in seven (93 million) is underweight.[5] Stunted children can face a lifetime of disadvantages, such as poor cognitive abilities and educational performance, which have a knock-on effect for adult wages and productivity. It is estimated that undernutrition is an underlying factor in 45% of child deaths,[6] and 80% of newborn mortality occurs in babies who are of low birth weight.[7] Malnutrition is important in older ages too, with anaemia contributing to 20% of maternal deaths.[5]

New in the SDGs is the emphasis on youth as a vulnerable population. In some cases the topic is addressed explicitly, as with SDG 2.2, which includes targets for the nutritional needs of adolescent girls (Figure 4.3). Though generally a healthy group, adolescents[8] are exposed to a range of risks and diseases, and as many health behaviours established during adolescence have profound effects over the rest of the life course, they are a population deserving more concerted attention from the global health community in the SDG era. Globally, road injuries, HIV/AIDS and self-harm are the leading causes of adolescent death.[9]

While mortality and burden of disease statistics are important, they sometimes fail to capture significant aspects of health and well-being. This is particularly true of sexual and reproductive health, where certain aspects of human experience are beyond the purview of morbidity and mortality data. It is estimated that between 100 and 140 million women alive today have been subjected to female genital mutilation (FGM),[10] while an estimated 15 million girls marry before age 18 each year,[11] and nearly one in three women has experienced physical or sexual intimate partner violence.[12] The SDGs confront several of these issues head on. For example, under Goal 5 for achieving gender equality, SDG 5.2 calls for the elimination of all forms of violence against all women and girls, and SDG 5.3 aims to eliminate all harmful practices, such as child, early and forced marriage and FGM. In the health goal, SDG 3.7 targets universal access to sexual and reproductive health-care services, following on from MDG 5.B. Much work is still needed to meet these targets.

Similarly, current metrics poorly capture developmental indices that tell whether children who survive are also able to thrive. Conservative estimates show that 1 in 3 children globally are at risk of sub-optimal development because of poverty and undernutrition.[13] If other risk factors such as low maternal education and exposure to violence are added, the proportion of children at risk increases. The SDG framework includes targets to protect, promote and support early child development and increasingly indicators and assessment tools are becoming available that can generate comparable data across settings and time.[14]

ACHIEVEMENTS

The MDG era was marked by significant progress in reducing maternal and child mortality, even though the global community fell short of achieving the ambitious mortality targets set by MDGs 4 and 5 (Figure 4.4). The global U5MR declined by 53% between 1990 and 2015, falling short of the MDG 4 target of a two thirds reduction, with 62 countries meeting the MDG 4 target on child mortality.[15]

The world's MMR fell by 44% between 1990 and 2015, missing the target of a 75% reduction.[2] Country-level estimates of the trends in the MMR are much more uncertain than for children because of data gaps. It is estimated that of the 95 countries with an MMR of at least 100 per 100 000 live births in 1990, 9 countries are meeting the MDG 5 target and another 42 countries have at least halved the MMR.

The Western Pacific Region had the largest decline in U5MR between 1990 and 2015 at 74%, while the South-East Asia Region had the most dramatic decline in the MMR, with a 69% reduction. The Eastern Mediterranean Region (48%) and the African Region (54%) had the smallest declines in U5MR, and the African Region (44%) and the Region of the Americas (49%) made the least progress in reducing the MMR. In 2015, the African Region accounts for 47% of child deaths and 64% of maternal deaths.

Importantly, global rates of progress have accelerated since 2000, with the average annual rate of decline in U5MR increasing from 1.8% during 1990–2000 to 3.9% during 2000–2015, and for MMR increasing from 1.2% in 1990–2000 to 3.0% in 2000–2015.

Running parallel to the declines in maternal mortality, global coverage of skilled birth attendance (an indicator for MDG 5) has increased, rising from 58% in 1990 to 73% in 2013.[16] This means that the fraction of births not attended by a skilled birth attendant[17] has fallen by more than one third since 1990. MDG 4 named only one indicator for interventions to reduce child mortality – measles vaccination – and here too the news is positive, with coverage of measles immunization increasing from 73% to 85% between 1990 and 2014 in infants younger than 12 months. Since 2000, measles deaths in children under 5 are estimated to have decreased by over 75%.[4] For child mortality globally, more than half of the decline since 2000 has been achieved through reductions in deaths due to pneumonia, diarrhoea, measles and malaria, all of which tend to affect children older than one month.[18]

Polio eradication is one of the earliest globally agreed health goals, even though it was not an explicit target in the MDGs. On 27 March 2014, the South-East Asia Region was certified polio-free, joining the Region of the Americas, Western Pacific Region and European Region; and brought the percentage of the world's population now living in certified polio-free regions to 80%, a significant leap towards global eradication.

There has also been substantial progress in reducing child undernutrition globally (Figure 4.5). The proportion of children under five who were underweight is estimated to

Figure 4.5
Global prevalence of stunting and underweight for children under five, 1990–2015[5]

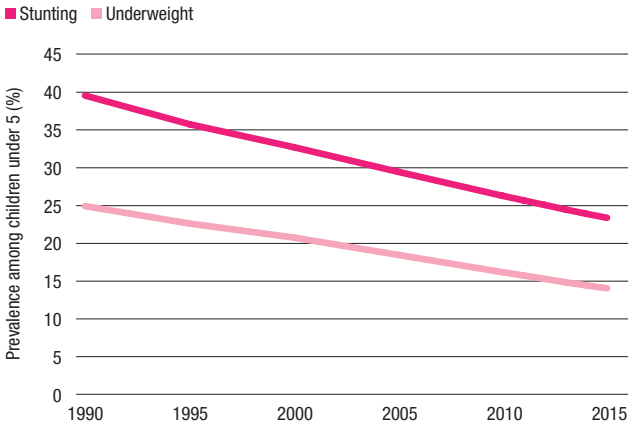
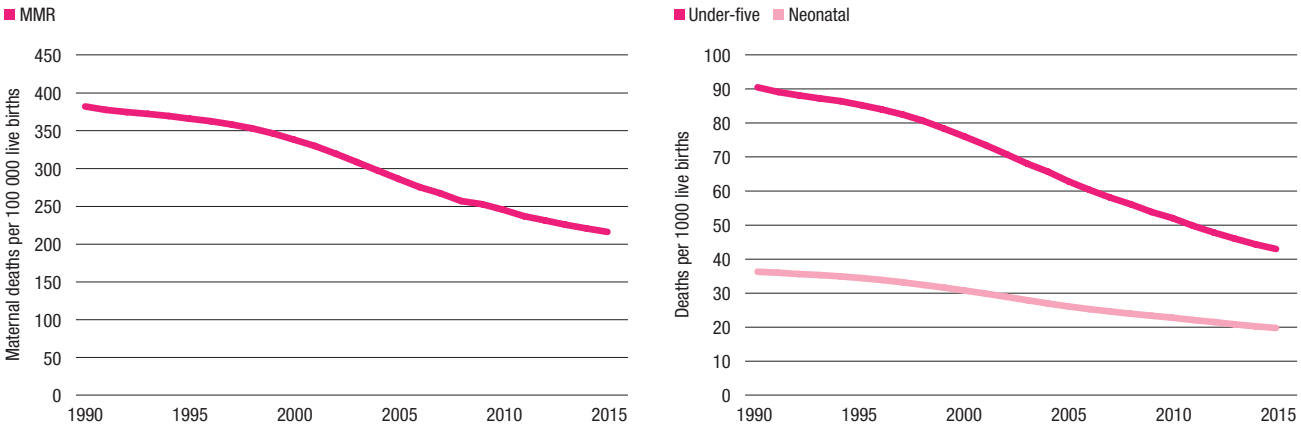


Figure 4.4
Global trends in maternal mortality, neonatal and under-five child mortality, 1990–2015[2,15]

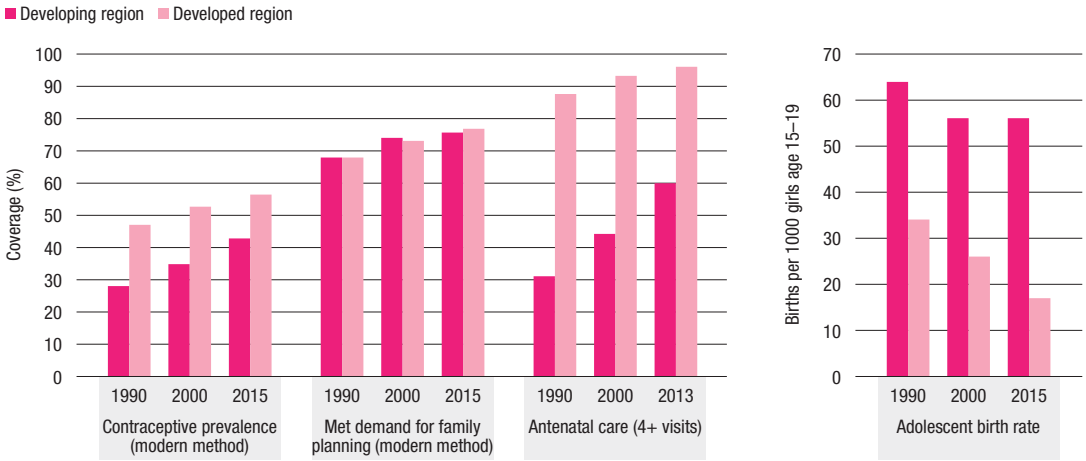


have declined from 25% to 14% between 1990 and 2015, a 44% reduction that falls just short of the MDG Target 1.C of a 50% reduction. The prevalence of underweight in the Western Pacific Region declined by 82%, falling from 23 million in 1990 to 3 million in 2015, while the South-East Asia Region had 43 million underweight children in 2015, compared to 83 million in 1990. As with underweight, all WHO regions reduced the absolute numbers of children affected by stunting between 1990 and 2015, except the African Region, where population growth outpaced a 27% reduction in stunting prevalence. Globally, stunting fell by 41% between 1990 and 2015.[5]

The target of achieving universal access to reproductive health (MDG 5.B) was only added to MDG 5 in 2007, but some progress has been made, nonetheless (Figure 4.6). MDG 5.B included four specific indicators: adolescent birth rate; antenatal care visits; contraceptive prevalence rate; and unmet need for family planning. Improvements in these areas are expected to reduce maternal mortality – since high fertility rates are correlated with an increased lifetime risk of dying from maternal causes – as well as improve the health of adolescent girls. Based on current projections to 2015,[19] the adolescent birth rate fell from 59 births per 1000 women age 15–19 in 1990 to 51 per 1000 in 2015. Declines in the adolescent birth rate were greater in developed (50% decline) than in developing regions (13% decline). However, southern Asia saw an impressive 47% decline. With regard to the recommended four or more antenatal care visits, coverage in developing regions nearly doubled, increasing from 31% in 1990 to 60% in 2013. While this is encouraging, 4 out of 10 women still do not have four routine antenatal clinic visits, and many of those that do experience poor quality of care.[16] As noted above, skilled birth attendance coverage also increased. In east Asia and the Pacific as well as in Latin America and the Caribbean, about 9 in 10 births now occur in health facilities. In contrast, in south Asia and sub-Saharan Africa, where the burden of maternal and newborn deaths is highest, only about half of births (45% and 46%, respectively) are delivered in a health facility.[20]

With regard to family planning services, contraceptive prevalence with a modern method rose from 48% to 58% between 1990 and 2015 among married or in-union women age 15–49, driven by a 10 percentage point increase in developing countries.[21] Meanwhile, family planning demand satisfied with a modern method increased from 68% in 1990 to 76% in 2015. All WHO regions reduced the unmet demand for family planning with a modern method by at least 25%, with the European Region and the South-East Asia Region achieving over a 30% reduction since 1990. These changes corresponded with a slight decline in unintended pregnancies, which fell from 43% to 40% between 1995 and 2012.[22] Among adolescents, in particular,

Figure 4.6
Changes in four MDG 5.B indicators, developing and developed countries, 1990–2015[21]



access to contraception is only one part of the picture determining pregnancy rates. In some settings, important cultural factors are in play, including traditions of child marriage. Globally, one in four young women in 2014 was married in childhood versus one in three in the early 1980s and the proportion of young women married before age 15 declined from 12% to 8% over the same period.[11]

The SDG era will include an increased focus on equity. As we enter this new era, it is important to recognize that there have actually been substantial improvements in equity in a number of RMNCAH areas, although these gains are certainly not universal.[23] For example, within many developing countries, absolute increases in coverage of diphtheria, tetanus and pertussis (DTP) (three doses/DTP3) immunization coverage have tended to be greater for the poor than for the rich. A similar pattern is observable in under-five mortality, with gains for the poorest quintile outpacing those in the richest quintile by at least 26 deaths per 100 000 live births over a 10-year period. There has also been a decrease in inequality regarding unmet demand for family planning across educational groups within many countries. Despite these relative reductions, large inequalities still remain in these and many other areas.

SUCCESS FACTORS

Increased coverage of proven high impact child health interventions: Country plans and programmes increasingly focused on achieving high coverage of key interventions for maternal and child health. The global consensus on essential interventions, commodities and guidelines for reproductive, maternal, newborn and child health has contributed to convergence in investments.[24] Countries with higher levels of coverage tend to have lower child mortality than countries with low coverage.[25] It is thus reasonable to suppose that the scaling up of priority interventions, alongside poverty reduction and improvements in basic living conditions, has been beneficial for health outcomes and has contributed to the impressive falls in child mortality since 1990. For instance, in high mortality countries, four out of five children are receiving two doses of Vitamin A supplementation,[26] an estimated 2–3 million deaths are prevented every year by vaccination against DTP and measles,[27] and in 2014, 84% of children globally received three doses of the polio vaccine. The proportion of children in countries with high malaria risk that were sleeping under an ITN increased from essentially 0 in 2000 to 43% in 2013, and similar gains were made in ART provision (see

Chapter 5). As noted above, there has been an increase in coverage of antenatal care, skilled attendance at birth and institutional deliveries.

Global and country-level consensus and commitments: The MDGs themselves constituted a significant global commitment to address maternal and child mortality. Also of note was the *Lancet* child survival series in 2003, followed by the Countdown to 2015 for maternal and child survival, and the support provided to countries by UN agencies led by the UNICEF, WHO, UNFPA and the World Bank, bilateral agencies and civil society organizations. A global partnership on maternal, newborn and child health was established in 2005.[28] However, in recognition of the relatively lacklustre investment in this area, in 2010, UN Secretary-General Ban Ki-moon launched the Global Strategy for Women's and Children's Health 2010–2015, which galvanized efforts to accelerate progress towards MDGs 4 and 5 in a number of countries.[29] In support of the implementation of the Global Strategy, the Commission on Information and Accountability for Women's and Children's Health[30] and the Commission on Life-saving Commodities for Women's and Children's Health made a number of recommendations that have supported work on health system strengthening. The H4+ partnership,[31] country commitment and leadership, and coordination and advocacy by the UN Secretary-General Every Woman Every Child initiative have also contributed to improvements in RMNCH outcomes,[32] as has increased and predictable financing (US$ 45 billion committed as of 2012–2013, with US$ 27 billion already disbursed).

Another notable effort is the the Global Polio Eradication Initiative, launched in 1988 as a result of the World Health Assembly resolution for the worldwide eradication of polio by 2000, which has become one of the largest global public health programmes, and has succeeded in mobilizing significant funding, through coordinated advocacy over a prolonged period of time. Additionally, the International Conference on Population and Development Programme of Action, focusing on sexual and reproductive health and rights, was adopted by 179 countries in 1994, and reviewed in 2014.[33,34] Meanwhile, early child development and adolescent health are increasingly recognized as critical areas of public health, not only for improving health outcomes in the short term, but also for building human capital along the life course.[9,35,36] As a consequence, the new Global Strategy for Women's, Children's and Adolescents Health has been expanded to address these challenges.

Socioeconomic changes: Prosperity brings many benefits (and challenges) for health. For example, increases in household income have improved the ability of families to obtain increased quantities and greater variety of foods for infants and young children.[37] It also contributes to improvements in basic infrastructure that are vital for improving health, including improved water and sanitation, roads and transport, and communication technology. Progress in education – especially of women and girls – also has a major impact on maternal and child mortality, early marriage and early pregnancy.[38,39] More than half of countries have achieved or nearly achieved universal primary education.[40] Rates of enrolment in secondary school have increased globally since 1990. For example, in 2000, the out-of-school population of children of lower secondary school age was 97 million, compared to 63 million by 2012,[41] despite an absolute increase in the population in this age range.

Improvements in legislation: Marked improvements have been seen in national policies and regulation for increasing access and coverage to reproductive, maternal, newborn and child health services. For example, among 68 countries monitored by the Countdown initiative between 2008 and 2015, 15 countries adopted policies enabling midwives to deliver life-saving interventions for emergency obstetric maternal and newborn care, representing a 57% increase, and 23 countries began allowing community health workers to identify and treat children with uncomplicated pneumonia in the community.[26] Progress was also made in legislation for sexual and reproductive health and rights, FGM and violence (see relevant sections). For instance, at least 24 of the 29 countries in which FGM is practised have passed anti-FGM laws or decrees.[42]

Financing: Global annual growth in development assistance for health doubled after the adoption of the MDGs in 2000. Funding for child health increased by 8.3% annually from 2000 to 2014, while maternal funding only grew at an average rate of 3.0% in the same time period. In comparison, funding for HIV, tuberculosis and malaria all increased by an average of more than 15% per year since 2000. Despite growth in overall assistance stagnating since 2010, funding for maternal and child health increased by 11% per year between 2006 and 2013. With funding falling slightly in 2014, maternal, newborn and child health received 27% of development assistance for health, with US$ 3.0 billion dispersed for maternal health and US$ 6.6 billion dispersed for child health. It is also worth noting that government health expenditure has increased substantially in the MDG era, growing at an average rate of 8.1% annually between 1995 and 2012 among low- and middle-income countries. This means that, while important, development assistance for health only accounts for roughly 5% of total health expenditure in these countries.[43] Also of note, is the fact that a number of countries have embraced health financing systems based on prepayment and pooling of resources and/or have introduced exemption schemes for MDG-target areas such as RMNCH to make services accessible to the poor[16] (see Chapter 2).

Improved measurement and monitoring: The investments of global agencies in international survey programmes to measure RMNCH indicators, notably through the DHS, mainly funded by the United States Agency for

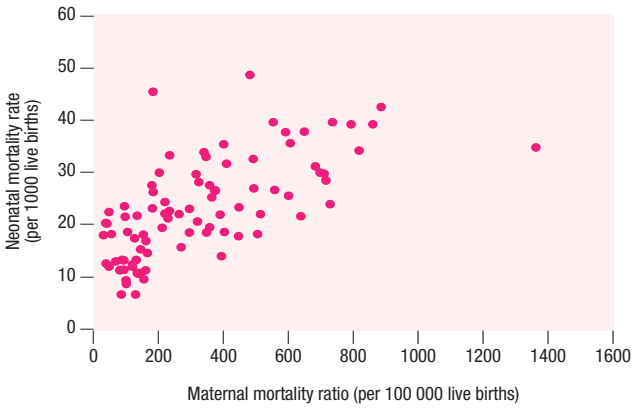
International Development, and Multiple Indicator Cluster Surveys (MICS), led by UNICEF, have been critical. The surveys have also formed the basis for the global production of regular estimates of maternal and child mortality through interagency and expert mechanisms[44] and for regular monitoring of intervention coverage.[45] These data, widely used in global planning, monitoring and review mechanisms, have helped sharpen the focus on RMNCH. The monitoring process implemented for tacking polio eradication shows what is possible, with the establishment of real-time surveillance and data analysis, a laboratory network that spans 145 countries, accountability mechanisms in countries with weak health systems, and specific strategies for accessing children in conflict areas.[46]

CHALLENGES

Improving care during time around birth: Declines since 1990 in neonatal mortality have been slower than for under-five mortality, and neonatal deaths now account for 45% of child deaths. The reduction in maternal mortality was also slower than that for children age 1–59 months over the same period. More rapid improvements in maternal and neonatal mortality will require increased focus on health-care services during labour, childbirth and in the first week of a newborn's life. High-impact, cost-effective interventions that benefit both mother and baby exist, and must be a focus of health system strengthening and improvements in quality of care. Improving maternal and newborn health should no longer be pursued with separate strategies, as outcomes are correlated (Figure 4.7).

Providing on-demand treatment: Essential interventions to improve newborn and child survival are well known and can be implemented at scale even in resource-constrained settings. However, increases in coverage have been variable. Interventions that can be scheduled such as immunization and vitamin A supplementation have much higher coverage than those that require around-the-clock medical services that can be accessed on demand, such as treatment of pneumonia, diarrhoea and malaria. Less than half of children with signs of pneumonia, diarrhoea or malaria access appropriate treatment in countries with a high burden of morbidity and mortality due to these conditions.[26]

Figure 4.7
Neonatal mortality rate (NMR) and maternal mortality ratio (MMR) in selected countries,[a] 2015[2,15]



[a] Countries with NMR >12 per 1000 live births or MMR >70 per 100 000 live births.

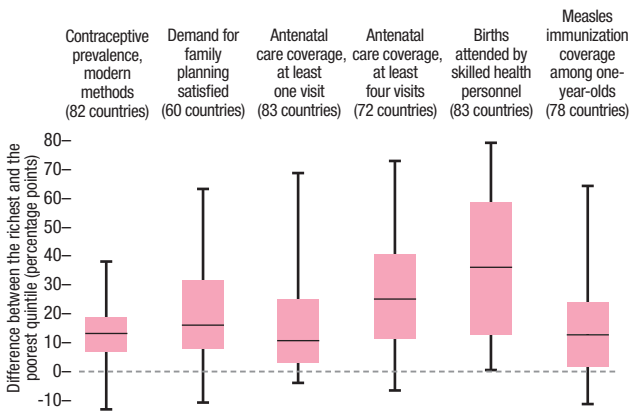
Enhancing quality of health care services: As access and utilization of health services improves, the quality of those services comes under greater scrutiny. Poor quality maternal, newborn, child and adolescent health care remains a pervasive problem, preventing progress in mortality reduction even in those settings where coverage rates of health service utilization are increasing. Fundamental challenges remain with regard to attracting, training, deploying, motivating, managing and retaining skilled, committed and caring health workers.[47] Shortages in medicines and supplies, poorly defined referral pathways, and the lack of regular and supportive supervision are other key factors affecting quality of care in particular in resource-constraint settings.

Reducing inequity in access to care: Across a spectrum of RMNCH coverage indicators, including access to family planning, antenatal care and skilled birth attendance, and measles vaccination, access to care varies importantly by household economic status within low- and middle-income countries (Figure 4.8). The largest gaps in coverage – between the richest and poorest, the most and least educated, and urban and rural areas – are reported for skilled birth attendance, which varies by as much as much as 80%.[23]

Conflict situations and fragile states: Access to and quality of regular primary health care services may collapse and severely disrupt the provision of essential RMNCH services. Eradication efforts are also affected. Polio remains endemic in Afghanistan and Pakistan and until poliovirus transmission is interrupted in these countries, all countries remain at risk of re-infection, especially in the "poliovirus importation belt" of countries from West Africa to the Horn of Africa. Several countries in the Middle East are at elevated risk because of deterioration of immunization systems due to the security situation in those countries.[48]

Reducing malnutrition in all forms: Stunting and wasting remain major causes for concern. An estimated one in four children (23%), or 156 million children, in 2015, are affected by stunting globally, and are exposed to risks that include diminished cognitive and physical development.[5] Globally, less than 40% of infants younger than six months are exclusively breastfed, often owing to inadequate care that starts in the first week of a baby's life and in spite of the fact that suboptimal breastfeeding practices contribute to 800 000 deaths among children under five each year.[6] Reductions in maternal anaemia have also been disappointing, ranging from 43% to 38% in pregnant

Figure 4.8
Wealth-related inequality in RMNCH intervention coverage indicators in low- and middle-income countries, 2005–2013[23]



women between 1995 and 2011.[49] Even as malnutrition due to undernutrition has improved in some areas, the growing rates of child and adolescent overweight and obesity in many counties pose serious risks to their health now and in the future.

Increasing contraceptive prevalence: While there was an 8.4 million increase in the number of girls and women using modern contraceptive methods between 2012 and 2013, it is still below the benchmark of 9.4 million new users, and more needs to be done to provide access to all.[50]

Protecting the rights of young girls and adolescents: Despite some progress in certain countries, and the fact that FGM has gained recognition as a human rights violation, annually, more than 3 million girls are at risk in Africa, living in areas where FGM is practised.[51] Globally, one in four young women in 2014 was married in childhood. The highest rates of child marriage are found in south Asia and sub-Saharan Africa.[11] Overall, there were an estimated 1.3 million adolescent deaths in 2012, most from causes that could have been prevented. Mortality is higher in boys than in girls. While there are many causes of mortality common to both sexes, violence is a particular problem for boys and maternal causes for girls.

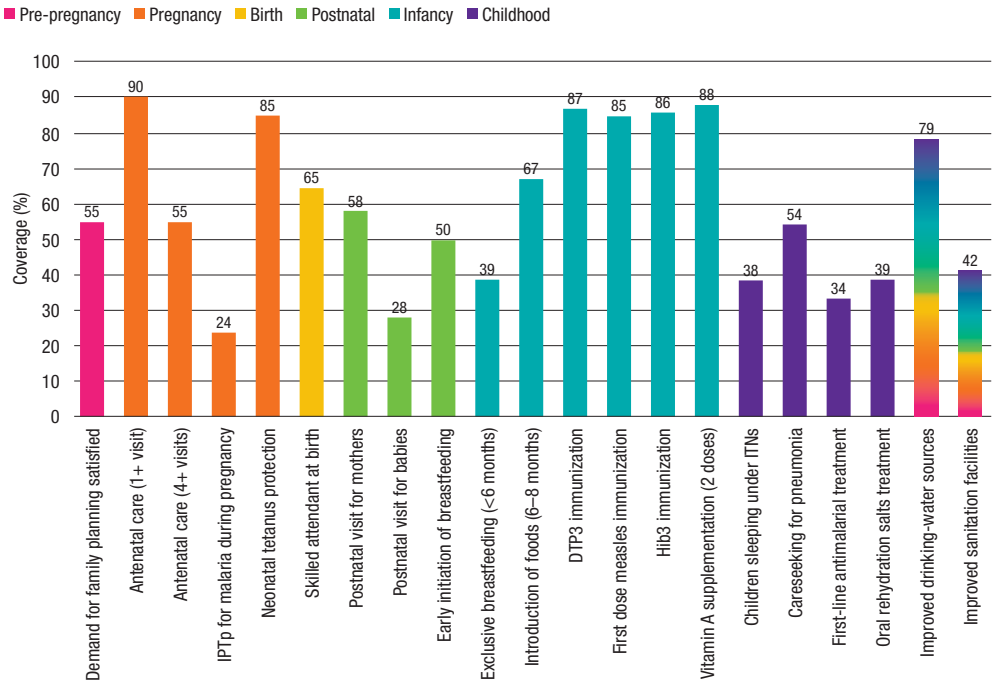
Improving monitoring: Relatively sparse data on maternal mortality, morbidity and causes of death make monitoring progress challenging. For example, many countries with high rates of maternal mortality have only a few nationally representative surveys between 1990 and 2015, which provide imprecise estimates of the MMR. Limited country-level data preclude accurate monitoring of trends in child causes of death, and data on adolescents are also very incomplete. Better birth registration is also critical. Only 59% of infants younger than 12 months is registered globally, with around 33% registered in south Asia and sub-Saharan Africa.[52]

STRATEGIC PRIORITIES

Women and children's health remains a central concern in the SDGs, as evidenced by the strong commitment to ending preventable newborn, child and maternal deaths by 2030, to ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and to protect, promote and support early child development and adolescents' health.

The first Global Strategy for Women's and Children's Health, launched by the UN Secretary-General in 2010, resulted in increases in financing, policy strengthening and dozens of global, regional and national initiatives.[53] The updated Global Strategy for Women's, Children's and Adolescents' Health 2016–2030 (Global Strategy 2.0),[54] launched in September 2015, acknowledges the unfinished MDG agenda regarding preventable mortality, takes into account new evidence regarding areas in which progress can be accelerated and emphasizes the importance of ensuring health and well-being for all at all ages on the SDG agenda.[29] An important focus is the scaling up of priority intervention areas and/or specific high-impact interventions to address major gaps in the continuum of care (Figure 4.9). There are also multiple initiatives and resolutions that provide impetus to specific interventions, such as Family Planning 2020,[55] A Promise Renewed,[52] Every Newborn Action Plan,[56] improving pneumonia prevention and treatment[57] and GAVI.[58] While each specific strategy has a legitimate rationale to address a major public health problem, the need to provide an integrated approach is paramount.

Figure 4.9
Intervention coverage[a] along the continuum of care[26]



[a] Median national coverage of 75 countries, based on most recent survey 2009 or later.

Under the new Global Strategy there is a clear desire to respond to governments' request for less fragmentation and better alignment of efforts. Three interconnected action areas underpin the delivery of the Global Strategy: country planning and implementation; financing of country plans and implementation; and engagement and alignment of global stakeholders. Global and regional partners are therefore working towards a simplified architecture in which many former initiatives will converge around a common coordination mechanism to enable harmonized support to countries with predictable financing.

The Global Strategy 2.0 pays particular attention to equity, rights and gender issues, while also highlighting the importance of innovation, including research and development of new technologies and operational innovations such as a more integrated approach to women's and children's health. The importance of accountability is also stressed, particularly with regard to meeting commitments for results and resources both at the country and global level. A Global Financing Facility in collaboration with Every Woman Every Child[59] has been established in support of the Global Strategy 2.0, using an innovative approach that combines external support, domestic financing and innovative sources for resource mobilization and delivery (including the private sector) in a synergistic way.

Priority strategies to improve RMNCAH include:

- ensuring universal access to high quality RMNCAH information and services that are free at the point of use, including for management of complications;
- strengthening care around the time of childbirth, with a focus on improving quality and experience of care, while ensuring full integration of services for mothers and babies;
- ensuring a continuum of health care across the life course of women, children and adolescents and between levels of service delivery – including community, primary care and referral levels;
- strengthening prevention and case management of childhood illness including pneumonia, diarrhoea, malaria, HIV and malnutrition, including through community-based health workers;
- implementing policies that are health promoting and mandate interventions to prevent exposure from harm – for example to decrease road traffic accidents or use of harmful substances such as tobacco;
- addressing inequities in access to and quality of sexual, reproductive, maternal, newborn and adolescent health care;
- ensuring accountability and transparency to improve access to quality of care and equity;
- harnessing the power of parents, families and communities and engagement with society at large;
- reaching out beyond the health sector to engage with other sectors that have an important impact on health, such as water and sanitation, education, economic and social protection, environment and gender .

The SDG targets on malnutrition and hunger resonate with several resolutions endorsed by the World Health Assembly, including resolution WHA65.6 on the comprehensive implementation plan on maternal, infant and young child nutrition[60] and resolution WHA63.23 on infant and young child nutrition in which Member States were urged to end inappropriate promotion of food for infants and

young children.[61] Specific indicators have been proposed to monitor progress in these areas. A global movement founded on the principle that all people have a right to food and good nutrition has been established.[62] Examples of areas requiring specific attention concerning young children include scaling up coverage of programmes that promote healthy, diversified diets, including high-quality, nutrient-rich foods in the complementary feeding period (6–23 months), scaling up the management of acute malnutrition and enacting labour policies in support of exclusive and continued breastfeeding.

MATERNAL HEALTH

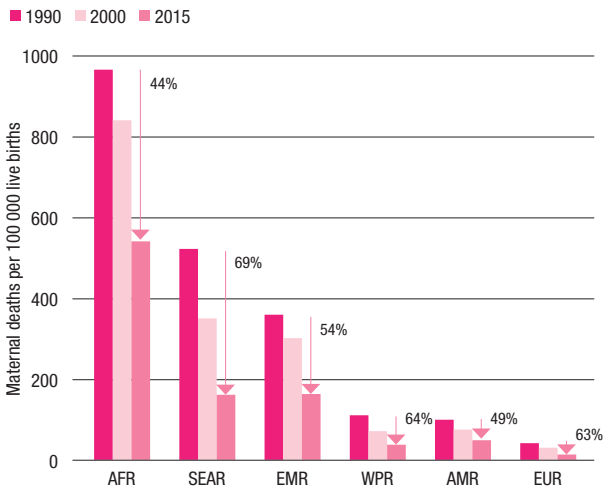
Ending preventable maternal mortality remains one of the world's most critical challenges despite significant progress over the past decade. There will be roughly 303 000 maternal deaths in 2015, largely from preventable causes before, during and after the time of giving birth.[2] Globally among women of reproductive age, maternal mortality is the second leading cause of death, and women currently face a 1 in 180 chance of dying from maternal causes.

ACHIEVEMENTS

Since 1990, the number of maternal deaths per 100 000 live births (the MMR) dropped by 44%. While this is a significant improvement, showing what can be achieved given sustained commitment, the world failed to meet the 75% reduction target set by MDG 5. The MMR dropped from 385 in 1990 to 341 in 2000 to 216 per 100 000 live births in 2015, indicating major acceleration of the decline after 2000.

The global declines in the MMR since 1990 have been driven largely by declines in the South-East Asia Region (69% decline) and the Western Pacific Region (64% decline). The African Region has shown the least progress, with a 44% decline between 1990 and 2015 (Figure 4.10) and now accounts for more than 6 out 10 maternal deaths globally.

Figure 4.10
Trends[a] in the maternal mortality ratio (MMR) by WHO region, 1990–2015[2]



[a] Percent change over the period 1990–2015 is shown at the top of each region.

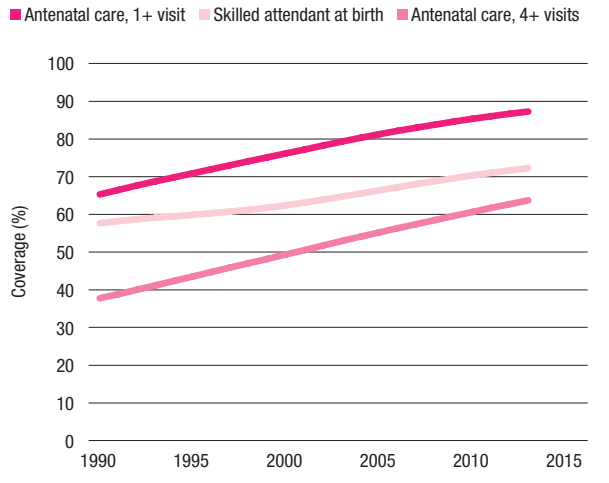
SUCCESS FACTORS

Country improvements in service coverage: Coverage of antenatal care, skilled attendance at birth and institutional deliveries has increased, along with the increased integration in the delivery of health services (Figure 4.11). Almost 90% of women have at least one antenatal care visit, and over 60% at least four.[16] Coverage of skilled attendance at birth increased from 58% to 73% between 1990 and 2013.[16] There has also been an increase in contraceptive prevalence, which gives women the ability to reduce their number of pregnancies and, therefore, mortality risk.

Global Strategy for Women's and Children's Health 2010–2015 and related initiatives: The slow initial progress towards the MDG target for maternal mortality led to a series of global initiatives in support of country action and mobilization of funds from 2005. The impetus provided by the WHO-led Making Pregnancy Safer initiative, the Global Strategy,[29] the Commission on Information and Accountability for Women's and Children's Health,[30] the H4+ partnership[31], country commitment and leadership, along with increased and predictable financing (US$ 45 billion committed as of 2012–2013, with US$ 27 billion already disbursed), have all contributed to improvements in maternal health outcomes, as did the earlier Partnership for Maternal Child and Newborn Health (2005).[32]

Socioeconomic development: Higher levels of education, especially for women and girls, are associated with lower levels of maternal mortality.[64] For women age 25 and above, average educational attainment has increased from 4.7 years in 1990 to 7.0 years in 2015.[65] In the African Region, it rose from 2.0 to 4.1 years, and in the South-East Asia Region it went from 2.0 to 4.3 years. Especially in Asia, the large maternal mortality declines are likely to have benefited from economic developments, leading to better access of services.

Figure 4.11
Global trends in coverage of maternal health interventions, 1990–2013[63]



CHALLENGES

Access to skilled care at birth: Despite steady improvement globally and within regions, more than 40% of women in the African Region and South-East Asia Region did not have access to a skilled health provider at birth in 2013.

Quality of care: As more women give birth in health facilities, the quality of care will become increasingly important.[66] Fundamental health systems challenges remain with regard to attracting, training, deploying, motivating, managing and retaining skilled, committed and caring health workers.[47]

Indirect maternal deaths: The increasing importance of the infectious and chronic noncommunicable diseases that contribute directly and indirectly to maternal mortality is a matter for concern. As countries reduce the MMR, there is a need to strengthen the recognition and management of indirect causes of maternal death, and coordinate with other relevant sectors and health providers to address care for noncommunicable diseases, develop innovative education, screening and management approaches for these conditions, as well as appropriate clinical guidelines and protocols.[67]

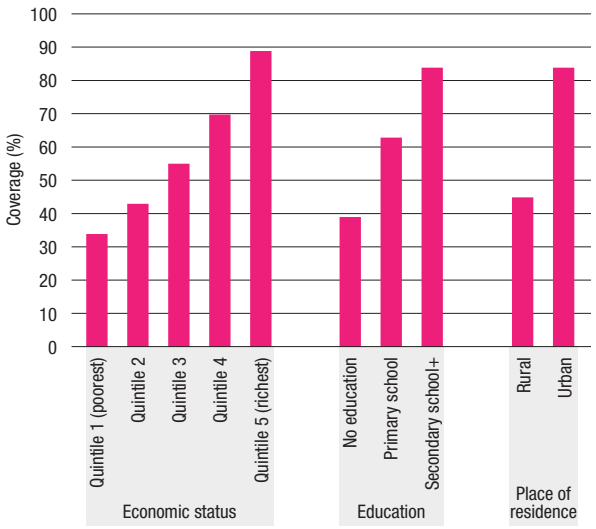
Inequity in access: In many countries, the delivery care women receive is strongly associated with their income, whether they live in an urban or rural area, and their level of education. Disparities across economic, education and urban/rural gradients are particularly pronounced in low-income countries (Figure 4.12).

Health workforce: Fundamental health systems challenges remain with regard to attracting, training, deploying, motivating, managing and retaining skilled, committed and caring health workers.

Funding: In addition to an overall funding gap for maternal health, there are large disparities in the targeting of donor funding and country needs, with some very poor countries with a high MMR getting relatively little funding.[68]

Monitoring: Sparse data on maternal mortality and morbidity and on causes of death in children in many countries make monitoring progress challenging. Vital statistics based on death registration is lacking. Even in high-income countries, vital registration systems typically miss about one third of maternal deaths.[2]

Figure 4.12
Births attended by skilled health personnel in low-income countries[a] by multiple dimensions of inequality, 2005–2013[23]



[a] Median value of 30 selected countries.

STRATEGIC PRIORITIES

There is a specific SDG target on maternal mortality under the health goal, based on the WHO Ending Preventable Maternal Mortality (EPMM) initiative.[67] The goal of the post-2015 maternal health strategy is to end all preventable maternal mortality using a holistic, human rights-based approach to sexual, reproductive, maternal and newborn health that rest on a foundation of implementation effectiveness. Specifically, the global target is that the global MMR is reduced to less than 70 per 100 000 live births by 2030. The EPMM target also specifies that no country has an MMR greater than 140 per 100 000. This implies countries achieving at least a two thirds reduction in their MMR between 2010 and 2030.

The key EPMM strategic objectives are to:

- address inequities in access to and quality of sexual, reproductive, maternal and newborn health information and services;
- ensure UHC for comprehensive sexual, reproductive, maternal and newborn health care;
- address all causes of maternal mortality, reproductive and maternal morbidities, and related disabilities;
- strengthen health systems to respond to the needs and priorities of women and girls;
- ensure accountability to improve quality of care and equity.

Other strategic objectives include improving metrics, measurement systems and data quality and allocating adequate resources and effective health-care financing. In this regard, it is vital to continue momentum to sustain and increase funding for RMNCH within the Global Strategy 2.0 through, for instance, the Global Financing Facility.[59]

NEWBORN HEALTH

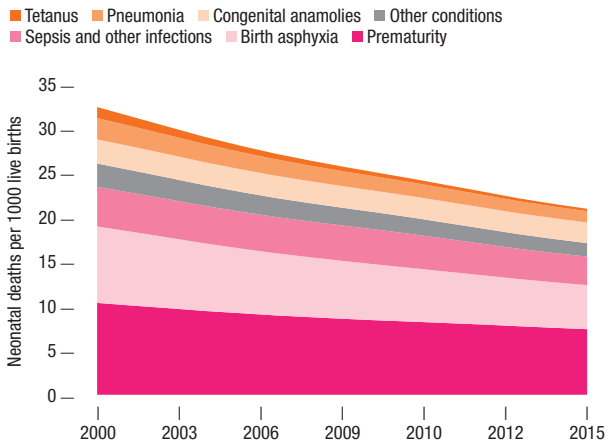
Global efforts to reduce child mortality have had most impact on children who have already survived their first month of life. In 2015, there were 2.7 million neonatal deaths (deaths within the first 28 days of life) globally, which represents 45% of all deaths among children under five.[15] The vast majority of newborn deaths is preventable, with 73% occurring within seven days of birth,[69] and require many of the same investments in health systems that are needed to improve maternal health outcomes.

ACHIEVEMENTS

NMRs have declined across all WHO regions since 1990, with the global rate falling from 36.2 to 19.2 deaths per 1000 live births between 1990 and 2015, a 47% decline.[15] Yet, the percentage of deaths in children under five that occurred in the neonatal period increased from 40% to 45% because mortality at age 1–59 months declined faster. The Western Pacific Region experienced the greatest decline in the NMR at 75%, while the Eastern Mediterranean Region and the African Region the smallest (both 38%).

Since 2000, neonatal mortality has fallen largely due to decreases in deaths from its two main causes, birth asphyxia (34% of total reduction) and prematurity (21%). Deaths due to neonatal tetanus have fallen by almost 80% (Figure 4.13).[4]

Figure 4.13
Global cause-specific risks of neonatal deaths, 2000–2015[4]



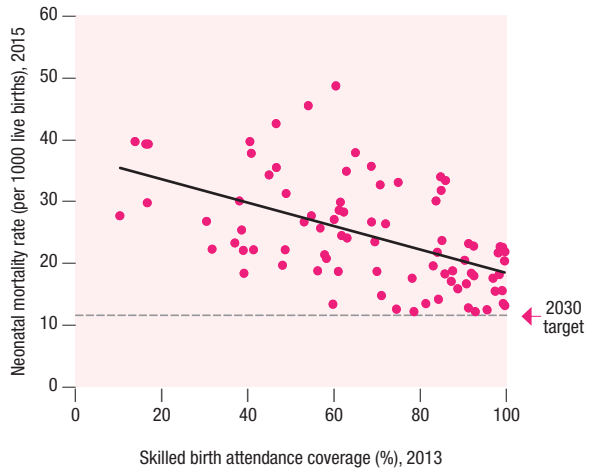
MAIN SUCCESS FACTORS

Country improvements in service coverage: Coverage of interventions for family planning, antenatal care, skilled attendance at birth and postnatal care for mother and baby in the first week of life are expected to lower NMRs.[70] There is, for example, a correlation between NMRs and coverage of skilled attendance at birth (Figure 4.14). The fraction of babies protected against tetanus at birth rose from 60% in 1990 to 83% in 2014.[71] By 2014, 60 out of 75 countries with a high burden of maternal and newborn mortality reported having a policy on home-based newborn care for mother and baby.[72]

Global commitments/partnerships: Much of the decline in neonatal mortality occurred before the global community started to prioritize newborn health, largely driven by the increasing relative importance of deaths in the first month of life. Many governments and partners responded to the UN Secretary-General Global Strategy for Women's and Children's Health in 2010[73] and its accompanying Every Woman Every Child initiative[74] as well as to recommendations made by the Commission on Information and Accountability[30] and the UN Commission on Life-Saving Commodities for Women and Children.[75] The global movement Committing to Child Survival: A Promise Renewed was initiated in 2012[52] and the global Every Newborn Action Plan (ENAP) was published in 2014.[76]

Non-health sector determinants: Other factors that have contributed to improved newborn survival include better water and sanitation, maternal education, poverty reduction, social protection (including conditional and unconditional cash transfers), policies and legislation to create a conducive environment and mitigate risks (e.g. maternity protection, restrictions on marketing of breast-milk substitutes) and urbanisation in so far as this leads to better access to quality health services.[77]

Figure 4.14
Current neonatal mortality rate (NMR) and skilled birth attendance coverage in selected countries[a, 15,63]



[a] Countries with NMR >12 deaths per 1000 live births in 2015.

CHALLENGES

Scaling up effective interventions: Low coverage and poor quality maternal and neonatal health care account for high rates of newborn mortality (Figure 4.15) as well as maternal mortality and intrapartum stillbirths.[52,76] Interventions with the greatest bottlenecks to scaling up are those related to the prevention and management of preterm births, inpatient supportive care of ill and small newborn babies, the management of severe infections, and kangaroo mother care.[78] It has been estimated that almost 3 million maternal and newborn deaths and preventable stillbirths could be averted by 2025 for US$ 1.15 per person in the 75 worst affected countries if coverage levels of essential interventions around the time of childbirth and for small and sick babies would improve.[70]

Strengthening weak health systems: System constraints to scaling up effective intervention packages are found in all high-burden countries, particularly for health workforce, finance and service delivery for newborn health.[78] Many high-burden countries face serious shortages in midwifery personnel, depriving women and newborns of essential care when they need it most.[79]

Overcoming inadequate postnatal care: Less than half of women and their newborn babies receive postnatal care within the first two days after birth.[80] Postnatal care is particularly important for reducing newborn mortality that occurs on the first day of life, but care during the first weeks postpartum also has an impact on maternal and newborn health.[81]

Reducing inequity: Inequitable access to quality health care continues to be prominent, due to geographical barriers, financial barriers or cultural barriers. Inequalities in access to essential newborn interventions remains pervasive even in countries where use of antenatal, child birth and postnatal care services is increasing.

