

The path to longer and healthier lives for all Africans by 2030: the *Lancet* Commission on the future of health in sub-Saharan Africa



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Executive summary

Sub-Saharan Africa's health challenges are numerous and wide-ranging. Most sub-Saharan countries face a double burden of traditional, persisting health challenges, such as infectious diseases, malnutrition, and child and maternal mortality, and emerging challenges from an increasing prevalence of chronic conditions, mental health disorders, injuries, and health problems related to climate change and environmental degradation. Although there has been real progress on many health indicators, life expectancy and most population health indicators remain behind most low-income and middle-income countries in other parts of the world.

Our Commission was prompted by sub-Saharan Africa's potential to improve health on its own terms, and largely with its own resources. The spirit of this Commission is one of evidence-based optimism, with caution. We recognise that major health inequities exist and that health outcomes are worst in fragile countries, rural areas, urban slums, and conflict zones, and among the poor, disabled, and marginalised. Moreover, sub-Saharan Africa is facing the challenges and opportunities of the largest cohort of young people in history, with the youth population aged under 25 years predicted to almost double from 230 million to 450 million by 2050. The future of health in Africa is bright, but only if no one is left behind.

Sub-Saharan countries face difficult development agendas in the decades to come, but also immense opportunities to be acted upon without delay. A key message of this Commission is that the opportunities ahead cannot be unlocked with more of the same approaches and by keeping to the current pace. Continuation at the current pace of progress, using models of service delivery and population health that are struggling with results, equity, and sustainability across the world, including in high-income countries, is a recipe for failure. Therefore, we advocate an approach based on people-centred health systems and inspired by progress, which can be adapted in line with each country's specific needs. Moreover, we believe firmly that better health will not only benefit countries' populations directly—it will also act as a catalyst, enabling successful pursuit of other development agendas summarised in the Sustainable Development Goals (SDGs).

Leadership on Africa's health, scientific, and development challenges should come from Africans in close

collaboration with the global community, including non-traditional development partners. In addition to alignment with the host country's priorities, harmonisation of the different global and domestic health mechanisms is important to reduce transaction costs of service delivery and reporting.

A comprehensive approach and system-wide changes are required. A fragmented health agenda will deliver

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Key messages

- Africa's health indicators remain behind those of other continents and major health inequities exist. Health outcomes are worst in fragile countries, rural areas, urban slums, and conflict zones, and among poor, disabled, and marginalised people.
- Most sub-Saharan countries face a double burden of infectious diseases, malnutrition, and child and maternal mortality, in addition to emerging challenges of chronic conditions, such as hypertension, mental health disorders, and health problems related to climate change and environmental degradation.
- Substantial progress in many health indicators has been made in the Millennium Development Goal era but progress at the present pace is a recipe for failure.
- The vision of this Commission is that by 2030 Africans should have the same opportunities for long and healthy lives that new technologies, well-functioning health systems, and good governance offer people living on other continents.
- The main opportunities ahead cannot be unlocked by keeping to the same pace and using more of the same approaches to health systems, as even high-income countries are struggling with the rapidly growing burden of chronic conditions.
- Africa-based and home-grown solutions—with the realities of each country and each community embedded at their cores—are required, and each country needs to chart its own sustainable path to improve health outcomes.
- A framework shift is needed to deliver better health outcomes through people-centred health systems, with focuses on prevention, primary care, and public health.
- There are historic, not to be missed opportunities to improve several health outcomes within the next decade, seizing the momentum generated by the Millennium Development Goals by bringing traditional challenges under control and preventing others from taking hold.
- Achievement of good health for all citizens should be a political and investment priority for every country, which will also contribute to economic growth and sustainable development.
- Countries can and should invest more in health and do more to address inefficiencies by identification of new funding sources and movement towards prioritisation of health in domestic budgets.
- Local generation and use of innovation will accelerate better health outcomes, reduce inequities, and have huge scope for prevention and care by harnessing the rapid growth in information and mobile technology in the African continent.
- Investment in higher education and research are essential for better health and sustainable development by enhancing research capacity for identification of challenges and devising local solutions.

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some results but will not succeed in strengthening health service delivery and public health systems, and will not address the determinants of health. Broad partnerships beyond the medical and health community are essential to move the health agenda forward. Without a serious shift in mindsets across all levels of society, all sectors of government, and all institutions it will be difficult to have meaningful and sustainable change. Young people in Africa will be key to bringing about the transformative changes needed to rapidly accelerate efforts to improve health and health equity across sub-Saharan Africa.