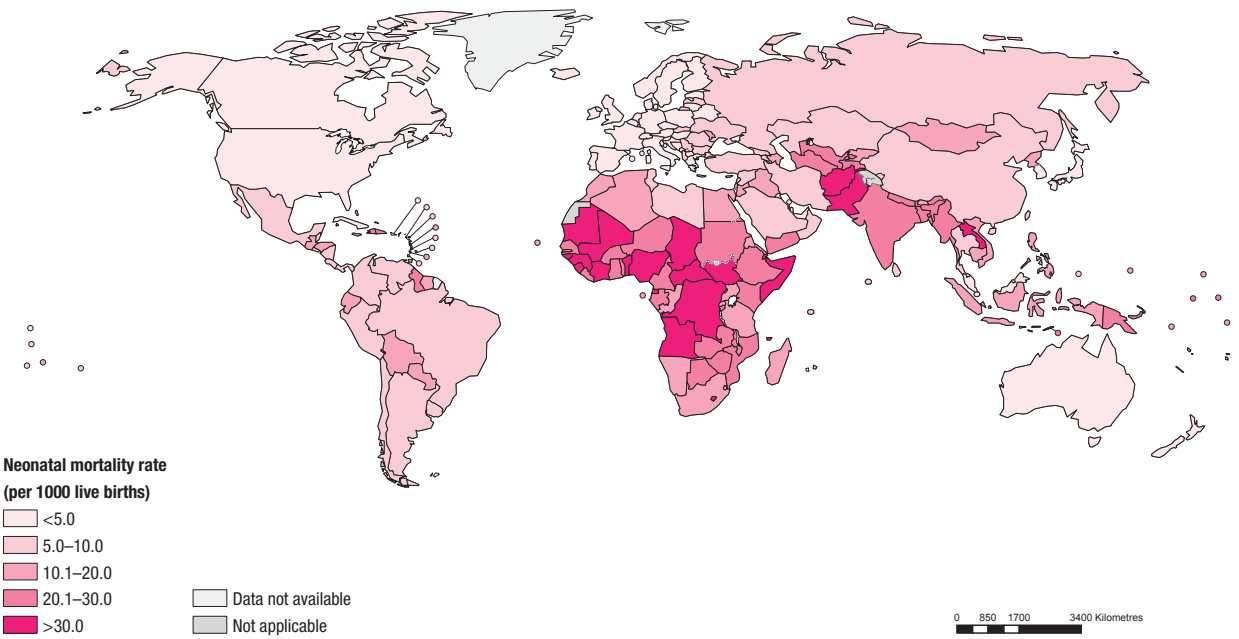
Making every child count: Progress cannot be monitored without basic data collection. Only 59% of infants younger than 12 months have their births registered, with around 33% registered in south Asia and sub-Saharan Africa.[52]

STRATEGIC PRIORITIES

The SDGs include a specific target for newborns: by 2030, achieve national NMRs of less than 12 deaths per 1000 live births. ENAP also includes a target on stillbirth: a reduction of the stillbirth rate to 12 deaths per 1000 total births. ENAP provides strategic directions on how to address the burden of preventable newborn mortality, highlighting that such investment will generate a triple return on investment, and also prevent maternal mortality and stillbirths. The main ENAP strategic objectives are:

- Strengthen and invest in care during labour, childbirth and the first day and week of life.
- Improve the quality of maternal and newborn care by introducing high-quality care with high-impact, cost-effective interventions for mother and baby together – in most cases, by the same health providers at the same time.
- Reach every woman and every newborn to reduce inequities, notably through the introduction of financing based on prepayment and pooling as the basis for UHC.
- Harness the power of parents, families and communities. Evidence has shown the power of engaged community leaders, women's groups and community workers in turning the tide for better health outcomes for newborns.
- Count every newborn. There is an urgent need to improve health metrics globally and nationally, especially for birth outcomes and quality of care. Every newborn needs to be registered and newborn deaths need to be counted. Counting every maternal death and stillbirth is of equal importance.

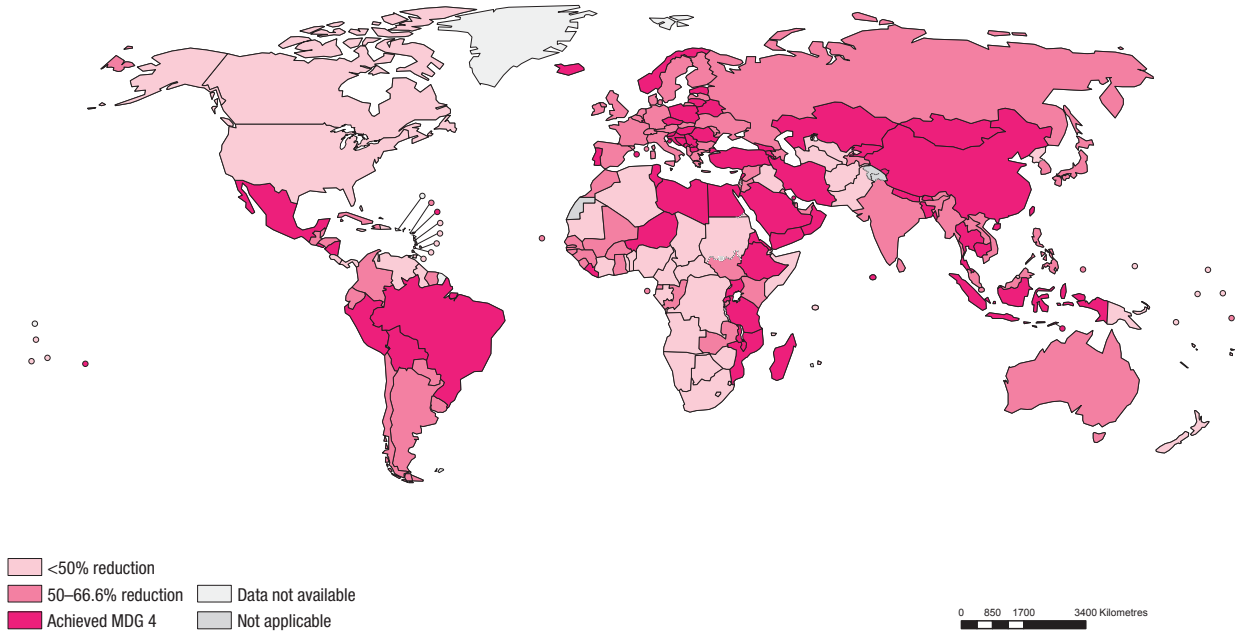
Figure 4.15
Neonatal mortality rate (NMR), 2015[15]



CHILD HEALTH

An estimated 5.9 million children under five will die in 2015.[15] While still unacceptably high, this represents more than a halving of the global child mortality rate in 1990. The vast majority of deaths occurs in less developed countries and are caused by infectious diseases, aggravated by poor nutrition, and manageable conditions around birth. Cost-effective, life-saving interventions exist and need to scale up further.

Figure 4.16
Country progress towards MDG 4, relative decline in under-five mortality rate, 1990–2015[15]



ACHIEVEMENTS

Globally, the U5MR has declined only from 91 to 43 per 1000 live births, that is, by 53% since 1990, and will thus fall short of the MDG target of a two thirds reduction. However, many countries have made tremendous progress, and 62 have achieved MDG 4, including several low-income countries (Figure 4.16). Progress was two times faster since 2000 than during the 1990s.[15]

From 2000 to 2015, the decline in child mortality has been driven by reductions in deaths due to pneumonia (47%), diarrhoea (57%), malaria (58%) and intrapartum-related complications (38%), and a dramatic decline in measles deaths of over 75%.[4]

MAIN SUCCESS FACTORS

Immunizations: Since 2000, global coverage of several immunizations has increased, some rapidly (Figure 4.17). In the same period, coverage of the Hib3 vaccine, which protects against meningitis and pneumonia, has leapt to over 50%, and in the past five years vaccines against pneumococcal disease (PCV3) and diarrhoea (rotavirus) have been introduced.[71] Efforts to eradicate polio have also resulted in an increase in immunization coverage (see subsequent section).

Coverage of other high impact interventions: Among the 75 countries with the highest burden of child mortality, there have been significant increases since the 1990s in the proportion of children sleeping under ITN, receiving treatment with recommended antimalarials and, to a

MAIN SUCCESS FACTORS cont.

lesser extent, treatment of children with diarrhoea and suspected pneumonia.[25] Apart from south Asia and sub-Saharan Africa, deaths attributable to vitamin A deficiency have almost been eliminated.[82]

Reductions in undernutrition: Prevalence of underweight children is projected to decline by 44% between 1990 and 2015,[5] a critical achievement as 45% of under-five deaths are linked to malnutrition.

Global Strategy 2.0 and related initiatives: Child survival has been a priority in the support given by UN agencies, especially UNICEF, bilateral donors, civil society organizations and WHO. Since 2010, following the launch of the UN Global Strategy for Women's and Children's Health 2010–2015, many more initiatives have emerged and many countries have accelerated action since. Examples of global initiatives for children include the Child Survival Call to Action, the UN Commission on Life-Saving Commodities for Women and Children and the Global Action Plan for Pneumonia and Diarrhoea.

Non-health sector determinants: Major progress was made in key determinants of child survival including reductions in extreme poverty,[19] increased primary school net enrolment for both girls and boys[19] and improved access to improved water and sanitation.[83]

Data and monitoring: U5MR is arguably the most consistently well-measured health outcome in developing countries, especially through household surveys, which has allowed for monitoring progress towards MDG 4.

CHALLENGES

Leaving no country behind: Deaths of children under five are increasingly concentrated in the African Region, where nearly half of all under-five deaths occurred in 2015, despite only having one quarter of global live births. Fragile states are a particularly great challenge.

Strengthening weak health systems: Major obstacles to UHC for child health interventions include: limited access and poor quality of health services; suboptimal programme management; poor procurement and supply chain management systems; inadequately prepared and supported health workforce with service provider shortages; and failure to convert national policies into actions.[84]

Renewing momentum for preventive and treatment interventions: There has been only modest progress in increasing rates of exclusive breastfeeding, appropriate care-seeking for signs of pneumonia and oral rehydration therapy for diarrhoea.[25] Coverage rates of new vaccines are below 50% and rates of increase in the coverage of well-established vaccines have waned since 2010 (Figure 4.17).

Addressing NCDs and injuries: Globally, more than one in four deaths in children age 1–59 months are now caused by non-infectious conditions.[4] Childhood obesity is increasing, particularly in urban settings. In 2015, over 41 million children under five were overweight, with five out of six of them living in developing countries (Figure 4.18).[5] Overweight and obese children are likely to stay overweight and obese into adulthood and are more likely to develop NCDs such as diabetes and cardiovascular diseases at younger ages. Addressing common causes of fatal injuries in children, especially those age five to nine, requires action to reduce road traffic injuries, drowning and burns.

Addressing child development: An estimated 200 million children are at risk of not reaching their full development potential because of undernutrition and poverty. Investing in early child development as part of interventions that promote survival is essential.

Reducing inequality: Children are at greater risk of dying before age five if they are born in rural areas, poor households or to mothers denied basic education. While there has been a reduction in the difference in U5MR between the rich and the poor in most regions since 1990, disparities still remain, with regions having around a 1.5–2.5 times higher U5MR among the poor as compared to the rich.[52]

STRATEGIC PRIORITIES

There is a specific SDG target for child mortality reduction, which includes the target that every country should reduce its U5MR to 25 per 1000 live births or fewer by 2030, set a few years earlier as part of the movement Committing to Child Survival: A Promise Renewed.[52] Specific plans such as the Global Action Plan for Pneumonia and Diarrhoea propose concrete operational targets in immunization, nutrition and water and sanitation with the aim of averting 2 million child deaths every year.[85]

Strategic directions for the post-2015 child health agenda include:

- Strengthen and invest in health system service delivery to ensure access to integrated packages of child health interventions through an optimal mixture of community and facility-based care.
- Promote coordinated and integrated actions to improve infant and young child feeding and nutrition, access to safe drinking-water and sanitation, handwashing with soap, reduction in indoor air pollution, immunization, malaria and HIV prevention, and treatment of malaria, pneumonia and diarrhoea.
- Improve quality of care at all levels of service provision, supported by appropriate managerial responses at subnational and national levels.
- Promote equity and reduce inequities through multidimensional approaches such as conditional cash transfers, voucher schemes, microcredit, outreach services and/or targeted community health services to ensure UHC.
- Identify and address emerging priorities of congenital anomalies, injuries and NCDs, including for children age five to nine years.
- Foster intersectoral collaboration of health, education, local government and other sectors.

Figure 4.17
Global coverage of key immunizations to protect children, 1990–2014[71]

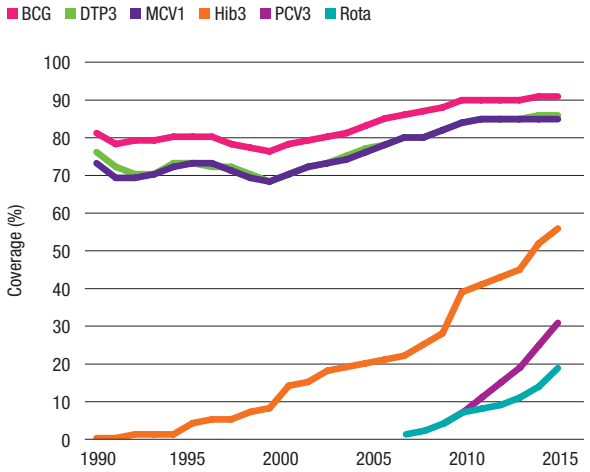
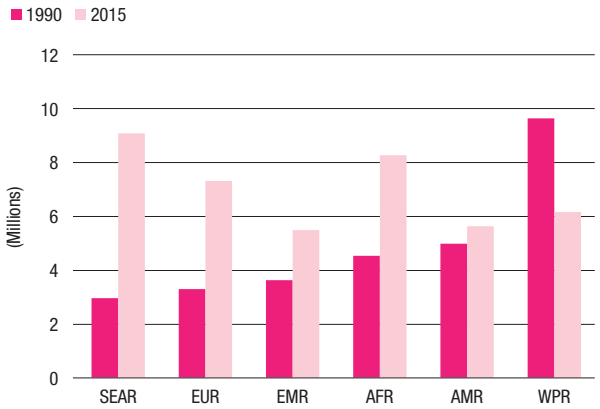


Figure 4.18
Number of overweight children under five by WHO region,[a] 1990 and 2015[5]



[a] Estimates for the European Region have low population coverage.

POLIO

Poliomyelitis (polio) is a highly infectious viral disease, which mainly affects young children. One in 200 infections leads to irreversible paralysis (usually in the legs), and 5–10% of those paralysed die. There is no cure for polio. It can only be prevented. Polio vaccine, given multiple times, can protect a child for life. If enough people in a community are immunized, then the virus will be deprived of susceptible hosts and will die out. High levels of vaccination coverage must be maintained to stop transmission and prevent outbreaks occurring.

TRENDS

Since 1988, the number of polio cases has decreased by over 99% from an estimated 350 000 cases in more than 125 endemic countries to fewer than 2000 cases in 2005, and 359 in 2014 (Figure 4.19). In the first nine months of 2015 there have been 44 cases in Afghanistan and Pakistan. However, the risk of international spread from endemic areas into polio-free areas remains high, as was demonstrated in 2014 with 19 cases in non-endemic countries. The extinction of infection with type 2 wild-type poliovirus, one of the three wild viruses, was proclaimed globally in 2000 and proved that eradication was possible. Nigeria was declared polio-free in September 2015.

In 1994, the Region of the Americas was the first to be certified polio-free (all types), followed by the Western Pacific Region in 2000 and the European Region in June 2002. On 27 March 2014, the South-East Asia Region was certified polio-free, meaning that transmission of wild poliovirus has been interrupted in this bloc of 11 countries stretching from India to Indonesia. This achievement marks a significant leap forward in global eradication, with 80% of the world's population now living in certified polio-free regions. This is testament to the success of vaccination efforts. Vaccination coverage with three doses of polio vaccine has increased during the same period in all regions of the world (Figure 4.20).

Figure 4.20
Coverage of third dose of polio vaccine, in selected WHO regions and globally, 1990–2014[87]

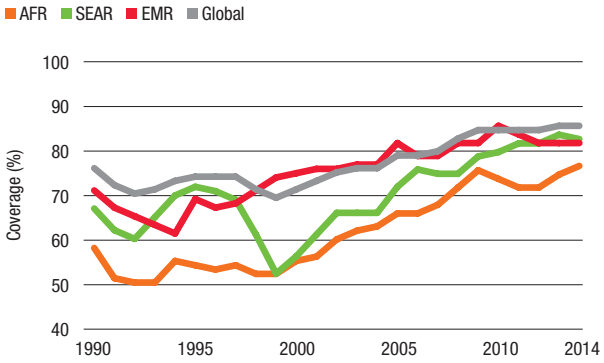
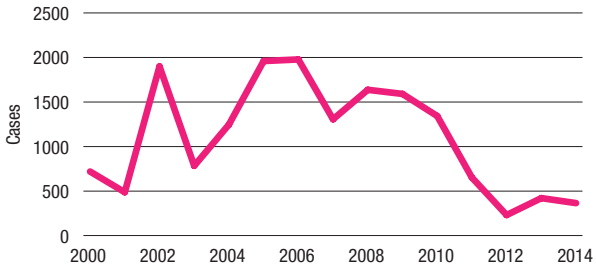


Figure 4.19
Number of wild poliovirus cases, 2000–2014[86]



POSITIVE DEVELOPMENTS

Technology: The development of effective vaccines to prevent paralytic polio was one of the major medical breakthroughs of the 20th century. Research and development efforts have continued and, with the development and evaluation of bivalent oral polio vaccine in 2009, there now is an armoury of five different vaccines to stop polio transmission, including four oral and one inactivated polio vaccine given by injection.

Partnership: Inspired by the success of global smallpox eradication, in 1988, the Forty-first World Health Assembly adopted a resolution for the worldwide eradication of polio by 2000. It marked the launch of the Global Polio Eradication Initiative, spearheaded by national governments, WHO, Rotary International, the United States Centers for Disease Control and Prevention (CDC), UNICEF, and supported by key partners including the Bill & Melinda Gates Foundation.

Funding: The Global Polio Eradication Initiative has become one of the largest global public health programmes, and has succeeded in mobilizing significant funding for polio eradication, through coordinated advocacy over a prolonged period of time. As a result, the programme benefits from a mix of funding that includes domestic resources, donor government funding, business and philanthropy. External funding for 104 countries in 2005–2012 hovered between US$ 1.5–2.0 billion per year. The economic benefits of polio, however, greatly outweigh these investments.[88]

Effective immunization strategy: The key components of the strategy are a standardized, real-time surveillance and response capacity, routine immunization of infants with polio vaccine, supplemental national or regional immunization campaigns based on detailed mapping of communities and rapid response to disease outbreaks. The partnership has mobilized and trained millions of volunteers, social mobilizers and health workers to implement this strategy, and used this same infrastructure to bring other health interventions such as vitamin A to underserved communities.

CHALLENGES

Endemic countries: Polio remains endemic in two countries: Afghanistan and Pakistan. In 2014, all cases of paralytic polio due to wild poliovirus were caused by wild poliovirus type 1 and most (85%) of them occurred in Pakistan. In Afghanistan, the reported cases were primarily a result of cross-border importation, although transmission of an indigenous wild poliovirus continued in the southern region.

Imported polio cases: Until poliovirus transmission is interrupted in the all countries, all remain at risk of importation of polio, especially in countries affected by conflict where immunization services falter. In 2014, seven countries reported polio cases associated with imported wild poliovirus, including Iraq, Somalia and the Syrian Arab Republic. Countries, and regions such as the Middle East, in close proximity to endemic countries and with deteriorating immunization systems, are at particularly high risk.[48]

Disasters, emergencies and conflict: Most of the remaining pockets of polio are in conflict-affected countries. Persisting reservoirs of naturally occurring (wild-type) polio have proven stubbornly resistant to control in Afghanistan and Pakistan in large measure due to continuing conflict.

Local resistance: Suspicion and mistrust in some communities have hindered progress towards universal immunization. This has occurred in Afghanistan and Pakistan as well as in Nigeria, where a poor public health infrastructure and, until recently, a lack of political will has resulted in very low routine immunization rates and ineffective supplemental immunization activities.[89]

Vaccine-derived polio: A further challenge has been the emergence of vaccine-derived polioviruses, genetically unstable viruses that revert towards the profile of the virulent parent strain as they circulate for extended periods in a population with low immunity levels. As wild poliovirus is eventually stopped, the risks of oral polio vaccine will start to outweigh its benefits, due to the threat of vaccine-derived poliovirus. A coordinated switch in type of vaccine will be necessary.[90,91]

STRATEGIC PRIORITIES

Polio eradication is one of the earliest globally agreed health goals, and was subsumed under the general child health and immunization goal in the MDGs. Even though polio eradication is not explicitly mentioned in the health SDG, there are implicit linkages to the health SDG, including Target 3.b on access to vaccines, Target 3.d on implementation of the IHR and Target 3.8 on universal access to health services and vaccines. SDG 16 on promoting peaceful and inclusive societies is highly relevant for polio eradication.

Recognizing both the epidemiological opportunity and the significant risks of potential failure, a new Polio Eradication and Endgame Strategic Plan 2013–2018 has been developed, in consultation with polio-affected countries, stakeholders, donors, partners and national and international advisory bodies.[92] It is the first plan to eradicate all types of polio disease simultaneously – both due to wild poliovirus and due to vaccine-derived polioviruses.

Successful polio eradication is potentially an early milestone for the SDGs, if political and financial commitment is maintained. Lessons learnt from the polio eradication programme can also play an important role in the implementation the SDGs. Some of the lessons include the establishment of real-time surveillance and data analysis, with a laboratory network that spans 145 countries, the importance of establishing accountability mechanisms in countries with weak health systems, and specific strategies for accessing children in conflict areas.[46]

UNDERNUTRITION

Of the three key undernutrition measures – underweight (defined as inadequate weight for age), stunting (defined as inadequate length/height for age) and wasting (low weight for height)[93] – stunting best reflects the cumulative effects of child undernutrition and infection during the critical 1000-day period covering pregnancy and the first two years of a child's life. An estimated one in four children (23.2%), or 156 million children, is affected by stunting globally in 2015, and is exposed to risks that include diminished cognitive and physical development.[5] An estimated 93 million children under five (one in seven children globally) suffer from the negative effects of underweight,[5] and 45% of child deaths is linked to undernutrition.

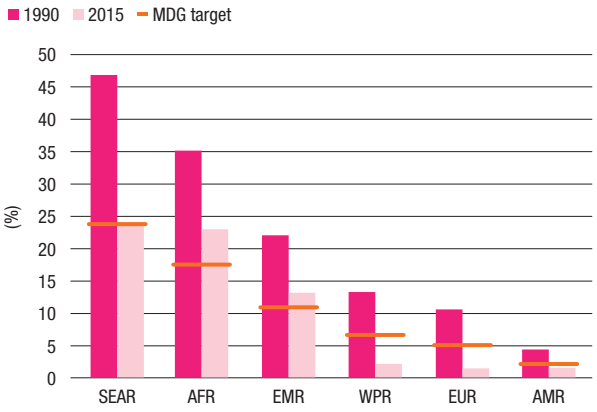
ACHIEVEMENTS

Between 1990 and 2015, the prevalence of underweight declined from 25% to 14% (Figure 4.21), a 44% reduction that falls slightly short of the MDG 1 target of halving the prevalence of underweight. All regions have experienced a decline in the prevalence of stunting among children, however, due to population growth, in the African Region the number of children affected by stunting increased by 28% between 1990 and 2015.[5]

Modest progress has been made in reducing maternal anaemia, which has dropped from 33% to 29% in non-pregnant women, and from 43% to 38% in pregnant women between 1995 and 2011.[49]

In 1990, 28% of infants younger than six months was exclusively breastfed compared to an estimated 34% in 2010. During this time period, 25 countries recorded gains of 20% or more in exclusive breastfeeding rates.[94]

Figure 4.21
Proportion of underweight children under five by WHO region,[a] 1990 and 2015[5]



[a] Estimates for the European Region have low population coverage.

SUCCESS FACTORS

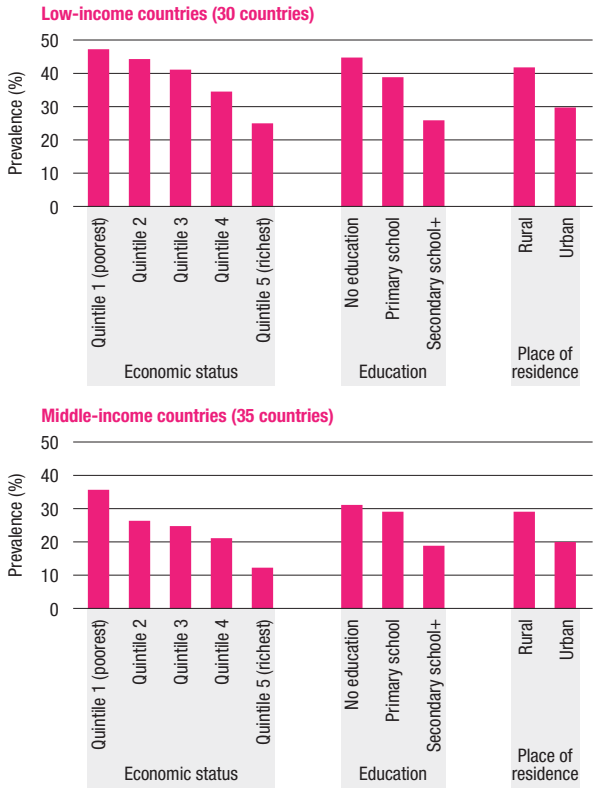
Economic development: Increases in household income have improved the ability of families to obtain increased quantities and greater variety of foods for infants and young children.[37]

Ancillary health programmes: Child illness has an important effect on the growth of children. Nutritional status has benefited from progress in the widespread delivery of related public health programmes, including malaria control, treatment of diarrhoea and pneumonia, immunization of children, deworming, water and sanitation, female education, and delayed umbilical cord clamping.

Enabling environment: Policies guided by the WHO UNICEF Global Strategy for Infant and Young Child Feeding, including national legislation on the International Code of Marketing of Breast-milk Substitutes, maternity protection for working women, and standards for maternity facilities have been implemented to remove barriers to breastfeeding.[95]

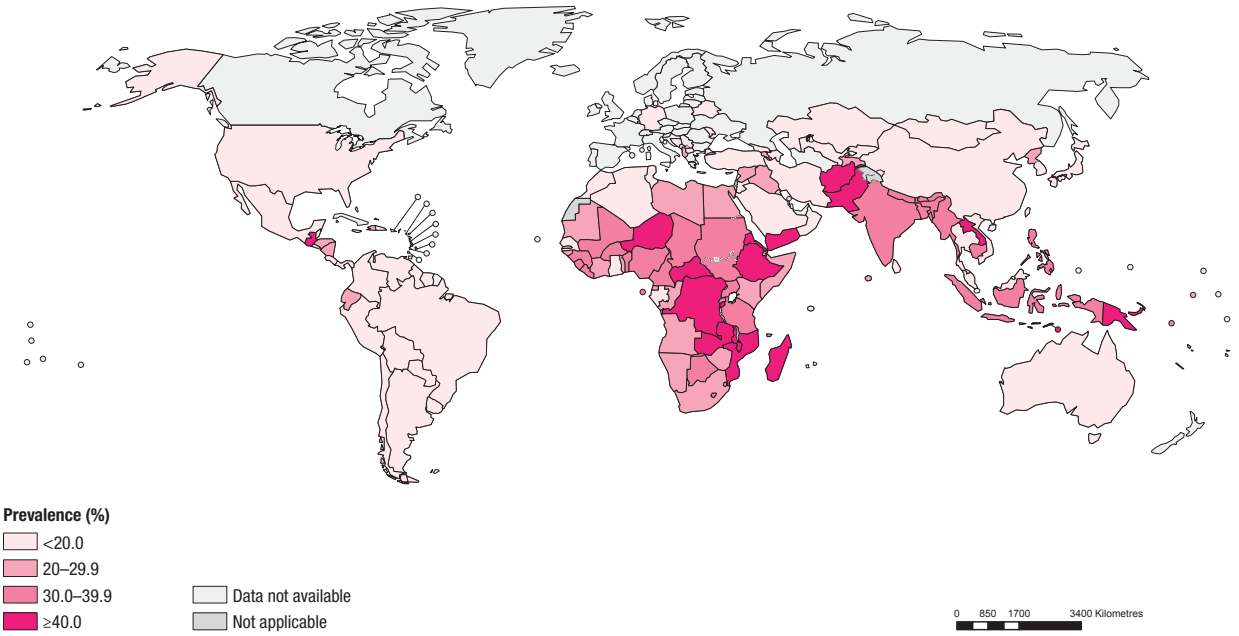
Service delivery: Community-based programmes to address acute malnutrition and vitamin and mineral supplementation have directly improved nutritional status. Increased capacity of health providers and community workers in providing counselling has given caregivers the skills they need to improve infant and young child feeding practices.[6]

Figure 4.23
Stunting prevalence in children under five in low- and middle-income countries,[a] by multiple dimensions of inequality, 2005–2013[23]



[a] Sixty-five countries with available data for all three dimensions of inequality.

Figure 4.22
Prevalence of stunting in children under five[96]



CHALLENGES

Stunting in Africa and India: Post-2015, efforts will need to focus on reducing the number of stunted children, with particular emphasis on India and the African Region (Figure 4.22).

Underweight: While the MDG for underweight was nearly met, there is still work to be done. The South-East Asia Region and African Region combined account for an estimated 84% of the global burden of underweight children under five. The percentage of babies with low birth weight varies widely from an average of 28% in south Asia to only 6% east Asia and the Pacific.[97]

Maternal anaemia: Progress has been made in reducing maternal anaemia, but most countries still have anaemia as a moderate or severe public health problem.[98] New and innovative strategies will be needed to effectively reduce anaemia to acceptable levels.

Wasting: Wasting is a strong predictor of mortality among children under five,[99] and is usually the result of acute significant food shortage and/or disease. Rates of severe wasting remain unacceptably high in the South-East Asia Region (4.3%), the Eastern Mediterranean Region (3.8%) and the African Region (3.3%).[5]

Inequity in child undernutrition: Prevalence of undernutrition is higher in disadvantaged children (Figure 4.23). In half of 77 low- and middle-income countries the absolute difference in stunting prevalence between richest and poorest quintiles was 18 percentage points or more.[23]

Inadequate implementation: Only a small minority of countries have fully implemented the International Code of Marketing of Breast-milk Substitutes or fully comply with the ILO Convention 183 on maternity protection.[100]

Inadequate resources: While new resources have been mobilized to address stunting in high-burden countries, other forms of malnutrition, including obesity, micronutrient deficiencies, breastfeeding and appropriate complementary feeding have not received the attention they deserve.

STRATEGY FOR THE SDGs

SDG Target 2.2 aims to end all forms of malnutrition by 2030, as part of the goal to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture". This approach recognizes the global dimension of the nutrition issue, as practically no country is exempt from malnutrition. The 2012 World Health Assembly endorsed six global nutrition targets for 2025:[60]

- achieve a 40% reduction in the number of children under five who are stunted;
- achieve a 50% reduction of anaemia in women of reproductive age;
- achieve a 30% reduction in low birth weight;
- ensure that there is no increase in childhood overweight;
- increase the rate of exclusive breastfeeding in the first six months up to at least 50%;
- reduce and maintain childhood wasting to less than 5%.

Key strategies to achieve these targets have been identified in the World Health Assembly Comprehensive implementation plan on Maternal, Infant and Young Child Nutrition and the Framework for Action.[101] They include a range of interventions such as scale-up coverage of programmes that promote healthy, diversified diets, including high-quality, nutrient-rich foods in the complementary feeding period (6–23 months), improvement of micronutrient intake through food fortification, including of complementary foods, and use of supplements and use of multiple channels for messaging and counselling on optimal infant and young child nutrition.

ADOLESCENT HEALTH

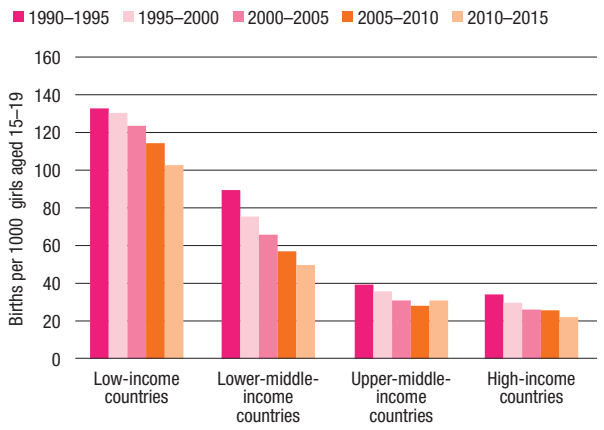
A focus on the adolescent phase of the life course is crucial for building a solid foundation for the SDGs. Today's adolescents will be 2030 policy and decision-makers. Adolescents[8] are exposed to a range of risks and suffer from a variety of illnesses, the most significant being unipolar depressive disorder, road injury, iron deficiency anaemia, HIV/AIDS and self-harm.[9] While mortality rates are low compared to other age groups, most causes of death among adolescents are preventable. Importantly, many health behaviours that are adopted during adolescence can have lasting impacts on health through the life course.

TRENDS

Adolescent mortality rates declined between 2000 and 2012, with the number of global deaths falling from 1.5 million to 1.3 million.[9] The adolescent birth rate (births to those age 15–19) declined by about 30% between 1990–1995 and 2010–2015 (Figure 4.24). The declines were greatest in lower-middle-income countries (44%).[102]

In 2014 over 1.6 million adolescents in the African Region were living with HIV/AIDS, which has become a leading cause of death among adolescents globally.[9,103]

Figure 4.24
Adolescent birth rates by country income group, 1990–2015[102]



POSITIVE DEVELOPMENTS

Increased policy focus in countries: Among the national health policy documents from 109 countries retrieved in 2013 from the WHO Country Planning Cycle Database, 84% of the policies included some attention to adolescents.

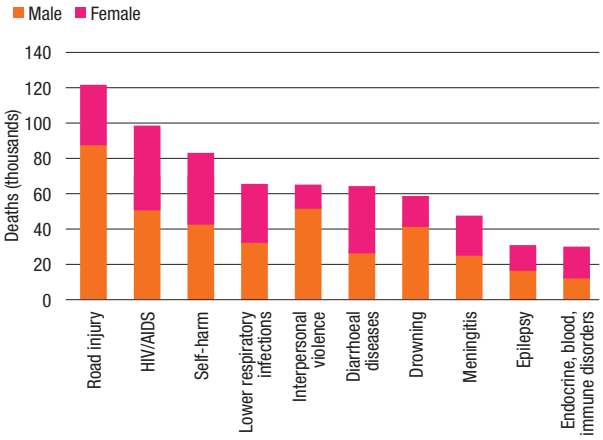
Global advocacy: The new UN Every Woman Every Child Global Strategy 2015–2020 includes adolescent health and, in 2012, the UN Secretary-General called for the development of a UN system-wide Action Plan on Youth (Youth-SWAP) to enhance the coherence and synergy of UN system-wide activities in key areas related to youth development, including health.

Improved coverage of interventions: Across countries with available data, there has been a steady increase in young women's use of modern contraceptive methods over the past two decades.[104] In eastern and southern Africa, where the HIV burden is high, the percentage of girls and boys who was sexually active before age 15 declined, and rates of condom use among girls increased from 22% to 33%.[103]

Benefits from childhood interventions: The increase in the immunization coverage with measles vaccine in childhood translated into health gains for adolescents, which reiterates the importance of the life course approach to policies and interventions.

Education: Rates of enrolment in secondary school have increased globally since 1990. For example, in 2000, the out-of-school population of children of lower secondary school age was 97 million, compared to 63 million by 2012,[20] despite an absolute increase in the population in this age range.

Figure 4.25
Global top 10 causes of death among adolescents by sex, 2012[1]



CHALLENGES

Spurring action in countries: Major causes of deaths and ill-health in adolescents, such as mental health, substance use and nutrition related disorders, do not get sufficient attention in national health policies. Among the national health policy documents from 109 countries, only approximately one third address tobacco and alcohol use among adolescents, and only one quarter address mental health.

Reducing road traffic injuries: The leading cause of death among adolescents is road traffic injuries (Figure 4.25), which will become an even greater problem as rates of vehicle ownership increase in the future, particularly in developing countries.

Treating mental illness: Suicide is estimated to be the number one cause of death among women age 15–19, and depression is the leading cause of illness and disability in adolescence. In any given year, 10–20% of adolescents will experience a mental health problem, most commonly depression or anxiety.[105]

Improving nutrition and physical activity: Many boys and girls in developing countries enter adolescence undernourished. The number of adolescents who are overweight or obese is increasing in both low- and high-income countries. Available survey data indicate that fewer than one in every four adolescents meets the recommended guidelines for physical activity. Anaemia resulting from a lack of iron affects girls and boys, and is the third cause of years lost to death and disability.[9]

Ensuring sexual and reproductive health services and rights: There are considerable barriers to access to health services due to mandatory third party authorization, and barriers to implementation of comprehensive sexuality education.[106] Early marriage of an estimated 39 000 adolescent girls every day often deprives them of their education, health and long-term prospects.[107] An estimated 33 million women age 15–24 have an unmet need for family planning in 61 countries.[104] Globally, some 30% of girls age 15–19 who are cohabiting have experienced violence by a partner.[9] Although the overall number of HIV-related deaths is down 30% since the peak eight years ago, estimates suggest that adolescents are the only population group in which HIV deaths are rising.[105]

Confronting adolescent male mortality: In the Region of the Americas, the adolescent mortality rate for males has been stagnant since

CHALLENGES cont.

2000, where one out of every three deaths among boys age 15–19 is due to interpersonal violence. The rate among those age 15–19 in the Eastern Mediterranean Region has increased since 2000 due to war-related deaths.[9]

Increasing monitoring: Although one in six people in the world is an adolescent, adolescent health is monitored poorly compared to many other age groups.

Improving equity: Adolescents have decreased rates of access to family planning services compared to older age groups. For example, based on survey data from 49 low- and middle-income countries, median coverage of demand for family planning satisfied with modern and traditional contraceptives is 1.5 times higher in women age 20–49 (66%) than in adolescents age 15–19 (42%).[16]

Removing barriers to care: Adolescents often find health services unacceptable because of perceived lack of respect, confidentiality and fear of stigma or discrimination. For adolescents responding to a WHO global consultation, cost and poor access were the top two reasons preventing them from using health services.[9]

STRATEGIC PRIORITIES

The 2030 SDG declaration mentions adolescents or youth in several instances as a vulnerable population. The targets include a few specific targets for youth, mostly on employment, but several targets that, if met, will substantially improve adolescent health. In addition to disease-specific interventions, such as increasing access to male circumcision and HPV vaccination, structural, environmental and social changes are required. These include infrastructure changes to improve road safety, greater alcohol and tobacco taxation, and increased access to education. In addition, actions to create adolescent-responsive health systems are necessary, such as facilitation of the adoption of health promoting and protecting policies that prevent exposure to harms and enable adolescents to adopt healthy lifestyles and strengthening of the capacity of primary and referral-level facilities to deliver adolescent responsive services.

SEXUAL AND REPRODUCTIVE HEALTH AND RIGHTS

The MDG 5.B target for sexual and reproductive health and rights that sought to "achieve universal access to reproductive health" was added in 2007. This target covers a wide range of health issues, from contraception to FGM, which makes it difficult to agree on a manageable set of appropriate indicators for the target. In the SDG, the sexual and reproductive rights are included in the gender goal.

ACHIEVEMENTS

Globally, contraceptive prevalence with any method rose from 55% in 1990 to 63% in 2010, with 58% of married women of reproductive age projected to be using a modern method by 2015 (Figure 4.26). The increase was primarily due to a 10 percentage point increase in developing countries. The unmet need for contraception with a modern method fell from 32% in 1990 to 24% in 2010, driven by decreases in developing countries. For women in the African Region, the met demand for family planning with a modern method jumped by 85% between 1990 and 2010 and is projected to have more than doubled by 2015.[21]

As a result, between 1995 and 2012, rates of unintended pregnancy fell from 69 per 1000 women to 53 per 1000 women.[22]

Primary infertility (non-voluntary childlessness) significantly has declined since 1990 in sub-Saharan Africa, where it is most common and in south Asia, although there was little change in other regions between 1990 and 2010.[108]

Globally, one in four young women in 2014 was married in childhood versus one in three in the early 1980s.[11] The proportion of young women who entered into marriage before age 15 declined from 12% to 8% between the early 1980s and 2014.[11]

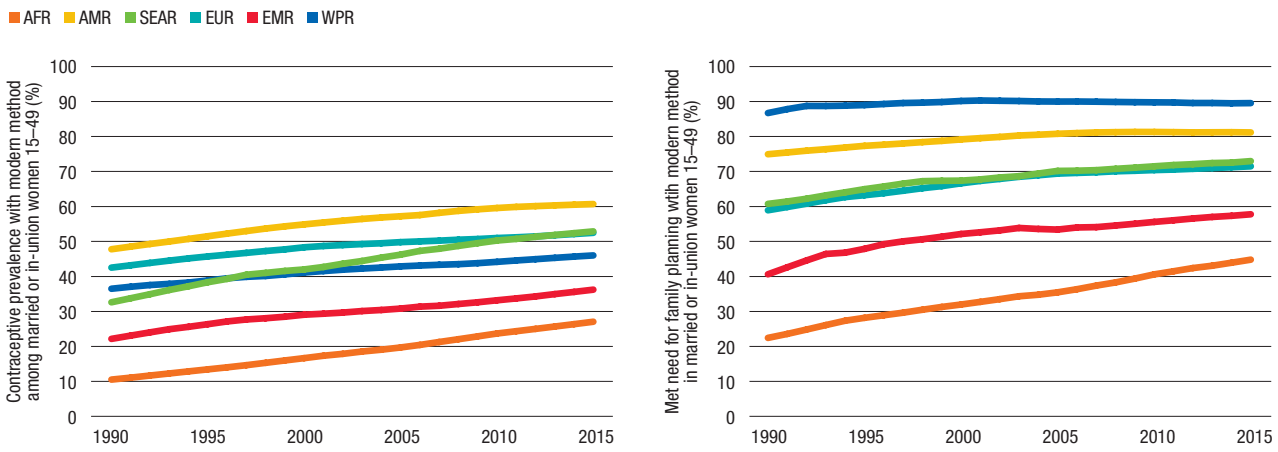
POSITIVE DEVELOPMENTS

Policies and legislation: In the past five years, 77% of country governments implemented concrete measures to increase women's access to comprehensive sexual and reproductive health services, regardless of marital status and age.[109] FGM gained recognition as a human rights violation and in the 29 countries that practise FGM, at least 24 have enacted anti-FGM laws or decrees.[42] Between 1975 and 2010, 119 countries enacted 260 changes in legislation to address intimate partner violence, 95% of these changes enacted since 1995.[110]

Global and country-level commitments: Notable commitments include the International Conference on Population and Development Programme of Action, which was adopted by 179 countries in 1994 and focuses on sexual and reproductive health and rights.[34] Over 30 country governments have committed to achieving Family Planning 2020 (FP2020), with 120 million new users of contraceptives by 2020, and donors provided US$ 1.3 billion dollars for family planning in 2013.[111]

Investments in education: Several high-quality interventions have demonstrated a link between investing in education and decreases in early marriage and early pregnancy.[38] More than half of countries and areas worldwide have achieved or nearly achieved universal primary education.[40]

Figure 4.26
Trends in contraceptive prevalence and met need for family planning by WHO region, 1990–2015[21]



CHALLENGES

Ending child marriage: Despite progress, of the world's 1.1 billion girls, 22 million are already married and hundreds of millions more are at risk, and the number will only grow as populations increase.[11]

Eradicating FGM: Annually, more than 3 million girls are potentially at risk of FGM in Africa.[51] The available evidence suggests only a modest decline in prevalence of FGM from the mid-1990s to the present.[112]

Stopping intimate partner violence: 30% of "ever partnered" women experience physical or sexual intimate partner violence in their lifetimes. The highest rates are in the South-East Asia Region (38%) and the African Region (37%), but reports by women from all regions indicate that it is a common behaviour.[12]

Halting sexually transmitted infections: The incidence of sexually transmitted infections remains high for many pathogens and coverage is still inadequate for several interventions (see Chapter 5).

Making abortion safe: In 2008, roughly half of the estimated 43.8 million induced abortions that occurred globally were unsafe, with the majority of them occurring in developing countries.[113] Induced abortion rates were between 20 and 40 per 1000 women of reproductive age in regions with legal restrictions on induced abortion. Around 8% of maternal deaths are due to abortion.[3]

STRATEGIC PRIORITIES

The SDGs include a specific target on ensuring universal access to sexual and reproductive health-care services as part of the health goal, and several targets on sexual and reproductive rights are included under the gender goal. All components of sexual and reproductive health such as family planning, prevention of unsafe abortion, eliminating harmful practices such as female genital mutilation, addressing violence against women, and ensuring access to sexual and reproductive health services by all who need them, including adolescents, are being addressed within the new Global Strategy for Women's, Children's and Adolescents' Health launched by the Secretary-General in September 2015.

Several World Health Assembly resolutions have addressed some of these issues including the Global Reproductive Health Strategy.[114] Global campaigns and action plans have been developed and are in place to address variety of sexual and reproductive health issues supporting the implementation of the Global Reproductive Health Strategy, such as Family Planning 2020, a global initiative aiming to accelerate meeting unmet needs in contraception,[115] a Global Health Sector Strategy for Sexually Transmitted Infections,[116] and a global plan of action to strengthen health system response to interpersonal violence, in particular against women and girls, are being prepared. Other efforts to address violence against women and girls, including female genital mutilation and child marriage, include the UN Secretary-General UNiTE Campaign to Eliminate Violence against Women[117] and the UNICEF #ENDviolence against Children campaign.[118]

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5

INFECTIOUS DISEASES

SUMMARY

SDG Target 3.3 is focused on the major infectious diseases and includes HIV/AIDS (1.2 million deaths), TB (1.1 million deaths) and malaria (438 000 deaths). Encouraged by the major achievements of the MDG era, ambitious new global targets have been set for HIV, TB and malaria in the World Health Assembly and by the Joint United Nations Programme on HIV/AIDS (UNAIDS) Programme Coordination Board. The SDG target also goes beyond the MDGs in broadening the scope of attention to specifically include ending neglected tropical diseases (NTDs), and combating waterborne diseases, viral hepatitis and other communicable diseases.

Globally, the number of deaths due to infectious diseases, including parasitic diseases and respiratory infections, fell from 12.1 million in 2000 to 9.5 million in 2012. The percentage of all deaths due to infectious diseases decreased from 23% to 17%. In the African Region, and to a lesser extent the South-East Asia Region and the Eastern Mediterranean Region, infectious diseases are still a leading cause of death. The three regions account for 81% of all deaths and 89% of all YLL due to infectious and parasitic diseases in the world.