This Commission highlights 12 strategic options that all sub-Saharan countries should consider in their policies and plans. These options are connected to the health-related SDGs and integrate commitments made by regional African bodies. The strategic options are as much about promotion of health and prevention of disease as they are about expansion of access to treatment.

Building health systems commensurate to the challenges of 21st century Africa requires action in the critical areas of:

- people-centred health systems, universal health coverage (UHC), the social determinants of health, and health outcomes.
- leadership, stewardship, civil society engagement, and accountability at all levels.
- financing for health.
- commodity security (eg, medicines, technologies, essential equipment, tools, and supplies).
- public health systems.
- health workforce development.
- research and higher education.
- innovation in products, service delivery, and governance.

These eight interconnected areas are covered in separate sections of this Commission. We describe the different areas where changes are needed and make recommendations for the way forward, recognising the great diversity within the region.

This Commission's vision and aspiration is that by 2030 Africans should have the same opportunities for long and healthy lives that new technologies, well-functioning health systems, and good governance offer people living on other continents. The Commission concludes with an agenda for action based on the following key messages.

A framework shift is needed to deliver better health outcomes through people-centred health systems and UHC

Frameworks that rely on hospitals and individual care are unlikely to lead to achievement of greatly improved health for all Africans. A rapid expansion of new, African-bred approaches to people-centred health systems, focused on prevention, primary care, and public health, and supported by clinical referral systems and quality tertiary care is required to move to the next stage of better health.

UHC should be designed with local values, sustainability, and equity in mind from the onset.

There are historic, not to be missed opportunities to improve health within the next decade

Given the African region's economic growth and societal changes, and building on the momentum from the beginning of the SDG era, most sub-Saharan countries have an opportunity to bring some traditional health challenges under control and prevent others from taking hold and having the same devastating effect seen in other regions of the world. Examples include elimination of polio and guinea worm, meeting demand for modern contraceptives, reduction of maternal mortality and water-borne diseases, greatly reducing the mortality and incidence associated with HIV infection, making substantial progress on sanitation, and prevention of an epidemic of tobacco-related diseases, among others.

Achievement of good health for all citizens should be a political and investment priority for every sub-Saharan African country

In addition to a better life for people, more investment in health will contribute to economic growth and sustainable development. Good health for all citizens is a central responsibility of the state and its elected bodies, which requires considerable investment of public funds, a legislative framework, and a whole-of-society response. Accountability requires mechanisms to hold duty-bearers to account, and people need to have the capacity to demand their rights.

Each country needs to chart its own sustainable path to improve health outcomes

Each country needs home-bred solutions to build the required systems based on its own culture, while making maximal use of international experiences and evidence, strengthened stewardship of health, and commitment to accountability. All domestic and external resources for health should be aligned to a country's national health strategy, with actions evaluated by specific health outcomes.

All countries can and should invest more in health and do more to address inefficiencies

Governments need to identify new funding sources and maintain steady progress over time towards increasing the share of prepaid contributions in total health expenditure and towards prioritising health in domestic budgets. Although there is no single benchmark to determine funding needs, targets to aim for include 5% of gross domestic product (GDP), 15% of government expenditure, and US\$86 per capita. Improvements to access and outcomes for poorer individuals should remain a priority and requires more effort to identify and reach these groups. Improvement to public financial management is the foundation of

better health spending and should be complemented by taking a systemic approach to implementation of reforms, with a view to reducing fragmentation and inefficiencies across health system functions, public sector portfolios, and stakeholders.

Closing health equity gaps should be a core concern for policy and action

Poor people in Africa still have disproportionately less access to health services and are more exposed to impoverishing expenditure compared to non-poor people. All efforts to improve health should explicitly address the serious inequities within countries. Health inequities are greatest among very poor people, rural populations, those who are marginalised or excluded from society, and those who live in humanitarian settings and conflict zones. A key priority is the reduction of out-of-pocket payments: despite overall progress during the past decade, some countries have had little reduction in their share of total health expenditure. In more than a third of sub-Saharan countries, such payments make up more than 40% of total health expenditure, and in only five countries (Botswana, Mozambique, Namibia, Seychelles, and South Africa) these payments represent less than 10%. Further progress is needed to remove user fees and ensure poorer people benefit the most from health insurance schemes.

Investments in higher education and research are essential for better health and sustainable development

Higher education is crucial for development of an adequate and skilled health workforce and increasing health research capacity, and should receive a higher priority in national and regional agendas. Because of the importance of context in improvement of health and delivery of health services, local research is necessary to identify challenges, set priorities, devise original solutions, and make the best use of scarce resources.