MDG Target 6 has been met for the major infectious diseases. Incidence (new HIV infections and new cases of malaria and TB) has declined: compared to 2000, the number of people newly infected with HIV was 35% lower; the malaria incidence rate among the population at risk was 37% lower and the TB incidence rate was 18% lower.

Major increases in the coverage of key interventions have been recorded for all three diseases. In 2014, 14.9 million people living with HIV were receiving ART, up from 690 000 in 2000. Coverage of (new) malaria interventions also increased rapidly. For instance, in sub-Saharan Africa an estimated 68% of children under five were sleeping under an ITN in 2015, compared to less than 2% in 2000. TB case detection rates increased from 38% to 63%, while maintaining high levels of treatment success (85% or higher) since 2007.

MDG progress has been made because of increased political commitment, strong global partnerships, drastic increases in funding, scaling up of new and existing interventions and better monitoring and use of data.

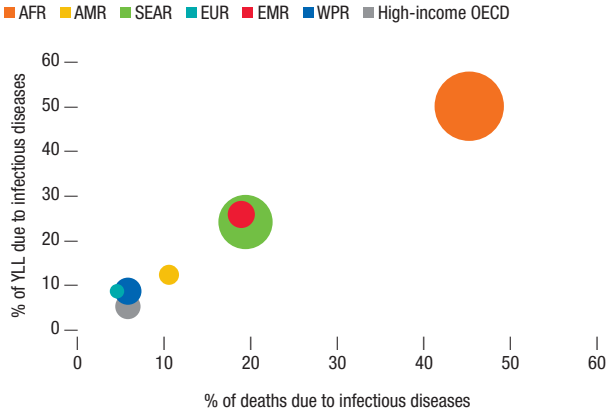
Infectious disease outbreaks remain a concern to all countries, imposing a significant burden on economies and public health. Several respiratory infectious disease outbreaks have occurred since 2000, including the 2003 severe acute respiratory syndrome (SARS) epidemic and the 2009 A(H1N1) influenza virus epidemic. Cholera is endemic in many countries and the Haiti outbreak of 2010–2011 provided a vivid reminder of its potential to spread. Most recently, the outbreak of Ebola virus disease in West Africa resulted in over 28 000 cases and more than 11 295 deaths (as of 23 September 2015), causing considerable concern across the globe.

The spread of infectious diseases is affected by multiple socioeconomic, environmental and ecological factors as well as rapidly increasing antimicrobial resistance. The SDGs provide a new platform for an integrated approach across the economic, social and environmental pillars of development, which should be used to address all infectious diseases.

Infectious and parasitic diseases are on the decline. Globally, the number of deaths due to infectious diseases, including parasitic diseases and respiratory infections, fell from 12.1 million in 2000 to 9.5 million in 2012.[1] The percentage of all deaths that was due to infectious diseases decreased from 23% to 17%. Yet, infectious diseases are still a major global public health problem for several reasons.

First, deaths due to infectious diseases occur at younger ages than deaths due to other causes, and thus account for a higher proportion – an estimated 26% worldwide – of YLL. Second, infectious diseases continue to weigh heavily in certain regions (Figure 5.1). For example, in the African Region, 50% of YLL are due to infectious and parasitic diseases, while in the South-East Asia Region and the Eastern Mediterranean Region, they account for 24% and 27% of all YLL, respectively. Globally, the three most affected regions account for 81% of all deaths and 89% of all YLL due to infectious and parasitic diseases.

Figure 5.1
Percentage of deaths and years of life lost (YLL) due to infectious diseases[a] by region, 2012[1,2]



[a] The size of the bubble indicates the relative number of deaths due to infectious diseases.

Third, emerging infectious diseases – 60% of which are zoonotic, mostly originating in wildlife and livestock[3,4] – impose a significant burden on global economies and public health. The spread of emerging infections is highly correlated with socioeconomic, environmental and ecological factors such as population growth, density and movement, urbanization, environmental and land-use changes, climate change and changing human behaviours, and thus presents particular challenges for prevention and control. Finally, the threat of infectious diseases is further intensified by increased antimicrobial resistance. The pathogens that cause infectious diseases and the vectors that carry them are increasingly resistant to the drugs and insecticides used to control them, threatening the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi.[5]

Infectious diseases are a key focus of the SDG health goal, with Target 3.3 calling specifically to, "By 2030, end the epidemics of AIDS, TB, malaria and neglected tropical diseases and combat hepatitis, waterborne diseases and other communicable diseases".[6] This represents a significant widening of focus relative to MDG 6 in two ways: a shift from control to elimination and specific reference to TB, NTDs, hepatitis and waterborne diseases in addition to HIV/AIDS, malaria and "other diseases" (Figure 5.2).[7]

SDG Target 3.3 includes HIV/AIDS (1.2 million deaths)[8], TB (1.1 million deaths)[9] and malaria (438 000 deaths).[10] Encouraged by the major achievements of the MDG era, ambitious new global targets have been set for HIV, TB and malaria in the World Health Assembly and by the UNAIDS Programme Coordination Board (see Table 5.1 in the strategy section).

As noted, the SDGs also go beyond the MDGs in broadening the scope of attention to include NTDs, waterborne diseases (including 1.5 million deaths due to diarrhoeal diseases) and viral hepatitis (1.4 million deaths). Tackling the 17 NTDs would reduce an important source of disability and chronic illness, NTDs being endemic in 149 countries and putting more than 1 billion people at risk of infection. NTDs represent a disease burden of at least 26 million disability-adjusted life years (DALYs), that is roughly half the burden of TB or malaria.[1,11]

There is also a strong case for tackling hepatitis, which was relatively neglected during the MDG era, despite having a disease burden comparable to infections such as HIV, TB or malaria. Viral hepatitis infection is a major cause of death mostly through liver cirrhosis or cancer due to chronic hepatitis B and C,[12] but major reductions can be achieved through prevention and treatment.

With regard to waterborne diseases, diarrhoeal diseases being the most prominent subgroup, the case for a target is also strong. Diarrhoea is a symptom of infections caused by a host of bacterial, viral and parasitic organisms, such as *Rotavirus* and *Escherichia coli*, and diarrhoeal diseases are responsible for 1.5 million deaths every year – more than half of that burden, or 842 000 deaths per year, attributable to unsafe water supply, and lack of sanitation and hygiene.[13] Addressing the problem requires a multisectoral response, a fact reflected in the SDGs. Goal 6 (Ensure availability and sustainable management of water and sanitation for all) includes targets to achieve universal and equitable access to safe and affordable drinking-water (6.1) and adequate and equitable sanitation and hygiene for all (6.2). This is an expansion of MDG target 7.c on water and sanitation.

Several important diseases (referred to as "other communicable diseases") are not specifically mentioned in the SDG target, including meningitis, which was associated with an estimated 395 000 deaths in 2012, and sexually transmitted infections (STIs), which account for an estimated half a billion new infections every year.[14]

Figure 5.2
MDG to SDG targets related to infectious diseases

MDG

MDG Target 6.A
Have halted by 2015 and begun to reverse the spread of HIV/AIDS

MDG Target 6.B
Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it

MDG Target 6.C
Have already halted by 2015 and begun to reverse the incidence of malaria and other major diseases

MDG Target 7.C
Halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation

SDG

SDG Target 3.3
By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases

and

combat hepatitis, waterborne diseases and other communicable diseases

SDG Target 6.1
By 2030, achieve universal and equitable access to safe and affordable drinking-water

SDG Target 6.2
By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls in those vulnerable situations

As an example, STIs are included in this chapter. Lower respiratory infections (especially pneumonia) and vaccine-preventable diseases such as measles are also not specified in the SDG. In this report, they are discussed in Chapter 4 in the context of SDG Target 3.2 for child health.

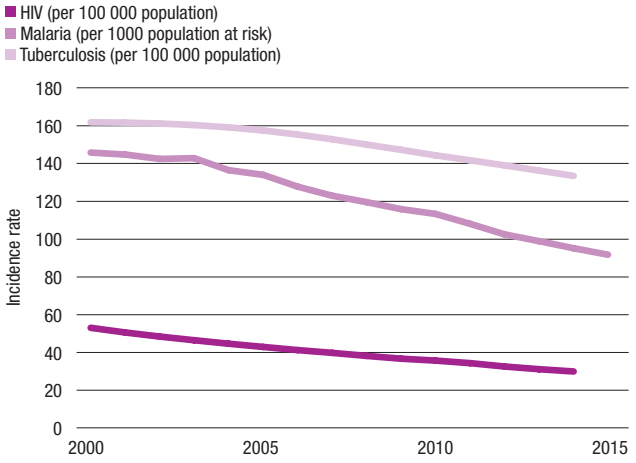
Infectious disease outbreaks, such as epidemics of influenza, Ebola or cholera, are a global concern with potentially large economic and public health consequences. The most relevant SDG target is Target 3.d "Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks".

While there is no explicit SDG target on antimicrobial resistance, the issue is mentioned in paragraph 26 of the SDG declaration: "We will equally accelerate the pace of progress made in fighting malaria, HIV/AIDS, tuberculosis, hepatitis, Ebola and other communicable diseases and epidemics, including by addressing growing anti-microbial resistance and the problem of unattended diseases affecting developing countries."

ACHIEVEMENTS

The MDG target has been met for the major infectious diseases. Incidence rates have declined since 2000 (or possibly earlier) (Figure 5.3). HIV incidence increased dramatically during the 1990s but, by 2014, the number of people newly infected with HIV was 35% lower than in 2000. New HIV infections among children declined from 520 000 in 2002 to 220 000 in 2014, mainly due to increased access to ARVs for HIV-infected pregnant women.[8] The malaria incidence rate among population at risk decreased by 37% globally between 2000 and 2015.

Figure 5.3
Global trends in HIV, malaria and TB incidence rates, 2000–2015[9,10,15]

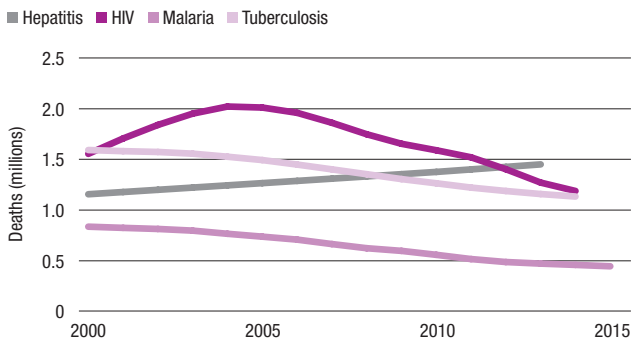


Of 106 countries with ongoing transmission of malaria in 2000, 102 are estimated to have met the MDG target for incidence reversal, while increasing numbers of countries are moving towards malaria elimination.[10] Between 2000 and 2014, the TB incidence rate fell at an average rate of 1.5% per year.[9] The TB incidence rate is also falling in all WHO regions and most of the high-burden countries.

In spite of the growing world population, the declines in incidence rates have meant that absolute numbers of new infections and cases of disease have also been falling: to 214 million cases of malaria in 2015, and 9.6 million cases of TB disease and 2.0 million new HIV infections in 2014.

Mortality also fell for the three diseases (Figure 5.4). By 2014, AIDS-related deaths had declined by 42% since mortality peaked in 2004. Malaria deaths are estimated to have declined by 53% between 2000 and 2015 and TB deaths fell by 29% between 2000 and 2014. By contrast, deaths due to hepatitis have increased since 2000.

Figure 5.4
Global number of deaths due to hepatitis, HIV, malaria and TB, 2000–2015[8,9,10,16]

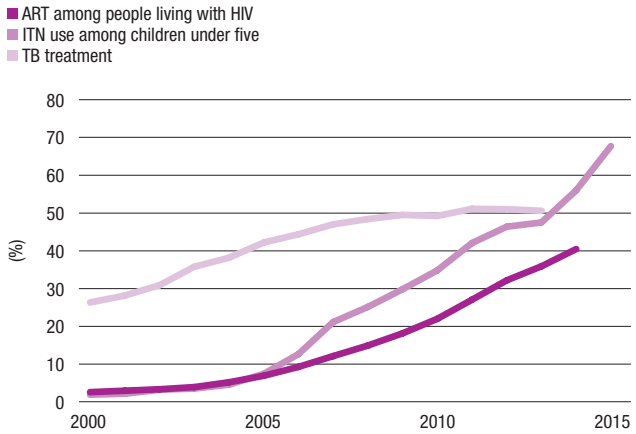


Progress towards the MDG 6 targets is also measured by several intervention coverage indicators.

Increases in the coverage of key interventions have been recorded for all three diseases. In 2014, 14.9 million people living with HIV were receiving ART, up from 690 000 in 2000.[8] This represents 40% of the estimated 36.9 million people living with HIV compared with 2% in 2000 (Figure 5.5).[17] Coverage of (new) malaria interventions also increased rapidly. For instance, in sub-Saharan Africa an estimated 68% of children under five were sleeping under an ITN in 2015, compared to less than 2% in 2002.[10] Regarding TB, the case detection rate for new and relapse cases (defined as the number of reported cases divided by estimated incidence in the same year) increased from 38% in 2000 to 63% in 2014. The global TB treatment success rate was 86% in 2013, and has been sustained at 85% or higher since 2007.[9] This corresponds to about 51% effective coverage, defined as successful treatment outcome among all cases.

While inclusion in the MDG infectious disease targets seems to have had a positive impact on the disease programmes concerned, there has also been progress in areas not specifically mentioned in the MDGs. For example, concerted efforts to combat NTDs, both at the global level and in endemic countries, have resulted in the passing of some important milestones, including unprecedented reductions in the numbers of new cases of human African trypanosomiasis (sleeping sickness), dracunculiasis (guinea-worm disease) and visceral leishmaniasis (Kala-Azar).[19]

Figure 5.5
Global coverage of interventions: ART among people living with HIV, ITN use among children under five and successful treatment for TB cases, 2000–2015[8,10,18]



The headline achievement with regard to hepatitis is the reduction in hepatitis B infections as a result of expanded hepatitis B vaccination programmes. Global coverage with three doses of hepatitis B vaccine in 2014 is estimated to be 82% and is as high as 88% and 92% in the WHO Region of the Americas and the Western Pacific Region, respectively.[20] The latter region is on track to reach its goal of reducing the prevalence of chronic hepatitis B (HBV) infection to less than 1% by 2017.[21] The development of new safe oral medicines that can cure over 90% of cases of chronic hepatitis C (HCV) infection has the potential to be a "game-changer" for the hepatitis response in the post-2015 era.

On the waterborne diseases front, there has been a sharp decline in diarrhoeal disease-related mortality (see Chapter 4) largely due to improvements in access to safe water and sanitation. Access to an improved drinking-water source grew from 76% coverage in 1990 to 91% in 2015, an increase of 2.6 billion people.[22] Today 58% of the global population now enjoys the highest level of access: a piped drinking-water connection on their premises. Progress has been less impressive with regard to sanitation. The MDG sanitation target called for a reduction of the proportion of the global population without access to improved sanitation to 23% in 2015, but one third is still without access.

Trends in mortality due to infectious disease outbreaks are difficult to ascertain, but annual numbers of deaths are considerably smaller than those caused by, for instance, HIV, TB and malaria. The SARS epidemic in 2003, for example, was associated with just 8098 cases and 774 deaths, but caused considerable disruptions in trade and travel. The MERS-CoV epidemic first occurred in 2012 in the Kingdom of Saudi Arabia and has resulted in 1112 confirmed cases and 422 deaths (as of 11 May 2015).[23] The most severe recent epidemic occurred in 2009, and was caused by the A(H1N1) influenza virus, a recombination of swine, bird and human influenza viruses. The epidemic is estimated to have resulted in more than 200 000 deaths.[24,25] Other outbreaks, such as the H5N1 avian influenza virus in 2003 and H7N9 in 2013, caused concern but were not associated with high case numbers or deaths.

The global trend in cholera cases is difficult to ascertain as official reporting is grossly inadequate. During 2000–2014, an annual average of 208 000 cases and 4157 deaths were reported to the WHO, with a low of 101 383 cases in 2004.[26] Africa remains the continent most affected by cholera, but the incidence spikes in 2010–2011 were caused by a severe outbreak in Haiti following the catastrophic

earthquake and subsequent UN emergency response. Over 7000 deaths occurred due to cholera in Haiti and the neighbouring Dominican Republic in 2010–2011.

Most recently, the outbreak of Ebola virus disease in West Africa resulted in 28 295 cases and more than 11 295 deaths (as of 23 September 2015) and caused considerable concern across the globe.[27] Since its discovery in 1976, there have been Ebola virus disease outbreaks in multiple countries in the African Region, the outbreaks generally occurring in remote communities and lasting for a short time.[28] The most recent outbreak in three countries in West Africa is quite different, however, involving major urban as well as rural areas, crossing international borders in a number of cases,[29] and affecting far more people. The outbreak is also projected to lead to major declines in economic activity in the three most severely affected economies of Guinea, Liberia and Sierra Leone.[30]

SUCCESS FACTORS

Although there are several important differences between the diseases and the programmes devoted to tackling them, there are common elements that have contributed to the impressive achievements made in recent years.

Political commitment: The establishment of a specific MDG for infectious diseases in the Millennium Declaration in 2000, and the subsequent investments in monitoring progress towards achieving the MDGs,[7] have positively influenced the battle against HIV, TB and malaria. HIV was also the topic of UN General Assembly special sessions in 2001 and 2011. Multiple resolutions on the three diseases were endorsed by the World Health Assembly (see below for detail). This translated into significantly strengthened global and country action. Also water and sanitation received greater attention through the International Decade "Water for Life".[31]

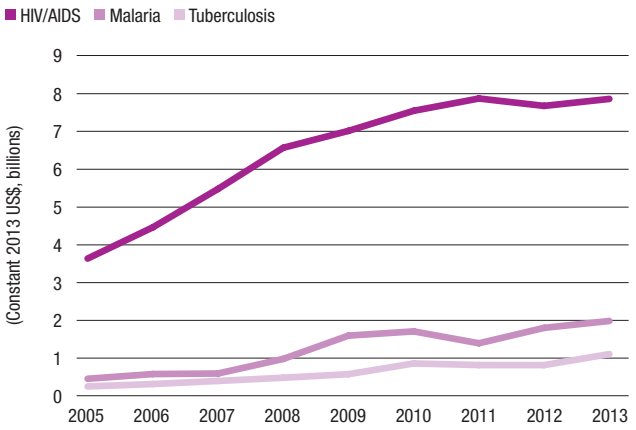
Global advocacy and partnership efforts: The establishment of broad partnerships committed to addressing the diseases and their consequences has made a major difference. UNAIDS was established in 1996, the Roll Back Malaria Partnership was founded in 1998 and the Stop TB Partnership in 2001. These partnerships have played important roles in, for example, advocacy, resource mobilization, price negotiations with industry, setting a research agenda, coordination of activities and civil society engagement.

There are striking examples of the power of partnerships for all three diseases. For HIV, alongside the establishment of UNAIDS, the UN General Assembly calls for action as well as the creation of special funds such as the Global Fund, the United States President's Emergency Plan for AIDS Relief (PEPFAR) and UNITAID are key aspects of the worldwide response. In addition, there has been a plethora of global, regional, country and local civil society initiatives. Especially in HIV/AIDS, a strong civil society response played a critical role at all levels, raising the bar for the role of civil society in all other health and disease areas. The 3 by 5 Initiative launched in 2003 by WHO and UNAIDS led to a rapid uptake of ART and showed that complex treatment programmes could be rolled out in resource-poor countries.

Strengthened partnerships and advocacy, notably through the Stop TB Partnership, have been crucial in mobilizing enhanced and collaborative action to address the challenge of TB, framed around three global five-year plans to stop TB. The Global Fund and UNITAID contributed significantly to the increase in resources. Improved control of malaria has been achieved thanks to the alignment of ministries of health and international agencies around WHO policy recommendations and a unified Global Malaria Action Plan, with increased support from, for instance, the Global Fund, the President's Malaria Initiative (PMI) and the Bill & Melinda Gates Foundation. Progress on hepatitis has been achieved in large part due to GAVI support, which enabled significant reductions in the price of hepatitis B vaccine and its introduction into the routine vaccination schedule as a component of the pentavalent vaccine.

Increased funding: International funding for control of infectious diseases in low- and middle-income countries has increased considerably over the past decade, especially for HIV, TB and malaria. Domestic funding also increased significantly in many middle-income countries. ODA disbursements for HIV more than doubled between 2005 and 2013 to US$ 7.9 billion per year, a figure that dwarfs the ODA funding directed to other infectious diseases (Figure 5.6).[32] As much as US$ 113 billion was invested in sub-Saharan Africa for HIV between 2000 and 2014, including domestic funding. Total funding for HIV in low- and middle-income countries in 2015 is estimated to reach US$ 21.7 billion. The United States is the largest donor for HIV, accounting for 47% of all bilateral assistance since 2000.[8]

Figure 5.6
ODA disbursements for HIV/AIDS, malaria and TB, 2005–2013[32]



International TB funding increased gradually to nearly US$ 1 billion in 2013 and malaria to about US$ 2 billion, with the Global Fund and the United States Government as lead donors. Other funding sources, such as foundations, have also increased support for control of infectious diseases, notably HIV. Domestic funding increases for TB were considerable: overall, about 87% (US$ 5.8 billion) of the US$ 6.6 billion available in 2015 is from domestic sources. In lower middle-income countries, TB domestic funding has risen from US$ 0.2 billion in 2006 to almost US$ 0.5 billion in 2015.[9]

New interventions and approaches: The development and global scale-up of access to ART has been one of the most successful public health interventions of the MDG era. The spectacular drop in the prices of ARVs, from around US$ 10 000 per person per year in 2000 to around US$ 100 by 2011,[8] due to global advocacy, greater predictability of demand, economies of scale, increased competition among manufacturers, engagement of generic manufacturers[33] and voluntary licensing, has made treatment more affordable and sustainable. Innovative health system approaches, such as task shifting among health workers and decentralization, were used to deliver the ARVs.[34] Treatment regimens were standardized and simplified where possible. For instance, ARV therapy was based on eight pills a day in 2000, and only one in 2015.[8] Malaria control efforts received a major boost through scaling up of multiple new interventions, including LLINs, ACT and rapid diagnostic tests. The development of a range of highly effective, safe, oral direct-acting antivirals that result in cure rates exceeding 90% for people with chronic HCV infection provide new opportunities to push back against HCV epidemics.

Scaling up effective approaches: Global strategies and related policy/normative guidance have provided a foundation for success. Progress in several areas was driven by more successful implementation of existing interventions. Clearly it is not just a question of spending more, but spending smart – that is to say spending money on approaches that work. Successful prevention and treatment programmes have resulted in declines in new infections, cases and mortality for several diseases. For example, reductions in diarrhoeal diseases have been achieved through significant improvements in access to safe drinking-water sources. Reductions in HBV infection are due to expanded vaccination. Reductions in HIV infections in newborns have resulted from programmes for the prevention of mother-to-child transmission of HIV.[8] TB progress is largely due to the widespread adoption of a standardized approach to diagnosis and treatment based on global strategies developed by WHO (the DOTS strategy from the mid-1990s until 2005, and the Stop TB Strategy during 2006–2015).

Global response to infectious disease outbreaks: Another critical development has been the revision of the IHR, spurred by the outbreak of SARS in 2003. The revised IHR, endorsed in 2005, came into force in 2007. Its scope is limited to five hazards: infectious, zoonoses, food safety, chemical, and radio nuclear.[35,36] Several global collaborations have also helped strengthen health security mechanisms. For example, the Global Outbreak Alert and Response Network (GOARN), a multidisciplinary technical collaboration of over 200 technical institutions and networks that works with over 600 partners worldwide, was established in 2000 by WHO and partners and contributes to global health security by ensuring that countries have rapid access to the most appropriate resources and experts for the identification, assessment and response to public health emergencies of international importance.[37,38] The WHO Global Influenza Surveillance and Response System (GISRS) monitors the evolution of influenza viruses and provides recommendations in areas including laboratory diagnostics, vaccines, antiviral susceptibility and risk assessment. It also serves as a global alert mechanism for the emergence of influenza viruses with pandemic potential.[39] Also notable in this context is the framework for pandemic influenza preparedness, adopted by the World Health Assembly in 2011, which has been developed in part out of the need to ensure novel influenza virus sharing for collective risk assessment and to increase access to vaccines and other products.[40,41]

Better data and monitoring: Increased investments in population-based surveys and disease surveillance, combined with better population-based measurement methods, including testing for HIV antibodies, TB presence and malaria parasites have resulted in better data for country policy-makers and implementers in many countries, and improved global reporting. Some progress was also made in monitoring risk- and treatment-seeking behaviours.

CHALLENGES

Increasing funding: Despite significant increases in resources, there are still major funding shortfalls in key programme areas in many developing countries. For example, in 2015 there is an estimated funding gap of US$ 1.4 billion for a full response to the global TB epidemic in low- and middle-income countries.[9] Inadequate investment in TB R&D is also an issue, with an estimated funding shortfall of US$ 1.3 billion per year for R&D related to new TB diagnostics, drugs and vaccines in 2013.[42] The funding gap for malaria programmes was estimated to be US$ 2.4 billion (53% of the total need) in 2013.[43] It is also estimated that an additional US$ 8–12 billion needs to be available annually by 2020 for HIV.[8] NTD programmes in many low-income countries have been highly dependent on community volunteers and external funding, with only two major bilateral donors.[19] To date, there has been no significant external funding for public health programmes addressing viral hepatitis, apart from HBV vaccination. Domestic levels of investment in infectious disease control have been growing, especially among middle-income countries, but are still inadequate.

Reducing rates of new infection and disease: Given the absence of effective vaccines for prevention of HIV, TB and malaria, it is essential to step up primary prevention and improve early recognition and treatment-seeking behaviour. With regard to HIV, for example, universal access to, and uptake of, condoms is still lacking. In 2014, two out of three women with multiple sexual partners still reported not using a condom the last time they had sex.[8] Young women are especially vulnerable due to gender inequalities and gender violence. Interrupting HIV and hepatitis virus transmission among sex workers, men who have sex with men, people who inject drugs and other most-at-risk populations, remains challenging in many countries. Service access problems are often compounded by stigma and discrimination. In many instances, infection rates are as much a function of awareness and individual behaviours as they are of service availability. Some behavioural risks are surprisingly persistent. For example, it is estimated that only 19% of people globally wash their hands with soap and clean water after defecation or contact with excreta.[44] Inadequate drinking-water, sanitation and hygiene are estimated to cause 842 000 preventable deaths each year.[13]

Improving intervention coverage: Ensuring that people in need of health services get them is a challenge for all of the infectious diseases for which SDG targets have been set. New treatment guidelines indicate ART should be initiated in everyone living with HIV,[45] yet only 40% are on treatment currently, notwithstanding the significant increases in coverage over the past decade. In spite of steady progress for more than a decade, only 54% of new TB cases are currently detected, treated and cured. In 2013, 278 million of the 840 million people at risk of malaria in sub-Saharan Africa lived in households without even a single ITN, 15 million of the 35 million at risk pregnant women did not receive preventive treatment and between 56 and 69 million children with malaria did not receive ACTs.[43] Very often, it is the rural poor who suffer most from lack of access. For example, of the 150 million people still relying on untreated surface water, over 92% live in rural areas. Rural residents also account for 70% of the 2.4 billion people who do not have access to an improved sanitation facility.[22] The majority of people requiring preventive chemotherapy for at least one NTD are not getting it (61%).[19] An estimated 62% of newborns are not receiving hepatitis B immunization.[20] Despite the effectiveness of curative treatments for chronic HCV infection, and suppressive treatment for chronic HBV infection, few public health programmes exist, with most treatment provided through individual clinical care for those who can pay for treatment.

Improving quality of care: The quality of care is a challenge for infectious diseases as in other areas of public health. An issue of significant concern is unsafe injection and blood transfusion practices. Reuse of syringes and needles without sterilization is thought to have declined from very high levels, but is still common and contributes to transmission of hepatitis B and C and HIV.[46,47] Patient behaviour is another area of concern. For example, it is estimated that 50% of patients self-administering medical treatments fail to follow the full course prescribed.[48] Suboptimal adherence to treatment schedules can also contribute to increasing resistance to medicines.

Increasing drug resistance: Antimicrobial resistance is a huge global concern across a wide range of infections. Box 5.1 describes some of the major issues in antibacterial resistance. HIV, TB and malaria face specific drug resistance challenges. There were an estimated 480 000 new cases of multidrug-resistant TB (MDR TB) in 2014. Reducing the burden of MDR TB will require preventing the development of drug resistance through high-quality treatment of drug-susceptible TB, and development of more effective treatment regimens for those with MDR TB (successful treatment rates average around 50% globally). With regard to malaria, *Plasmodium falciparum* is already resistant to artemisinin in five countries. Strains of drug resistant HIV are also emerging and, while the use of combination therapies has been successful in keeping levels of resistance manageable, they impose a much higher treatment cost.

Insecticide resistance: Major achievements in reducing the global burden of malaria in the last 10–15 years have been driven by scaling up access to LLINs. With insecticide resistance of vectors becoming widespread in disease-endemic areas, the effectiveness of this tool that currently uses a single class of insecticides (pyrethroids) is threatened. Effective and sustained use of insecticide-based vector control tools will require enhanced investment in product development, monitoring and management of insecticide resistance, and capacity strengthening in public health entomology and low-risk use of pesticides.

Climate change: Rising temperatures, changes in precipitation patterns, increases in extreme weather events and biodiversity loss may affect the spread of infectious diseases in complex ways.[49] Climate change may alter the distribution of disease vectors such as mosquitoes carrying dengue[50] or malaria, enhance the spread of diseases through contaminated water including cholera and create conditions favourable to the transmission for pathogens such as West Nile or Hantavirus.[51]

Addressing the social determinants: The incidence and consequences of infectious diseases are not randomly distributed in the population,[52] the poor, the less educated and rural populations generally bearing the greater disease burden. Gender issues play a critical role, especially with regard to HIV.[53] The SDGs will have to reinvigorate efforts to address the determinants in an integrated and more effective manner than the MDG did.

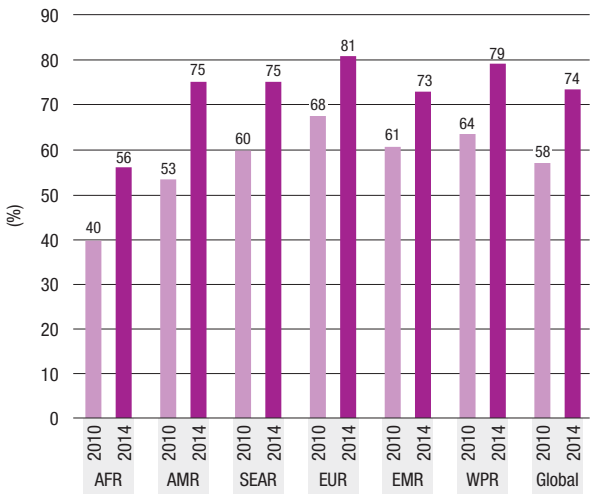
Enhancing the response to outbreaks: The continued and increasing risks of emerging and re-emerging infectious disease outbreaks due to virulent, drug-resistant and lethal microbial organisms are an major concern, as is the risk of bioterrorism, for example in the form of a deliberately dispersed pathogenic biological agent. Even though there has been progress in the implementation of the IHR core capacities in recent years, the situation in 2014 is far from satisfactory, especially in the African Region (Figure 5.7). In fact, 84 of the 196 IHR States Parties (43%) have requested and obtained extensions to 2016 to meet IHR core capacity requirements.[54] There are still major deficiencies in preparedness, surveillance, response capacity and other critical capacities.[55] The Ebola epidemic in West Africa has stimulated in-depth reflection on the state of global health security, not least in terms of inadequate global capacity for quick response. WHO was first alerted to the outbreak on 23 March 2014, but it was not until 8 August 2014, after a meeting of the International Health Regulations Emergency Committee, that it declared a public health emergency of international concern.[56] The epidemic has also revealed weaknesses in the funding mechanisms used to finance outbreak responses. Of the US$ 2.89 billion that the international community pledged to support the Ebola response, little more than 40% had reached the affected regions by the beginning of 2015.[57]

Box 5.1
Antimicrobial resistance: a global threat

Antimicrobial resistance threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. For instance, increasing rates of antibacterial resistance are reported for multiple respiratory, gastrointestinal, wound and other infections caused by *E. coli* and *Klebsiella* pneumonia, which are resistant to third generation cephalosporins. For example, *Streptococcus pneumoniae*, is showing reduced susceptibility to penicillin, leading to invasive pneumococcal disease (e.g. pneumonia and meningitis), especially in children and elderly people. *S. aureus* is showing high rates of methicillin-resistance, with implications for common skin and wound infections. *Neisseria gonorrhoeae* is increasingly resistant to third generation cephalosporins, the treatment of last resort for gonorrhoea.

The consequences of antibacterial resistance are multiple. Patients with infections caused by bacteria resistant to a specific antibacterial drug generally have an increased risk of worse clinical outcomes and death and consume more health-care resources than patients infected with the same bacteria not demonstrating the resistance pattern in question. Available data are insufficient to estimate the wider societal impact and economic implications when effective treatment for an infection is completely lost as a result of resistance to all available drugs. Nevertheless, it is clear that antimicrobial resistance is a global health security threat that requires concerted cross-sectoral action by governments and society as a whole. Surveillance that generates reliable data is the essential basis of sound global strategies, and public health actions to contain antimicrobial resistance are urgently needed around the world.[5]

Figure 5.7
IHR implementation status: average of 13 capacity scores, 2010 and 2014[58]



Developing new products: The importance of new drugs and vaccines in combating infectious diseases has already been stated, but it is clear that continuous drug and vaccine R&D is vital if momentum is to be maintained. R&D investments in diseases that are major public health problems in low- and middle-income countries is only small fraction of global R&D investment.[59] The task is daunting. For example, work on an effective malaria vaccine has been going on for at least 20 years, and has thus far resulted in one semi-viable vaccine, RTS,S/AS01.[60] It is a similar story with HIV, where dozens of clinical trials of vaccines are ongoing (Phase I and II), testing a variety of candidates and vaccine concepts. It remains to be seen whether any winner will emerge. The only TB vaccine that is currently in use was developed in the 1920s, and while it provides protection against severe forms of TB in children, its efficacy in preventing TB in adults (who account for about 90% of the world's cases) is highly variable. There are currently 15 TB vaccine candidates in clinical trials. With regard to NTDs, there is an urgent need for more R&D to combat the emergence of resistance to medicines as well as to pesticides for vector control. There are multiple new medicines in the pipeline to cure chronic HCV infection, however, their high prices and the lack of simple and affordable diagnostics pose barriers to implementing scalable public health programmes. There is also the need for more effective, curative treatment and simpler diagnostics for chronic HBV infection.

STRATEGIC PRIORITIES

The SDG targets for infectious diseases are very ambitious, but are in line with what a number of disease-specific strategies and WHA resolutions have already been exploring. For all infectious diseases, the targeted reductions aimed at progressing towards elimination goals in the coming 15 years far outstrip what has been achieved since 2000.

New strategies include:

- UNAIDS global strategy Fast Track: Ending the AIDS Epidemic by 2030 and the draft WHO Global Health Sector Strategy on HIV 2016–2021;[61,62]
- The End TB Strategy;[63,64]
- Global Technical Strategy for Malaria 2016–2030;[65]
- NTD Roadmap;[66] and Water Sanitation and Hygiene for Accelerating and Sustaining Progress on NTDs: A Global Strategy 2015–2020;[67]
- Draft Global Health Sector Strategy on Viral Hepatitis 2016–2021.[68]

The strategies and related documents have proposed a number of more specific targets and indicators for monitoring progress towards the goals, linked to the overall SDG target (Table 5.1).

The battle against infectious diseases needs to focus on the geographic areas and populations that are at the highest risk. The African Region has by far the highest burden of infectious diseases, followed by the South-East Asia Region and the Eastern Mediterranean Region. Major reductions in new infection rates are needed, implying an emphasis on prevention efforts complemented by effective treatment. A number of common strategic priorities can be identified for all infectious diseases.

Table 5.1
Summary of specific targets in global plans and other international agreements for SDG Target 3.3 on infectious diseases

SDG target	Specific plan – main targets 2030
Ending the epidemic of AIDS	Reduce the annual number newly infected with HIV by 90% and the annual number of people dying from AIDS-related causes by 80% (compared with 2010)
Ending the epidemic of TB	90% reduction in TB deaths
	80% reduction in TB incidence rate (to less than 20 per 100 000 population)
	Zero TB-affected families facing catastrophic costs due to TB
Ending the epidemic of malaria	90% reduction in global malaria mortality rate
	90% reduction in global malaria case incidence
	Malaria eliminated from at least 35 countries
	Re-establishment of malaria prevented in all countries identified as malaria-free
Ending the epidemic of NTDs	90% reduction in the number of people requiring interventions against NTDs
Combat hepatitis	95% decline in new cases of chronic HBV infection between 2010 and 2030; 80% reduction in new cases of chronic HCV infection over the same period; 65% reduction in HBV- and HCV-related deaths
Combat waterborne diseases[69]	No one practises open defecation (by 2025)
	Everyone uses a basic drinking-water supply and handwashing facilities at home
	Everyone uses adequate sanitation when at home (by 2040)
	All drinking-water supply, sanitation and hygiene services are delivered in progressively affordable, accountable and financially and environmentally sustainable manner

and NTDs; (ii) behavioural changes such as safe sex and condom use to reduce HIV, STI and hepatitis B transmission; (iii) harm reduction for people who inject drugs to prevent HIV, HBV and HCV acquisition; (iv) use of ITNs for malaria prevention; and (v) improved health-care safety to reduce nosocomial transmission of HIV, hepatitis and other pathogens. Preventive chemotherapy based on large-scale delivery of free, safe, single-dose, quality-assured medicines at regular intervals is a cornerstone of tackling NTDs. Child vaccination is a priority intervention to combat hepatitis B, including the administration of a birth dose, and *Rotavirus* vaccination to reduce the incidence of diarrhoea (see Chapter 3). For other diseases, continued investments in the development of vaccines are needed which may pay off in the coming 15 years.

Detection, diagnosis and treatment: Expansion of effective case detection, rapid diagnosis and high-quality treatment are essential components of the post-2015 strategies for all infectious diseases. The encouragement of health-seeking behaviour and provision of good diagnostic and treatment facilities are essential to increasing treatment coverage. Lack of awareness of HIV status is often the main reason for low coverage with ARVs, which requires easy access and high utilization of HIV testing for all relevant population groups.[8] Effective and simple screening, diagnosis and disease staging are critical to identify people with chronic HBV and HCV infection and to determine their eligibility for treatment.

High-level coverage with quality interventions is a core strategy for all programmes. This requires the availability of low-cost, quality medicines for all, evidence-based health service delivery and high adherence to prescribed treatments by individuals. Maintaining high-quality treatment programmes has been a cornerstone of TB programmes for two decades. For HIV too, coverage expansion is a core strategic objective, as countries work to meet the requirements of the new WHO treatment initiation guidelines. For NTDs, treatment coverage expansion is vital, and if high-quality coverage is sustained for long enough – as few as three years for some NTDs requiring preventive chemotherapy – it may be sufficient for transmission to be completely interrupted. However chemotherapy must be complemented with interventions to improve water, sanitation and hygiene, to be most effective. High treatment coverage is not only an important preventive measure for diseases such as TB and malaria, where a cure can be achieved, but also for HIV, for which it has been shown that effective viral suppression can lead to reduced incidence in the general population.[70] Advances in treatment of chronic HBV and HCV infection need to be translated into public health programmes.

Antimicrobial resistance: In response to the antimicrobial resistance challenge, the WHO draft global action plan on antimicrobial resistance was presented to the World Health Assembly in May 2015.[71,72] The goal of the global action plan is to ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality assured, used in a responsible way and accessible to all who need them. To achieve this goal, the action plan sets out five strategic objectives:

- improve awareness and understanding of antimicrobial resistance;

- strengthen knowledge through surveillance and research;
- reduce the incidence of infection;
- optimize the use of antimicrobial agents;
- ensure sustainable investment in countering antimicrobial resistance.

Integrated approach and universal health coverage (UHC): Priority strategies for the infectious disease SDGs will necessarily reflect the principal challenges identified. Expanded population coverage with quality prevention and management services supported by adequate funding must be at the centre of efforts in the post-2015 era. The proximity of this objective to that of UHC suggests that there will be many opportunities for alignment, integrating disease-specific initiatives with broader, system-wide reforms. The specific strategies outline such a focus. For instance, HIV focuses on inclusiveness: a focus on populations that have been left behind by the HIV response, such as adolescent women, key populations such as sex workers, migrants, children and older people. TB focuses on integrated, patient-centred care and prevention, including early diagnosis of TB; treatment of all people with TB, including those with drug-resistant TB; collaborative TB/HIV activities and management of co-morbidities; preventive treatment of people at high risk; and vaccination against TB. HIV also aims for an integrated HIV response that expands the contribution towards UHC, including health workforce, procurement systems, injection and blood safety, and treatment of coinfections.[73] All require universal access affordable quality services.

IHR implementation: A report submitted to the World Health Assembly in 2015[74] identified several strategic priorities for improving IHR implementation. Many of these are based on lessons learnt from Ebola outbreaks and focus on the need to be able to draw upon existing public health capacities and networks during emergencies. Key actions needed in the coming decade include: (i) in-country leadership, integration of laboratory services and surveillance systems to improve integrated surveillance; (ii) building multisectoral surveillance capabilities at local and community levels, with trained staff working with clinicians, integrating surveillance systems for both communicable diseases and other hazards, and establishing early warning alert and response systems; (iii) building up core capacities at points of entry, particularly in terms of surveillance, preparedness and response capacities; and (iv) identifying new mechanisms to address continuing gaps in core capacities in countries and the inadequacy of current methods to accurately monitor their development and status, including independent status assessment of IHR core capacities complementing self-assessment. Preventing and reducing the likelihood of outbreaks, detecting threats early, and rapid, effective response requires multi-sectoral, international coordination and communication.[75]

Intersectoral action: This is also critical, especially for preventive purposes. An obvious example is waterborne diseases where better water supply, safer sanitation, strengthened action in the crucial area of hygiene promotion and expanded efforts in neglected rural areas all require the involvement of multiple sectors.[76] But multisectoral action is also critical for many other diseases such as HIV, malaria and NTDs, including addressing the social determinants of health, such as gender, education etc. Tackling the causes and consequences of climate change also requires a multisectoral approach, investing in public health and collaboration across multiple disciplines and countries to protect the health of people and animals.[49] Similarly, addressing antimicrobial resistance requires the engagement of multiple sectors.

Monitoring and research: Monitoring and surveillance is needed to detect infectious disease patterns and trends, not only to respond to major disease outbreaks, and to identify successful (and unsuccessful) interventions and approaches. Research is essential to optimize implementation, document impact and develop and promote innovations. Strengthening country capacity for both monitoring and research with regular quality data is thus critical. In addition, greater investment is needed in research and development of effective interventions for NTDs in developing countries.

HIV/AIDS

More than 30 years since the disease was first described in 1981, HIV remains a leading cause of ill-health and mortality. While investments in the HIV response have achieved unprecedented results, globally, in 2014, there were 36.9 million people living with HIV, 2.0 million new infections and 1.2 million deaths.[8] Seven out of ten people living with HIV are in sub-Saharan Africa, where HIV is a leading cause of death among adults, women of child-bearing age and children.

ACHIEVEMENTS

MDG Target 6A (halting and beginning to reverse the spread of HIV by 2015) has been achieved. By 2014, the number of people newly infected with HIV was about 40% lower than peak incidence in the second half of the 1990s (Figure 5.8). AIDS-related deaths have declined by 42% since the peak in 2004. New HIV infections among children declined from 520 000 in 2000 to 220 000 in 2014, mainly due to increased access to ARVs for HIV-infected pregnant women.[8]

There has also been good progress towards MDG Target 6.B (universal access to treatment) with 14.9 million people living with HIV receiving ART globally by the end of 2014, up from 690 000 in 2000 (Figure 5.9). However, this still only represents 40% of the estimated 36.9 million people living with HIV.[17] In sub-Saharan Africa, the ART coverage rate stands at 10.7 million of a total of 25.8 million people living with HIV.[8]

Figure 5.8
Global trends in HIV incidence and mortality, 1990–2014[8]

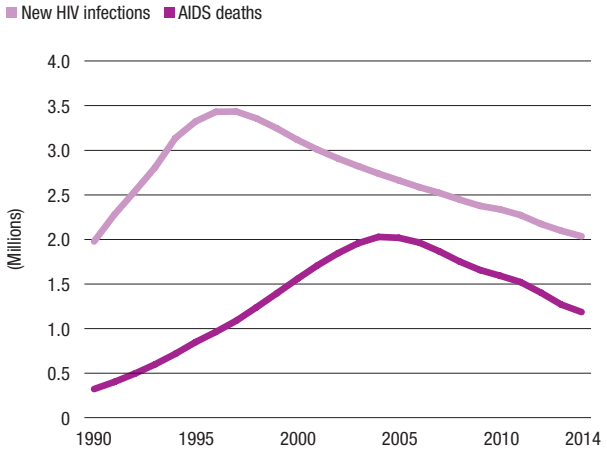
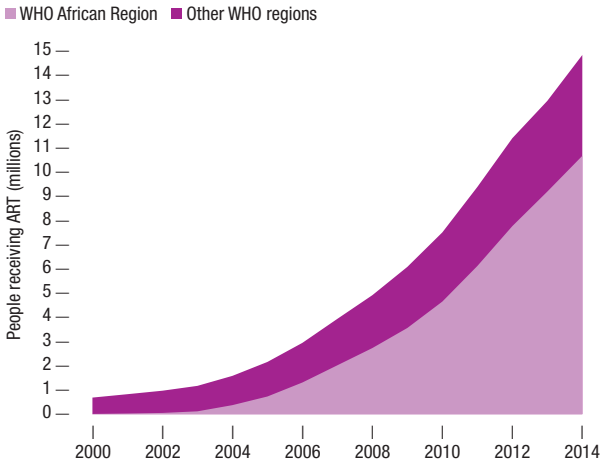


Figure 5.9
Scale-up of ART in the WHO African Region and other WHO regions, 2000–2014[15]



SUCCESS FACTORS

The worldwide response and partnership: The strong combination of domestic, donor and public-private financing, based on the UN General Assembly declarations on HIV/AIDS and the establishment of new and innovative funding mechanisms for HIV such as PEPFAR, the Global Fund and UNITAID, along with global and local civil society mobilization, have provided leadership, advocacy, coordination and resources for a worldwide response.