Generation and use of innovation will accelerate better health outcomes and reduce inequities

Capitalising on innovation is key to the future of health in sub-Saharan Africa and can support leapfrogging health improvements, by adopting more advanced technologies rather than following slow, classic paths. Innovative, low-cost vaccines, diagnostics, therapies, and information technology applications have huge scope for prevention and care. Innovations in health professional education, health service delivery, and governance are also urgently needed, particularly those using information and communication technologies.

Stronger regional cooperation will add value to national health efforts

Pooling resources among sub-Saharan countries and collaboration on issues related to commodity security, surveillance, emergency response, governance, the

health workforce, and research and development would benefit population health and quality of care in countries and the African region as a whole, and would facilitate more proactive sharing of data, innovations, and technical expertise.

In summary, through sustained commitment towards good governance and health investment, cross-sectoral action, and leadership geared towards innovation, closing the health gap in a generation is within reach.

Introduction: a sobering legacy, a promising future

Sub-Saharan Africa comprises 49 very different countries, with clusters of common culture and history. It is difficult, if not impossible, to envisage the future without considering history. In the case of Africa, this history includes the heaviest burden of infectious diseases, maternal and child mortality, and malnutrition in recent times, and more broadly a legacy of colonisation—even over the 50 years since independence for most nations—and a turbulent more recent history in several countries.

The early 20th century, a time of ecological and economic disruption due to European colonisation,¹ saw epidemics of trypanosomiasis (from which a third of the population around Lake Victoria died between 1901 and 1905),² and the 1918–19 H1N1 influenza pandemic, which caused 2 million deaths across sub-Saharan Africa.³ Malaria exerted a heavy toll; even in Nairobi at 1800 m, over 14 000 malaria cases were recorded in 1913.⁴ Tuberculosis was unknown in areas like Tanzania until colonisation,⁵ and miners were disproportionately affected. There were substantial outbreaks of syphilis across sub-Saharan Africa, gonorrhoea in the central African region,¹ and meningococcal meningitis in the Sahel and sub-Saharan Africa; a 1921 meningitis epidemic in Nigeria caused 45 000 deaths in Sokoto province (population 1·36 million) alone.⁶ Sub-Saharan Africa had a high incidence of smallpox relative to other regions; even by 1962, the estimated incidence rate in DR Congo was 144 per 100 000 people, compared to India's 10 per 100 000 people.⁷

Before European colonisation, health-care services based on indigenous knowledge systems were widely available in urban and rural communities. Traditional practitioners used herbs and other remedies to treat various ailments, and people trusted them. The popularity of traditional medicine continues today. However, European colonisation and the subsequent emergence of western medicine and Christianity created tensions between the two care systems. As sub-Saharan Africa moves forward, the existence of the traditional medicine system and these tensions can no longer be disregarded.

Perhaps the most visible legacy of up to 5 centuries of European colonisation relates to official working languages, health worker education, and nurses' uniforms. This historic effect is also reflected in the organisation of the health system. Francophone countries

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Panel 1: African health-related initiatives, declarations, and reports

- The African Union's Agenda 2063 and its first 10-year implementation plan¹⁰
- Mindset Shifts for Ownership of Our Continent's Development Agenda. Report of the Committee on Ensuring Country Ownership of Africa's Development Agenda in the Post-2015 Era¹¹
- The Roadmap on Shared Responsibility and Global Solidarity for AIDS, Tuberculosis and malaria in Africa¹² (its three pillars—diversified financing, access to affordable and quality-assured medicines, and enhanced leadership and governance—relate to health more broadly)
- Pharmaceutical Manufacturing Plan for Africa¹³
- Preventing a tobacco epidemic in Africa: a call for effective action to support health, social, and economic development¹⁴
- Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods¹⁵
- Delivering on the data revolution in sub-Saharan Africa and the African Data Consensus Statement Resolution of the Ministers¹⁶
- The outcomes of the Summit on Higher Education in Dakar, in March, 2015¹⁷
- The Cairo Declaration, which followed the 15th African Ministerial Conference on the Environment in March, 2015¹⁸
- Planet Earth Institute, a non-governmental organisation lobbying for an African science agenda

For more on Planet Earth Institute see <http://planetearthinstitute.org.uk>

inherited a mixed system of heavily centralised disease control programmes (so-called *la lutte contre les grandes endémies*, and often managed by military physicians in colonial times) and primary care services, whereas anglophone countries traditionally embraced a more decentralised health system with multiple layers. Christian missions and non-governmental organisations (NGOs) have played a major part in former Belgian and Portuguese colonies. In general, public health systems aimed to ensure a workforce for whatever the agricultural, mining, or industrial needs of the coloniser were.