Preventive interventions: Combinations of effective interventions have contributed to reduced HIV transmission, including behaviour change communication to encourage changes in sexual behaviour; programmes targeting key populations such as harm-reduction programmes for people who inject drugs; maximizing the prevention benefits of ARVs, including for the prevention of mother-to-child transmission of HIV;[71] and voluntary medical male circumcision in high HIV-prevalence settings.

ART: The development and global scale-up of access to ART has been one of the most successful public health interventions of the MDG era. The drop in the prices of ARVs, owing to global advocacy, greater predictability of demand, economies of scale, increased competition among manufacturers, involvement of generic manufacturers[33] and voluntary licensing have made treatment more affordable.

Increased funding: In 2015, US$ 21.7 billion, four times that in 2000, was invested in the AIDS response in low- and middle-income countries; in 2014, 57% of these investments came from domestic sources. Since 2000, international funding has increased approximately tenfold, rising from nearly US$ 900 million to US$ 8.6 billion in 2014.[8]

Innovative approaches to services delivery: The use of task shifting, decentralization and community involvement helped stretch health-care delivery systems to expand services without comprising quality. This has extended the public health approach into communities.

CHALLENGES[78]

Africa: 70% of people living with HIV are in the African Region, where nearly one in every 20 adults is infected (Figure 5.10). An integrated multisectoral, multifaceted approach will require continued substantial external funding together with increased domestic contributions.

Treatment coverage: The 2015 revision of the WHO guidelines for ART[45] removes the threshold for treatment initiation, recommending treatment for all, which expands the population eligible for treatment and presents an obvious coverage challenge. The main obstacle to higher treatment coverage is not access to treatment, but unawareness of HIV status; it is estimated that about half of all people living with HIV are not aware that they are infected.[8,79,80]

Vaccines: More than 30 clinical trials of HIV vaccines, testing a variety of candidates and vaccine concepts, are currently under way (Phases I and II), but no effective vaccine is likely to be available in the near future.

Bringing down incidence: Universal access to, and uptake of, male and female condoms is still lacking, especially for young people. Young women are especially vulnerable, due to various factors, including gender inequalities and gender violence. Interrupting HIV transmission among key populations, including sex workers, men who have sex with men, people who inject drugs, transgender people and prisoners, remains a challenge in many countries.

Stigma and discrimination: Legal environments in many countries increase HIV vulnerability, contribute to risk behaviours and inhibit access to HIV services. Many countries retain laws that either criminalize, or sanction the persecution of, people (or their behaviours) who are at higher risk of HIV infection.

Eliminating health-care associated transmission: In spite of major reductions in HIV transmission through unsafe injections and blood transfusion, 24% of blood donations in low-income countries are not screened for one or more viruses (HIV, HBV, HCV) using basic quality procedures.

Coinfections and other comorbidities: TB, hepatitis (B and C), and other communicable diseases occur in conjunction with HIV infection. As people living with HIV live longer on ART they experience a broader range of NCDs related to their chronic HIV infection, side-effects of their treatment and ageing, including cardiovascular disease, diabetes, respiratory disorders and cancers, all requiring chronic care.

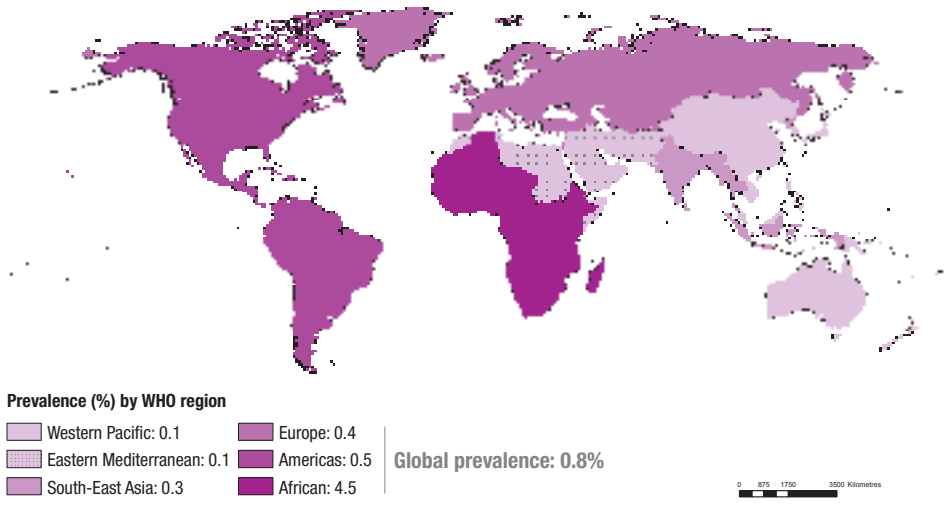
STRATEGIC PRIORITIES

The SDG target is to end the AIDS epidemic by 2030. UNAIDS has led the development of a global strategy, Fast Track: Ending the AIDS Epidemic by 2030, while more detailed, sectoral strategies such as the WHO Global Health Sector Strategy on HIV 2016–2021 are under development.[61,62] The global strategy targets a reduction in the annual number of people newly infected with HIV by 90% and the annual number of people dying from AIDS-related causes by 80% (compared with 2010).

The main areas of focus post-2015 include:

- a focus on populations that have been left behind by the HIV response, such as adolescent girls, key populations (sex workers, men who have sex with men, people who inject drugs and transgender people), migrants, children and older people;
- a focus on locations where the greatest HIV transmission is occurring and with the greatest HIV burden, and the use of data to support the impact of programmes;
- an integrated HIV response that expands the contribution towards UHC, including health workforce, procurement systems, injection and blood safety and treatment of coinfections;
- sustainable programmes with transitioning to domestic funding of essential HIV services.

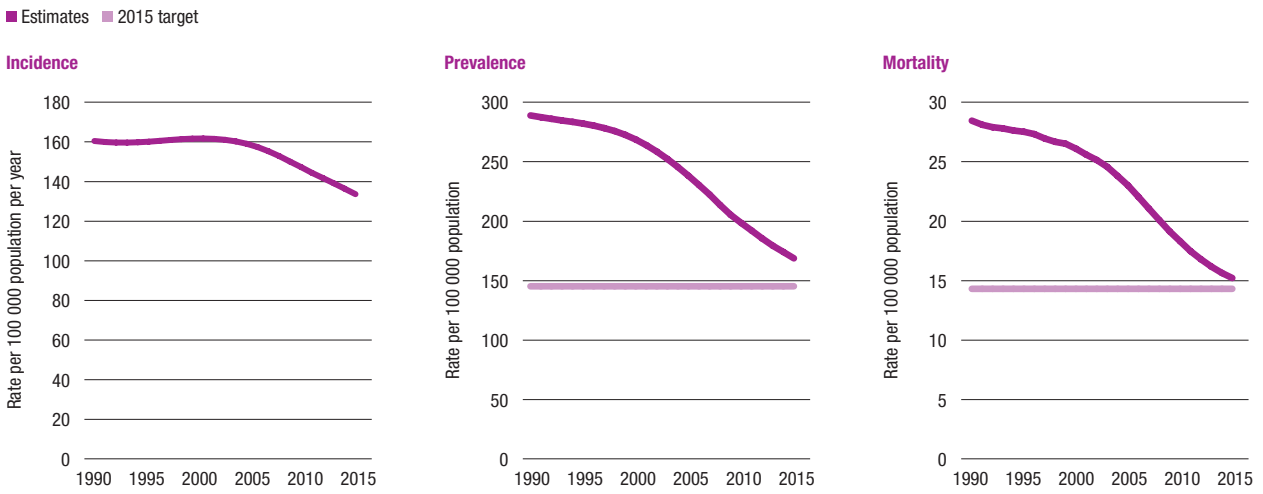
Figure 5.10
HIV prevalence among adults 15–49 years by WHO region, 2014[15]



TUBERCULOSIS

TB is a treatable and curable disease, but remains a major global health problem. In 2014, there were 9.6 million new TB cases and 1.5 million deaths, including 0.4 million deaths among HIV-positive people.[9] For the past two decades, national and international efforts in TB prevention, diagnosis and treatment have been guided by the DOTS strategy (mid-1990s until 2005) and subsequently the Stop TB Strategy (2006–2015).[81] The Stop TB Strategy was designed to achieve global TB targets set for 2015 within the context of the MDGs.[82]

Figure 5.11
Global trends in TB incidence, prevalence and mortality rates, 1990–2015[9]

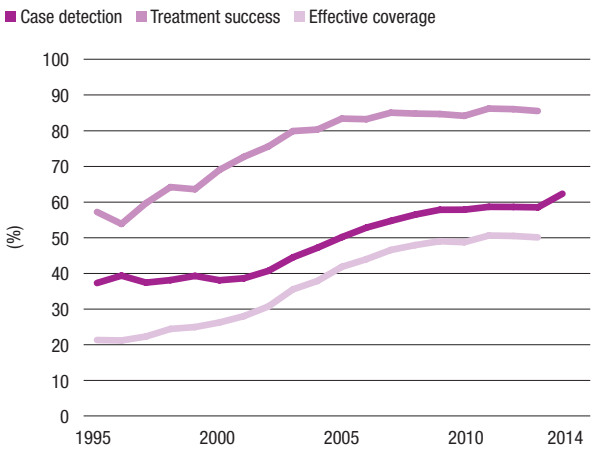


ACHIEVEMENTS

MDG 6C targeted a decline in the TB disease incidence rate by 2015.[83] Targets to halve prevalence and mortality rates by 2015 compared with 1990 levels were established during the development of the Global Plan to Stop TB 2001–2005.[84] Global progress on all these fronts has been remarkable (Figure 5.11). The TB incidence rate has been falling since 2000 at an average rate of 1.5% per year during 2000–2014, while TB mortality and prevalence rates have fallen by 47% and 42%, respectively, during 1990–2015.

Case detection and treatment success rates have been monitored at national and global levels since 1995, following the establishment of global targets (70% and 85%, respectively) for these indicators.[85] The case detection rate for new and relapse cases increased to 63% by 2014, up from 38% in 2000. The global TB treatment success rate was 86% in 2013, and has been sustained at around 85% since 2007. In combination, this means that 51% of TB cases were reported to have received diagnosis and successful treatment in 2013 (Figure 5.12).[86]

Figure 5.12
Global trends in TB case detection and treatment success rates, with estimated effective coverage, 1995–2014[9,18]



MAIN SUCCESS FACTORS

Adoption of effective interventions: The widespread adoption of DOTS and the Stop TB Strategy since the mid-1990s has been critical to progress. By 2007, virtually all countries had adopted DOTS.[87]

Increased funding: An estimated US$ 6.6 billion was available for TB prevention, diagnosis and treatment in 2015, more than double the level of 2006 (US$ 3.2 billion).[9]

Strengthened partnerships and advocacy: The Stop TB partnership was founded in 2001 and by 2014 included 1300 international and technical organizations, government programmes, research and funding agencies, foundations, nongovernmental organizations, civil society and community groups and the private sector. In 2001, it established a Global Drug Facility, which by 2014, had delivered more than 24 million high-quality affordable treatment courses to 133 countries.

CHALLENGES[9,42,88]

Reaching missed cases: Each year more than 3 million people who develop TB disease are either detected but not reported or not diagnosed at all, resulting in high TB mortality, especially in the African Region and the South-East Asia Region (Figure 5.13).

MDR TB epidemic: Although there is no evidence that the epidemic is worsening at the global level, there were an estimated 480 000 new cases of MDR TB in 2014. Reducing the burden of MDR TB will require preventing the development of drug resistance through high-quality treatment of drug-susceptible TB and better treatment regimens for MDR-TB. Globally, the cure rate is only 50%.

TB/HIV epidemic: Coverage of ART among HIV-positive TB cases is still low and needs to be increased.

Inadequate funding: Despite increases in funding, there is an estimated funding gap of US$ 1.4 billion for a full response to the global TB epidemic in low- and middle-income countries in 2015. In several countries, more than 90% of available funding in 2015 is from international donor sources.

Inadequate investment in TB R&D: The Global Plan to Stop TB 2011–2015 estimates that an additional US$ 2 billion per year is required for R&D related to new TB diagnostics, drugs and vaccines. In 2013, there was a shortfall of US$ 1.3 billion.

STRATEGIC PRIORITIES

SDG Target 3.3 aims to end the epidemic of TB by 2030. The End TB Strategy, endorsed by the World Health Assembly in 2014,[63,64] has the overall goal of ending the global TB epidemic by 2035. The targets for 2030 are a 90% reduction in TB deaths and an 80% reduction in the TB incidence rate (to less than 20 per 100 000 population) compared with 2015. An earlier target, linked to progress towards UHC, is that zero TB-affected families should face catastrophic costs due to TB by 2020.

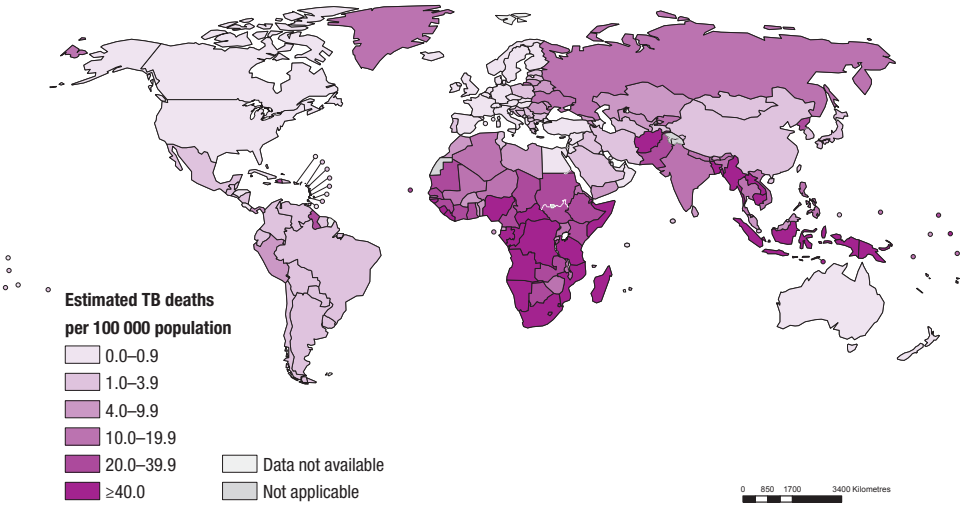
The three main pillars of the End TB Strategy are:

Integrated, patient-centred TB care and prevention: including early diagnosis of TB; treatment of all people with TB, including those with drug-resistant TB; collaborative TB/HIV activities and management of co-morbidities; preventive treatment of people at high risk; and vaccination against TB.

Bold policies and supportive systems: including political commitment with adequate resources for TB care and prevention; engagement of communities, civil society organizations and public and private care providers; UHC policy and regulatory frameworks for case notification, vital registration, including ascertainment of causes of deaths in hospitals and communities, quality and rational use of medicines, and infection control; and social protection, poverty alleviation and actions on the other determinants of TB.

Intensified research and innovation: including discovery, development and uptake of new tools, interventions and strategies; and research to optimize implementation, impact and promotion of innovations.

Figure 5.13
TB mortality rates excluding TB deaths among HIV-positive people, 2014[9]



MALARIA

Almost half the world's population, living in nearly 100 countries and territories, are at risk of malaria. There are an estimated 214 million cases and approximately 438 000 deaths in 2015 – most of these in children under five living in Africa. Sub-Saharan Africa bears the highest burden of the disease, accounting for 89% of cases and 91% of deaths. More than two thirds of malaria deaths occur in children under five.

ACHIEVEMENTS

The incidence rate of malaria is estimated to have decreased by 37% globally between 2000 and 2015 and malaria mortality rates have fallen by 60% (Figure 5.14). Hence the MDG Target 6.C (to have halted by 2015 and begun to reverse the incidence of malaria) has been met. Of 106 countries with ongoing transmission of malaria in 2000, 102 are estimated to have met the MDG target of reversing the incidence of malaria. An increasing number of countries have moved towards eliminating malaria from within their borders. In 2014, 13 countries with malaria in 2000 reported zero indigenous cases. Another six countries reported fewer than 10 cases.[10]

The coverage of key interventions has increased dramatically during the MDG era. In sub-Saharan Africa, an estimated 68% of children under five were sleeping under an ITN in 2015, compared to less than 2% in 2000. (Figure 5.15).[10] Coverage of at least one dose of intermittent preventive treatment in pregnancy (IPTp) increased from less than 5% in 2000 to 57% by 2013. The proportion of suspected malaria cases that was tested for parasites rose from 47% in 2010 (when the WHO recommendation to test all suspected malaria cases was introduced) to 62% in 2013, mainly due to an increase in the use of rapid diagnostic tests. By 2013, ACT had been adopted as the national policy for first-line treatment in 79 of 87 countries in which *P. falciparum* is endemic.[43] However, treatment with appropriate antimalarial drugs continues to be inadequate with an estimated 13% of febrile children receiving ACTs in 2015.

Figure 5.15
Proportion of children under five sleeping under insecticide-treated mosquito nets, sub-Saharan Africa, 2000–2015[10]

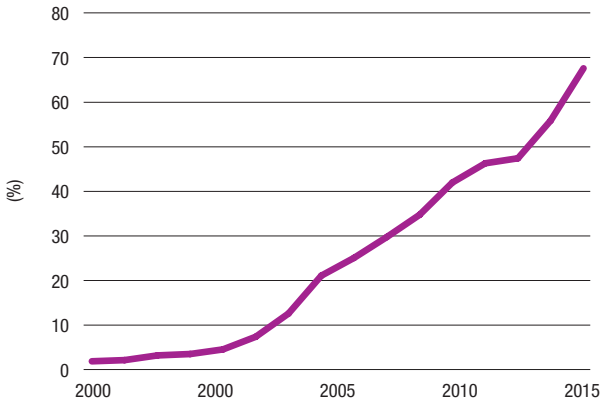
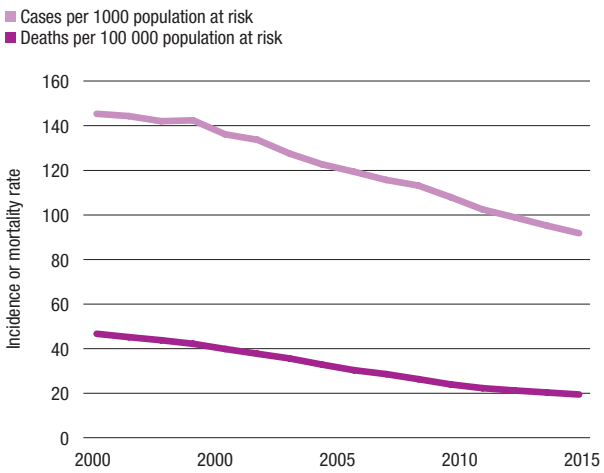


Figure 5.14
Global trends in malaria incidence and mortality rates, 2000–2015[10]



SUCCESS FACTORS

Increased funding: Annual funding for malaria control and elimination totalled US$ 2.7 billion in 2013. International financing for malaria control has increased 20 fold since 2000, reaching US$ 2.2 billion in 2013. Domestic investments have also increased year on year.[10]

Innovation: Programmes have benefited from technologies that were not available in 2000, including LLIN, rapid diagnostic tests and ACTs.

Partnership and advocacy: The Roll Back Malaria Partnership, comprising more than 500 partners, was established in 2001 as a global framework to mobilize resources, forge consensus among partners and implement coordinated action against malaria.

Planning and programming: Malaria control is now high on the agenda of ministries of health and international agencies, which have aligned their malaria control policies with WHO recommendations. They also united their efforts around a Global Malaria Action Plan developed in response to a call for universal access to malaria interventions by the UN Secretary-General in 2008. Malaria-endemic countries have defined national strategies aiming to ensure that cost-effective interventions are accessible to all in need. Effective partnerships have been formed at the country level to help implement national strategic plans.

Economic development and rising incomes have also contributed to reductions in malaria incidence and mortality. Among the many benefits of increased prosperity is the strengthening of health systems that have reduced both the risk of acquiring malaria and the consequences of infection.

CHALLENGES[10,43]

Sub-Saharan Africa: Children under 5 living in sub-Saharan Africa suffer the largest burden of malaria disease and mortality, where malaria accounts for 10% of all deaths in this age group in 2015 (Figure 5.16).

Inadequate funding: The funding gap for malaria programmes was estimated to be US$ 2.4 billion (53%) in 2013.

Resistance: The effectiveness of vector control is threatened as malaria mosquitoes develop resistance to the insecticides used in ITNs and indoor residual spraying. Resistance of *P. falciparum* to artemisinin in five countries and multiple drug resistance in western Cambodia highlights the importance of eliminating *P. falciparum* in the Greater Mekong subregion.

Gaps in intervention coverage: In 2013, 278 million of the 840 million people at risk of malaria in sub-Saharan Africa lived in households without even a single ITN; 15 million of the 35 million pregnant women did not receive preventive treatment; and between 56 and 69 million children with malaria did not receive ACTs. This is because a substantial proportion of these patients do not seek care, and not all those who do seek care receive appropriate antimalarial treatment.

STRATEGIC PRIORITIES

The SDG Target 3.3 is to end the malaria epidemic by 2030. New malaria goals and targets were endorsed by the World Health Assembly in 2015.[65] The targets for 2030, with 2015 as the baseline year, are:

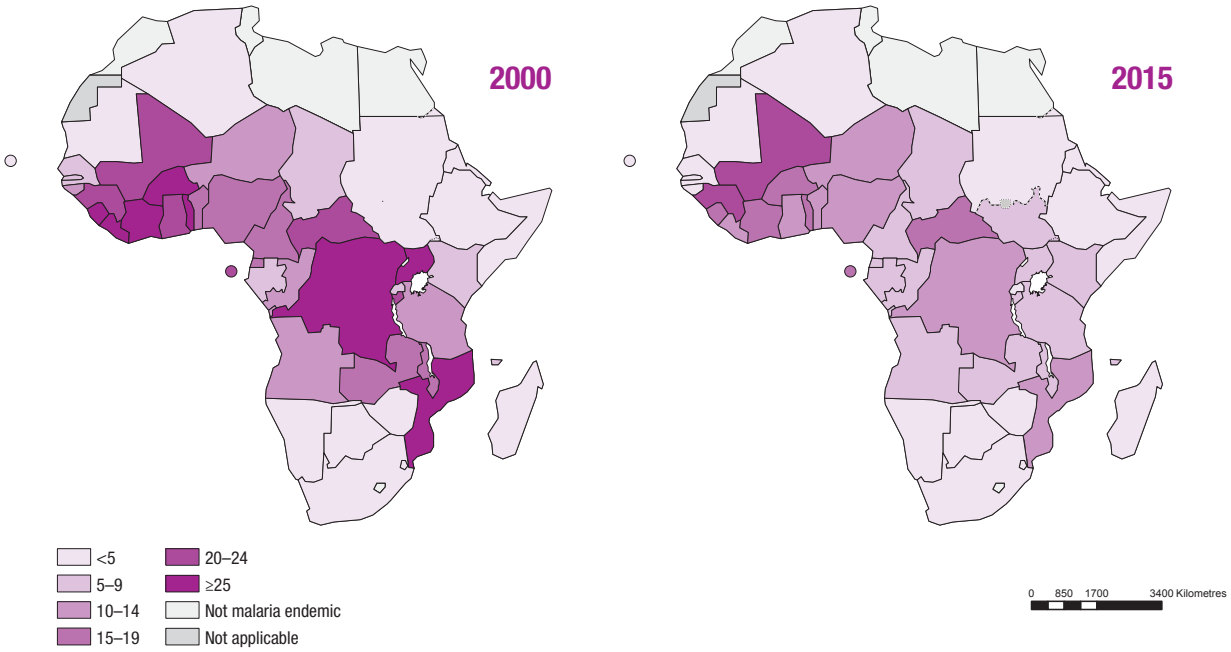
- 90% reduction in global malaria mortality rate;
- 90% reduction in global malaria case incidence;
- malaria eliminated from at least 35 countries;
- re-establishment of malaria prevented in all countries identified as malaria-free

The global technical strategy for 2016–2030 aims to maximize the impact of current interventions, focusing on three pillars:

- ensuring universal access to malaria prevention, diagnosis and treatment;
- accelerating efforts towards elimination and attainment of malaria-free status;
- transforming malaria surveillance into a core intervention.

This strategy is to be supported by optimizing the use of innovation, expanding research and strengthening the enabling environment, including political and financial commitments, multisectoral approaches and capacity strengthening.

Figure 5.16
Percentage of deaths caused by malaria in children under five in sub-Saharan Africa, 2000 and 2015[10]



NEGLECTED TROPICAL DISEASES

NTDs[89] are endemic in 149 countries. More than 1 billion people are at risk of infection and 17 NTDs currently account for a disease burden that is around half the burden of TB or malaria.[1] There are five key interventions to tackle NTDs: preventive chemotherapy based on large-scale delivery of free, safe, single-dose, quality-assured medicines at regular intervals; innovative and intensified disease management; vector ecology and management based on sound ecological principles and the judicious use of pesticides to reduce the transmission of diseases carried by insects; improvements in water, sanitation and hygiene in NTD-endemic areas to sustain reductions in prevalence; and veterinary interventions among animals to protect and improve human health.

ACHIEVEMENTS[19,90,91,92,93]

- In 2014, there were just 126 cases reported of dracunculiasis (guinea-worm disease), compared to almost 1800 in 2010 and 3.5 million in the mid-1980s.
- In 2014, the number of new cases of human African trypanosomiasis dropped to fewer than 4000 annually for the first time in 50 years.
- In 2013, Colombia became the first country where WHO verified the elimination of onchocerciasis, followed by Ecuador in 2014 and Mexico in 2015.
- In 2014, the elimination of visceral leishmaniasis (Kala-Azar) as a public health problem has been achieved in 87% of endemic districts and subdistricts in the South-East Asia Region.

Since 2006, more than 5 billion NTD treatments have been delivered to people in need. In 2012 alone, 800 million people received preventive chemotherapy for at least one disease, the number dropping to a little more than 785 million in 2013, as a result of the successful interruption in transmission in a number of areas. Indeed, by the end of 2014, 18 countries with endemic lymphatic filariasis (elephantiasis) had achieved a reduction in infection such that preventive chemotherapy was no longer required.[94] Globally, 43% of people requiring preventive chemotherapy for at least one NTD received it in 2013 (Figure 5.17).

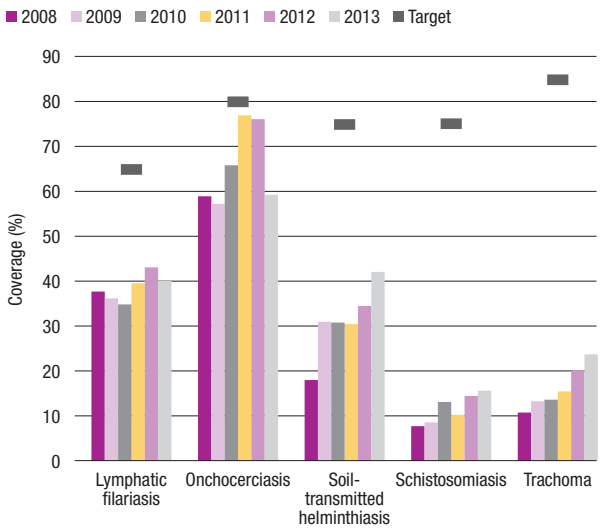
SUCCESS FACTORS

NTD concept and approach: The concept of NTDs and the integrated approach to their prevention and control began to take shape in the early years of the MDGs. The focus on poor, rural and marginalized populations and co-implementation of key interventions across the diseases most common to those populations have boosted the investment case for NTDs.

Global leadership and country ownership: WHO established global strategies in the Global Plan to Combat Neglected Tropical Diseases, 2008–2015. The NTD Roadmap for implementation, launched in 2012, set clear targets for universal access to interventions and the eradication or elimination of 11 NTDs by 2020. Countries have taken ownership of implementation, building on existing health systems at the community level.

Partnership: The NTD Roadmap was followed by the London Declaration on NTDs,[97] with a broad set of partners, including the pharmaceutical industry, pledging to provide the resources necessary for implementation. In 2012–2013 alone, 2.5 billion treatments were donated. External assistance is estimated at US$ 200–300 million per year, excluding the drug donations of the pharmaceutical industry.[98] The Roadmap has given renewed impetus for collaboration between WASH and NTD actors, and in 2015 a joint strategy was developed to ensure more effective delivery of WASH alongside other NTD interventions.[67] Partnerships with civil society have been critical in many countries globally.

Figure 5.17
Global status of preventive chemotherapy coverage: proportion of people receiving preventive chemotherapy out of those requiring it for five NTDs,[95] 2008–2013[96]



CHALLENGES

Inequality within countries: Today 1 billion (about three quarters) of the world's poor live in middle-income countries. Similarly, most (about two thirds) of the people requiring, but not yet receiving interventions against NTDs, live in middle-income countries (Figure 5.18).

Funding gap: NTD programmes have been disproportionately dependent on community volunteers and development assistance, with most funding provided by just two bilateral donors. Domestic levels of investment are still inadequate, especially in middle-income countries. Additional investment of US$ 450 million per year is targeted in the period 2015–2020 for treatment and care, including preventive chemotherapy (excluding vector control).

Inadequate coverage: Coverage with early diagnosis and treatment as well as appropriate and timely implementation of vector management, water, sanitation and hygiene, and veterinary public health interventions remain patchy. The "last mile" of preventive chemotherapy coverage is the most difficult and costly; when preventive chemotherapy stops, another challenge begins – verifying the interruption of transmission and maintaining surveillance to prevent recrudescence.

Climate change: The distribution and incidence of at least some NTDs are expected to increase with climate variability and long-term environmental changes, as well as unplanned urbanization and increased international movement of people and goods. This is especially true of the rapidly expanding burden of dengue and chikungunya. Capacity-building and mitigation measures need to be developed in the most vulnerable areas.

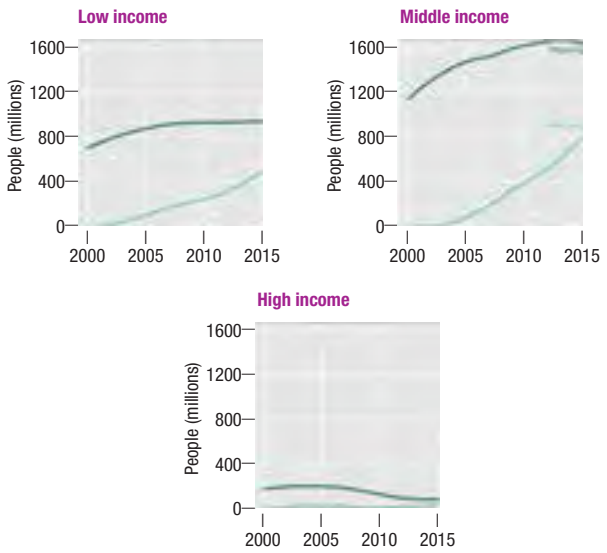
R&D: There is a need for more R&D across the five key interventions, and containment of the emergence of resistance to medicines as well as to pesticides. Improved diagnostics would be a priority through broad-based efforts such as the Special Programme for Research and Training in Tropical Diseases (TDR).[100] Discovery of insecticides with new modes of action, development of new vector control tools – particularly to curb the spread of vectors that spread disease such as dengue and chikungunya – and insecticide resistance management are the priorities for effective vector management.

STRATEGIC PRIORITIES

SDG Target 3.3 is to "end the epidemic" of NTDs. NTDs are also closely linked to the UHC target, as a measure of success in reaching the poorest. The UHC target of 80% coverage of essential health services by 2030 is consistent with coverage targets for the prevention of NTDs by 2020 (Figure 5.16).[101] If high-quality coverage is sustained for long enough – as few as three years for some NTDs requiring preventive chemotherapy – transmission may be completely interrupted. The total number of people requiring interventions against NTDs may begin to decrease as soon as 2017, as diseases are eradicated, eliminated and controlled (Figure 5.19). Scale-down for some diseases should free up resources for the management of epidemic-prone NTDs, including dengue, chikungunya and leishmaniasis.

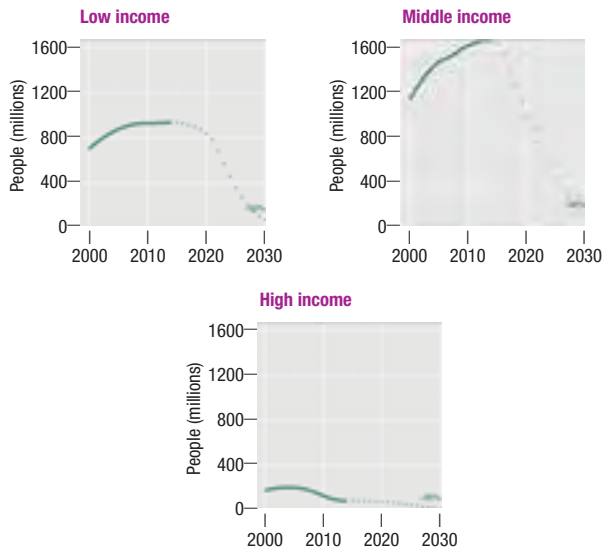
For global advocacy purposes, the existing coverage and eradication or elimination targets for individual NTDs could be brought together under a single indicator and target for 2030: for instance, a 90% reduction in the number of people requiring interventions against NTDs. This means a 90% reduction in the number of people in need of preventive chemotherapy and in the number of new cases requiring innovative and intensified disease management. It includes, but is not limited to: eradication of dracunculiasis (2015[102]) and yaws (2020); global elimination[103] of leprosy (2020), lymphatic filariasis (2020), trachoma (2020), onchocerciasis (2025) and human African trypanosomiasis (2020, with zero incidence in 2030); and regional elimination[103] of schistosomiasis (2015–2020), rabies (2015) and visceral leishmaniasis (2020). These remain critical milestones on the path towards the end of the NTD epidemic by 2030.

Figure 5.18
Number of people requiring and receiving interventions against NTDs, by country income group, 2000–2015[a,99]



[a] The period 2013–2015 is based on an assumption of linear scale-up from actual coverage reported in 2012 towards 2020 targets.

Figure 5.19
Targeted number of people requiring interventions[a] against NTDs if coverage targets are met, by country income group, 2015–2030[99]



[a] Preventive chemotherapy and innovative and intensified disease management.

HEPATITIS

Viral hepatitis is caused by five different viruses, and transmission occurs through contaminated food or water (hepatitis A and E) or through exposure to blood or body fluids (hepatitis B, C, D). Viral hepatitis infection kills an estimated 1.45 million per year, with approximately 90% of deaths due to chronic HBV and HCV infection, which cause cirrhosis and liver cancer.[12] The majority (85%) of viral hepatitis deaths occur in Asia, North Africa, East Africa and West Africa. A comprehensive set of hepatitis prevention interventions exists (Table 5.2) and effective treatment can cure more than 90% of patients with chronic HCV infection and suppress viral replication of hepatitis B. Despite the high disease burden and available prevention and treatment interventions, hepatitis has not received the same attention as other diseases with a comparable burden of disease, such as HIV, TB or malaria.

Table 5.2.
Elements of a comprehensive hepatitis prevention programme

Virus	Prevention intervention
A E	Safe water and food
A	Hepatitis A vaccination according to the country's epidemiological situation
B	Hepatitis B vaccination for all children and administration of birth dose
B C	Access to safe blood (universal screening of all blood donations in a quality-assured manner)
B C	Access to sterile injections and other invasive medical equipment in formal and informal health settings
B C	Access to sterile injection equipment and other harm-reduction measures for people who inject drugs
A B C	Promotion of safe sex practices

ACHIEVEMENTS

Vaccination: The reduction in HBV infections as a result of hepatitis B vaccination programmes is the greatest achievement in hepatitis control. By the end of 2014, 194 countries had introduced the vaccine into their immunization schedules.[104,105] Global coverage with three doses of hepatitis B vaccine is estimated to be 82% (Figure 5.20) and is as high as 92% in the WHO Region of the Americas and the Western Pacific Region. The Western Pacific Region is on track to reach its goal of reducing the prevalence of chronic HBV infection to <1% by 2017.[21] In China, the prevalence of chronic HBV infection has been reduced to 1% among children age 1–4 years (Figure 5.21).[106] Eighteen countries[104] have introduced universal childhood hepatitis A vaccination by the end of 2014 and reductions in incidence have been documented.[107]

Injection safety: Surveys data from developing countries suggest that, between 2000 and 2010, reuse of injection equipment decreased from 39.6% to 5.5% – an 86% reduction.[109] Over the same period, unnecessary injections also fell, the average number of injections per person in developing countries declining from 3.4 to 2.9. In 2000, unsafe injections were responsible for 19.7 million new hepatitis B cases, 1.9 million new hepatitis C cases and 267 000 HIV infections. In 2010, those numbers had dropped to an estimated maximum 34 000 for HIV, 1.7 million for hepatitis B and 315 000 for hepatitis C.

Figure 5.20
Global coverage of third dose of hepatitis B vaccine in infants, 1990–2014[108]

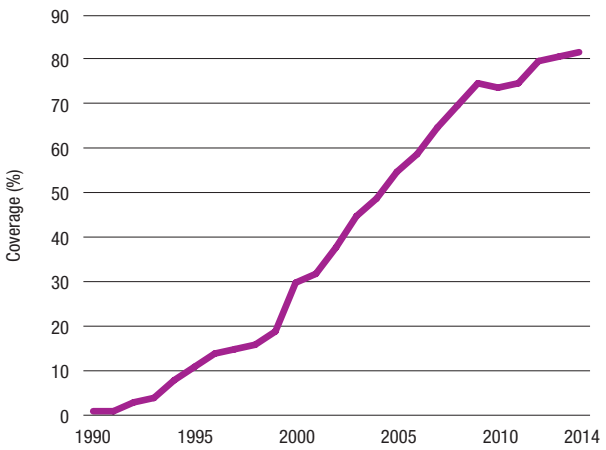
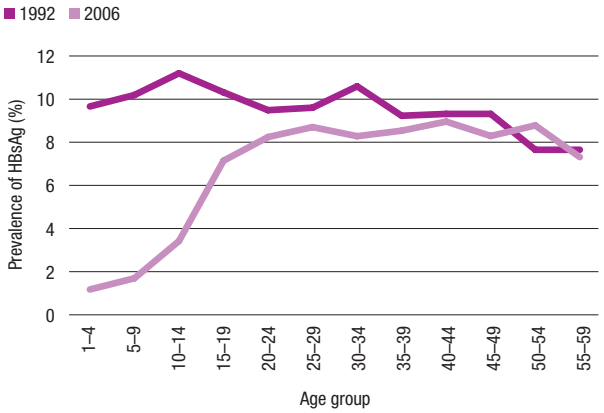


Figure 5.21
Prevalence of hepatitis B surface antigen (HBsAg) by age group, China, 1992 and 2006[106]



SUCCESS FACTORS

Hepatitis B vaccination: Support by GAVI led to reductions in the price of hepatitis B vaccine and its introduction in the routine vaccination schedule as a component of the pentavalent vaccine. This led to a dramatic increase in immunization coverage.

Injection safety: The Safe Injection Global Network (SIGN) was created with the support of partners, including PEPFAR. Its three core strategies are: to promote behaviour change among patients and health-care workers in order to reduce unnecessary injections and ensure safe practices; to increase the availability of essential and good quality injection devices and supplies; and to properly manage sharps disposal.

Harm-reduction programmes: Expansion of sterile needle and syringe programmes, opioid substitution treatment for opioid users and peer outreach programmes have resulted in significant reductions in risk behaviours, although the high infectivity of HCV requires enhanced harm-reduction programmes.

New treatments: Dramatic progress in drug development has yielded a number of safe, oral treatment regimens that can cure almost all chronic HCV infections and suppress hepatitis B viral replication.

CHALLENGES

Lack of political engagement: Viral hepatitis was not included in the MDGs, reflecting a general lack of political engagement and funding. As a result, hepatitis control did not feature prominently in international health strategies such as those promoted by WHO and much will need to be done to address this gap.

Strategic information: There is a lack of reliable data on infection incidence and prevalence as well as for health outcomes and impact. This lack of data undermines national planning efforts as well as advocacy.

Comprehensive programmes: Addressing viral hepatitis requires a holistic approach that involves many components of the health sector. However, only a few countries have comprehensive public health programmes for viral hepatitis.

Mother-to-child transmission of hepatitis B: This remains a major source of infection. To minimize this risk, WHO recommends that all children receive a dose of hepatitis B vaccine within 24 hours of birth. Global coverage of the birth dose is currently estimated to stand at just 38%.

Hepatitis diagnosis and screening: The majority of people with chronic HBV and HCV infection are unaware of their status until they become sick. Improved and affordable diagnostics and testing approaches are required to identify people with chronic viral hepatitis early.

Scaling up care and treatment services: This will be a major challenge that will depend on major reductions in the prices of medicines, particularly for the treatment of chronic HCV infection.

STRATEGIC PRIORITIES

Combating hepatitis is now an explicit SDG target (part of Target 3.3). In 2014, the World Health Assembly requested that WHO initiate a process to examine the feasibility of eliminating hepatitis B and hepatitis C. Accordingly, a Global Health Sector Strategy on Viral Hepatitis is under development that will set global targets towards the elimination of HBV and HCV as public health threats by 2030.[110]

Vaccination will remain a priority preventive intervention, along with expanding blood and injection safety within and beyond health-care settings, and taking harm-reduction programmes to scale for people who use drugs. Expansion of treatment will require innovations in diagnostics, including point-of-care technologies, reductions in prices of medicines and a public health approach to treatment and care.

Implementation of the global strategy will aim to achieve a 90% reduction in new cases of chronic HBV and HCV infection and hepatitis deaths from 1.4 million to fewer than 500 000 by 2030. To achieve this impact, services will need to be expanded to achieve universal access to HBV vaccination (including birth dose), safe injections and harm reduction, and 80% of people with chronic hepatitis receiving treatment.

Table 5.2 shows the priority interventions of a comprehensive programme, including prevention of transmission through safe water, safe sex, and safe medical practices as well as vaccination.

WATERBORNE DISEASES

Waterborne diseases, by definition, are those that are transmitted by ingestion of contaminated water. Important waterborne diseases include diarrhoeal diseases, cholera, shigella, typhoid, hepatitis A and E, and poliomyelitis. Diarrhoeal diseases alone account for an estimated 3.6% of the global burden of disease (DALYs), and are responsible for of 1.5 million deaths (2012). It is estimated that 58% of that burden in low- and middle-income countries – 842 000 deaths per year, including 361 000 in children under five – is attributable to unsafe water supply, inadequate sanitation and lack of hygiene.[13]

ACHIEVEMENTS

Between 1990 and 2012, the number of diarrhoeal diseases attributable to inadequate water, sanitation and hygiene fell from 1.8 million to 842 000, with all regions experiencing major declines (Figure 5.22).

Substantial progress has been made in improving access to safe drinking-water and sanitation in both urban and rural populations (MDG 7).[22] Access to an improved drinking-water source jumped from 76% coverage in 1990 to 91% in 2015, an increase of 2.6 billion people. Of the global population, 58% (4.2 billion people), now enjoy the highest level of access: a piped drinking-water connection on the premises. On the sanitation front, progress has been less impressive. Open defecation decreased from 24% to 13% between 1990 and 2015, and 2.1 billion people gained access to improved sanitation, but almost one third of the global population remains without access, well short of the MDG coverage target of 23% lacking improved sanitation. Despite improvements during the MDG era, people living in rural areas remain at a considerable disadvantage in terms of access to both safe water and sanitation compared with those in urban areas (Figure 5.23). In 2015, only an estimated one person in three living in rural areas had piped water on the premises, compared with 79% in urban areas. Although half of those living in rural areas were using improved sanitation facilities, this compares poorly with over 80% of those in urban areas.

Figure 5.22
Decline in diarrhoea deaths attributable to inadequate water and sanitation in low- and middle-income countries, by WHO region, 1990 and 2012[13]

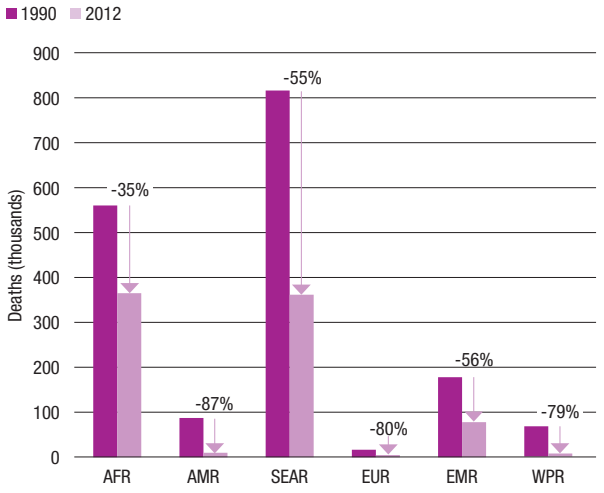
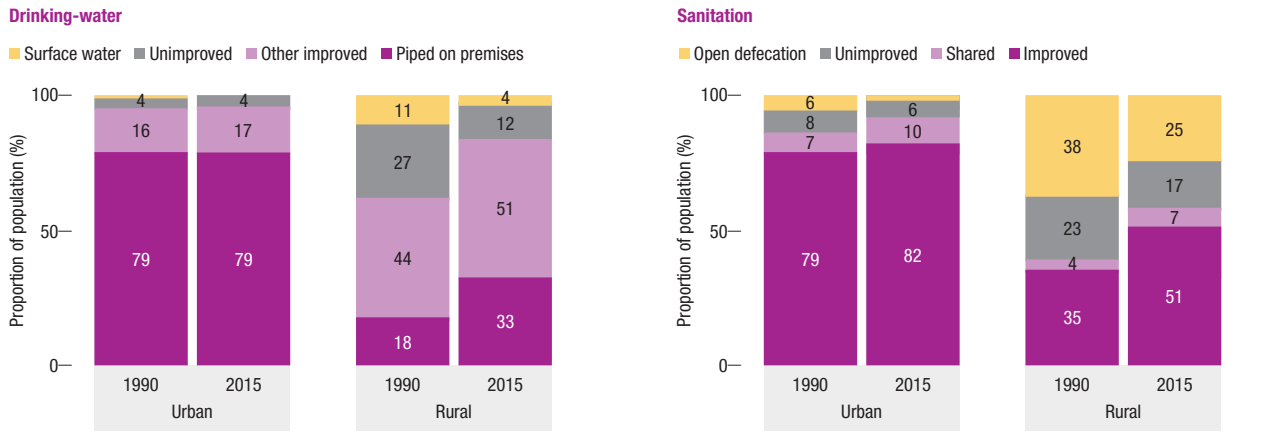


Figure 5.23
Trends in proportion of the global population with access to improved drinking-water source and improved sanitation, urban and rural, 1990 and 2015[22]



SUCCESS FACTORS

Global advocacy and action: Increased attention on the issue of water and sanitation, typified by the International Decade for Action "Water for Life" 2005–2015[31] and the sector-wide technical consultation on drinking-water, sanitation and hygiene (WASH),[76] has helped drive change, as has improved collaboration between global agencies and organizations. The WHO/UNICEF Joint Monitoring Programme has sharpened focus on the issue and enhanced collaboration.[111]

Country action: The push to improve access to safe water and sanitation has been broadly supported at the country level. Two thirds of surveyed countries recognize access to both safe drinking-water and sanitation as human rights in national legislation,[112] while national policies on drinking-water and sanitation have been approved in over 80% of surveyed countries. Many governments are investing in infrastructure development, especially in transitional economies.

Funding: Development assistance commitments for water and sanitation increased by 30% since 2000 to over US$ 10.9 billion in 2012, with support increasingly directed towards low-income countries.[112]

Improved case management and treatment: Increased recourse to oral rehydration therapy, better nutrition and other evidence-based interventions have probably contributed to reductions in diarrhoeal disease related mortality, especially among children.

CHALLENGES

Marginalized rural populations: Of the 159 million people still relying on untreated surface water, 93% live in rural areas. Rural residents also account for 70% of the 2.4 billion people who do not have access to an improved sanitation facility, while open defecation (that is, without even basic sanitation such as a pit latrine) is predominantly a rural issue, with 90% of open defecators living in rural areas.[22]

Lack of focus on health facilities and schools: Inadequate water and sanitation policies and practices are fuelling the spread of disease, not only in households and communities, but in schools and health facilities.

Poor hand hygiene: It is estimated that only 19% of the world's population wash hands with soap after defecation or contact with excreta.[44]

Poor maintenance: Even improved water supplies are frequently contaminated (though not as frequently or as seriously as unimproved supplies) and improved sanitation facilities are often associated with environmental discharges of untreated faecal waste.

Weak country capacity to implement plans: Despite strong political support for universal access to water and sanitation, few countries surveyed have the capacity to fully implement their national WASH plans and conduct meaningful monitoring and review.

Inadequate funding: Current funding levels are insufficient to meet targets for drinking-water and sanitation in many countries. Out-of-pocket payments to obtain or connect to existing water and sanitation services exclude the poorest; affordability schemes to subsidize water supply to the poorest are only operational in a minority of countries.[112]

STRATEGIC PRIORITIES FOR THE SDG

The overall SDG health goal (Goal 3) includes a specific target (3.3) for waterborne diseases, while Goal 6 (Ensure availability and sustainable management of water and sanitation for all) includes targets to achieve universal and equitable access to safe and affordable drinking-water (6.1) and adequate and equitable sanitation and hygiene for all (6.2), as well as reducing the proportion of untreated wastewater (6.3). Meeting these challenges will require a multisectoral response and monitoring. To a large degree, strategies to increase access to safe and sufficient drinking-water and adequate sanitation, along with improved hygiene, are also implied in multiple SDGs, including the eradication of poverty and hunger, achieving health and well-being for all and ensuring environmental sustainability.[112]

There is a broad consensus on what needs to be done regarding drinking-water, sanitation and hygiene, as indicated by the proposed policy goals that emerged from the broad, sector-wide technical consultation on WASH.[76] However, effectively implementing WASH policies at the national level is going to require efforts on several fronts, starting with securing, absorbing and targeting sustained international and national financing. The priority areas for action are:

- renewed focus on health facilities;
- strengthened action in the crucial area of hygiene promotion;
- support for the operation and maintenance of existing infrastructure and services;
- expanded efforts in neglected rural areas where the need for improved services is greatest;
- developing effective monitoring and evaluation to track progress and identify gaps.

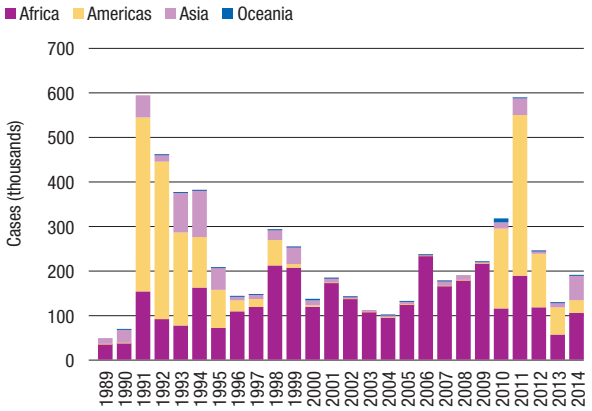
CHOLERA

Cholera is an acute diarrhoea caused by infection due to ingestion of food or water contaminated with the bacterium *Vibrio cholerae*. It is endemic in more than 50 countries, mostly in Africa and Asia, and may also cause epidemics.[113] More than 1 billion people are at risk of cholera in endemic countries, with an estimated 2.9 million cholera cases and 95 000 deaths per year.[114] The most recent major cholera epidemic occurred in Haiti in 2010–2011, following an earthquake, causing over 7000 deaths in Haiti and neighbouring Dominican Republic.[115,116] Environmental factors are critical in the epidemiology of cholera. Climate change, war, natural disasters, population movement and urbanization are complicating efforts to control the disease.[117]

TRENDS

From the reported data on cholera cases it is difficult to ascertain whether progress has been made in reducing global incidence rates, as official reporting is far from complete. Figure 5.24 shows the global and regional numbers of reported cases to WHO during the last two decades. In general, Africa is the most affected continent. Peaks in the numbers of cases occurred in 1991–1992 and 2011, associated with severe outbreaks in the Americas. In 2015, a cholera outbreak was reported in the Kigoma region of the United Republic of Tanzania. Cholera is endemic in the region, but due to a recent influx of thousands of Burundian refugees, overcrowding and poor sanitation, the situation has deteriorated.

Figure 5.24
Reported cholera cases by continent, 1989–2014[26]



POSITIVE DEVELOPMENTS

Water and sanitation: Cholera is a waterborne disease and can be largely prevented when people have access to safe drinking-water and sanitation facilities. A major achievement during the MDG era has been the progress in improving access to safe drinking-water and sanitation in urban and rural populations (MDG 7).[22] Access to an improved drinking-water source jumped from 76% coverage in 1990 to 91% in 2015, an increase of 2.6 billion people. On the sanitation front, progress has been less impressive. Open defecation decreased from 24% to 13% between 1990 and 2015, and 2.1 billion people gained access to improved sanitation, but one third of the global population is still without access in 2015.

Case management: Alongside progress in cholera prevention, there have also been advances in the ability to effectively manage cholera. In particular, the use of oral rehydration therapy has become a more widely applied standard of care. Very severely dehydrated patients require administration of intravenous fluids. Such patients also require appropriate antibiotics to diminish the duration of diarrhoea, reduce the volume of rehydration fluids needed and shorten the duration of *V. cholerae* excretion. Recommended control methods, including standardized case management, have proven effective in reducing the case-fatality rate and reduce the mortality of severe cholera to less than 1%, even in resource-limited settings.[118]

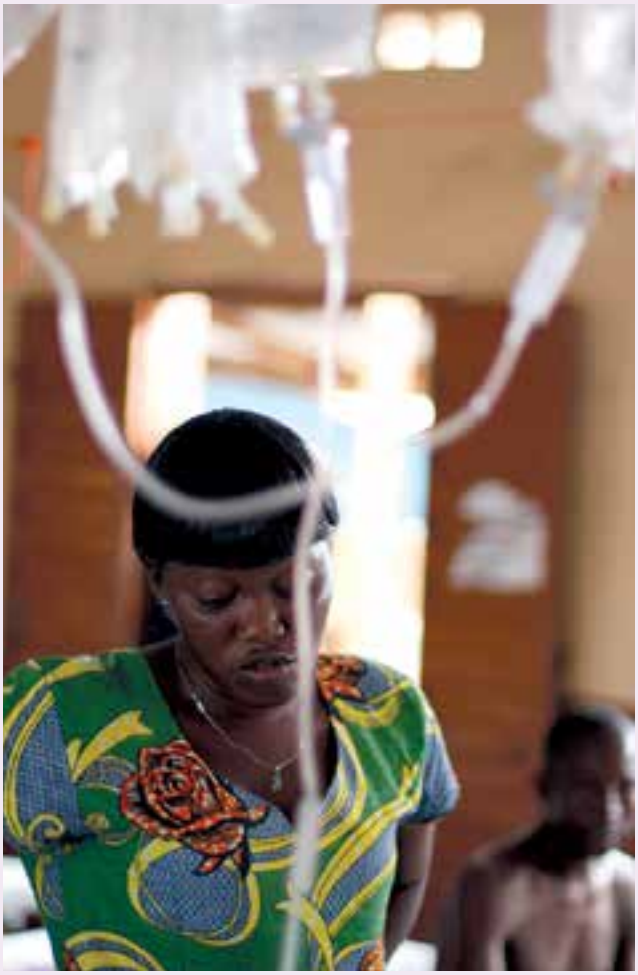
CHALLENGES

New strains: The majority of cholera outbreaks are caused by one strain – *V. cholera*, but recently new variant strains have been detected in several parts of Africa and Asia. Observations suggest that these strains cause more severe cholera with higher case fatality rates. The main reservoirs of *V. cholerae* are people and aquatic sources such as brackish water and estuaries. Recent studies indicate that global warming creates a favourable environment for the bacteria.[119]

Prevention: Cholera transmission is closely linked to inadequate environmental management. Typical at-risk areas include peri-urban slums, where basic infrastructure is not available, as well as camps for internally displaced people or refugees, where minimum requirements of clean water and sanitation are not met. The consequences of a disaster – such as disruption of water and sanitation systems, or the displacement of populations to inadequate and overcrowded camps – can increase the risk of cholera transmission should the bacteria be present or introduced.

Vaccination: A review of recent studies shows levels of protective effectiveness ranging from 23–58% (overall 37%)[120] and there is also evidence of some beneficial indirect effects on the unvaccinated population.[121] However, the use of the parenteral cholera vaccine has never been recommended by WHO due to its low protective efficacy and the high occurrence of severe adverse reactions. Very few countries have vaccination programmes.

Preparedness: Early in cholera epidemics mortality rates can still exceed 10% before appropriate response mechanisms, such as local treatment centres become available to improve rapid access to therapy and minimize the time to initial rehydration, as the incubation time and the time between onset of symptoms and dehydration and death is short.[122,123]



STRATEGIC PRIORITIES

In 2011, the WHO Member States unanimously agreed that cholera needs to be recognized as an increasing public health threat for many countries and regions, as it is on the rise due to climate change.[124] This requires prevention, epidemic preparedness and response. Proper, timely and solid surveillance systems, improved environmental management – in particular, access to clean water and proper sanitation – and the adequate use of cholera vaccines as a complementary measure are essential. Cholera prevention requires access to safe water, adequate sanitation, adequate food safety, appropriate hygiene and a community-based approach.

An internationally licensed oral cholera vaccine is currently available on the market in limited stocks and is suitable for travellers. WHO recommends that it should always be used as an additional public health tool, but should not replace usually recommended control measures such as improved water supplies, adequate sanitation and health education. Countries neighbouring an area affected by cholera should improve preparedness to rapidly respond to an outbreak and improve surveillance for risk assessment and early detection of outbreaks.

Cholera is recognized as a clear marker of environmental management, as well as an indicator of how the global public health community should engage with the IHR and conduct surveillance.

SEXUALLY TRANSMITTED INFECTIONS

STIs are caused by more than 30 different bacteria, viruses and parasites and are spread predominantly by sexual contact. Of the eight pathogens known to be transmitted through sexual contact linked to the greatest incidence of illness, four are currently curable (syphilis, gonorrhoea, chlamydia and trichomoniasis) and four incurable (the viral pathogens hepatitis B, herpes, HIV and human papillomavirus [HPV]), but susceptible to mitigation through treatment.

ACHIEVEMENTS

STIs are an important cause of morbidity and mortality; gonorrhoea and chlamydia, for example, being major causes of pelvic inflammatory disease, adverse pregnancy outcomes and infertility, while HPV infection causes 264 000 cervical cancer deaths each year.[1] Syphilis in pregnancy leads to 305 000 fetal and neonatal deaths every year and leaves 215 000 infants at increased risk of dying from prematurity, low birth weight or congenital disease. Some STIs can increase the risk of HIV acquisition three-fold or more. Despite steady progress in reducing the prevalence and incidence of STIs, there are still an estimated 357 million new infections of curable STIs per year (Table 5.3) as well as 84 000 deaths. Trichomoniasis and chlamydia represent the bulk of curable STI cases, but gonorrhoea infection is also significant, at an estimated 78 million new cases per year. The burden of viral STIs is also high with an estimated 417 million cases of herpes infection and 291 million women infected with HPV.[125,126,127] The epidemiology of STIs is changing, with an increase in viral infections, while other previously common infections, such as chancroid, have nearly disappeared.[128,129]

Reduced syphilis infection: Syphilis data show a decreasing trend since 1995, while there has also been substantial progress towards global elimination of congenital syphilis. Maternal and congenital syphilis decreased by 33% between 2008 and 2012.[126] Cuba achieved elimination of mother-to-child transmission of syphilis and HIV in 2015 and 13 more countries are promising candidates for elimination of vertical syphilis transmission.

SUCCESS FACTORS

Evidence-based, affordable and cost-effective interventions: The Global Strategy for the Prevention and Control of Sexually Transmitted Infections: 2006–2015 has been adapted for use in all WHO regions and is being used by the majority of countries. Most countries report using syndromic case management for STI treatment and 88% of reporting countries has updated national STI guidelines since 2006. In addition, 60% of reporting countries has a national strategy in place for elimination of mother-to-child transmission of syphilis. Nearly 90% of countries reported offering symptomatic STI treatment for sex workers in 2013 and 80% reported that STI services were available for men who have sex with men.[126]

Linkage to HIV prevention: Interventions for prevention of STIs and HIV overlap to a large degree and programmes targeting key populations for HIV are reaching those most at risk for STIs.

Advances in diagnosis and treatment: Rapid tests to diagnose syphilis infection have become widely available, contributing to increased coverage of syphilis screening and treatment, especially among pregnant women. Antenatal screening for STIs increased globally from 78% in 2008 to 84% in 2013 and syphilis seropositivity among pregnant women decreased by nearly half over the same period, from 1.4% to 0.6%.[5] Treatment regimens for common STI syndromes have been standardized and simplified with use of single-dose treatments wherever possible.

Table 5.3
Global estimates of new cases of curable STIs, 2012[125]

STI	Estimated new cases (millions)
Chlamydia trachomatis	130.9
Neisseria gonorrhoeae	78.3
Syphilis	5.6
Trichomonas vaginalis	142.6
Total	357.4

CHALLENGES

Inadequate funding: National STI programmes are experiencing funding gaps and staffing crises due to shortage of funds. Globally, there are no special funds for STI control other than HIV.

Coverage of STI prevention and treatment services: Most of the implemented interventions are not of a scale or scope sufficient to achieve universal access. Barriers to access include persistent stigma and discrimination, criminalization of behaviours of highest risk populations, weak political commitment to STI control and lack of funding.

Lack of quality data: Few etiological and prevalence studies have been conducted in the past decade as STI programmes were merged into HIV programmes. STI surveillance systems lack the capacity to provide robust and consistent information and data to support decision-making.

Global threat of gonococcal antimicrobial resistance: The Global Antimicrobial Resistance Surveillance Programme (GASP) has been reintroduced as a response to the emergence of gonococcal antimicrobial resistance, but with insufficient funding and staff. Monitoring for antimicrobial resistance is still patchy in the majority of WHO regions.

Changing epidemiology: STI epidemiology is changing with viral STIs becoming more prevalent than bacterial pathogens, requiring updated information for locally appropriate prevention and treatment strategies. More research is needed for development of prevention interventions for viral infections, such as vaccines, microbicides and other new technologies.

Lack of diagnostic test capability: The majority of STIs are asymptomatic (especially among females), and require development and widespread availability of reliable and simple diagnostic tests to augment syndromic management of symptomatic cases.

STRATEGIC PRIORITIES

There is no explicit STI target but STIs relate to multiple targets in the health goal. STI prevention and control activities will support the SDG targets to reduce child and neonatal mortality (3.2), end the epidemics of AIDS and other communicable diseases (3.3), reduce NCDs and improve mental health (3.4), sexual and reproductive health (3.7) and universal health coverage (3.8). The current STI prevention and control strategy ends in 2015 and development of the next phase will focus on building on successes to achieve universal coverage, developing new technologies for diagnosis and prevention and improving behaviour change interventions. The next phase of the global STI strategy will address the following areas:

- *Strengthening financing mechanisms* for services for STIs and increasing human resource capacity.
- *Increasing coverage of services* through the integration of STI prevention and management into the broader agendas on HIV infection and reproductive health. Strategies for increasing access to services for key populations and other vulnerable populations, such as adolescents, are needed.
- *Strengthening surveillance and data quality* to improve knowledge and increase the number of countries reporting on prevalence, etiologies of STI syndromes and antimicrobial resistance.
- *Developing strategies for addressing gonococcal antimicrobial resistance*, which threatens to reverse successes achieved to date. An aggressive response is needed to prevent gonorrhoea from becoming a non-curable disease.
- *Accelerating research on and access to innovations*, including point-of-care diagnostic tests, more efficacious therapeutics, STI vaccines, microbicides and health promotion methods. There is a growing need for rapid diagnostic tests to augment syndromic management and detect asymptomatic infections, particularly in women.
- *Eliminating the consequences of STI*, particularly congenital syphilis and cervical cancer.

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83 Four other TB indicators were included within the MDG framework: (i) the TB mortality rate; (ii) the TB prevalence rate; (iii) the proportion of cases detected (case detection rate, calculated as notifications of new and relapse cases to national authorities, divided by incidence in the same time period); (iv) and the treatment success rate. Case detection and treatment success rates have been closely monitored at national and global levels since 1995, following the establishment of targets (70% and 85%, respectively) for these indicators within a 1991 World Health Assembly resolution. Source: 44th World Health Assembly. Geneva: World Health Organization; 1991 (WHA44/1991/REC/1).

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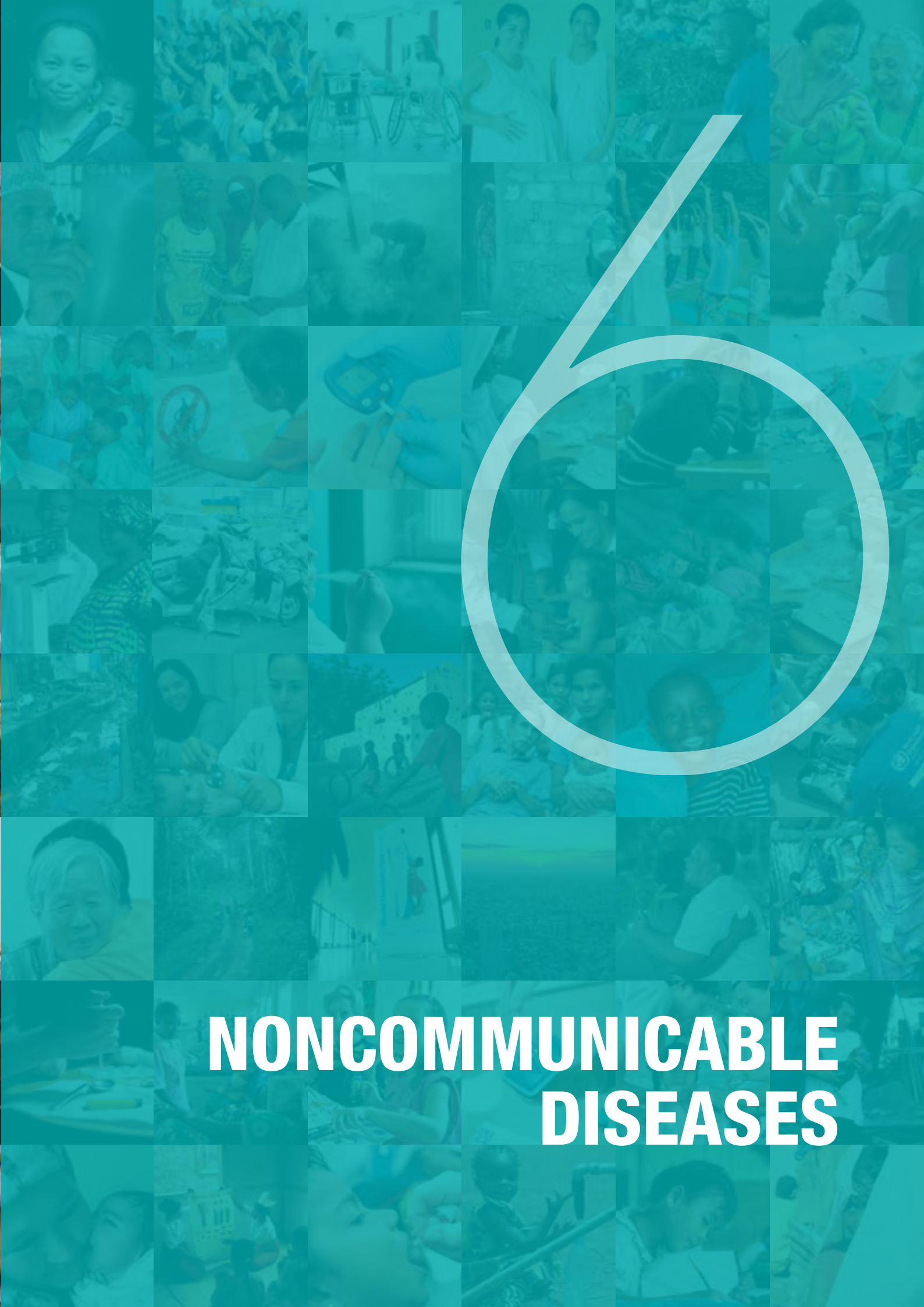


6

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 two thirds 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.

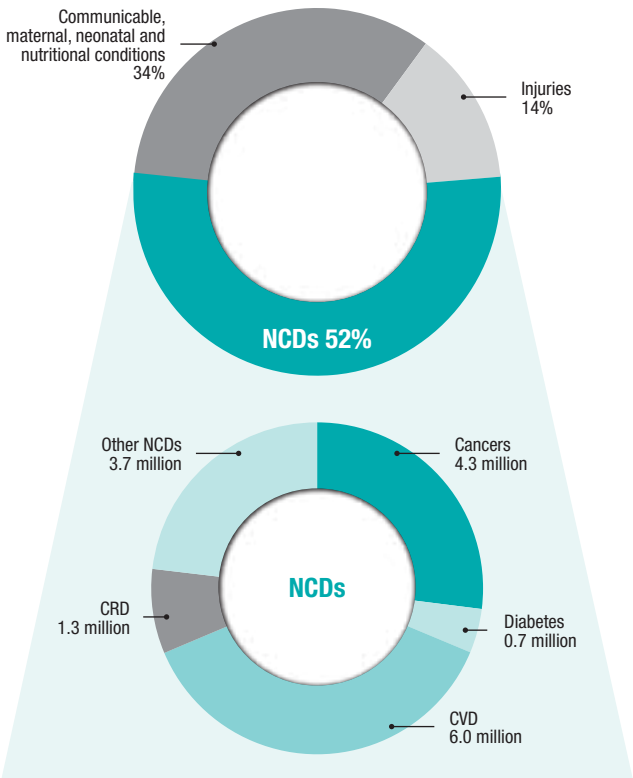
SDG Target 3.9 aims to reduce deaths and illnesses related to hazardous chemicals, as well as air, water and soil pollution and contamination. About 7 million NCD deaths are attributed to indoor and outdoor air pollution. Global awareness of the need for multisectoral action is exemplified by the inclusion 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]

Figure 6.1
Proportion of global deaths under age 70, by cause of death, 2012[1]

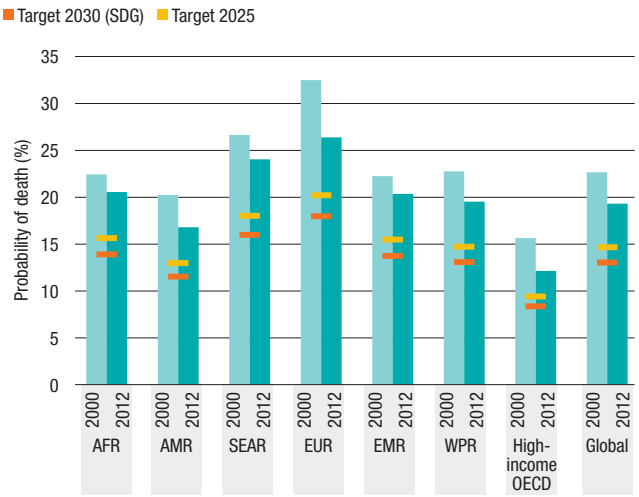


TRENDS

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.

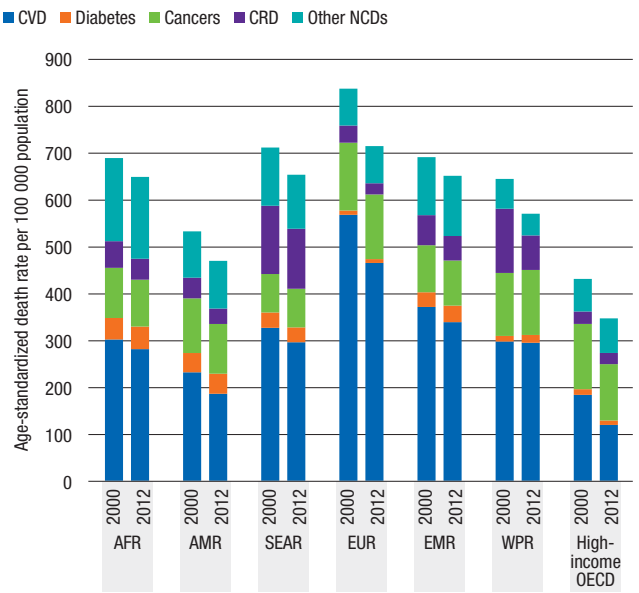
The major factor contributing to reduced NCD mortality is declining CVD deaths, which have decreased in every region (Figure 6.3). Age-standardized CVD death rates fell 16% globally between 2000 and 2012. Particularly significant declines have occurred in low-, middle- and non-OECD high-income countries 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[1,8]



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[1,8]



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).

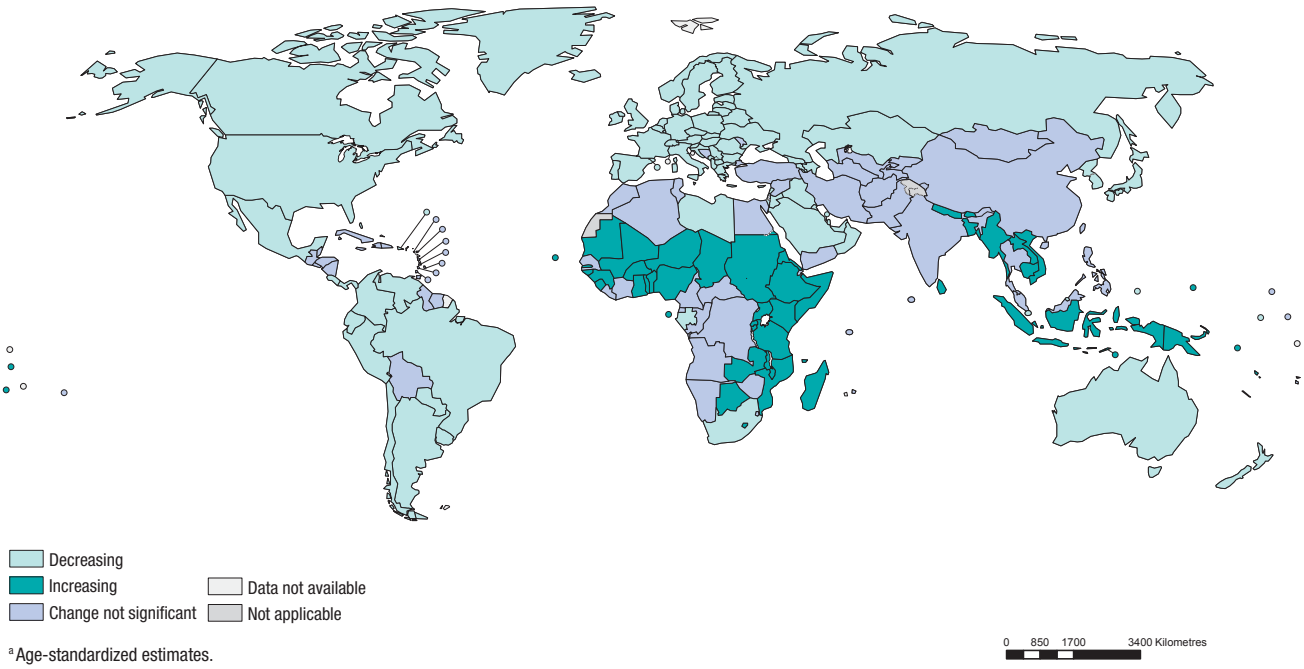
Globally, the prevalence of diabetes continues to increase.[12] The leading risk factors for type 2 diabetes are excess body weight and physical inactivity. Diabetes is highly correlated with the global prevalence of obesity, which has nearly doubled since 1980. In 2014, 11% of men and 15% of women age 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]



[a] Age-standardized estimates.

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 NCDs[18] 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.

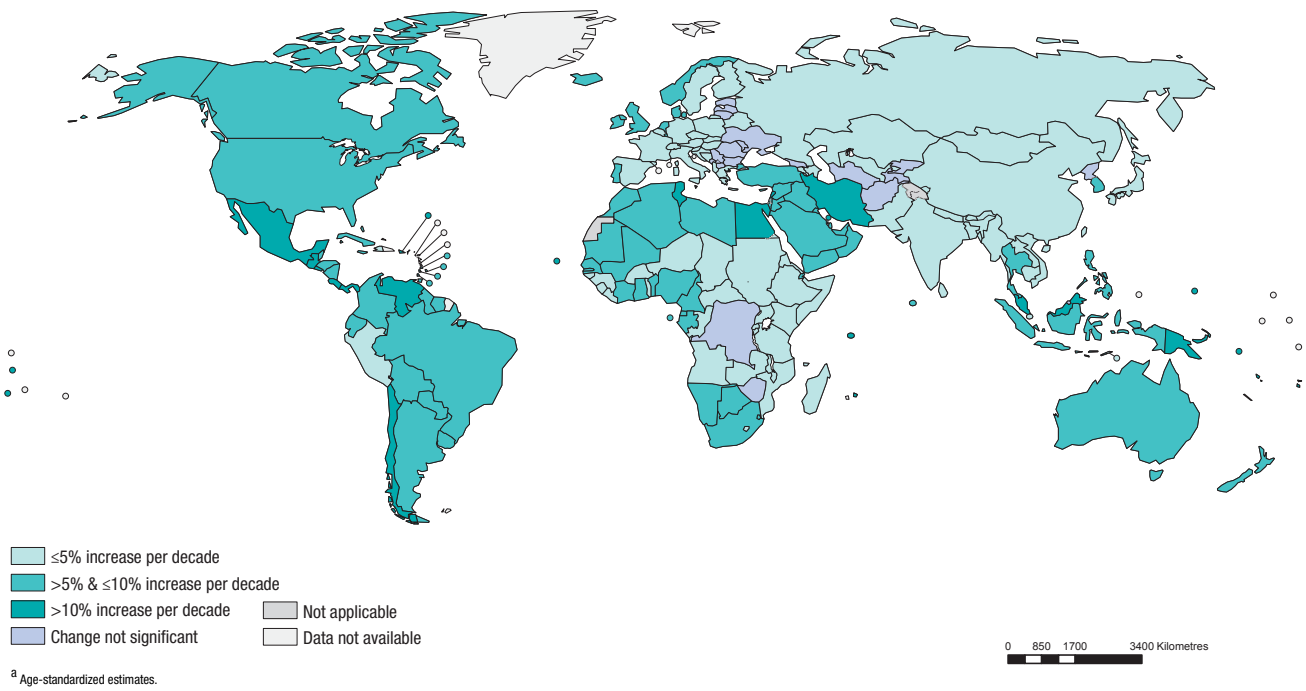
Lack of preventive action: While policy attention to NCDs has increased, too many countries continue to pay insufficient attention to the problem. For example, according to the WHO 2015 Country Capacity Survey, only 54% of countries reported having an operational national NCD policy with a budget for 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 countries [32].

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] 1980–2008[28]

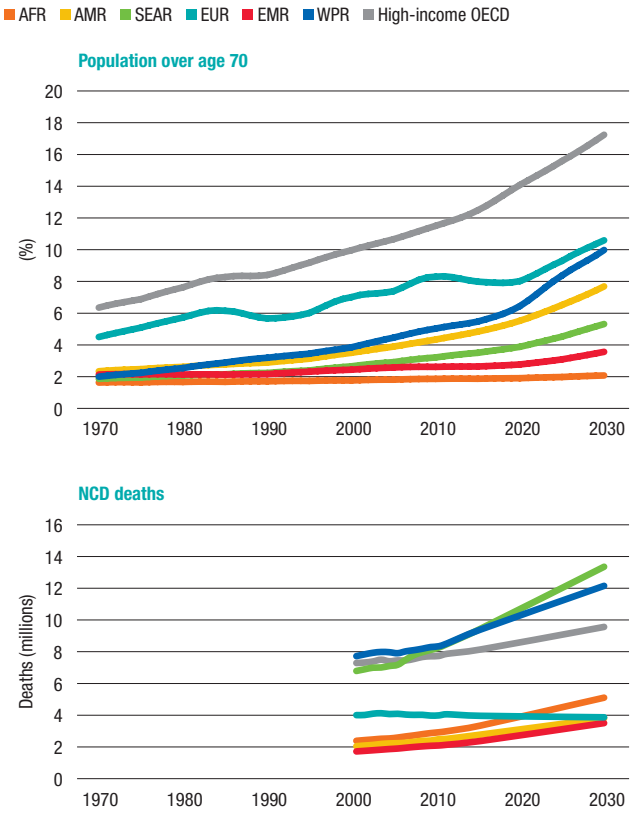


[a] Age-standardized estimates.

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, 2000–2030[25]



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 targets[41]

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 PEN[23] 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 2015[42] 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.

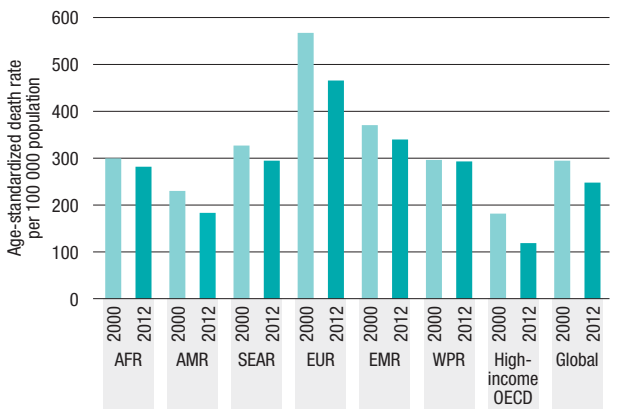
CARDIOVASCULAR DISEASES

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]

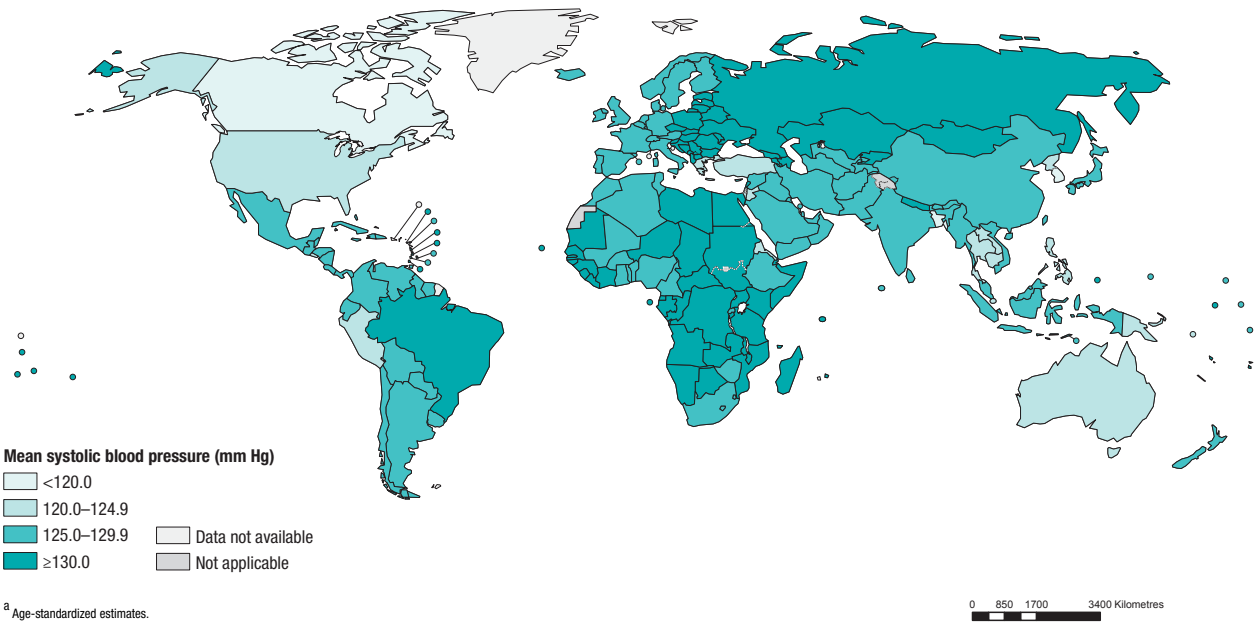
STRATEGIC PRIORITIES

The 2011 UN Political Declaration on NCDs[39] and the 2014 UN Outcome Document on NCDs[5] 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 2013–2020[3] 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] 2014[13]



[a] Age-standardized estimates.

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]

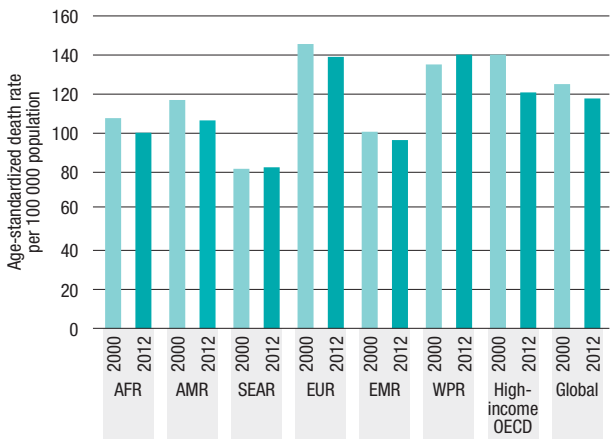
POSITIVE DEVELOPMENTS

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 directly[60] 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

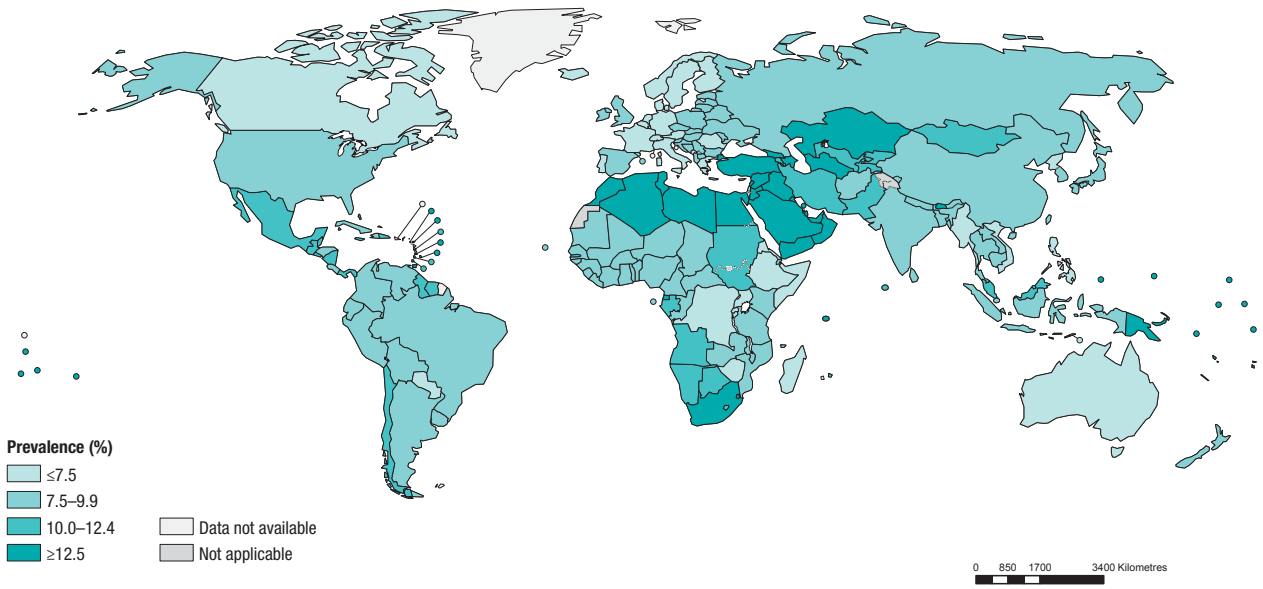
It is estimated that 9% of adults age 18 years and older has diabetes (Figure 6.10).[13] The prevalence of diabetes is highest in the Eastern Mediterranean Region (14% for both sexes) and lowest (including high-income countries) in the European Region and the Western Pacific Region (8% and 9% for both 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] 2014[113]



[a] ≥7.0 mmol/L or on medication for raised blood glucose.
[b] Age-standardized estimates.

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 NCDs[4] and the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020[3] 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.

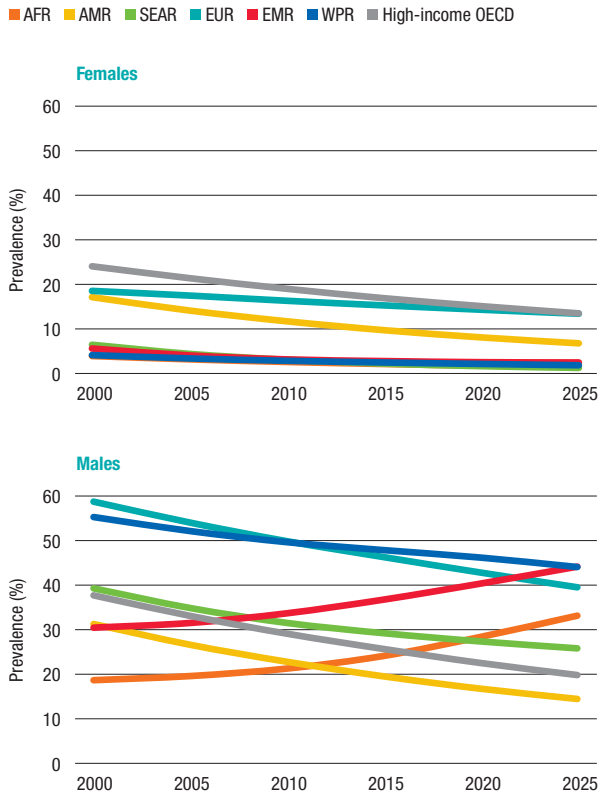
TOBACCO USE

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 use[77], 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, 2000–2025[8,80]



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

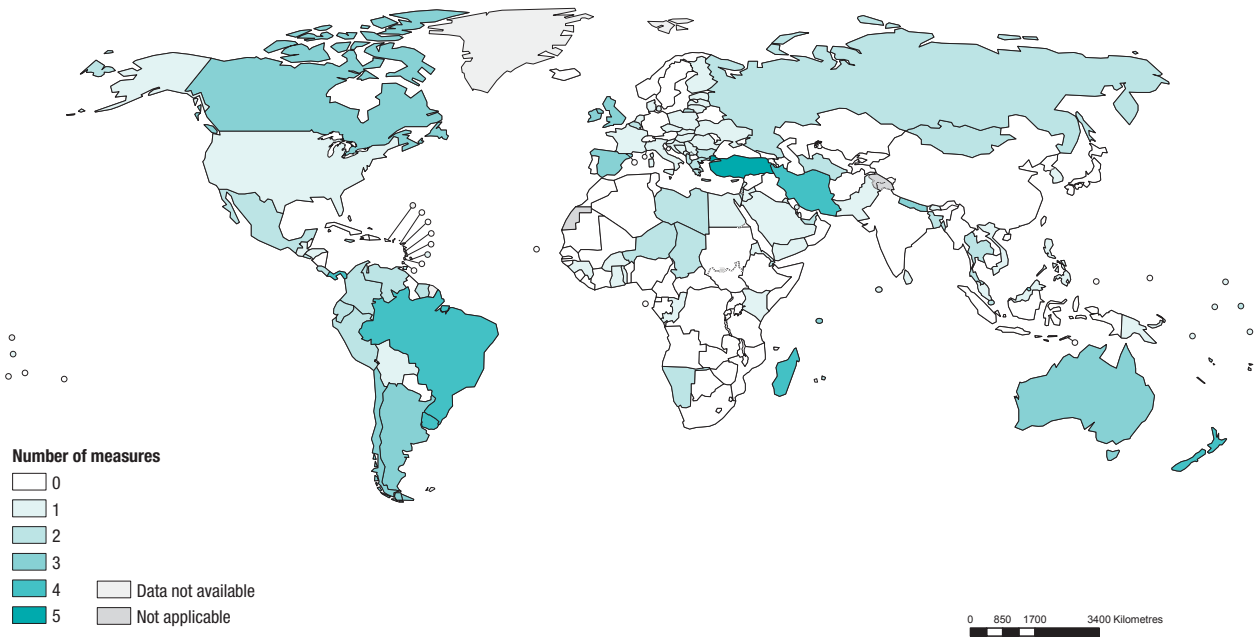
Tobacco control is a critical measure to achieve SDG Target 3.4 on reducing premature mortality due to NCD, being one of the leading risk factors for NCD. In addition, one of the health targets is specifically about tobacco control: "Strengthen the implementation of the World Health Organization Framework 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 MPOWER interventions implemented at the highest level, 2014[81]



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]

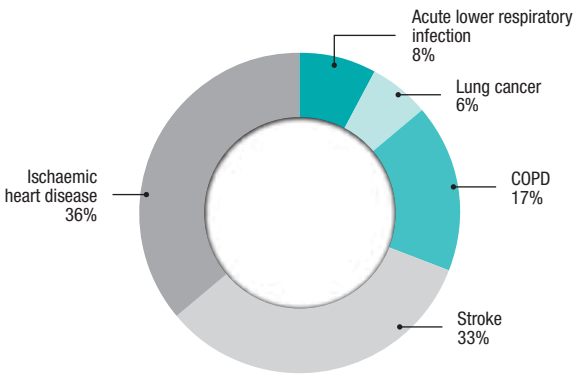
TRENDS

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]

Figure 6.13
Distribution of 7 million deaths attributable to the joint effects of household and ambient air pollution by disease, 2012[86]



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 pollution[92] and ambient air quality in cities[93] 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.