Human resources for health were woefully inadequate at independence in almost every sub-Saharan African country, but Belgian and Portuguese colonies were the least prepared for management of their health systems. This unpreparedness was partly because colonial governments focused on training low level cadres of health workers, such as nursing aides and auxiliaries, or clinical assistants. It was only much later in the 1930–50s when higher level training (eg, medical education for doctors) was established, and trainees had to be registered in Europe. By 1960, only six medical schools existed in sub-Saharan Africa outside South Africa. This is in marked contrast to the explosion of medical schools and other health professional training schools in the past 20 years. Nevertheless, many African countries still have a major shortage of health-care workers, as a result of weak educational systems in general, inadequate investments in training, and losses of doctors, nurses, and midwives to high-income countries. There are different patterns among countries in terms of human resources; some countries do not have enough positions in the public sector, although they have enough qualified

medical staff, and others have vacant positions and yet cannot fill them. Since independence, health services have also expanded substantially to reach rural areas, although quality and equity remain huge issues. The legacy of apartheid and continuing inequalities in South Africa—including in the face of health and illness—is a special case in point, and has been well described in a special series in *The Lancet*.⁸

Africa's colonial past explains why WHO Regional Office for Africa is based in hard-to-reach Brazzaville—as it was the capital of French Central Africa—and not in Addis Ababa, where the region's main political and economic institutions are based. Donor preferences and private investments in particular countries are also largely a reflection of history. Such continuing European influence is probably most extreme in many francophone countries; these countries use the CFA franc as currency, which is linked to the Euro through the French Treasury, and France has a strong influence on national policy and budgets in several African countries. Finally, with the notorious exception of Ethiopian Airlines and Kenyan Airways, airline connections in Africa are often more directed to either Europe or South Africa, making regional and sub-regional cooperation more difficult and expensive.

Post-colonial history has also had a major effect on health and health systems. For example, health systems in several sub-Saharan countries have yet to recover from the impact of structural adjustments and other economic reforms imposed by the International Monetary Fund, the World Bank, and other international agencies in the wake of the economic downturn in the 1970s. Many countries have a health system under their respective Ministry of Health and other parallel health systems managed by funders and NGOs.

Another important factor is the failure of some societies and governments to uphold human rights, freedom of information, freedom of speech and habeas corpus: generally, a failure to legally and politically empower citizens and patients. Moreover, although genocides, such as in Rwanda and Darfur, are extreme examples, large parts of Africa have had a heavy and prolonged share of armed conflict and predatory leaders, including a diversion of much needed public resources for health and education, besides directly and indirectly causing the death of millions of people. Failed states that have emerged at different times are unable to provide sound governance, leadership, and funding to their health systems and even minimum coordination of international partners. Several countries continue to be in fragile situations and their health challenges require special approaches, as discussed later.

Sub-Saharan Africa's health challenges are numerous, wide-ranging, and well documented. Although nowhere near the scale of other infectious diseases such as HIV, tuberculosis, malaria, respiratory infections, and diarrhoeal diseases, the Ebola epidemic in 2014–15 was a stark reminder that the public health infrastructure in many countries is not fit for purpose. Climate change

will probably affect Africa very profoundly. Less widely reported are achievements and the possibilities to greatly improve health outcomes within a generation. Failure of health achievements to date is more likely to be caused by inadequate and poor implementation of the most important ideas, an inadequate health workforce, and insufficient investment in health systems, rather than by a paucity of novel ideas. Importantly, the solutions to

many of sub-Saharan Africa's health challenges lie beyond the domain of the health sector, in public finances, legal frameworks, education, nutrition, water sanitation, social protection and poverty reduction, safer roads, and cleaner air.

Our Commission was prompted by the African region's potential to improve health on its own terms, and largely with its own resources. The spirit of this Commission is