CHALLENGES

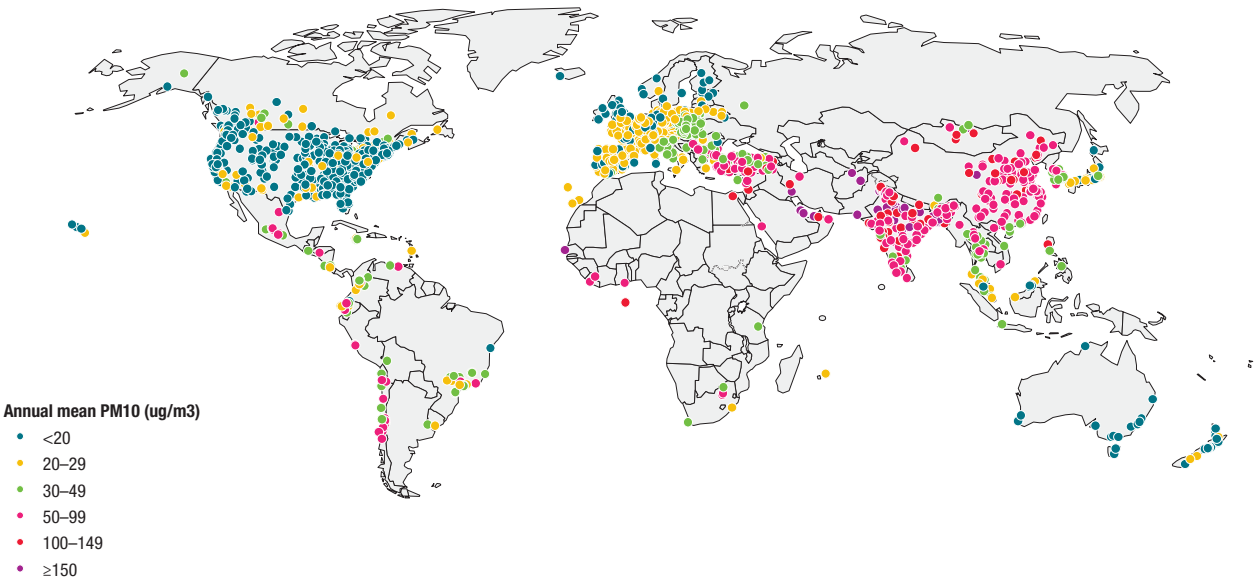
Air pollution remains a problem everywhere, but low- and middle-income countries carry the greatest air pollution burden. The following are the principal challenges to be faced.

- *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-Policies[18] 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 (SG13). 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 (PM_{10}) in 1600 urban areas,[a] 2008–2013[90]



[a] The mean annual concentration of fine suspended particles of less than 10 microns in diameters is a common measure of air pollution. The mean is an urban population – weighted average from cities with available air pollution measures.

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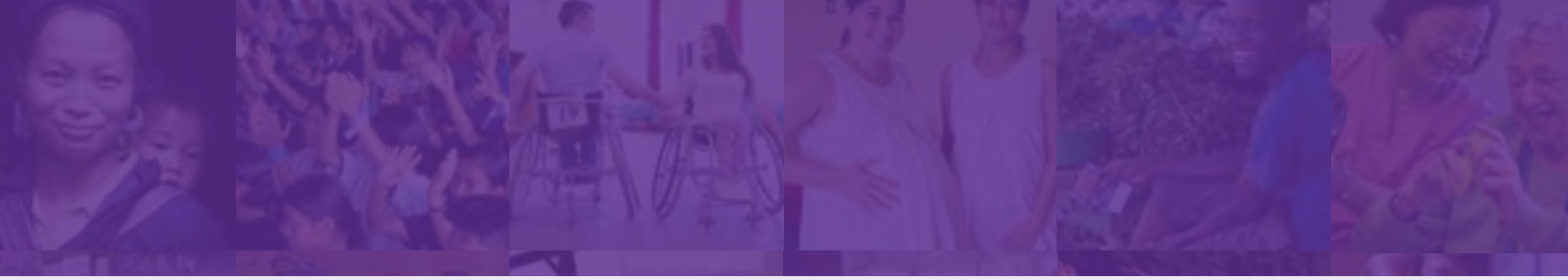
7

MENTAL HEALTH AND SUBSTANCE USE



SUMMARY

Unlike the MDGs, the SDGs include mental health and substance use disorders that, together with neurological and developmental disorders, are responsible for over 10% of the global disease burden.

SDG Target 3.4 calls for the promotion of mental health and well-being. Depression and suicide take a major toll on the health of the population. Nearly one in 10 people in the world suffer from a mental disorder. An estimated 804 000 deaths due to suicide occurred worldwide in 2012. Treatment coverage for mental disorders is very poor in many countries and significant scale-up will be required. Evidence-based guidelines for the management of depression and suicide are available, and the WHO Mental Health Action Plan 2013–2020 calls for a 20% increase in service coverage for severe mental disorders.

Dementia has become a major global health issue because it affects many people and their families (it is estimated that over 46 million people are living with dementia in 2015, a number expected to reach almost 75 million by 2030) and imposes major financial costs on societies (globally US$ 604 billion in 2010). Momentum is gathering with regard to the need to understand the causes of dementia and to develop appropriate prevention strategies and treatments. A broad public health approach is needed to improve the care and quality of life of people with dementia and family caregivers, articulated in a stand-alone dementia policy or plan, or integrated into existing health, mental health or old-age policies and plans.

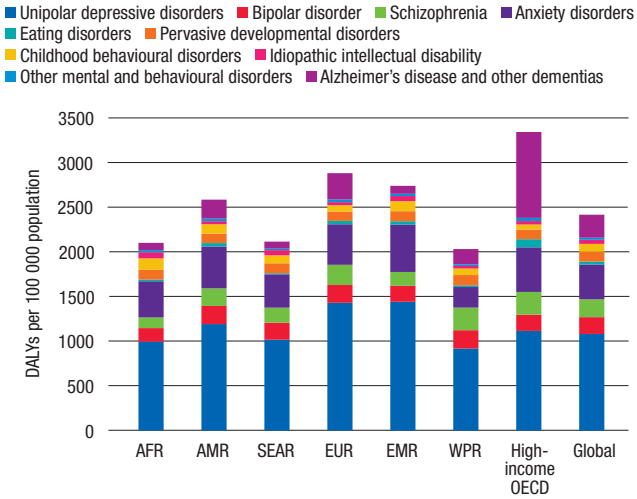
SDG Target 3.5 calls for strengthening the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol. Almost 2% of the global burden of disease is estimated to be associated with alcohol and other substance use disorders. Alcohol use is one of the major risks for NCDs and a target of reducing harmful use by 10% over the next 15 years has been set. The WHO global strategy on reducing the harmful use of alcohol calls for national policies to strengthen the public health response to harmful use and build capacity for prevention and treatment of substance use disorders and associated health conditions.

In 2013, some 27 million people worldwide suffered from drug use disorders; almost 50% injected drugs, and an estimated 1.65 million were living with HIV. Since 2006, the number of people using illicit drugs has increased by 38 million, reaching 246 million in 2013. The number of problem users has remained fairly constant at 27 million since 2008. Treatment coverage for drug use disorders continues to be low. A special session of the UN General Assembly will be held in 2016 to address the world drug problem.

Mental disorders, including dementias, are among the leading causes of disease worldwide, accounting for around 6.2% of the total disease burden as measured in DALYs.[1] The burden of mental disorders, including dementia, is highest in the high-income OECD countries, partly reflecting the higher proportion of elderly people in the population relative to other countries (Figure 7.1). Low-, middle- and non-OECD high-income countries in the Region of the Americas, the European Region, and the Eastern Mediterranean Region also carry burdens above the global DALYs average.

In terms of years of life lived with disability (YLD), mental disorders impose an even greater burden, over one fifth of YLD being due to this cause. A large proportion of mental disorders is caused by depression and anxiety and people between age 15 and 59 are most affected.

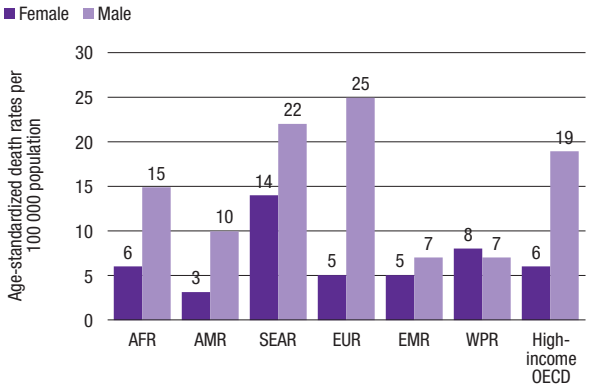
Figure 7.1
DALYs for mental disorders by region and globally, 2012[1,2]



The level of premature mortality among people living with mental disorders is more than twice that of those without mental disorders.[3] The main causes are suicide and unaddressed physical health conditions such as cardiovascular disease, aggravated by poor access to and quality of health-care services, lifestyle factors and other social determinants of health such as poverty. In 2012, there were over 800 000 estimated suicide deaths worldwide with suicide rates varying considerably by region and by sex (Figure 7.2).[4]

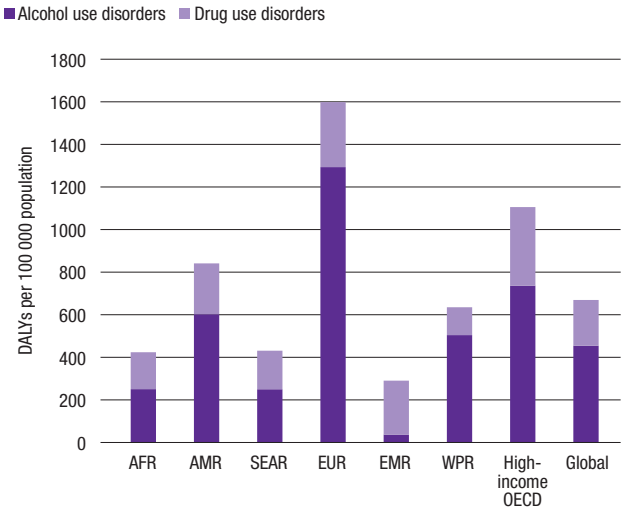
Approximately 1.8% of the worldwide disease burden is attributable to substance use disorders (1.2% to alcohol use disorders and 0.6% to drug use disorders). The burden due to substance use disorders varies considerably by region (Figure 7.3). For example, the DALY rate for the low-, middle- and non-OECD high-income countries in the European Region is five times higher than that of the Eastern Mediterranean Region, where the consumption of alcohol is banned in many countries. The disease burden peaks between ages 30 and 49, while the burden of drug use disorders occurs maximally between ages 15 and

Figure 7.2
Suicide death rates by region, 2012[1,2]



29. In both cases, the burden declines rapidly after age 50, although alcohol use disorders continue to impose a significant disease burden up to age 70 and older. Harmful use of alcohol is among the top five risk factors contributing to the global burden of disease. Alcohol-attributable disease burden, which includes but is not limited to, alcohol use disorders, amounts to 5.1% of the global burden of disease and injury. Illicit drug use continues to constitute a serious threat to public health and to people's safety and well-being – particularly that of children, young people and their families.

Figure 7.3
DALYs for substance use disorders by region and globally, 2012[1,2]

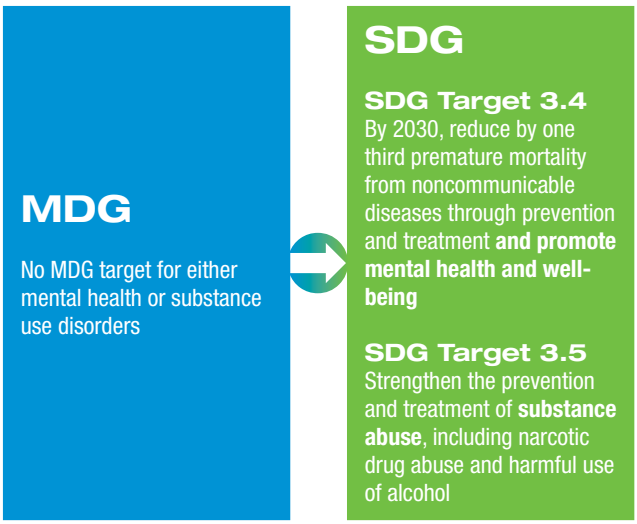


Needless to say, the burden imposed by mental and substance use disorders, goes beyond the immediate health impact of the diseases themselves, notably in terms of the responsibilities shouldered by family members in care-giving roles. Mental and substance use disorders also have an important economic impact. According to one recent study, the total economic output lost to these disorders in 2010 alone was US$ 8.5 billion worldwide, an annual sum expected to nearly double by 2030, barring a concerted response.[5] Concerning economic costs attributable to alcohol use and alcohol use disorders alone, a separate study estimated a loss equivalent to 1.3–3.3% of GDP in a range of high- and middle-income countries, with over

two thirds of the loss accounted for by lost productivity.[6] The global cost of dementia was estimated to be US$ 604 billion in 2010.[7]

Despite their significance as public health issues in all regions, mental and substance use disorders did not figure in the MDGs. The SDGs, on the other hand, address the issues as part of the broader NCD target (3.4), which calls for efforts to promote mental health and well-being, and in Target 3.5, which explicitly targets substance abuse and focuses on narcotic drugs and harmful use of alcohol (Figure 7.4). In addition, the UHC target (3.8) has clear implications for the provision of effective health promotion, illness prevention, curative, rehabilitative and palliative interventions to all people living with mental and substance use disorders.

Figure 7.4
MDG and SDG targets related to mental and substance use disorders



TRENDS

There was a 9% decrease in the estimated global number of suicides between 2000 and 2012.[1] The global age-standardized suicide rate fell by 26% over the same period, and has declined in all regions except the African Region, among men in the Eastern Mediterranean Region, excluding high-income OECD countries, and women in the high-income OECD countries.

With regard to depression, while it is known to be common, data are not adequate to provide reliable estimates of global and regional trends. Treatment coverage is low. According to an analysis of the World Mental Health Surveys, even in high-resource settings, only 50% of people living with depression get any treatment, and about 40% get treatment that would be considered to be only minimally adequate.[8,9]

The number of people living with dementia worldwide has been increasing during the past decades, linked with the rapidly ageing world population. It is estimated that there were over 46 million people living with dementia in 2015, a number that is expected to almost double every 20 years.[10] There are marked differences in the levels of the incidence of dementia between regions, with high-income countries having much higher incidence rates than low-income countries.

Data availability for alcohol use has only recently improved, and past global and regional trends are difficult to assess. In 2012, about 6% of all deaths worldwide was attributable to the consequences of alcohol consumption, with a significant proportion of those deaths being due to cardiovascular diseases and injuries. It has been estimated that 38% of the world population age 15 or older had drunk alcohol in the past 12 months, and 16% engaged in heavy episodic drinking.[11]

The estimated number of people using illicit drugs has increased by 38 million to 246 million over the period of 2006–2013, while the number of problem users, who use drugs in a high-risk manner, has remained fairly constant at 27 million since 2008. Almost half of problem users (12.2 million) injects drugs, and an estimated 1.65 million have been infected with HIV, also as a result of unsafe injection practices such as needle sharing in 2013.[12]

POSITIVE DEVELOPMENTS

A major reason for the progress in some areas has been the increasing recognition of the importance of mental health and well-being, as well as healthy lifestyles, for successful human, social and economic development. Not only has the motto of "no health without mental health" struck a chord with national health ministries and international partners, but the consequences of inaction for economic growth are now better appreciated by public policy-makers.

From the landmark 2001 World Health Report on mental health,[13] the publication of two *Lancet* series drawing attention to the fact that up to nine out of 10 people living with mental disorders do not get even basic care in many countries around the world,[14,15] to the launch of the WHO Mental Health Gap Action Programme (mhGAP)[16] and the Grand Challenges in Global Mental Health supporting new research, there has been an important sharpening of focus on mental disorders. A major milestone was reached with the development and endorsement of the WHO Mental Health Action Plan 2013–2020 by Member States.[17] Other milestones include the development and endorsement of the WHO global strategy to reduce the harmful effects of alcohol in 2010,[18] and the development and implementation of the joint WHO and United Nations Office on Drugs

and Crime (UNODC) Programme on Drug Dependence Treatment and Care (currently operational in more than 15 less-resourced countries), as well as the generation of new WHO guidelines and tools on identification and management of substance use disorders.[19,20,21,22,23]

Mental disorders were not included in the WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020 or the political declaration arising from the United Nations High-level Meeting on NCDs.[24] Their absence in these strategically important documents was a factor in the decision of a number of WHO Member States to push for the development of a dedicated WHO action plan on mental health.[17] The political declaration, however, recognized the important contribution of harmful use of alcohol as one of the four major risk factors for NCDs and the WHO Action Plan for the Prevention and Control of NCDs 2013–2020 reinforced the WHO global strategy by calling for at least a 10% reduction by 2025 in the harmful use of alcohol compared to 2010. The UN General Assembly has also passed a resolution to hold a special session on the world drug problem in 2016.

Progress is also being driven by the emerging global consensus regarding which evidence-based interventions should be singled out for prioritized scale-up, based on an analysis of their cost-effectiveness, affordability and feasibility. For example, evidence that the cost of delivering a treatment package for conditions such as depression, bipolar disorder and schizophrenia would require only a modest investment is driving the scale-up of key interventions.[25,26] Similarly, evidence regarding the effectiveness of task sharing by non-specialist health workers working with specialist mental health professionals is suggesting new approaches to health workforce capacity development.[27,28,29]

WHO has supported these trends by providing guidance regarding interventions for mental, neurological and substance use disorders in non-specialized health settings,[30] which presents a series of protocols and tools which are currently being implemented to a greater or lesser extent in over 80 countries.[31] There has also been a substantial increase in the funding of global mental health research, about US$ 50 million in the last five years alone, which has enabled the generation and dissemination of new evidence on the impact and viability of a range of intervention strategies for addressing mental disorders in low- and middle-income countries.[32,33] That national governments are also taking note is borne out by the most recent WHO Mental Health Atlas survey,[34] which shows that over two thirds of countries now have a specific policy or plan for mental health, and that over half have a stand-alone mental health law.

There has also been progress on the monitoring front, notably with regard to the epidemiology of mental disorders using common instruments for assessment and consistent analytical methods; several major multicountry initiatives are in progress.[35] These studies have provided more comparable estimates of the extent, distribution and nature of mental disorders in all regions of the world, thereby helping to define the burden better, and have also contributed to better classification of mental health conditions.[36,37,38,39]

CHALLENGES

Despite the achievements mentioned above and the factors that have contributed to the successes, several significant challenges remain.

Lack of funding: While the political will to invest in mental health continues to grow, it is still far from adequate. Public spending on mental health continues to be very low at 2% or less of total health-care spending in most low- and middle-income countries, or less than US$ 2 per capita.[35] This funding is mainly spent on inpatient care. Similarly, while development assistance for mental health increased between 2007 and 2013, both in relative and absolute terms, reaching US$ 134 million annually on average, as a proportion of overall development assistance for health it was less than 1%.[40]

Global dementia epidemic: Prevalence and incidence projections indicate that the number of people with dementia will continue to grow, particularly among the

oldest old, and countries in demographic transition will experience the greatest growth.[7] The huge cost to health systems will be just one aspect of the challenge faced. For 2010, the costs were estimated at US$ 604 billion per year[41] and costs are set to expand even faster than dementia prevalence.

Lack of quality data: Country health information systems do not routinely collect data on a core set of mental health indicators in over two thirds of countries, and are unable to provide reliable information on the extent of service coverage for even severe mental disorders.

Stigmatization: Negative attitudes to people living with mental and substance use disorders abound, both among the general public and health-care providers.[42] Such attitudes have been compounded by the lack of "objective" markers or diagnostic tests for mental illnesses, which is often interpreted as evidence for these not being "real" diseases. There is a lack of awareness and understanding of dementia in most countries, resulting in stigmatization and barriers to diagnosis and care, which negatively impact both the affected person and their families.

Lack of advocacy: The lack of strong advocacy groups, such as the civil society organization movements that have been remarkably successful for HIV, prevents mental health issues being brought to the fore.

Health workforce: The human resource challenges remain immense with regard to mental and substance use disorders, and in particular with regard to dementia. Investments are needed in training carers to recognize mental disorders, and in particular in supporting the non-specialist health-care workers that are essential for the full integration of a package of interventions in primary or general health-care settings. Developing these collaborative care models for mental disorders and dementia with shifting tasks to non-specialists with the right skills to scale up services will be a huge challenge.

Ease of access: In the particular case of alcohol use, an additional challenge relates to "profit driven disease" as policies and regulations that govern commercial interests interfere with public health objectives. The constantly changing market of illicit drugs and transit routes, along with new psychoactive substances regularly being reported, pose additional challenges in tackling this problem.[12]

STRATEGIC PRIORITIES

The way forward for mental health and substance use primarily lies in the appropriate and effective implementation of the already approved WHO Mental Health Action Plan 2013–2020 and the global strategy to reduce the harmful use of alcohol. Concerning other drug use, the 2016 United Nations special session devoted to the world drug problem is expected to provide the strategic direction and actions for the years to come.

While investment in mental health research has grown over the last five years, in making the case for mental health with regard to sustainable development, it is necessary to undertake more nuanced research and analyses of the relationship between mental health, poverty and inequality leading to the development of what has been referred to as the "political economy of mental health". The effects of poverty on mental health in settings of particular inequality need to be studied, and the impact of poverty alleviation strategies on mental health better understood.[43]

The WHO Mental Health Action Plan 2013–2020 has the following objectives and targets:

- To strengthen effective leadership and governance for mental health:
  - Target: 80% of countries will have developed or updated their policies/plans for mental health in line with international and regional human rights instruments (by 2020).
  - Target: 50% of countries will have developed or updated their laws for mental health in line with international and regional human rights instruments (by 2020).

- To provide comprehensive, integrated and responsive mental health and social care services in community-based settings:
  - Target: service coverage for severe mental disorders will have increased by 20% (by 2020).

- To implement strategies for promotion and prevention in mental health:
  - Target: 80% of countries will have at least two functioning national, multisectoral promotion and prevention programmes in mental health (by 2020).
  - Target: the rate of suicide in countries will be reduced by 10% (by 2020).

- To strengthen information systems, evidence and research for mental health:
  - Target: 80% of countries will be routinely collecting and reporting at least a core set of mental health indicators every two years through their national health and social information systems (by 2020).

A broad public health approach is needed to improve the care and quality of life of people with dementia and family caregivers. The key strategic priorities set out in "Dementia: a public health priority",[7] which was developed jointly developed by WHO and Alzheimer's Disease International are:

- promoting a dementia-friendly society;
- making dementia a national public health and social care priority worldwide;
- improving public and professional attitudes to, and understanding of, dementia;
- investing in health and social systems to improve care and services for people with dementia and their caregivers;
- increasing the priority given to dementia in the public health research agenda.

The clear recognition of the substance use issue under SDG Target 3.5 is a major step forward. The main approach to strengthen the reduction of the harmful use of alcohol and its health and social consequences will be based on implementation of the WHO global strategy to reduce the harmful effects of alcohol and its suggested policy options for national action.[18] Public health advocacy and partnerships, increased technical support and capacity-building, strengthened international activities on production and dissemination of knowledge, and mobilization and pooling of available resources to support global and national action to reduce harmful use of alcohol will form the key elements going forward to reduce the individual and societal impacts of harmful use of alcohol.

With regard to substance use (other than alcohol) and drug use disorders, action will need to be based on strengthening public health responses to the world drug problem and increasing engagement of the health sector in the prevention of non-medicinal drug use and prevention and treatment of drug use disorders. It is expected that by 2030, countries will have developed or revised their relevant national policies and programs to increase treatment coverage for substance use disorders. Key activities should include raising awareness of the disease burden due to harmful substance use and promotion of an integrated health service response to substance use disorders through primary health care and community-based specialized health and social services.[18] All this will need to be backed by a strong political commitment that will possibly be demonstrated at the planned United Nations Special Session on the world drug problem in 2016.

DEPRESSION AND SUICIDE

Mental disorders occur in all regions and cultures of the world, the most prevalent being depression and anxiety, which are estimated to affect nearly one in 10 people on the planet (676 million cases).[44] The prevalence of depression among women is substantially higher than among men.[45] At its worst, depression can lead to suicide. An estimated 804 000 suicide deaths occurred worldwide in 2012, an annual global suicide death rate of 11.4 per 100 000 population, and for every suicide there are many more suicide attempts.

TRENDS

There has been a 9% decrease in the number of global suicide deaths from 2000 to 2012, at the same time as the global population has increased.[1] The global age-standardized suicide mortality rate has fallen 26% between 2000 and 2012 and rates have fallen in all regions except in the African Region, among men in the Eastern Mediterranean Region and women in the high-income OECD countries. (Figure 7.5).

Just over 75% of all suicide deaths occur in low- and middle-income countries. Globally, among young adults between ages 15 and 29, suicide accounts for 8.5% of all deaths and is ranked as the second leading cause of death (after road traffic injuries). In high-income countries, three times as many men die of suicide than women; in low- and middle-income countries the male to female ratio is 1.5.[4]

Despite the serious health impact of mental disorders very few of the people who need treatment receive it. According to the World Mental Health Surveys,[36] even in high-resource settings only one half of those with depression get any treatment and about 40% get treatment that would be considered to be minimally adequate, while in low-income countries coverage is much lower. In Nigeria, for example, only one fifth of those with a depressive episode get any treatment and only 1 in 50 gets treatment that is minimally adequate (Figure 7.6).

The incidence and prevalence of depression and other common mental disorders peak in the middle years of adulthood, and lead to a significant loss of productive years.[39] Estimates suggest that households with people with a mental disorder have earnings that are between 16% and 33% lower than the median level of income in countries,[46] and people living with such disorders lose roughly a month every year off work.[38] Common mental disorders such as depression also frequently occur together, and at least two thirds of those with a mental disorder have at least one chronic disease.[47,48,49]

Figure 7.5
Suicide death rates by region, 2010 and 2012[1,2]

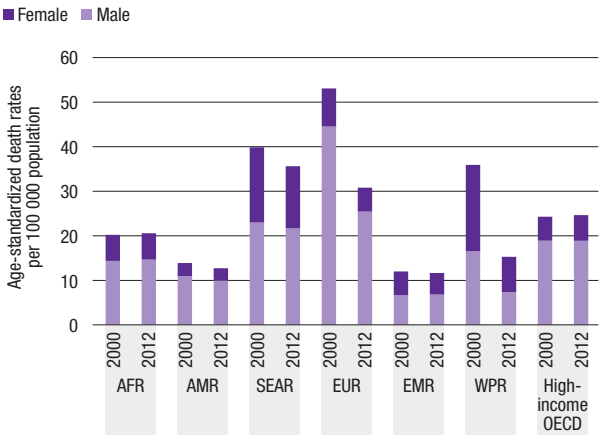
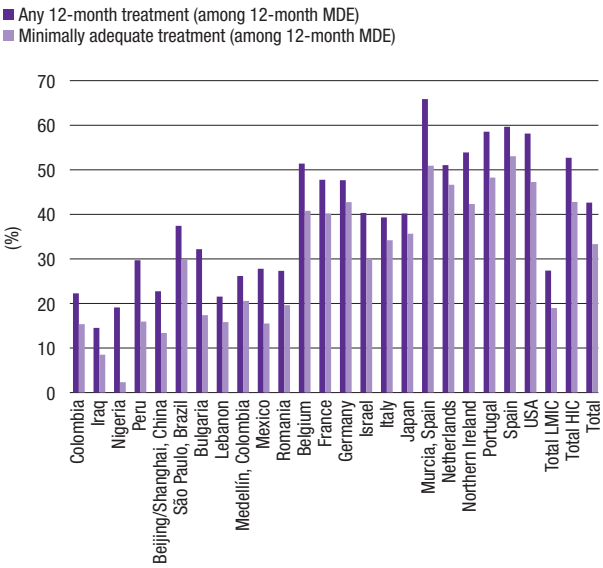


Figure 7.6
Treatment rates after 12 months for people with a major depressive episode (MDE) in the past year[35]



HIC: high-income countries; LMIC: low- and middle-income countries.

POSITIVE DEVELOPMENTS

Country actions: In the past half-century, the decriminalization of suicide in many countries has made it possible for those with suicidal behaviours to seek help, if available. Comprehensive national strategies or action plans, especially in high-income countries,[50] and, in some countries, restriction of access to means of suicide such as pesticides or legislation restricting firearm ownership have also contributed to the improvements.

Global standards: The development and dissemination of depression treatment and suicide prevention guidance as part of the mhGAP Intervention Guide, which is based on systematic reviews of the relevant international literature and is now being used in over 80 countries worldwide.[51] This includes a better understanding of strategies to prevent suicide.[52,53,54]

Advocacy and awareness: In some countries, increased rates of awareness about and treatment of depression and alcohol use disorders are aided, for example, by special articles in high-impact global periodicals and multimedia products such as "I had a black dog; his name was depression" (which has had more hits than any other WHO webpage).[55]

Research funding: Increased research funding into mental health services research, including randomized controlled trials of interventions to manage depression in resource-constrained settings.

Better treatments: New treatments have become available for depression, both for acute episodes and relapse prevention, in terms of medications and psychological interventions that are effective and produce fewer side effects.[56,57,58]

CHALLENGES

Poor detection of mental illness: Low rates of recognition of depression, both by people suffering from it and by health-care providers.

Stigma: High rates of stigma around depression and suicide, which impedes help-seeking by individuals and the development of services by health authorities. Around 25 countries still have laws or sanctions that may be applied for attempted suicide, potentially deterring people from seeking help.

Lack of preventive action: Unwillingness or difficulties in restricting access to the means of suicide (especially access to firearms, but also pesticides).

Lack of access to treatment: Many facilities in low- and middle-income countries do not have the capacity to provide basic treatment for depression, as health workers are not trained in mental health issues and medicines are not available.[34]

STRATEGIC PRIORITIES

SDG Target 3.5 aims to promote mental health and well-being. Moderate and severe depression are included within the Mental Health Action Plan 2013–2020 target to increase service coverage for people with severe mental disorders by 20% by 2020. Member States have committed to developing and providing comprehensive, integrated and responsive mental health and social services in community-based settings.[59] Suicide prevention is also an integral component of the Action Plan, with the target of reducing the rate of suicide in countries by 10% by 2020.[17] For national responses to be effective, a comprehensive multisectoral suicide prevention strategy is needed, including:

- improving coverage of mental health services and access to treatment for mental and substance use disorders, early identification and effective management of suicidal risk, as well as follow-up and community support of those who attempted suicide;
- reducing harmful use of alcohol;
- restricting access to the most common means, including pesticides, firearms and certain medications;
- responsible media reporting and social media and crisis helplines;
- public awareness programmes to raise awareness and reduce stigma;
- targeted prevention strategies for vulnerable groups.

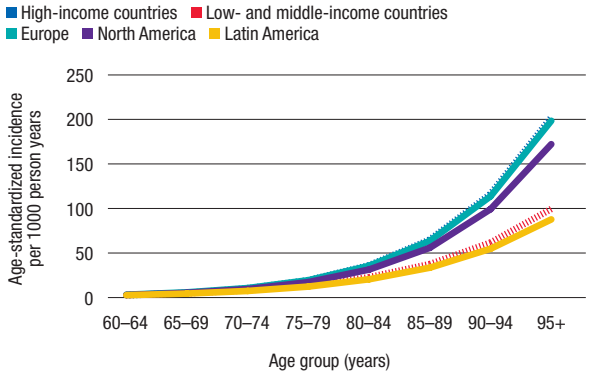
DEMENTIA

The world's population is ageing. Improvements in health care in the past century have contributed to people living longer and healthier lives. However, it has also resulted in an increase in the number of people with NCDs. Even though dementia mainly affects older people, it is not a normal part of ageing. A syndrome rather than a single illness, dementia is caused by a variety of brain illnesses that affect memory, thinking, behaviour and the ability to perform everyday activities.

TRENDS

The number of people living with dementia worldwide was estimated at 46.8 million in 2015, a number that is estimated to reach 74.7 million in 2030 and to 131.5 million by 2050.[60] The incidence of dementia increases exponentially with increasing age. A recent review concluded that the incidence of dementia doubled with every 5.9 years' increase in age, from 3.1 for every 1000 person years at age 60–64 to 175 for every 1000 person years at age 95 and over (Figure 7.7).[61] There are marked differences in the levels of the incidence of dementia between regions, with high-income countries having much higher incidence rates than low- and middle-income countries.

Figure 7.7
Incidence of dementia by age across countries[66]



POSITIVE DEVELOPMENTS

Global advocacy and awareness: Increased recognition of the importance of the issue, as exemplified by the world's first G8 dementia summit held in London in December 2013,[62] which led to increased awareness and investments in dementia research, is encouraging as was the first WHO Ministerial Conference on Global Action Against Dementia held in March 2015.[63]

Country action: The development of national dementia strategies leading to prioritization and action at the country level is also a marker of success. There is a growing movement to enhance the public understanding of dementia through advocacy campaigns such as "dementia friends".[64] These efforts are intended to provide people with more information about dementia and encourage more people to help those with dementia in the community improve their lives.

Better data: With improved efforts at harmonization and coordinated data collection efforts, there is increasing understanding of the epidemiology, burden and impact of dementia especially in low- and middle-income countries. The collaboration between research networks across the globe holds promise for generating more comparable data over time.[65]

Prevention: Recent advances in the understanding of dementia suggest that several modifiable risk factors contribute to dementia prevalence. An examination of the dietary and life style risk factors suggests that minimizing saturated and trans fats, replacing meat and dairy products with vegetables and legumes, ensuring minimal intake of vitamin B12, aerobic exercise, reducing stress and engaging in leisure activities may all reduce the risk of dementia.[66,67,68]

Setting standards: The development of clinical assessment and management guidelines for non-specialists as part of the WHO mhGAP Intervention Guide and its implementation across the world has also ensured that people with dementia get the appropriate care within primary care settings.[69]

CHALLENGES

Global dementia epidemic: Prevalence and incidence projections indicate that the number of people with dementia will continue to grow, particularly among the oldest old, and countries in demographic transition will experience the greatest growth.[7]

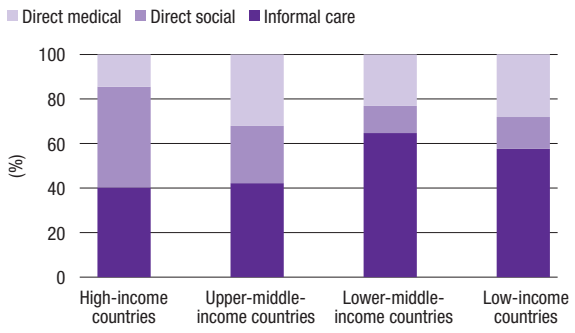
Stigmatization: There is a lack of awareness and understanding of dementia in most countries, resulting in stigmatization and barriers to diagnosis and care. For those who are living with dementia (both the person and their family) stigma contributes to social isolation and to delays in seeking diagnosis and help. Improving the awareness and understanding of dementia across all levels of society is needed to decrease discrimination and to improve the quality of life for people with dementia and their caregivers.

Lack of effective treatment: While considerable progress has been made in the understanding of the underlying mechanisms for dementia in terms of what has been called the amyloid cascade, this has not led to the development of drug treatments of substantial impact.[70] Currently available medications for dementia only provide some relief of symptoms and possibly slow down progression.[71]

Escalating cost: The huge cost of the disease will challenge health systems to deal with the predicted future increase of prevalence. The costs were estimated at US$ 604 billion per year in 2010[72] and are set to increase even more quickly than the prevalence. The costs are driven mainly by social care needs. Health-care costs account for a small proportion of the total, given the low diagnosis rate, limited therapeutic options and the underutilization of existing evidence-based interventions (Figure 7.8). In low- and middle-income countries, where nearly two thirds of people with dementia live, most of the caregiving burden is borne by informal caregivers such as family members. Going forward, it will be necessary to develop policies involving all stakeholders focused on improved health and social care services that include chronic disease management and long-term care.[7]

Lack of support for carers: Caring for dementia patients is overwhelming for caregivers. The stresses include physical, emotional and economic pressures. Caregivers require support from the health, social, financial and legal systems.

Figure 7.8
Distribution of costs of dementia by country income group, 2010[7]



STRATEGIC PRIORITIES

A broad public health approach is needed to improve the care and quality of life of people with dementia and family caregivers. The aims and objectives of the approach should either be articulated in a stand-alone dementia policy or plan or be integrated into existing health, mental health or old-age policies and plans. Some high-income countries have launched policies, plans, strategies or frameworks to respond to the impact of dementia.[7]

The principal goals for dementia care are:

- diagnosing cases early;
- optimizing physical health, cognition, activity and well-being;
- detecting and treating behavioural and psychological symptoms;
- providing information and long-term support to caregivers.

The key strategic priorities set out in "Dementia: a public health priority", which was developed jointly developed by WHO and Alzheimer's Disease International are:[7]

- promoting a dementia friendly society;
- making dementia a national public health and social care priority worldwide;
- improving public and professional attitudes to, and understanding of, dementia;
- investing in health and social systems to improve care and services for people with dementia and their caregivers;
- increasing the priority given to dementia in the public health research agenda.

SUBSTANCE USE AND SUBSTANCE USE DISORDERS

Psychoactive substance use (including alcohol and illicit drugs) is an important risk factor for poor health globally.[11,73] The use of dependence producing substances may result in development of substance use disorders. The intoxicating effects of psychoactive substances, or their toxic effects on organs and tissues, or the mode of their administration, are also contributing factors to the development of diseases, injuries and other health conditions.[12]

TRENDS

In 2012, 5.9% of all deaths worldwide was attributable to alcohol consumption with a significant proportion of alcohol-attributable deaths from cardiovascular diseases and injuries (Figure 7.9). Worldwide alcohol consumption in 2010 was 6.2 litres of pure alcohol per person age 15 or older: 38% of the world population age 15 or older had drunk alcohol in the past 12 months, and 16% engaged in heavy episodic drinking.[11] There is considerable global variation (Figure 7.10), but no clear global trend between 2005 and 2010 could be observed in alcohol per capita consumption.

It is estimated that in 2013, some 27 million people in the world suffered from drug use disorders, and almost half of them (12.2 million) injected drugs of which an estimated 1.65 million were living with HIV.[12] About 5% of the population between ages 15 and 64 used illicit drugs in 2013. Since 2006, the number of people using illicit drugs has increased by 38 million, while the number of people problem users remained fairly constant at 27 million since 2008.

Figure 7.9
Distribution of alcohol-attributable deaths, by broad cause category, 2012[11]

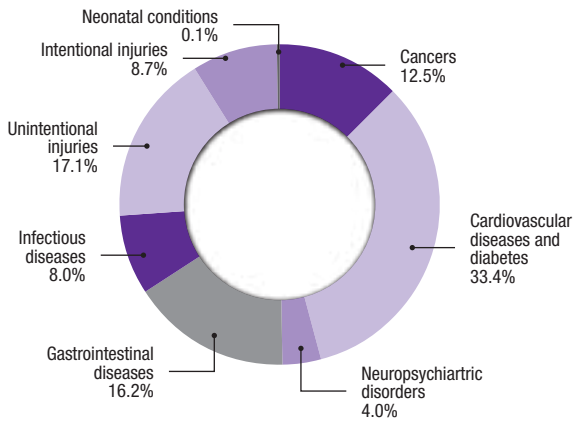
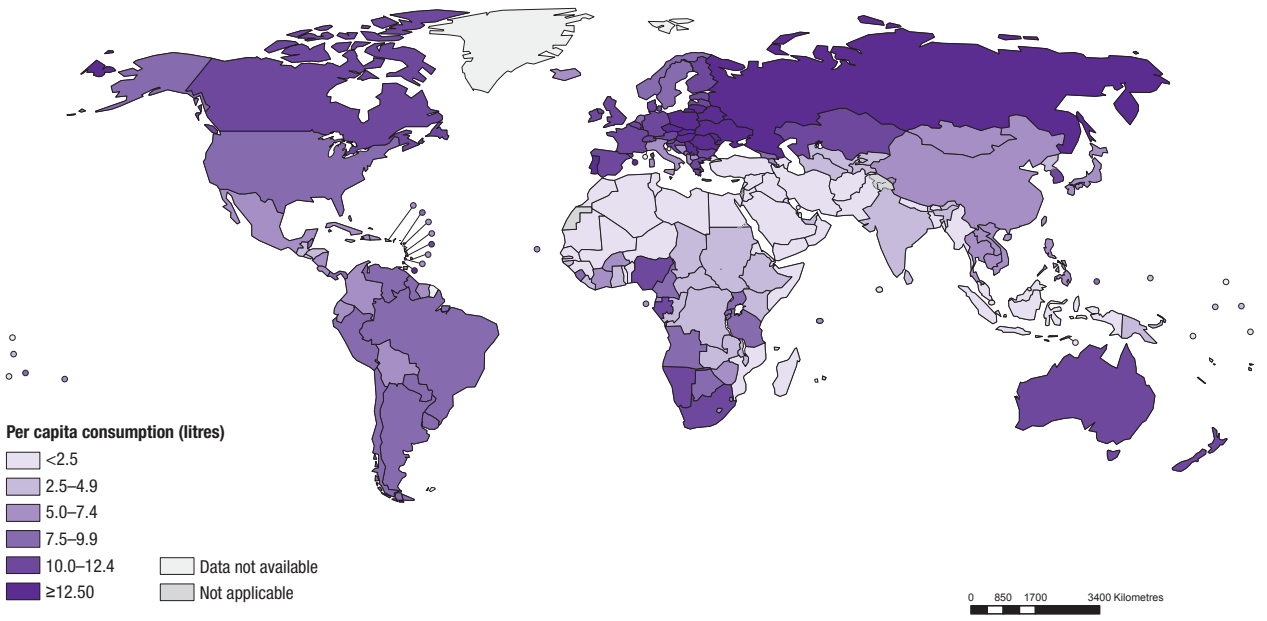


Figure 7.10
Total alcohol per capita (15+ years) consumption in litres of pure alcohol, 2010[74]



POSITIVE DEVELOPMENTS

Political will: Increasing political will, as reflected by global agreements on reducing the harmful use of alcohol and the UN General Assembly resolutions to address the drug problem globally, including the resolution to hold a special session of the UN General Assembly on the world drug problem in 2016.

Linking with the NCD agenda: Recognition of the harmful use of alcohol as a key risk factor for NCDs and endorsement of the global target of 10% relative reduction in the harmful use of alcohol by 2025 in the NCD Global Monitoring Framework.

Better data: Gradually, more data are becoming available on alcohol and illicit drug use in the world through WHO and UNODC databases and global reports, leading to increased awareness and supporting data on the impact of alcohol and drug use on population health and development.

Interagency collaboration: Within the UN system and beyond on addressing the harmful use of alcohol and the world drug problem, for instance, WHO and UNODC developed a programme on drug dependence treatment and care.[75]

CHALLENGES

Stigma and neglect: Stigmatization of substance use disorders and low priority given to these conditions in health systems in spite of the scope of preventable disease and social burden associated with psychoactive substance use.

Lack of resources and response capacity: Limited capacity of international institutions and limited investment in public health responses to substance use disorders at all levels. There is limited involvement of the public health sector in drug policy development and implementation in many countries and poor interaction between drug control and public health governmental sectors.

Data gap: Insufficient quality data on levels and patterns of substance use, especially for illicit drugs and especially in low- and middle-income countries.

Commercial interests: Interfering with public health interests with regard to policies and regulations for legally traded substances such as alcohol and prescription drugs.

Prescription drug abuse: Increased non-medical use of prescription medicines.

STRATEGIC PRIORITIES

The clear recognition of the substance use issue under SDG Target 3.5 (strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol) is a major achievement. Going forward, strategies will be based on the implementation of global policy frameworks and action plans with a focus on public health policies and health systems, including the implementation of the WHO global strategy on harmful use of alcohol. Key activities will include:

- public health advocacy and partnerships to strengthen commitment and capacity of governments and relevant parties at all levels to reduce the harmful use of alcohol worldwide;
- increased technical support and capacity-building to create, enforce and sustain the necessary policy and legal frameworks;
- strengthened international activities regarding the production and dissemination of knowledge on trends in alcohol consumption, alcohol-attributable harm and the societal responses;
- mobilization and pooling of available resources to support global and national action to reduce harmful use of alcohol in identified priority areas.

With regard to other psychoactive substance use and drug use disorders, action will be based on strengthening public health responses to the world drug problem and increasing engagement of the health sector in the prevention and treatment of substance use disorders. It is expected that by 2030 countries will have developed or revised their relevant national policies and programmes to increase treatment coverage for substance use disorders. Key activities will include:[18]

- articulating ethical and effective policy options to reduce harmful use of substances and the associated health and social consequences, while ensuring access to controlled medicines for medical purposes;
- raising awareness of the disease burden due to harmful psychoactive substance use;
- strengthening partnerships and international collaboration and information exchange;
- disseminating evidence of effectiveness and cost-effectiveness of strategies and interventions in primary prevention, early intervention, treatment, rehabilitation and social reintegration;
- providing normative guidance, technical support and capacity-building in the area of prevention and treatment of substance use disorders and associated health conditions;
- promoting an integrated health service response to substance use disorders, including primary health care and community-based specialized health and social services;
- supporting the production and dissemination of knowledge on the epidemiology of substance use and its health consequences;
- maintaining and further developing the global information system on prevention and treatment resources for substance use disorders.[76]

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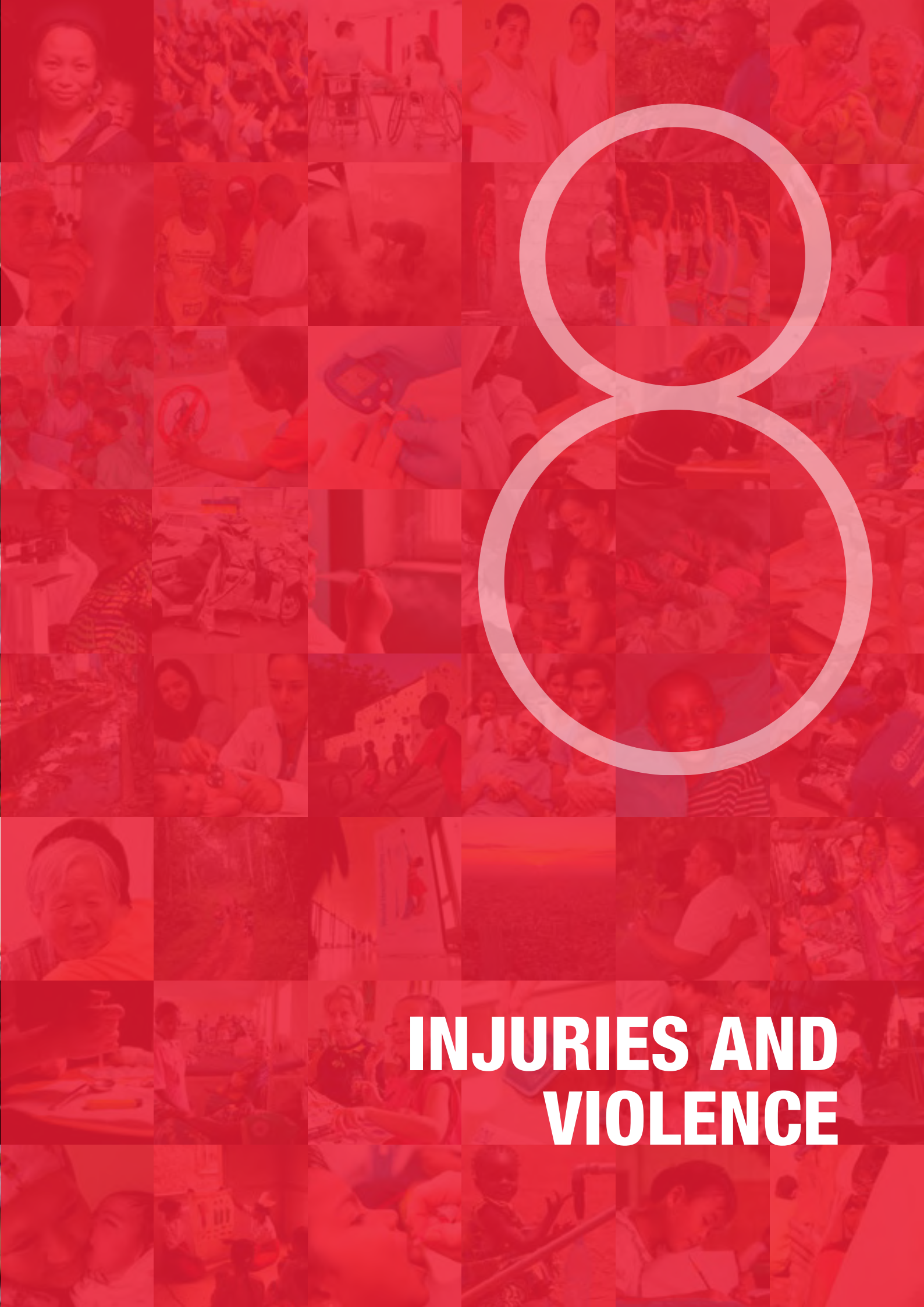


8

INJURIES AND VIOLENCE

SUMMARY

Unlike the MDGs, the SDGs include targets for reductions in injuries and violence, which are associated with more than 5 million deaths, or one in 11 deaths. This chapter focuses on road traffic injuries, violence, war and conflict, and natural disasters.

There is an explicit SDG target on road traffic deaths under the health goal and a target on access to safe transport systems which includes improving road safety. Currently about 1.25 million deaths annually are due to road traffic crashes and collisions, which is 23% higher than in 2000. The past decade has shown that implementing a range of interventions, from legislation and driver behaviour change to vehicle design, reduces the risk of injury and death due to road traffic accidents. But because of the increase in numbers of vehicles (90% increase since 2000 to over 1.5 billion and a further 47% increase expected by 2030), halting further increases in road traffic deaths will, in itself, be a major achievement. Further, major reductions in the numbers of road traffic deaths will require an extraordinary effort in all countries.

There are also 1.5 million deaths and many more nonfatal injuries due to other unintentional injuries, including falls, drowning, burns and poisonings, which should be addressed to reach the overall health SDGs.

The SDGs have four targets on reducing deaths and injuries due to violence in goals other than health. Nearly half a million people died from interpersonal violence in 2012, mostly men, with half of murders committed with firearms. Compared to the global rate, homicide rates are four times higher in the low- and middle-income countries of the Americas and more than three times lower in the low- and middle-income countries of the Western Pacific Region. Globally, homicide rates have declined by nearly 17% since 2000.

Physical or sexual violence against women, harmful practices such as child marriage and female genital mutilation, and violence against children, are common in many countries and specific SDG targets to address these issues have been set for 2030. Preventing homicide and nonfatal violence requires a multisectoral approach that addresses underlying causes, such as gender, social and economic inequalities, cultural norms that support violence, easy access and misuse of alcohol, drugs and firearms.

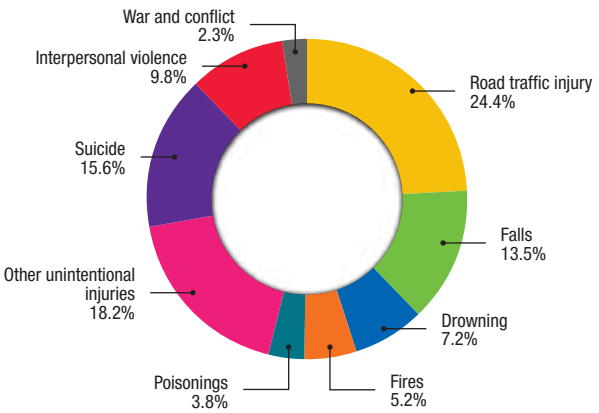
SDG 16 promotes peaceful and inclusive societies for sustainable development, which cuts across all sectors, including health. There has been a long-term decline in the number and intensity of wars and conflict since the end of the Second World War. Since 2011, however, there has been an upturn in conflict deaths, notably due to the increased level of conflict in the Middle East, putting many populations at additional health risk due to increased transmission of infectious diseases, poor nutrition and deteriorating health services, and jeopardizing global efforts to eradicate diseases such has polio.

The SDGs also include several targets that aim to reduce exposure, vulnerability, resilience and adaptive capacity in relation to disasters. Between 2000 and 2014 there were on average 865 000 deaths due to natural and technological disasters. Since 2000, three major disasters that were associated with more than 100 000 deaths have dominated the mortality trend, the Indian Ocean tsunami in 2004, the Myanmar cyclone in 2008 and the Haiti earthquake in 2010. The global numbers of forcibly displaced people as a result of persecution, conflict, generalized violence or human rights violations have reached unprecedented numbers (almost 60 million) in 2014, with further increases in 2015.

Injuries, whether sustained accidentally or as a result of intentional acts of violence, kill more than 5 million people worldwide annually, accounting for 9% of global mortality, which is nearly 1.7 times the number of fatalities that result from HIV/AIDS, tuberculosis and malaria combined. In addition, tens of millions of people suffer nonfatal injuries that require treatment and may result in temporary or permanent disability. For many injuries and some types of violence, there exist effective, evidence-based initiatives that can help reduce incidence and mitigate impact. There is thus a strong case for including injuries in the SDGs, both in terms of the burden of disease they represent and the solutions available to tackle them.

The leading cause of injury deaths is road traffic injury, followed by suicide, falls and interpersonal violence. Other important causes of injuries include drowning,[1] fires and burns, poisonings, and war and conflict (Figure 8.1). This chapter focuses on fatal and nonfatal injuries resulting from road traffic accidents, interpersonal violence, conflict and natural disasters. Injuries related to self-harm are addressed in Chapter 7, which deals with mental health disorders.

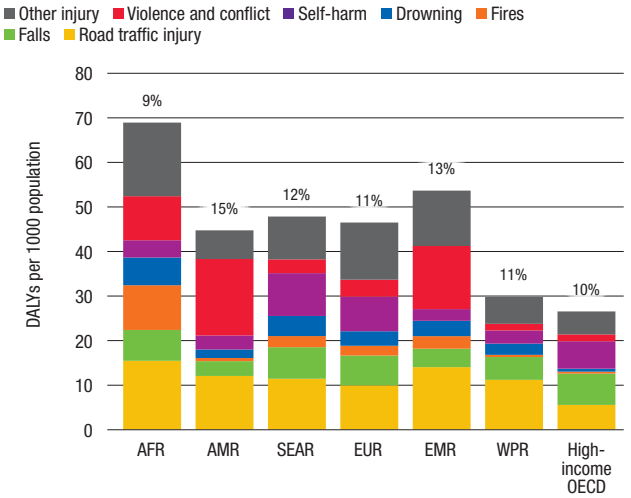
Figure 8.1
Leading causes among 5.1 million global deaths due to injuries and violence, 2012[2]



Every year, 1.25 million people die from road traffic injuries, and another 20–50 million people sustain nonfatal injuries as a result of road traffic collisions or crashes.[3] Road traffic injuries are a top 10 cause of death globally, and the leading cause of death for people age 15–29. A significant cause of suffering and death, road crashes also impose a heavy economic burden, costing more than US$ 1800 billion or 3% of GDP globally, with low- and middle-income countries losing around 5% of their GDP.[4]

Homicide and collective violence account for around 10% of global, injury-related death. In 2012, there were an estimated 475 000 murders. Four fifths of homicide victims are men, and 60% of victims, males age 15–44.[5] The low- and middle-income countries of the Region of the Americas has the most homicides, with 28.5 per 100 000 population, while the lowest murder rate, almost 14 times lower (2.1 per 100 000 population), is found in the low- and

Figure 8.2
DALYs for main external causes of injury by region,[a] 2012[2,6]



[a] Injury DALYs as a % of total DALYs for all causes is shown at the top of each bar.

middle-income countries of the Western Pacific Region. One of the main drivers of homicide rates is access to guns, with approximately half of all homicides committed with a firearm. Among women, intimate partner homicide accounts for almost 38% of all murders as compared to 6% of murders of men. While homicide grabs headlines, far more people suffer severe health consequences as a result of nonfatal assaults, often sustaining serious injuries requiring emergency care and in some cases resulting in lifelong disability.

There are substantial regional differences in injury burden (Figure 8.2). The African Region and the Eastern Mediterranean Region have the highest per capita burdens, but the Region of the Americas, excluding high-income OECD countries, has the highest injury burden as a proportion of total disease burden (15%), largely due to the very high levels of interpersonal violence and homicide.

Unlike the MDGs, the SDGs have several targets for injuries and violence , including an explicit target for road traffic deaths in the health goal (Target 3.6: "By 2020, halve the number of global deaths and injuries from road traffic accidents") and Target 11.2 regarding access to safe, affordable, accessible and sustainable transport systems for all and improving road safety. The four SDG targets addressing the issue of interpersonal violence range from loosely defined targets (Target 16.1: Significantly reduce all forms of violence and related death rates everywhere) to specific targets on elimination of violence against all women and girls (Target 5.2, discussed in Chapter 4), elimination of harmful practices such as child marriage and female genital mutilation (Target 5.3, discussed in Chapter 4) and violence against children (Target 16.2).

Four fifths of deaths from homicide, and nine tenths of deaths from war impact men.[7] That said, there is clearly a case for highlighting violence experienced by women and children, which is often hidden, stigmatized and

perpetrated by someone known to the victim. For example, based on data from 79 countries and two territories, one in three women worldwide have experienced physical and or sexual violence by an intimate partner or sexual violence by perpetrators other than partners.[8] This form of violence appears to be common in all regions. With regard to children, physical violence and abuse is experienced by both boys and girls. One quarter of all adults report having been physically abused as children, and around 20% of women and 5–10% of men report having been sexually abused as a child.[5] Older people are also victims of violence, as indicated by some studies reporting that 6% of older adults report abuse in the past month. However, data are limited on the prevalence of elder abuse, particularly from low- and middle-income countries.[9]

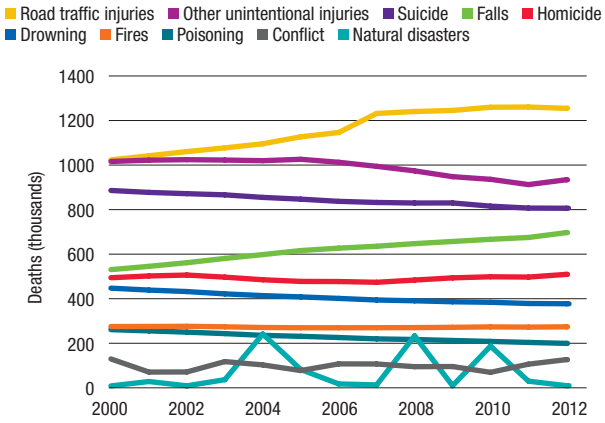
Natural disasters were not mentioned in the MDGs, but are referred to several times in the SDGs (Targets 1.5, 3.d, 11.5 and 13.1). As part of the goal on cities and human settlements, Target 11.5 states: "By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations." Target 13.1 refers to climate-related disasters: "Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries".

Annually, there were an average 656 reported disasters and 86 500 deaths during 2000–2014, excluding epidemics.[10] Overall, the largest numbers of deaths are associated with earthquakes and tsunamis, but storms also take a heavy toll. The economic losses of disasters vary considerably and, in absolute terms, are usually much higher in high-income countries. However, expressed as a percentage of GDP, the direct economic losses from natural disasters in low-income countries between 1980 and 2011 were found to be more than 14 times higher than in high-income countries.

TRENDS

Globally, mortality rates due to all major cause groups of injuries have fallen since 2000, but, because the world population is growing, this has not translated into fewer annual deaths (Figure 8.3). Since 2000, global road traffic deaths have increased by 23%, and are currently running at an annual rate of about 1.25 million deaths.[2] Recent estimates suggest a lower rise of 13% over the period 2000–2013.[3] One of the main drivers of this trend is the increase in traffic, the number of registered vehicles having grown by 90% since 2000. It is encouraging to note, however, that the mortality rate has remained fairly flat in recent years, despite the increase in traffic.

Figure 8.3
Trends in global deaths due to main external causes of injury, 2000–2012[4]



During 2000–2012, homicide rates are estimated to have dropped by almost 17% globally and by an impressive 39% in high-income countries. In the low- and middle-income countries of the European Region, homicide rates have seen an even steeper decline, falling by more than 50% since 2000. In other low- and middle-income countries, progress has been less pronounced, the rate falling 13% in middle-income countries and 10% in low-income countries.[5] Whether this decline is fully reflected in broader violence statistics is unclear.

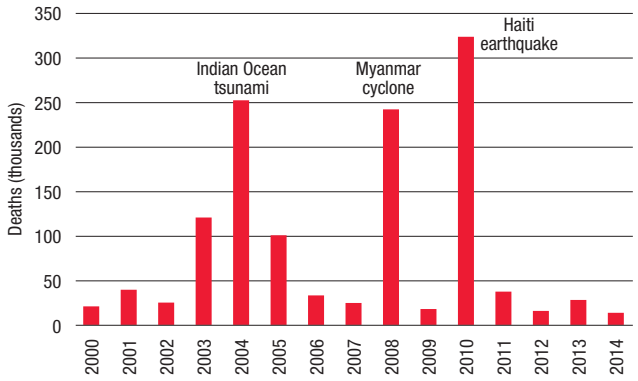
It is not yet possible to establish global or regional trends for the incidence of violence against women and children

due to limited data. However, the surveys that have been undertaken – usually collecting data from adults on past violence and abuse – often show very high rates.

WHO estimates of global direct conflict deaths (injury deaths) vary substantially by year, but there has been a statistically significant decline during 1990–2010 of 2% per year, if the Rwandan genocide of 1994 is excluded. There has also been a long-term decline in the number and intensity of wars and conflict since the end of the Second World War.[11,12] Since 2011, however, there has been an upturn in conflict deaths, notably due to the increased level of conflict in the Middle East.[13]

According to estimates of mortality directly associated with disasters produced by the Centre for Research on Epidemiology of Disasters (CRED), during 2000–2014, an annual average of about 86 500 people were killed by natural and technological disasters.[11] Since 2000, three major natural disasters that were associated with more than 100 000 deaths have dominated the picture: the Indian Ocean tsunami in 2004; the Myanmar cyclone in 2008; and the Haiti earthquake in 2010 (Figure 8.4). The number of disasters has been declining in the last decade and the number of people affected reached its lowest levels since 2000 in 2012 and 2013.

Figure 8.4
Number of people reported killed in disasters, 2000–2014[11]



POSITIVE DEVELOPMENTS

Mortality due to road traffic injuries has remained fairly flat, despite the increases in numbers of vehicles and population, suggesting that interventions to improve global road safety are working. Given the existence of well-established road safety interventions, the prospects for mitigating the damage done by cars, trucks and motorcycles are good. No fewer than 76 countries[3] have already reduced the number of deaths on their roads during 2000–2013, demonstrating that improvement is possible, and that many more lives could be saved.

Several factors have contributed to these positive trends:

- *Effective, enforceable legislation*: The introduction of enforceable legislation, coupled with social marketing, regarding speed, seat belts and child restraints, motorcycle helmets, and drinking and driving has already made a difference in a number of countries.

- *Safer roads*: The same is true of improvements in the construction of new roads, with increased emphasis on the needs of vulnerable road users, including pedestrians, motorcyclists and cyclists.

- *Safer vehicles*: Vehicles too have been made much safer and continuing improvements in vehicle design and safety, such as strengthened front-end design, air bags and computerized braking systems, will be essential components of any post-2015 campaign to bring about a drop in road traffic injuries and deaths.

Drops in homicide may be associated with improvements in country policies and strategies to reduce violence and its consequences. Roughly one third of countries are currently implementing such strategies, including support for safe, stable and nurturing relationships between children and parents or caregivers, reducing the availability and harmful use of alcohol, reducing access to guns, and knives, and promoting gender equality.[14] It is, however, unknown to

what extent these strategies have been a factor in the estimated decrease in the homicide rate.

During 2005–2015, the Hyogo Framework for Action 2005–2015[15] promoted a strategic and systematic approach to reducing disaster risks, and underscored the need for building the resilience of nations and communities to disasters. The Hyogo Framework was instrumental in stimulating countries, development partners and other agencies to take action to reduce disaster risk, and may have helped decrease mortality rates in the case of some hazards, such as floods, for example, which, despite increasing frequency, are killing fewer people. Many countries (85%) have a national emergency preparedness and response policy and two thirds of countries have a policy in place for health sector emergency preparedness and response.[16]

CHALLENGES

Increase in vehicles: Based on current trends, and unless urgent action is taken, road traffic death is expected to rise on the list of leading causes of death. The main challenge is to bring road traffic deaths down at a time of rapidly increasing motorization, especially in low- and middle-income countries. A matter of particular concern is the rapid increase in traffic volume without a concomitant investment in road safety strategies.

Access to guns: One of the main drivers of homicide incidence is access to guns, approximately half of all homicides being committed with a firearm. It appears unlikely that access to firearms will decline in the coming years in most countries.

Gender inequality: Violence against women and children is embedded in gender inequality and discrimination against women and girls. Increased and sustained efforts are needed to bring about changes in gender norms to: (i) empower women and girls, notably through improved access to education and safe, adequately remunerated employment; ii) mobilize communities and institutions to reduce the acceptability of violence, promote egalitarian gender norms and (iii) reform and effectively enforce laws to address sexual violence and intimate partner violence against women, as well as other laws that limit women's rights regarding marriage, divorce, child custody and property and inheritance.

Increasing risks for some types of disasters: Natural hazards such as hydrometeorological disasters may increase in frequency and intensity as a result of climate change, significantly impeding progress towards sustainable development (see Chapter 2). These risks may be exacerbated by population growth and unsustainable use of natural resources.

Disabilities: Millions of people who do not die as a result of injuries and violence suffer serious injuries and, in some cases, lifelong disabilities as well as mental trauma. Greater investment for the prevention, treatment and rehabilitation of functioning loss due to injuries is critical.

Other injuries – falls: The SDGs focus on road traffic injury and violence, but other key injury areas are also of concern. An estimated 693 000 fatal falls occurred in 2012, making it the second leading cause of unintentional injury death, after road traffic injuries. There are also tens of millions of falls that, while not fatal, are severe enough to require medical attention. Older people who suffer falls are also at risk for subsequent long-term care and institutionalization.

Other injuries – burns: Fire-related injuries are another concern, with the majority occurring in low- and middle-income countries. They are often associated with unsafe cooking methods, including cooking with open fires, and with violence against women. Women and children are particularly at risk. Largely preventable, in high-income OECD countries burns have been reduced to almost negligible levels.

Other injuries – drowning: An estimated 372 000 people died from drowning in 2012, and over half of the world's drowning occurs in the South-East Asia Region and the Western Pacific Region. Many deaths due to drowning could be averted by barriers to control access to water, ensuring constant adult supervision for preschool children, teaching school children basic swimming and safe rescue skills as well as improving flood risk reduction strategies.

Conflict: As noted in the SDG declaration spiralling conflict, violent extremism, terrorism and related humanitarian crises and forced displacement of people threaten to reverse much of the development progress made in recent decades. It will be a major challenge to reverse current trends and provide more effective support to conflict and post-conflict countries in all sectors including health.

STRATEGIC PRIORITIES

Given the complexity of the determinants of injuries and violence, establishing development targets that are both simple and compelling enough to focus attention, but also specific enough to facilitate the drawing up and implementation of effective policy, is fraught with difficulty. However, certain targets look promising. Road traffic deaths, for instance, are an example of a specific target that is relevant to all countries, a serious problem that is easily defined and measured, while also being something that we can make progress on, using well-established, evidence-based interventions. The target of halving the global number of road traffic deaths by 2020 is much more ambitious than the target set at the Decade of Action for Road Safety 2011–2020, which was endorsed by the UN General Assembly in 2010,

aiming to stop the predicted increase at about current levels.[17] Given the projected increase in road vehicles (47% by 2030), it will be a substantial achievement to hold global road traffic deaths to the current level, let alone achieve a decrease. The key strategies are to roll out and implement effective behaviour change interventions such as legislation, enforcement and social marketing; improve road infrastructure, bearing in mind vulnerable road users; and encourage the uptake of good vehicle design measures.

Reducing interpersonal violence, particularly against women and children, is also a priority with considerable global support, notably among UN agencies, including the UN General Assembly, the UNESCO, the United Nations Development Programme (UNDP), the UNICEF, United Nations Entity for Gender Equality and Women's Empowerment (UN Women) and WHO. In 2014, the World Health Assembly drew attention to the important role of health systems in addressing violence, in particular against women and girls and against children, and called upon the WHO Director-General to develop a global plan of action to strengthen the role of the health system in addressing interpersonal violence.[18]

The global violence prevention field's vision for the post-2015 era is one of cutting worldwide levels of interpersonal violence by half within the next 30 years.[19,20] While not as ambitious as the SDG targets, which aim to eliminate several forms of violence in the next 15 years, this vision aligns well with SDGs 5 and 16 that explicitly target violence reduction. A 15-year global plan of action on strengthening the role of the health sector in addressing interpersonal violence, in particular against women and children, will be considered by WHO Member States at the May 2016 World Health Assembly.

To date, few countries have implemented the social, economic and educational policy measures needed to address important risk factors for violence. This is a particular matter of concern in regard to violence against women, which is an issue for all regions and countries, and is worse in settings where familial violence against women and against children is considered socially acceptable. As noted above, access to guns is another major concern, and while nearly all countries have national laws to regulate firearm possession and use, there is wide variation in the adequacy and enforcement of these laws.

The SDGs provide a framework for the focus on preventing conflict and more effective assistance to conflict and post-conflict countries. Better integration of humanitarian and development assistance is essential. Health will have to continue and strengthen working closely with other sectors to reduce the impact of conflict on people's health and

well-being. In each area of concern, from intimate partner and other family violence, sexual violence to human trafficking, policy responses and effective interventions already exist. The SDGs are an important opportunity to steer decision-makers towards them, as part of global, regional and country efforts to address these pressing issues.

The main strategy for managing the health risks associated with disasters in the post-2015 era is supported by the Sendai Framework for Disaster Risk Reduction 2015–2030.[21] The Framework identifies four priorities for action that involve national, regional and global participation:

1. Understanding disaster risk: in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics, and the environment.

2. Strengthening disaster risk governance to manage disaster risk: for prevention, mitigation, preparedness, response, recovery and rehabilitation.

3. Investing in disaster risk reduction for resilience: for the enhancement of the economic, social, health and cultural resilience of people, communities, countries and their assets as well as the environment.

4. Enhancing disaster preparedness for effective response and to "build back better" in recovery, rehabilitation and reconstruction.

WHO's Six-year Strategic Plan to Minimize the Health Impact of Emergencies and Disasters 2014–2019 outlines the policies and programmatic implications for the health sector.[22] Effective emergency and disaster risk management health policies and programmes should be guided by a comprehensive approach across the emergency management cycle: prevention/mitigation; preparedness; response and recovery. Policies and programmes should also be designed to address common issues and build essential capacities in an "all-hazard approach", supplemented by hazard-specific elements such as outbreaks, floods, earthquakes, radiological hazards and conflict.

While the health sector will lead in managing the risk of infectious diseases (chapters 3 and 5), for most types of hazards and events other sectors will play a key role. Intersectoral collaboration is thus crucial to building health security capacity. It should also be remembered that community members are central to effective emergency and disaster risk management, as they are the primary responders – and victims – of any emergency. The resilience of communities can be strengthened by helping them identify relevant hazards and vulnerabilities, and by building their capacities to mitigate, prepare for, respond to and recover from emergencies.

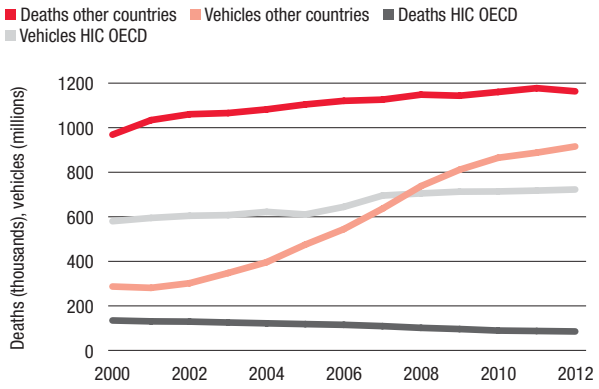
ROAD TRAFFIC INJURIES

Every year, approximately 1.25 million people die, and another 20–50 million people sustain nonfatal injuries, as a result of road traffic collisions. Road traffic injuries are the ninth leading cause of death globally, and the leading cause of death for people age 15–29.[3] Almost 60% of road traffic deaths are among people age 15–44. Based on current trends, and unless urgent action is taken, road traffic deaths will become the fifth leading cause of death by 2030.

TRENDS

While the number of registered vehicles increased by no less than 90% between 2000 and 2012,[3] the increase in numbers of deaths due to road traffic injuries was much less dramatic (Figure 8.5), suggesting that interventions to improve global road safety have had some impact on mortality statistics. Indeed, 76 countries[3] reduced the number of deaths on their roads between 2000 and 2013, showing that improvements are possible, and that many more lives could be saved if countries took further action.

Figure 8.5
Trends in road traffic deaths and vehicle numbers, high-income OECD countries and other countries[a], 2000–2012[3]



[a] Other countries refer to low-, middle- and non-OECD high-income countries.

POSITIVE DEVELOPMENTS

There are positive developments for several interventions from legislation to vehicle design that contribute to positive trends, such as:[3]

- *Comprehensive legislation*: While considerable effort is still needed to bring legislation into line with best practice, progress is being made. Between 2011 and 2014, 17 countries, representing 409 million people; amended their road safety laws on one or more behaviour risk factors to make them comprehensive. Criteria used to assess comprehensive legislation are being refined and made stricter as the epidemiological evidence relating to particular risk factors evolves.
- *Speed limit laws*: 26% of countries have adopted comprehensive urban speed laws.
- *Comprehensive seat belt laws*: Covering occupants in both front and rear seats; 58% of countries have passed this kind of legislation.
- *Drinking and driving laws*: Almost 20% of countries have such laws in place, based on blood alcohol concentration, with a limit of 0.05 g/dl or less for the general population 0.02 g/dl for young drivers, which is in line with best practice.
- *Motorcycle helmet laws*: Comprehensive laws are in place in a quarter of countries.
- *Child restraints*: A third of all countries have comprehensive laws for child restraints.
- *Attention to all road users*: Increased attention to the needs of all road users when constructing new roads, with increased emphasis on the needs of vulnerable road users (pedestrians, cyclists and motorcyclists). Safety ratings are available that rate roads according to different categories of road users.
- *Vehicle safety*: Continuing improvements in vehicle design and safety, such as strengthened front-end design, electronic stability control, ensuring seat belt fixture and anchorage points. These offer huge potential to reduce the likelihood of crashes and the severity of injury from road crashes.

CHALLENGES

Elevated mortality rates in low-, middle- and non-OECD high-income countries: Over 90% of road traffic deaths occur in low-, middle- and non-OECD high-income countries, which account for 85% of the world's population, but only 56% of the world's registered vehicles. Several factors are at work, including: poor or poorly implemented regulations; inadequate road and vehicle quality; a higher proportion of vulnerable road users; and increasing vehicle numbers.

Increasing road traffic death rates in some regions: This is partly attributable to the rapid rate of motorization in many developing countries that has occurred without a concomitant investment in road safety strategies (Figure 8.6).

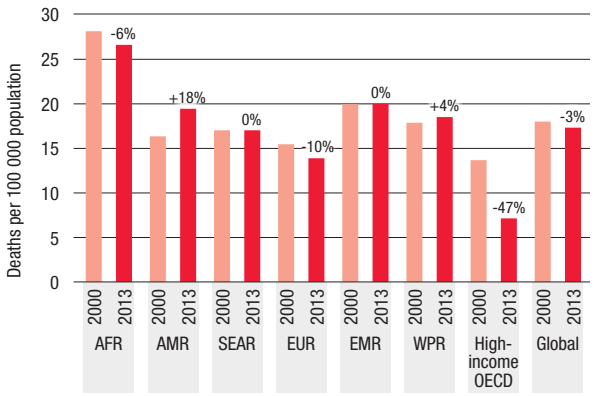
High mortality among younger adult men: More than one third of all road traffic deaths are among men age 15–44, the group that is often least likely to pay attention to public health messages (Figure 8.7).

Vulnerable road users: Half of the world's road traffic deaths occur among motorcyclists (23%), pedestrians (22%) and cyclists (4%). In most low- and middle-income countries, a much higher proportion of road users are pedestrians, cyclists and users of motorized two- or three-wheeled vehicles than in high-income countries.

Lack of legislation meeting best practice on key behavioural risk factors: As indicated above, many countries lag behind on adopting best practice legislation relating to speed and drink-driving, and the use of motorcycle helmets, seat belts and child restraints.

Lack of law enforcement: While an increasing number of countries have enacted laws relating to key risk factors for road traffic injuries, in the vast majority of countries the enforcement is lacking. For example, only one quarter of countries rate their enforcement of seat belt laws as good.

Figure 8.6
Trends in road traffic death rates by region and globally,[a] 2000–2013[3,6]



[a] % change during the period is shown at the top of each region.

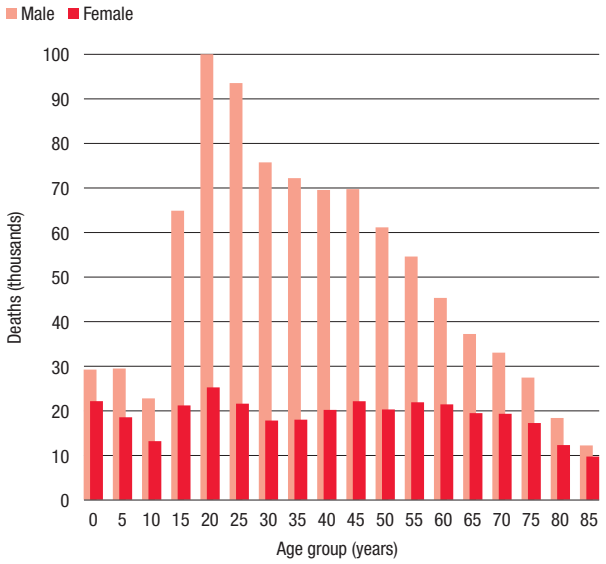
STRATEGIC PRIORITIES

SDG Target 3.6 aims to halve the global number of road traffic deaths by 2020. This is much more ambitious than the target set at the Decade of Action for Road Safety 2011–2020, which was endorsed by the UN General Assembly in 2010, aiming to stop the predicted increase at about current levels.[17] Given the projected increase in road vehicles (47% by 2030), it will be a substantial achievement to hold global road traffic deaths to the current level, let alone achieve a decrease.

If current trends continue, and nothing is done to address the various challenges faced, then global road traffic deaths may increase to around 1.5 million per year. Under an optimistic scenario, where increases in vehicles per capita are associated with fatality rates falling to those observed in high-income countries over the last two decades, global deaths will decrease to around 1 million per year by 2030. Substantial additional efforts will be required to make progress towards the SDG target of 625 000. There is a strong evidence base on the kinds of interventions and government actions that are effective; the key is to ensure their implementation. The most recent UN General Assembly resolution,[23] which acknowledges the coordinating role of WHO for the UN system, and the Decade of Action for Road Safety 2011–2020 outline the strategic priorities for making progress towards the SDG targets on road safety as the following:

- *Enacting and enforcing comprehensive legislation on key risk factors*: Laws to address speeding and drink-driving and to ensure the use of motorcycle helmets, seat belts and child restraints need to be enacted and enforced, supported by government commitment and funding.
- *Making road infrastructure safer for pedestrians and cyclists*: The needs of road users must be taken into consideration in road safety policy, transport planning and land use. In particular, governments need to consider how non-motorized forms of transport can be integrated into more sustainable and safer transport systems.
- *Improving vehicle standards*: Governments should focus on ensuring that vehicles in circulation are well maintained and meet international standards, including crash-testing standards.
- *Improving post crash care*: The way victims of road traffic crashes are dealt with following a crash determines their chances and quality of survival. Prompt communication and activation of the response system, prompt response and effective assessment, treatment and transport of injured people to formal health-care facilities (where necessary) are essential.

Figure 8.7
Global road traffic deaths by age and sex, 2012[2]



VIOLENCE AND HOMICIDE

There were an estimated 475 000 deaths globally in 2012 as a result of interpersonal violence (homicide).[5] Four out of five homicide deaths were men, most of them age 15–44, which makes homicide the third leading cause of death in this age group. Globally, as many as 38% of homicides occurring in women are committed by their male partners; by comparison, only 6% of homicides in men are committed by their female partners.[5,24] There is very large variation in homicide rates between regions.

Victims of nonfatal violence far outnumber victims of homicide. While young to middle-aged men generally experience higher rates of nonfatal violence than others, women, children and elderly people also suffer from the nonfatal consequences of physical violence and sexual and psychological abuse. Nearly one quarter of all adults report having been physically abused as children, while 18% of women report having been sexually abused as children.[5] Violence against women is all too common and takes many forms, including violence committed by an intimate partner, sexual violence by any perpetrator, trafficking for purposes of sex, murders in the name of honour or dowry, and early child and forced marriage (see also Chapter 4). About one in three women report having been a victim of physical or sexual violence by an intimate partner at some point in their lives.[25]

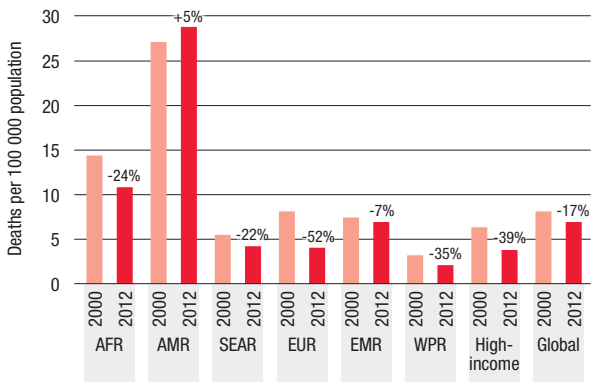
TRENDS

During 2000–2012, there has been a marked decline in homicide rates (Figure 8.8), which are estimated to have fallen by around 17% globally (from 8.0 to 6.7 per 100 000 population), and by an impressive 39% in high-income countries (from 6.2 to 3.8 per 100 000 population). In the low- and middle-income countries of the European Region, homicide rates have seen an even steeper decline, falling by more than one half since 2000. In several other regions, modest declines were observed with the exception of the low- and middle-income countries of the Region of the Americas, where homicide rates continue to be very high.

The differences in levels between regions are striking. The low- and middle-income countries of the Region of the Americas has 28.5 homicides per 100 000 population. This is four times higher than the global average and almost 14 times higher than in the low- and middle-income countries in the low- and middle-income countries of the Western Pacific Region, where murders occur at a rate of 2.1 per 100 000 population per year. Organized criminal violence and violence related to illicit drugs have been important contributors to rising homicide rates in some countries of Latin and Central America.[12]

Globally, approximately half of homicides are committed with a firearm, but murder methods vary markedly by region. For example, firearm homicides account for 75% of all homicides in the low- and middle-income countries of the Region of the Americas, but only 23% in the low- and middle-income countries of the Western Pacific Region.

Figure 8.8
Trends in homicide rates by region and globally,[a] 2000–2012[5]



[a] % change during the period is shown at the top of each bar.

POSITIVE DEVELOPMENTS

Roughly one third of countries are undertaking steps to implement promising strategies to reduce violence, including:[14]

- increasing safe, stable and nurturing relationships between children and their parents and caregivers;
- developing life skills in children and adolescents;
- reducing availability and harmful use of alcohol;
- reducing access to guns, knives and poisons (particularly pesticides);
- promoting gender equality and the empowerment of women;
- changing cultural norms that support violence;
- victim identification, care and support;
- identification and prosecution of perpetrators in order to reduce the "culture of impunity".

It is unknown to what extent interventions such as these have contributed to the observed declines in homicide since 2000. Homicide as well as most forms of interpersonal violence are strongly associated with social determinants such as social norms, gender inequality, poverty and unemployment, and other cross-cutting risk factors.[5]

CHALLENGES

The Global Status Report on Violence Prevention 2014 and the Report on Global and Regional Estimates of Violence Against Women 2013 identified several core concerns:

- Continued extremely high homicide rates in the low- and middle-income countries of the Region of the Americas;
- Few countries are implementing social, economic and educational policy measures to address the social, cultural and economic risk factors for violence;
- Violence prevention laws are widely enacted, but enforcement is often inadequate;
- While nearly all countries have national laws to regulate firearms, enforcement is often inadequate, and few countries report having special firearms control programmes such as gun buy-backs and firearms collection and destruction programmes;
- Availability of services to identify, refer, protect and support victims varies markedly;
- Prevalence estimates for intimate partner violence are substantially higher in the low- and middle-income countries of the African Region, the Eastern Mediterranean Region and the South-East Asia Region, compared to other regions of the world (Figure 8.9), but only half of countries in these regions are implementing wide-scale social and cultural norm-change strategies to address sexual and intimate partner violence;
- In many settings, intimate partner violence against women and child maltreatment are considered socially acceptable and are often condoned;
- Discrimination against women and girls, including in legislation, continues to detract from efforts to address violence against women and girls;
- National surveys of violence against children conducted in Africa have documented high rates of childhood physical, sexual and emotional abuse;
- Violence prevention requires a multisectoral response, but few countries report the existence of lead agencies to coordinate the activities of different sectors and report periodically on progress.

STRATEGIC PRIORITIES

The global violence prevention field's vision for the post-2015 era is to cut worldwide levels of interpersonal violence by half within the next 30 years.[19,20] While not as ambitious as the SDG targets, which aim to eliminate several forms of violence in the next 15 years, this vision aligns well with SDGs 5 and 16, that explicitly target violence reduction.

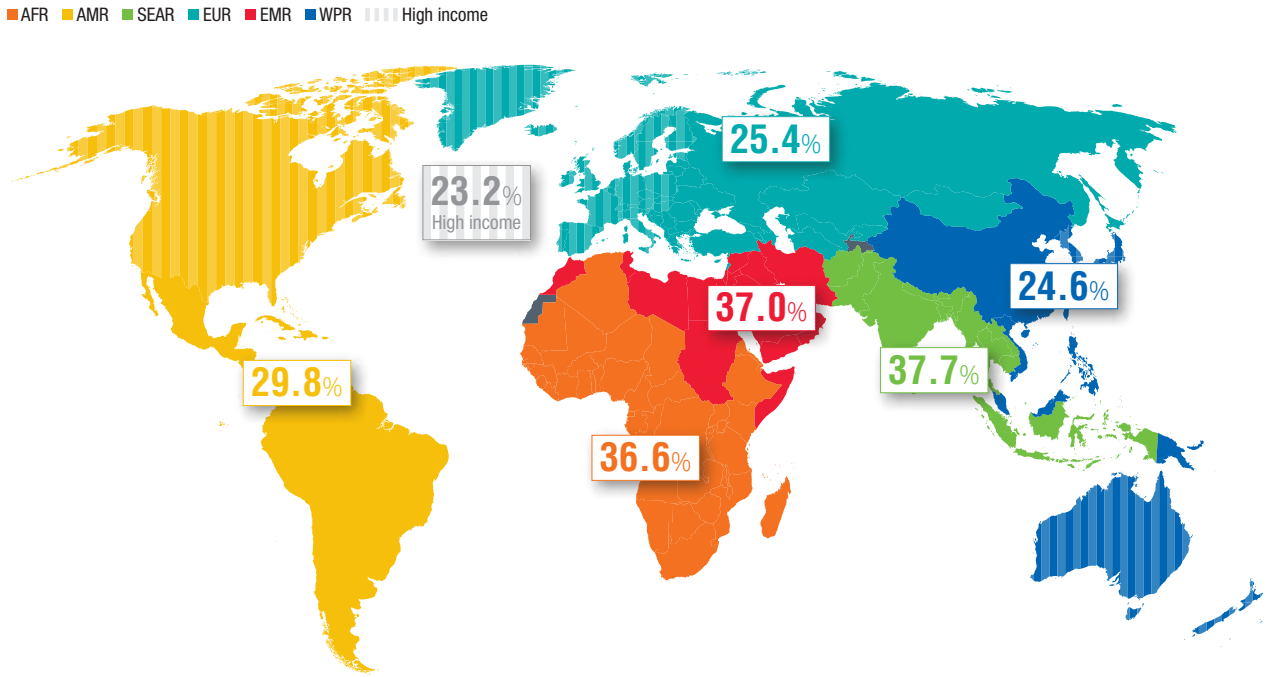
Several UN agencies have focussed on violence reduction as a priority, including WHO, UNESCO, UNODC, UNDP, UNICEF and UN Women as well as the UN General Assembly.

In 2014, the World Health Assembly drew attention to the important role of health systems in addressing violence, in particular against women and girls and against children, and called upon the WHO Director-General to develop a global plan of action to strengthen the role of the health system in addressing interpersonal violence, in particular against women and girls and against children.[18]

A 15-year global plan of action on strengthening the role of the health system in addressing interpersonal violence, in particular against women and girls and against children, will be considered by WHO Member States at the May 2016 World Health Assembly. It will include actions to address four strategic directions to address violence, in particular against women and girls and against children:

- strengthening leadership and governance of the health system;
- strengthening health service delivery and the capacity of health workers to respond to violence;
- strengthening programming for prevention;
- improving research and information.

Figure 8.9
Prevalence of intimate partner violence by region, 2010[8]



WAR AND CONFLICT

In 2012, an estimated 164 000 people died related to war and conflict, corresponding with about 3% of global deaths, and increasing to over 200 000 conflict deaths in 2014.[2,26] These estimates do not include deaths due to the indirect effects of war and conflict on the spread of diseases, poor nutrition and collapse of health services.

TRENDS

Between 1990 and 2011 there was a decline in the number and intensity of wars and conflicts.[11,12] According to the Human Security Report 2013, the total number of conflicts dropped 40% from 1992 to 2011. High-intensity conflicts declined by more than half after the end of the Cold War, while terrorism, genocide and homicide numbers were also down.[12]

WHO estimates of global direct conflict deaths (injury deaths) vary substantially by year, but there is a statistically significant average decline during 1990–2010 of 2% per year, if the Rwandan genocide of 1994 is excluded (Figure 8.10).

Since 2011, however, there has been an upturn in conflict deaths, notably due to the increased level of conflict in the Middle East (Figure 8.11).[13,26] It appears likely that conflict mortality levels for 2015 may be similar to or exceed those for 1990. It is estimated that in 2014, there were at least 17 conflicts that killed more than 1000 people each, compared to 15 in 2013.[26] Ongoing conflict in Afghanistan, Iraq and the Syrian Arab Republic accounts for significant numbers of conflict-related deaths, with these three countries accounting for an estimated two thirds of global conflict deaths in 2014. Nigeria's ongoing conflicts were the fourth deadliest, doubling on the previous year as the conflict with a militant group, Boko Haram, intensified. Sudan and South Sudan are also suffering from conflict as are an increased number of African countries. There is increasing documentation and evidence on high rates of sexual violence against women in conflict situations.[27]

Figure 8.10
Trends in global injury deaths due to conflict, 1990–2014[26]

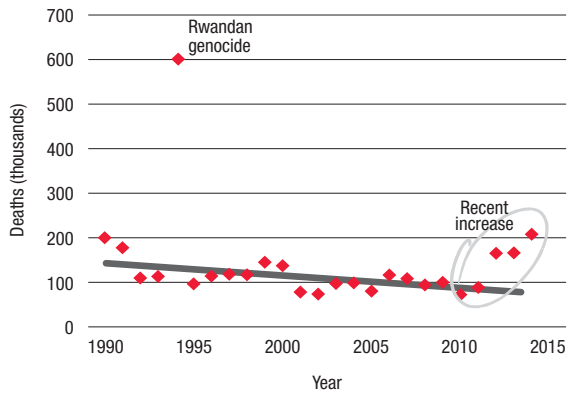
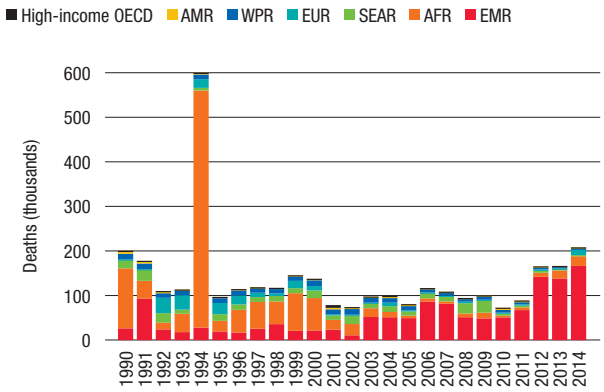


Figure 8.11
Trends in injury deaths due to conflict by region, 1990–2014[6,26]



POSITIVE DEVELOPMENTS

Notwithstanding the recent increase in violent conflict, it is possible to point to a number of reasons for the long-term decline in the numbers of wars and the level of conflict-related violence since the end of the Second World War.[11]

- *Global partnership*: The strong normative proscription against the use of military force – except in self-defence, or sanctioned by the UN Security Council. This also includes more emphasis on peacekeeping, peace-building and peace-making initiatives.
- *Economic factors*: Increased economic interdependence (globalization) and increased economic development.
- *Increased democratization*: This may be associated with reduced national willingness to wage wars of offence.
- *Enhanced state capacity*: This means access to greater resources to address grievances and deter violence.
- *Fewer conflicts of global scale*: Examples include the Second World War, anti-colonialism and the Cold War.

CHALLENGES

Fragile and conflict/post-conflict situations: These situations present the most profound challenges to development in the world today. In both fragile and conflict-affected states, poverty levels are usually high and welfare levels low. The stability and social cohesion necessary for development are frequently lacking. And often there are no strong and legitimate institutions to address poverty and manage conflict. Violent conflict is more likely to re-emerge in such areas, leading to further impoverishment, undercutting social cohesion and eroding institutions.[28,29] Each conflict is slightly different, but important factors include the longstanding and intractable Middle East crisis, remnants of the Cold War and sectarian religious divisions. Many conflicts are also driven by underlying causes, including poverty, poor governance and neglect, and local grievances.

Sociopolitical factors: These include the upturn in the number and intensity of conflicts in the last five years, both in the African Region and the Eastern Mediterranean Region. It also involves the religious extremist component in many of the conflicts, including the transnational upsurge of belligerence associated with certain manifestations of Islam, which may in turn be in part stimulated by economic stagnation and unemployment, along with increased globalization. Risks of nuclear or chemical terrorism are likely to have increased.

Adverse impact on disease control and nutrition: War and conflict impede the maintenance of public health interventions and health services and are major obstacles in efforts to eradicate, eliminate or control diseases such as malaria and HIV. Polio is a particularly telling example: the battle against the virus has become entirely focused on conflict zones such as in Afghanistan and Pakistan. War and conflict also adversely affect the economy and people's livelihoods and may cause serious malnutrition and famines.

STRATEGIC PRIORITIES

SDG 16 is to "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels". Its first two targets are to:

- significantly reduce all forms of violence and related death rates everywhere;
- end abuse, exploitations, trafficking and all forms of violence against and torture of children.

To break cycles of insecurity and reduce the risk of their recurrence, national reformers and their international partners need to build legitimate institutions that can provide a sustained level of citizen security, justice and jobs – offering a stake in society to groups that may otherwise receive more respect and recognition from engaging in armed violence than in lawful activities, and punishing infractions capably and fairly.[29]

In May 1998, the Fifty-first World Health Assembly accepted the role of WHO in *health as a bridge for peace* in the Health for All in the 21st century strategies. In fragile and conflict-affected settings, health can serve as an important entry point around which all stakeholders can unite. Health investments can potentially contribute to state-building and, perhaps, to enhanced national and local legitimacy. It is essential to work with local communities and with non-state actors in order to rebuild or preserve the functioning of the health system, ensure disease control, address the needs of affected groups such as women and children, provide access to comprehensive services, including sexual and reproductive health and mental health and psychosocial care, maintain health financing and protect health-care workers.

The SDGs provide a global framework for greater focus and action in conflict and post-conflict countries. This requires greater integration efforts of health and other sectors, and of humanitarian and development support.

DISASTERS

Disasters are often associated with hazards that include hydrological (floods and landslides), meteorological (extreme temperatures and storms), climatological (droughts and wildfires) and geophysical phenomena (earthquakes/tsunamis, volcanic eruptions and dry mass movements). Hydrological and meteorological disasters accounted for 47% and 36%, respectively, of all natural disasters in 2014. Globally, 324 natural disasters were registered in 2014, which were associated with 141 million victims and 7 823 deaths.[30] Technological disasters, including industrial and transport disasters, accounted for almost 40% of all types of disasters in 2014, but affect smaller numbers of people as they tend to be more localized.

TRENDS

During 2000–2014, an average 86 500 people were killed each year by natural disasters (not including biological hazards). Since 2000, there have been on average 656 natural and technological disasters each year, with slightly lower figures during 2012–2014. In 2013, the number of people affected reached its lowest point since 1997 (Figure 8.12).

The number of total deaths was the lowest in 2014, but the long-term mortality trend is dominated by major events (Figure 8.13).[30] Several major natural disasters stood out, each killing more than 50 000 people in a single year: the Indian Ocean tsunami in 2004 and the Haiti earthquake in 2010, the cyclone in Myanmar in 2008, and the extreme temperatures in Europe in 2003 and 2010.

Out of over one million disaster-related deaths during 2000–2014, 61% occurred in Asia where 60% of the global population live, and 20% in the Americas. Africa (6%) and Oceania (less than 1% of deaths) had much smaller proportions.

Figure 8.12
Number of reported disasters and people affected, 2000–2014[10]

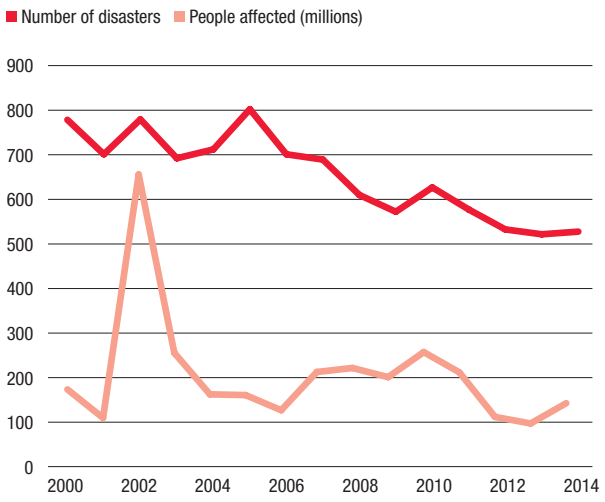
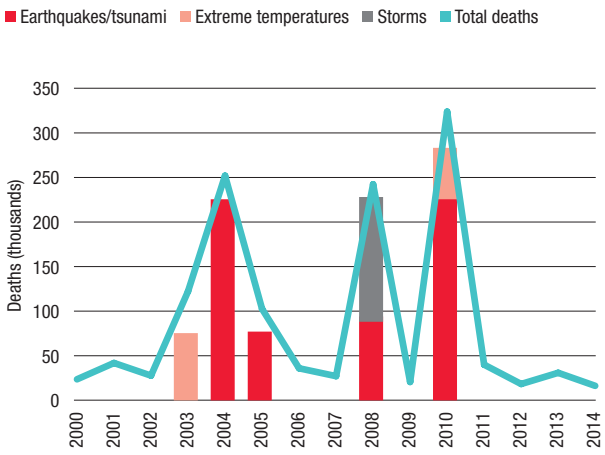


Figure 8.13
Trends in number of people reported killed due to disasters, with disaster type of phenomenon if deaths exceeded 50 000 in a single year, 2000–2014[10]



POSITIVE DEVELOPMENTS

Global framework for action: The Hyogo Framework for Action 2005–2015 provided the basis for risk management embedded inside health systems that ensured a greater focus on prevention, including exposure and vulnerability reduction, while also addressing preparedness, response and recovery. International mechanisms for strategic advice, coordination and partnership development for disaster risk reduction, such as the Global Platform for Disaster Risk Reduction and the regional platforms for disaster risk reduction, as well as other relevant international and regional forums for cooperation, have been instrumental in the development of country policies and strategies and the advancement of knowledge and mutual learning.

Country action: Many countries (85%) have a national emergency preparedness and response policy and two thirds of countries have a policy in place for health sector emergency preparedness and response.[16] In their reporting to WHO, 130 Member States indicated that they have "emergency preparedness and response programmes" in place.

Globally 79 countries have reported they are implementing the Safe Hospital Initiative, which provides concrete actions towards the implementation of the Sendai Framework for Disaster Risk Reduction 2015–2030. WHO has been promoting safer hospitals for more than 20 years[31] and there is evidence of success. For instance, the hospitals in the Kathmandu valley were functioning immediately after the earthquake in Nepal (April and May 2015), helping to save lives.

While the number of floods has been increasing, mortality has fallen. This likely reflects improvements in development conditions in low- and middle-income countries and better early warning, disaster preparedness and response in health and other sectors.[32]

CHALLENGES

Disasters occur frequently: On average there is about one major disaster recorded on the global databases every day on earth, and intensity may be increasing, in some cases as a result of climate change.

Large economic impact: Many countries – especially low- and middle-income countries, where the mortality and economic losses from disasters are disproportionately higher – are struggling to meet the financial, logistical and humanitarian needs for recovery from disasters.

Lack of country policies and poor emergency care services: One third of countries do not have any type of policy in place for health sector emergency preparedness and response.[16]

Tackle disaster risk drivers: Further efforts are needed to reduce exposure and vulnerability and to tackle underlying disaster risk drivers, such as the consequences of poverty and inequality, climate change and variability, unplanned and rapid urbanization, and poor land management.

STRATEGIC PRIORITIES

The post-2015 development agenda provides the international community with a unique opportunity to enhance coherence across policies, institutions, goals, indicators and measurement systems for implementation. SDG Target 3.d calls for strengthening of country capacity for early warning, risk reduction and management of national and global health risks, which aligns with the application of a comprehensive all-hazards approach to the development of country capacities for emergency and disaster risk management for health. This links with several WHO resolutions that called for Member States to strengthen national emergency prevention, preparedness, response and recovery programmes, and the resilience of health systems.[33,34]

The Sendai Framework for Disaster Risk Reduction 2015–2030, as part of the post-2015 development agenda, aims to substantially reduce disaster risk and loss through integrated and multisectoral actions to prevent new disasters, mitigate existing disaster risk, reduce hazard exposure and enhance preparedness for response and recovery.[21] The Framework puts health at the centre of global policy and action to reduce disaster risks[35,36] and takes an all-hazards approach, including epidemics and pandemics within its scope as well.

To enhance the resilience of national health systems, the Sendai Framework recommends that disaster risk reduction strategies be integrated into all aspects of health-care provision (primary, secondary and tertiary). WHO has worked with Member States and stakeholders on the development of an Emergency Disaster Risk Management for Health (EDRM-H) policy framework, based on a comprehensive and integrated risk management approach, referring to a series of closely interrelated steps of prevention/mitigation, preparedness, response and recovery.[37] It is intended to serve as an overarching policy across all types of hazards.

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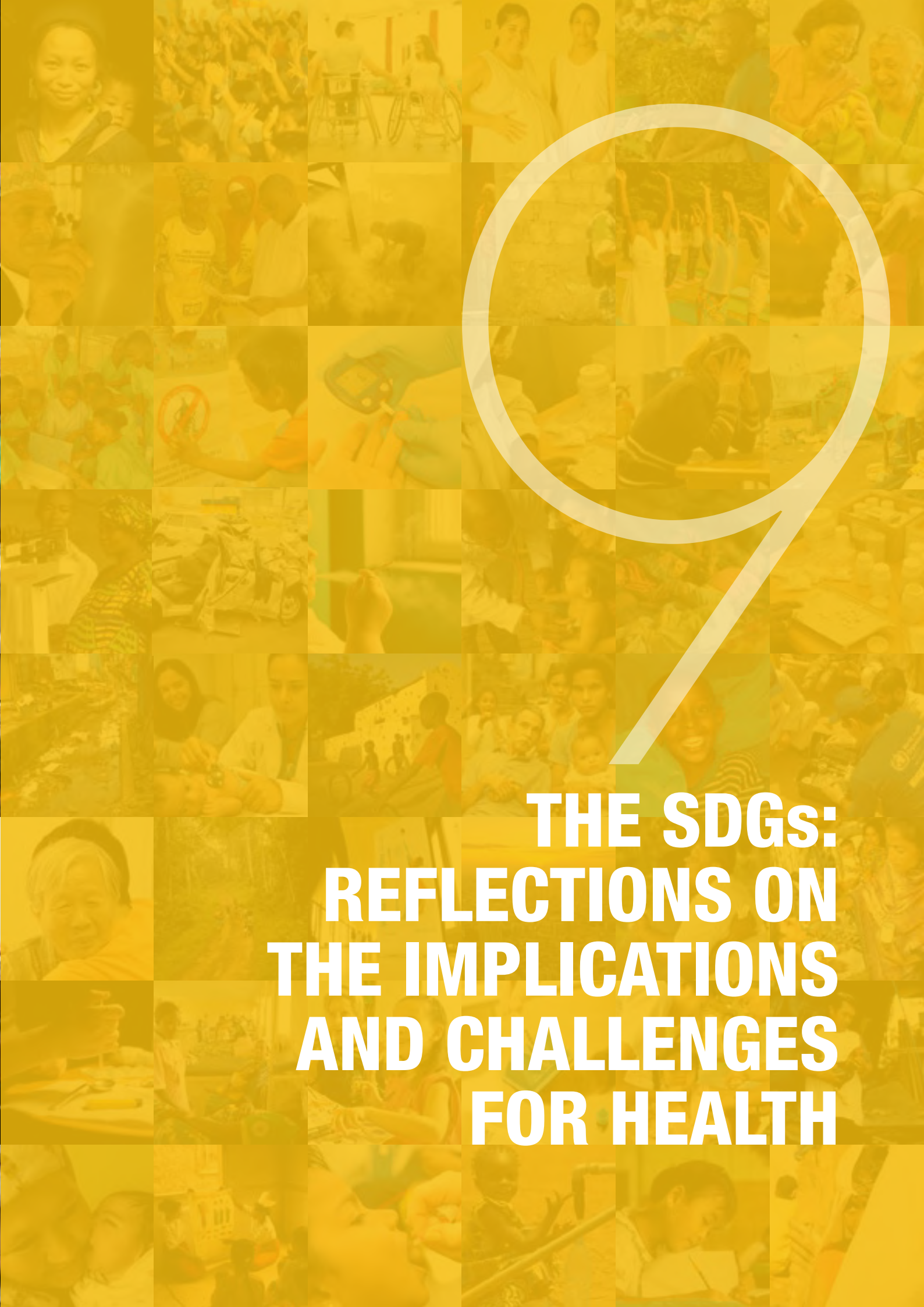


9

THE SDGs: REFLECTIONS ON THE IMPLICATIONS AND CHALLENGES FOR HEALTH

SUMMARY

In September 2015, heads of state and governments met at the UN in New York to agree on a new generation of 17 SDGs and 169 targets to succeed the MDGs and to guide global development over the 15 years to 2030.[1]

A product of extensive global consultation, and prolonged negotiation, the SDGs have been welcomed by many for their comprehensiveness, universal applicability and breadth of ambition. But they have also been criticized for lacking precision and for proposing an unattainable utopia.[2] While these and other schools of thought will be represented among WHO Member States, a pragmatic middle ground is possible, which uses the SDGs as an opportunity to accelerate progress in health, universal coverage and human development.

The SDGs represent a potentially important and exciting opportunity for global health. Forging a clear narrative that clearly articulates the opportunities, challenges and the practical significance of the SDGs for health is therefore urgent. This final chapter briefly summarizes the development of the SDGs, highlighting key differences with the MDGs. It also outlines key elements of a strategic position for WHO and the health sector in general, in recognition of the fact that the SDGs will have significant implications for the work of WHO, ministries of health and global and regional health partners.

THE LEGACY OF THE MDGs

It is generally agreed that the MDGs have been a success. Certainly they have been more influential and achieved wider public recognition than any other attempt at international target setting in the field of development. The period of their currency – 2000 to 2015 – has also seen significant increases in development financing, particularly for health: development assistance for health more than tripled after 2000, accompanied by strong growth in domestically sourced financing.

Their success is generally attributed to the fact that they galvanized concerted action around a limited number of time-bound, measurable and easy to communicate goals. While criticized for ignoring many aspects of development (not least sustainable economic growth and health system strengthening) and focusing on aggregate rather than equitable achievement, the MDG targets were nevertheless widely accepted as a measure of progress in the developing world.

The degree to which the remarkable progress in health outcomes over the last 15 years, and the increase in resources that have made these achievements possible, is directly attributable to the existence of MDGs *per se* is debatable.[3] However, there have been significant achievements. Global MDG targets for HIV, TB and malaria have been met. Child mortality has fallen by 53% since the MDG statistical baseline year 1990 and maternal mortality by 44%. Even though these latter figures fall short of the two thirds and three quarters declines that were targeted, they are still cause for celebration.

While it is hard to isolate specific causal effects, it seems reasonable to suppose that the intensity of focus (and investment) has been a key driver of innovation, enabling the scale-up of new interventions, such as ART, LLINs, ACTs, vaccines against pneumonia and diarrhoeal disease, and new and better diagnostic tests for multiple diseases.

It can also be argued that without the influence of the MDGs on promoting measurement, and the development of monitoring systems, the world would not be in a position to track progress with the degree of confidence that is now possible. Moreover, the focus on measurement has encouraged political leaders in several countries to make public commitments to achieving specific targets in areas such as maternal or child mortality. These commitments not only put pressure on ministries of health, but also provide a way for civil society, parliament and the media to hold health providers accountable for their performance.

Beyond the health sector, the broader determinants of health have shown similar improvements. Extreme poverty, as measured by the number of people living on less than US$ 1.25 per day, has declined by more than half. The proportion of under-nourished people in developing countries has fallen significantly. Primary school enrolment, for girls and boys equally, has exceeded 90% and, in 2015, 91% of the global population are using improved drinking-water sources.

However, there remain several targets where progress has been limited (for example, use of family planning and improved sanitation) and there remains an "unfinished agenda" to complete work on the current health MDGs. It is also evident that progress within and between individual countries is highly variable. This unfinished MDG agenda is reflected in the SDGs and has been enhanced to include new and more ambitious targets such as ending epidemics of HIV, TB and malaria and all preventable maternal and child deaths – all with a greater focus on equity.

THE BIRTH OF THE SDGs

Member States of the UN gave a first mandate to start work on the post-2015 development agenda in 2010, five years before the completion of the MDGs. In response, the Secretary-General convened a High-level Panel of Eminent Persons (HLP) in 2012 that submitted a report one year later, proposing 12 goals and 54 targets. Concurrently, the UN Development Group agencies, including WHO, led a "global conversation" to solicit views through web-based portals and innumerable face-to-face thematic and sectoral meetings at national, regional and global level. While the impact of the HLP's work has been limited, their report served to build confidence at a time when many feared that it might be impossible to reach any consensus at all, given the vast range of issues competing for attention.

A second mandate was agreed at the UN Conference on Sustainable Development in Rio de Janeiro in 2012 (Rio+20). The Rio+20 outcome document – *The future we want* – established an open working group (OWG) of UN Member States to develop a set of sustainable development goals that would be presented to the UN General Assembly for consideration. It also stipulated that the SDGs should be aligned with and integrated into the UN development agenda post-2015. The OWG, following its own consultative process, duly presented its proposals in 2014, at which point it was agreed that they would provide the main basis for negotiation of a final set of goals to be agreed by heads of state and governments in September 2015.

A final text for adoption by the UN General Assembly, which takes into account the outcome of other global meetings in 2015 (the Sendai Framework for Disaster Risk Reduction and the Addis Ababa Action Agenda on Financing for Development), was published in August 2015. The goals were endorsed by resolution at the UN Sustainable Development Summit in September 2015.

A 10-page declaration precedes the main body of the document that sets out 17 goals and 169 targets. A full list of goals is found in Table 1.2. The main sections of the SDG declaration focus on the new agenda, the means of implementation and follow-up and review.

The goals will come into effect on 1 January 2016. Thereafter, two processes will be completed. First, work is underway to develop a global indicator framework under the auspices of the UN Statistical Commission, involving an Inter-Agency and Expert Group on SDG indicators (IAEG-SDG) with 28 Member States as members and UN agencies as observers. A proposal from the UN Statistical Commission to the UN Economic and Social Council (ECOSOC) is expected in March 2016. This should include the full set of indicators for SDG monitoring.

Second, while the SDG goals and targets are global in nature and universally applicable, the declaration envisages a situation with "each government setting its own national targets guided by the global level of ambition but taking into account national circumstances". How this will work in practice and what will be the role of global and regional institutions in helping countries to set such targets remains to be seen.

Once an indicator framework is agreed, a complex and intensive reporting, follow-up and review process will begin. The Secretary-General, with support from the UN system, will produce an *annual* SDG Progress Report. The report will inform the High Level Political Forum (HLPF) for Sustainable Development, under the auspices of ECOSOC, which will also receive a Global Sustainable Development Report (frequency to be decided). Every four years "under the auspices of the UN General Assembly, the HPLF will provide high level political guidance on the SDG agenda and its implementation". Review mechanisms will also be established at regional and national level and are likely to be more active and relevant than has been the case for the MDGs.

CHILDREN OF THEIR TIME: THE SDGs ARE DIFFERENT

The transition from MDGs to SDGs cannot be seen solely as the exchange of a shortlist of goals and targets for a longer one. The SDGs are fundamentally different to the MDGs, as is the political context in which they have been developed and in which they will be implemented.

The MDGs had a consistent and more or less singular purpose. Emerging from a series of global development conferences in the 1990s, they were about the achievement of improved human development outcomes (primarily in terms of poverty, education and health) in developing countries.

They were also framed as a compact between developed and developing countries, with Goal 8 specifying what the rich world could do to help low-income countries achieve goals 1 to 7. They were closely associated with aid spending, and have been a key determinant of aid budgets for health, with inevitable consequences for priority setting in both donor and recipient countries.

The Millennium Declaration adopted by the UN General Assembly in 2000 was similar in breadth and ambition to the text of *Transforming Our World: the 2030 Agenda for Sustainable Development*. The big difference in 2000 was that following the adoption of the declaration, a technocratic process led by the UN resulted in a *selected* list of goals and targets. The SDGs, by contrast, reflect the breadth and ambition of the declaration of which they are part.

The SDGs in the words of the declaration are, "integrated and indivisible, global in nature and universally applicable". The SDGs seek to be relevant to *all* countries. They are therefore about development, but not just about developing countries (although each reference to universality in the SDG declaration is qualified by phrases such as "taking into account national realities, capacities, policies and priorities").

The second major difference is the breadth of the proposed agenda; the SDGs are "unprecedented in scope and significance". While the MDGs were about a limited set of human development targets, the SDGs cover the economic, environmental and social pillars of sustainable development with a strong focus on equity – expressed most frequently in the phrase, "no one will be left behind". While the breadth and ambition of the agenda has attracted much critical comment, one can argue that the range of topics covered in the SDGs more closely reflects the range of issues with which a government in reality has to contend, than the narrow agenda encompassed by the MDGs.

The MDGs were silent about the impact of political factors in countries. Yet, most of the countries in which targets are farthest from being met are those that have gone through a period of sustained political turbulence requiring humanitarian and developmental support. Goal 16 of the SDG explicitly recognizes the importance of peace and security as necessary conditions for sustainable development.

"We recognize that each country has primary responsibility for its own economic and social development." This sentence from the declaration points to another difference that is worthy of consideration: the positioning of the SDGs in relation to development assistance. A complex issue, it can be expressed in simple terms: if the SDG agenda is genuinely universal and relevant to all countries, then the close link between development goals and financing from donors should become less important. The outcome

of the UN Conference on Financing for Development held in Addis Ababa points in the same direction, emphasizing the importance of domestic and private financing, and highlighting the role of international public finance, including ODA, in catalysing additional finance from other sources. There is a growing consensus that over the next 15 years, development assistance will remain important, but for a *decreasing* number of poor and often fragile countries.

Such conceptual tendencies aside, the SDG/development assistance issue is likely to remain ambivalent. In Addis Ababa a clear difference between some donor and recipient countries on the importance of development assistance in financing SDG-related efforts became apparent. While not meant to be a pledging event, one of the few concrete targets to be agreed on was the reaffirmation of the "... commitment by many developed countries to achieve the target of 0.7% of ODA/GNI and 0.15 to 0.2% of ODA/GNI to LDCs."

Finally, it is worth noting that in attracting both aid money and political attention the MDGs fuelled intense competition during the period of consultation and implementation. A wide range of interest groups, including international agencies, lobbied intensely to ensure that their priorities were supported – with little concern for the coherence of the agenda as a whole. While this competition and fragmentation is likely to continue, the SDG declaration stresses the crucial importance of inter-linkages and the integrated nature of the goals to ensure that the purpose of the new Agenda is realized.

Overall, the MDGs were forged in an atmosphere of greater global optimism, in which the prospects for increases in development assistance spending were bright (and indeed were realized). The political context is now very different. Economic insecurity, cuts in public services and growing inequality in much of the western, rich world reduces political interest in international development and increases public hostility to aid. Indeed, it has been argued that only if the governments of developed countries do more to tackle inequality and insecurity at home, as part of their contribution to the SDGs, will they have the political space to pursue the idea of global solidarity that underpins the new agenda.[4]

TOWARDS A WHO POSITION ON HEALTH AND THE SDGs

Several health targets follow on from the unfinished MDG agenda, and many of the other health targets are derived from World Health Assembly resolutions and related action plans. Much of the critique (around feasibility, precision, measurability etc.) that has been directed at the SDGs as a whole can be relatively easily dealt with when it comes to health, even though the agenda is now much more ambitious.

At the same time, it is important to recognize the breadth of the new agenda: one that sees health not only as ensuring healthy lives and promoting well-being for all at all ages, but also one in which health and its determinants influence, and are influenced by, other goals and targets as an integral part of sustainable development.

The following section sets out 10 points that will contribute to an organizational position on health and the SDGs. They are grouped under five broad headings.

THE PLACE OF HEALTH IN THE SDGs

1 Having one health goal is enough

Goal 3 on health – *Ensure healthy lives and promote well-being for all at all ages* – is one goal among the 17. Some commentators have suggested that health has either lost out or been demoted from its place in the MDGs, where three out of eight goals were concerned with health. This should not be a matter of concern. Goal 3 is drafted in extremely broad terms and, in any case, the comparison, is flawed. The MDGs reflected a relatively narrow range of human development outcomes within which it is logical that health be prominent. The SDGs, by contrast, reflect a far wider range of environmental, economic and societal concerns. All the SDGs are designed to be cross-cutting and the inter-linkages and networks within the SDGs are as important as the individual goals themselves. Moreover, the importance of reducing "inequalities within and among countries" has been explicitly recognized as an SDG in itself (Goal 10), and applies to all other goals including health. Having only one goal is both logical and in no way detracts from the importance of health. Health is positioned as a major contributor to other SDGs: without health many other SDGs cannot be achieved. Health also benefits from progress towards the other SDGs.

2 There are some important health issues missing from the SDGs, but not many

The targets included under Goal 3 cover a great deal of ground. Almost all targets can be linked to strategies and global action plans that have been adopted by the World Health Assembly in recent years or are under development.

Gaps are few. There is no mention of immunization coverage as a specific target, but it is integral to the achievement of at least four of those that are listed. Access to sexual and reproductive health care is included, but sexual and reproductive rights, violence and discrimination against women and girls are dealt with elsewhere (Goal 5). Older people are mentioned in Goal 2 on nutrition, and in Goal 11 on cities (safer environments). The implications of population ageing as a global trend with important implications for health systems is absent, except indirectly through its impact on NCDs and mental health. It therefore needs to be seen as integral to progress on UHC.

One of the few issues that appear in WHO's leadership priorities that is missing is antimicrobial resistance. It has been squeezed in as an afterthought in the health paragraph of the declaration, but is omitted from the specific targets. The omission is indicative of one of the main failings of the health targets, namely that they perpetuate current ways of thinking and working within the health sector, and give insufficient attention to issues like antimicrobial resistance that, by their very nature, cut across diseases and sectors.[5]

HEALTH SYSTEMS ARE CENTRAL TO THE NEW AGENDA

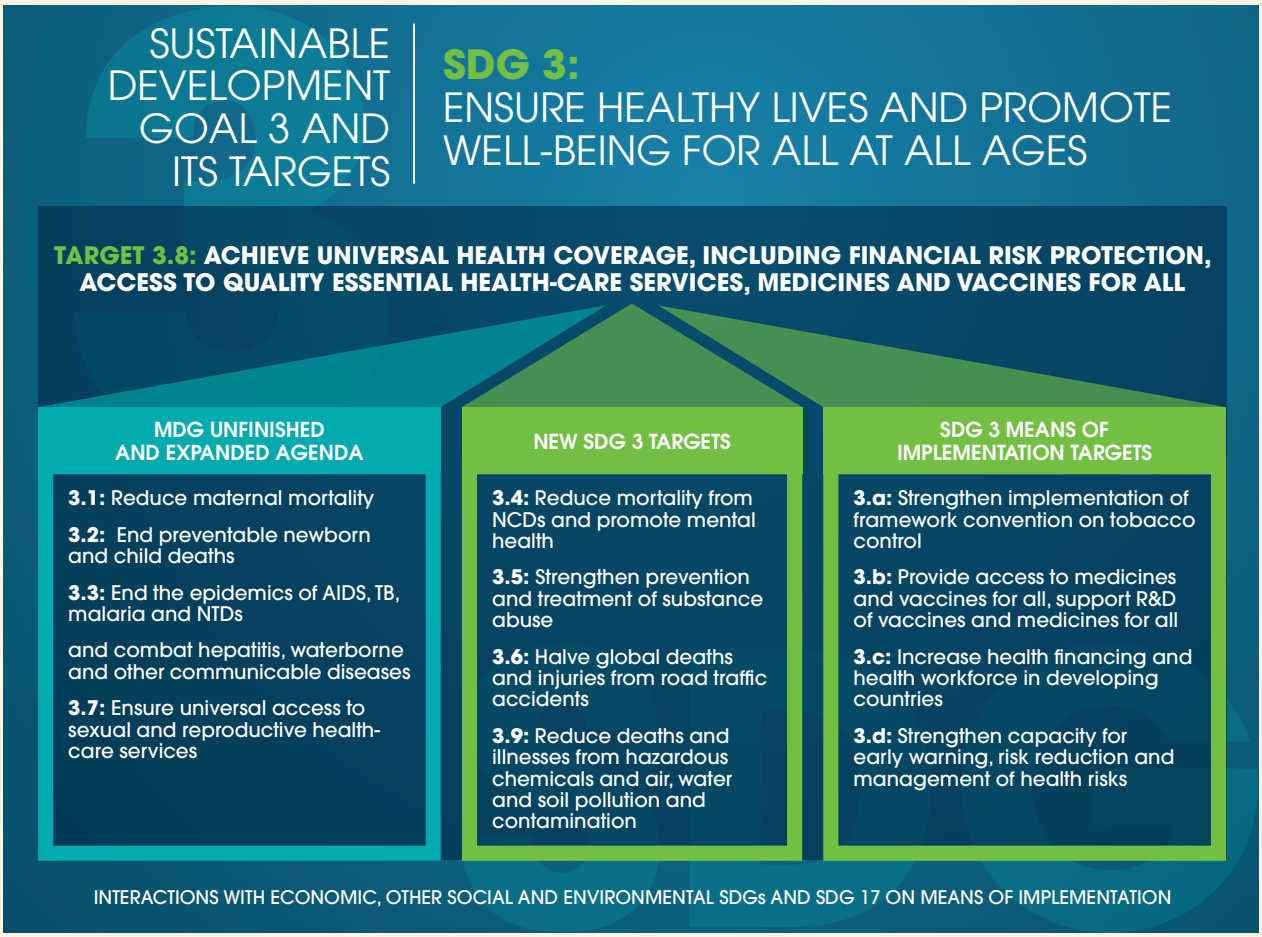
3 The health targets have a logical relationship

Goal 3 has nine substantive targets and four additional points, which are also targets, but are listed as "means of implementation". The full text of all 13 is found at Table 1.3. The order in which the targets are listed gives no sense of their relationship, but the declaration endorsed by heads of government in the section on "the New Agenda" provides more direction:

> *"To promote physical and mental health and well-being and to extend life expectancy for all, we must achieve universal health coverage and access to quality health care. No one must be left behind. We commit to..." (thereafter follows a brief summary of health targets).*

This places UHC as the target that underpins and is key to the achievement of all the others. Placing UHC as the target to which all the others contribute also shows how UHC can serve to increase coherence, reduce fragmentation in the health sector, and contribute to the development of strong health systems. Figure 9.1 presents the targets under Goal 3 in a way that distinguishes those that have been carried forward and enhanced from the MDGs, those that have been added, and the means of implementation. Goal 17 is a cross-cutting goal on means of implementation that is relevant to all the others. It covers financing, partnership, technology assessment and data, monitoring and accountability.

Figure 9.1
A framework for the SDG health goal and targets



4 Achieving the new health targets cannot rely on business as usual

One of the acknowledged problems of the MDG era was the fragmentation of country health systems that resulted from the establishment of separate programmes, each focusing on its own targets, with little consideration for the impact on the health system as a whole. This situation is exacerbated when each programme produces a separate estimate of financial needs – geared primarily towards advocacy rather than accurate budgeting. The net result is

that health systems providing integrated, people-centred care, with realistic estimates of overall cost, and capable of achieving multiple targets have been hard to establish.

With 13 health targets covering most national health concerns and the majority of WHO's work programme areas, an approach to national health development that focuses on individual programmes in isolation will be counterproductive. It risks even greater fragmentation and competition than has been seen in the past. More critically, as noted above, it will fail to address the many cross-cutting issues that do not fit neatly into programme areas.

This point has fundamental implications for work in WHO, particularly at country level. To respond to the new agenda, WHO will need to ensure that individual programme areas contribute to, and work within, the framework of a country's overall health plan or strategy. This will require more active collaboration within and between programmes than has been the case in the past. It also raises important questions as to how planning, budgeting and resource allocation, can provide the incentives needed to drive more collaborative work across the organization.

THE SDGs CAN PUT HEALTH GOVERNANCE CENTRE STAGE

5 Used creatively, the SDGs can enhance governance for health

One of the basic principles underpinning the SDGs is that they are "integrated and indivisible": progress in one area is dependent on progress in many others. Translating this insight into practical action is one of the key challenges for the new agenda. Many of the synergies are well known (such as those that exist between health, education, nutrition, social protection and conflict). Other links, however, while less immediate, are no less important – for example the links between sustainable consumption and NCD risk factors, or climate change and the spread of vector-borne diseases.

One area of growing concern that the nexus of SDG links can help address is the impact of non-health policy sectors on health. The fundamental idea behind *governance for health*[6] is that deliberate action is needed to influence governance in other policy arenas to promote and protect health. The integrated nature of the SDG agenda provides additional legitimacy for WHO to pursue a more active agenda in this domain. Areas of particular relevance, in which governance can have a positive impact on health, include trade and intellectual property, sustainable energy, income inequality, migration, food security, and sustainable consumption and production. While much of the attention on governance for health has focused on global issues, the SDG declaration points to the importance of governance for health at national and regional levels.

6 The SDGs should provoke a deeper debate about health architecture

The MDGs have had a marked influence on the institutional landscape for global health. While they have been successful in mobilizing money and political attention, many of the mechanisms established over the last 15 years (the Global Fund; GAVI; the Partnership for Maternal, Newborn, and Child Health; and a wide range of other advocacy and fundraising partnerships etc.) have contributed to creating a competitive institutional landscape globally with fragmented delivery systems at country level. UN agencies, often encouraged by their major donors, have behaved in similar ways, claiming allegiance to or ownership of particular goals or targets. The result is that competition for funds (on behalf of one target or another) and for the limelight of public attention, too often outweighs collaboration on improving health as a whole with people rather than diseases as the centre of concern.

With talk already starting about creating yet more purpose-specific funds aligned to specific health targets, it is evident that the new generation of goals could make the situation worse. But there is an alternative. The adoption of the SDGs offers an opportunity to take a fresh look at the institutional arrangements that are required to improve and maintain people's health. Such an approach would widen the scope of the "global health architecture" discussion beyond the current debates on financing and institutional positioning. Instead there is now an opportunity to start thinking about what is needed in terms of institutional arrangements for financing and producing global public goods; for improving cross-border health security; for improving the relevance and coherence of the UN development agencies in the field of health; for addressing the causes of NCDs; and for enhancing standardized measurement and accountability. This lays the basis for the institutional arrangements for better governance for health.

FINANCING THE SDGs

7 The SDGs are affordable…

Many critics point to the UN's estimate that the SDGs will cost between US$ 3.3 and US$ 4.5 trillion a year to achieve as evidence of their unaffordability.[7] However, the SDGs are affordable, but with important caveats.

First, like any normative framework the aim is for progressive realization. Countries will proceed at their own pace given the availability of resources. In the case of the SDGs this point is reinforced by the emphasis on national target setting. Second, even though estimating the costs of some of the more aspirational targets will remain highly imprecise, some goals, including Goal 3, can and should be costed more accurately. Third, the SDGs will not be primarily financed from aid budgets (a concern that often prompts the affordability question in the first place). In fact, despite the large increases in development assistance for health during the MDG era, the average low-income country still financed 75% of its total health expenditure from domestic resources.

As noted above, development assistance will remain important for some countries, but their number is likely to decrease, so that aid spending in the coming years will be more concentrated in a few, fragile, least developed countries.[8] Of growing concern in regard to these countries will be the better integration of humanitarian and development assistance. In too many instances, sustainable recovery and the development of more health systems that can mount an all-hazards approach to health security have been compromised by the hiatus that occurs when short-term humanitarian assistance ends and longer-term development is late or support fails to materialize.

8 …but the jury is still out on how the SDGs will influence financing for health

The economies of many low- and lower-middle-income countries are expected to continue relatively rapid growth rates in the foreseeable future. Country capacity to raise and spend funds domestically will be further enhanced if statements of intent made in Addis Ababa to make tax systems more efficient nationally are realized; if measures to combat tax evasion and illicit tax flows globally are effective; and if partnerships with private sector entities align investments with the principles of better health and sustainable development.

Looking at health more specifically, the key question is whether the SDGs will change established patterns of spending *within* the sector. While NCDs do not threaten global security, as AIDS or pandemics have been predicted to do, the increase in NCDs in low- and middle-income countries threatens to overwhelm fragile health systems unless rapid investments in prevention and promotion are made. So far, however, there are few signs of a shift in development assistance actually happening. NCDs are still seen as competing for health funds by development assistance agencies (despite the need for intersectoral action) and the growing interest in health systems arguably has more to do with concerns about health security than universal health coverage and people-centred care.

A preliminary conclusion therefore is that if the SDGs are to cause a fundamental change in the pattern of health financing, the onus is on domestic budgets to make this happen. While this trend is desirable and consistent with the idea of self-reliance, growing pressures from global partnerships to increase "counterpart funding" in their specific areas of interest may limit governments' financial room to manoeuvre.

FOLLOW-UP AND REVIEW

9 Monitoring the health goal is as important as monitoring individual targets

The annual review of progress by the HLPF for Sustainable Development under the ECOSOC and the four-yearly reviews by the UN General Assembly will be informed by reports on SDG progress prepared by the UN Secretary-General. If the purpose of this process is to enhance accountability for commitments made at the UN General Assembly, it is critical that the high-level picture is not lost in detailed reporting on targets and indicators.

The process for follow-up and review is described in the SDG declaration. With 169 targets and potentially well over 200 global indicators, including 20 or so for the health goal, this will inevitably be complex. A further risk, therefore, is that a legitimate concern for accountability results in too many demands for data, and that the process will fail to gain support, particularly in those countries that already feel over-burdened by existing reporting requirements.

For the health goal, many existing reporting systems can be used to monitor individual targets. Moreover, the SDG agenda offers an opportunity to rationalize the reporting requirements contained in multiple WHA resolutions. The key risk, however, is that current efforts to develop indicators, assess progress and hold governments and others to account focus exclusively on individual targets, ignoring the big picture, the interrelations between goals and targets and, particularly, equity.

Several overarching indicators can serve the purpose of monitoring progress toward the health goal, including life expectancy, the number of deaths before age 70 years,[9] and healthy life expectancy. If it could be measured reliably, healthy life expectancy captures both mortality and years of life lived in less than good health (that is, with a disability).[10] However, challenges remain with regard to the availability of data that are comparable over time and across populations, and which allow progress in reducing inequalities to be tracked.

10 There will be a growing focus on accountability at country level

Much of the world's attention to the MDGs has been based on aggregate global and regional achievements. The declaration makes it clear, as noted above, that global monitoring will remain important for the SDGs – albeit posing major challenges to graphic artists, report designers and meeting organizers as to how it will be presented in a digestible fashion.

In contrast to the MDGs however, the SDG declaration puts much greater emphasis on country and regional follow-up and review processes, as the basis for accountability and remedial action. Given the more political nature and breadth of the SDG agenda, one can assume that civil society and others will use the SDGs to hold their governments to account.[11]

Again in contrast to the MDGs, it is inevitable that social media – through civil society and a hyper-connected generation of socially concerned advocates – will play an important role, initially in determining whether the SDGs gain public traction, and assuming that they do, in insisting on greater accountability.

It is thus not hard to imagine how the SDGs, in addition to being the subject of country-level monitoring of specific health targets, will also be used to provoke debate about a country's position on inequality of income or in health, on migration, on access to medicines and many other factors that impact on health. Whilst sticking to its concerns for health and equity, WHO needs to be ready to handle demands for more detailed scrutiny of country performance, and to provide the comprehensive analyses needed by national governments and regional bodies.

FINAL REFLECTIONS

The SDG health goal and the 13 targets, as well as the multiple health-related targets in other SDGs, provide a good basis for discussion and actions to improve health for all at all ages in all countries. The set of health targets is comprehensive and builds upon a wide array of recent World Health Assembly resolutions, WHO and other global plans of action and current country health strategies. The health targets within the SDGs cover all the main priorities in the WHO 12th General Programme of Work 2014–2019.

The health targets per se are likely to galvanize action in many programme areas. The achievement of individual targets will remain critical, but the higher ambition will require thinking about the SDGs as an "integrated and indivisible" agenda, in the way that they are intended. A focus on UHC, as the target that underpins all other targets, and greater emphasis on the strategic and operational interactions with the social, economic and environmental dimensions of sustainable development are two central pieces of the new health agenda. The SDGs also provide a new and exciting opportunity for strengthening governance for health and interaction with policy processes in other sectors at global, and increasingly, at regional and country level. It is also essential to revisit and reshape the architecture for global health, particularly in relation to health security and the development of global public goods.

The SDG agenda now requires that the focus of global health be geared to a broader set of national priorities in health and related sectors. This means that all global health partners should adapt the timing and the structure of planning to reflect a more country-driven agenda in health. This should also ensure adequate resource allocation for health governance, health systems development and cross sectoral work that is implied by the new agenda.

While WHO will continue to work closely with other partners in the UN family and beyond, and target-specific work is likely to continue and be strengthened, WHO is the only global agency with the mandate to cover the whole health agenda. This requires that WHO maintain and strengthen the core functions in the 12th General Programme of Work, particularly in terms of defining indicators and improving ways of measuring and reporting on progress; supporting countries to generate necessary funding; advising on best-buy interventions, implementation and delivery strategies; and defining research priorities.

The breadth of the SDG health agenda under Goal 3 and the range of health determinants reflected in the full set of goals poses an importance governance challenge: how to tell a coherent story about whether health is improving? Within the overall UN framework for SDG follow-up and review of progress the WHO governing body meetings should play a key role. Using the MDG review methods that focused on target level achievements will be unwieldy for the SDG, even just for the 13 health targets. A framework for reporting by WHO in collaboration with relevant UN agencies and review with five components is suggested in Box 9.1.

Box 9.1
Summary framework for reporting on the health SDGs

Summary measures of health and well-being using healthy life expectancy or premature mortality as discussed earlier.

Progress toward universal health coverage underpins the achievement of all other health targets under Goal 3. UHC is relevant and an issue of concern in all countries, and there is now a framework that can be used to measure progress towards it using coverage and financial protection indicators disaggregated by socioeconomic and other key determinants.

Progress in reducing health inequity across the life course drawing on overall data and data from specific targets.[12]

Progress towards the health targets, framed as part of an overall assessment of progress towards the SDGs.

Focus on *selected* determinants and trends that influence health, reflecting the linkages between health and other SDGs, including a summary of capacities related to health security, and a qualitative assessment of changes in health architecture and health governance. This part of the framework can be *customized* annually to include issues deemed to be of particular regional and/or global relevance.

Even though many of the SDGs do indeed lack precision, are hard to achieve, have a staggering number of targets, of which many are difficult to measure; importantly they reflect issues that are of critical importance to people and the planet. The SDGs may have profound implications for countries and regional and global agencies, including WHO. They provide an opportunity to demonstrate that the goal of healthy life and well-being for all at all ages is more than the sum of the individual targets that contribute to their achievement. The integrated nature of the SDGs provides new legitimacy for addressing the wider determinants of health, while offering a basis for discussing (among other issues) the importance of peace and security for health, the need for better governance, the impact on health of growing inequities, and the importance of putting people rather than diseases at the centre of strategies to improve health.

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7 edie explains: Sustainable Development Goals. edie.net. 5 August 2015. (http://www.edie.net/library/UN-Sustainable-Development-Goals-2015-SDGs-list-definition/6637, accessed 26 October 2015).

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ANNEX 1.
REGIONAL GROUPINGS

WHO regional groupings

WHO African Region: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, South Sudan, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

WHO Region of the Americas: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States of America, Uruguay, Venezuela (Bolivarian Republic of).

WHO South-East Asia Region: Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste.

WHO European Region: Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, the United Kingdom, Uzbekistan.

WHO Eastern Mediterranean Region: Afghanistan, Bahrain, Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen.

WHO Western Pacific Region: Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam.

WHO regional groupings with high-income OECD countries separated out[1,2]

High-income OECD countries: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, United States of America.

Low-, middle- and non-OECD high-income countries:

WHO African Region: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, South Sudan, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

WHO Region of the Americas: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of).

1 WHO Member States that are member countries of the OECD and classified as high income according to the World Bank analytical income classification of economies (based on the 2013 Atlas estimates of gross national income per capita) are grouped together as "high-income OECD countries". The remaining WHO Member States are grouped into the six WHO regions.

2 Member States marked with an * have been classified into income groups using gross domestic product.

WHO South-East Asia Region: Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste.

WHO European Region: Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Malta, Monaco, Montenegro, Republic of Moldova, Romania, Russian Federation, San Marino, Serbia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, Uzbekistan.

WHO Eastern Mediterranean Region: Afghanistan, Bahrain, Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, Yemen.

WHO Western Pacific Region: Brunei Darussalam, Cambodia, China, Cook Islands*, Fiji, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Nauru*, Niue*, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam.

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