	Main interventions	Related SDGs and targets	Examples of African-led initiatives
Control of major communicable diseases (HIV, tuberculosis, malaria, neglected infectious diseases, and measles), including eradication of polio and dracunculiasis, and elimination of onchocerciasis, leprosy, trachoma, and lymphatic filariasis, and of malaria in selected countries	HIV/AIDS: combination HIV prevention, antiretroviral therapy, prevention of mother-to-child transmission, anti-discrimination action, structural interventions, harm reduction; Malaria: integrated vector management, insecticide-treated bednets, case management with artemisinin-based combination therapy, intermittent preventive treatment, vaccination; Tuberculosis: early detection and treatment, screen for co-infection with HIV; Others: sanitation, safe drinking water, mass treatment, vaccination, vector control	3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases	The African Union Roadmap for Shared Responsibility and Global Solidarity for AIDS, Tuberculosis and Malaria Response; The African Leaders Malaria Alliance, a coalition of 49 African heads of state and government to monitor and facilitate progress towards malaria targets in the continent
Prevent the spread and minimise the effect of infectious disease outbreaks	Robust national and regional public health systems for epidemiological surveillance, prevention, early warning, and rapid response	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	African Public Health Emergency Fund
By 2030, reduce the global maternal mortality ratio to 70 or lower per 100 000 livebirths, with no country higher than 140, reduce the global stillbirth rate to 12 or lower per 1000 total births, reduce the neonatal mortality rate to 12 or less per 1000 livebirths, and reduce the under-5 mortality rate to 25 or lower per 1000 livebirths	Access to good quality antenatal and facility-based care at childbirth; emergency obstetric care; safe abortion and post-abortion care; prevention of mother-to-child transmission of HIV; breastfeeding; immunisation; prevention and management of early childhood illness and malnutrition; secondary education for girls; family planning; ending early and forced marriage for girls	3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 livebirths; 3.2 By 2030, end preventable deaths of newborns and children aged under 5 years, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 livebirths and under-5 mortality to at least as low as 25 per 1000 livebirths; 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	Campaign on Accelerated Reduction of Maternal Mortality in Africa to accelerate actions to reduce maternal, newborn and child mortality across Africa; Every Newborn Action Plan (supported by World Health Assembly resolution in 2014)
Reduce fertility to replacement level	Family planning and contraceptive services, including targeted interventions for young women to raise age of first pregnancy; comprehensive sexuality education for all children and adolescents; secondary education for girls; programmes to reduce gender-based violence; and poverty reduction (strong link between wealth and fertility)	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	The Maputo Declaration, the African Charter on Human and Peoples' Rights, and the Continental Framework on Sexual and Reproductive Health and Rights; Addis Ababa Declaration on Population and Development beyond 2014
Sustain and accelerate decreases in smoking rates	Taxation and regulation, targeted education campaigns, full implementation of the Framework Convention on Tobacco Control	3.a Strengthen the implementation of the WHO Framework Convention on Tobacco Control in all countries, as appropriate	The Africa Tobacco Control Regional Initiative and The African Tobacco Control Alliance to provide the network building and technical assistance needed to grow tobacco control capacity and resources for sub-Saharan African countries
Reduce risk factors for non-communicable diseases and promote mental health and wellbeing	Campaigns targeting overweight and obesity, unhealthy diets, physical inactivity, dietary salt, and alcohol abuse; management of hypertension; taxation and regulation of sugary drinks, highly processed food, and alcohol; clean energy fuels used in the home; reduced exposure to occupational and environmental hazards; integration of mental health promotion interventions into school-based and community programmes; reducing alcohol and substance abuse; addressing discrimination and interpersonal violence	3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment, and promote mental health and wellbeing	The Chronic Disease Initiative for Africa, a regional hub to enhance collaborations between local and international researchers to develop and evaluate models of chronic disease care and the prevention of their risk factors in Africa
Provide essential treatment for priority non-communicable diseases	Early diagnosis and integrated management of hypertension, heart disease, diabetes, asthma, mental illness, and selected cancers; primary health care and access to essential medicines	3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and wellbeing	The Chronic Disease Initiative for Africa

(Table 1 continues on next page)

	Main interventions	Related SDGs and targets	Examples of African-led initiatives
(Continued from previous page)			
Reduce incidence of traffic accidents and interpersonal violence	Road safety campaigns, better infrastructure, enforcement of seat belts and helmets, alcohol control for drivers; in urban areas: pedestrian and bicycle lanes; more efficient public transportation systems; community and personal interventions, alcohol and drugs control, employment and housing policies, gender education, police education and enforcement	3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents; 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; 16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children	The African Plan for the Decade of Action for Road Safety 2011–20, designed to enable African countries to consider and manage road infrastructure safety during design, construction, and operation
End hunger and eliminate stunting, with a view to reduction of childhood stunting to 10% by 2025; end protein-energy malnutrition, and micronutrient deficiencies, with a view to reduction of childhood underweight to 5% by 2025	National nutrition programmes and targeted public awareness campaigns; food security; secondary education for girls; legislation on marketing of breastmilk substitutes	SDG 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture; 2.1 By 2030, end hunger and ensure access by all people, in particular poor people and people in vulnerable situations, including infants, to safe, nutritious, and sufficient food all year round; 2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children aged under 5 years, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older people	The Comprehensive Africa Agriculture Development Programme is a policy framework for agricultural transformation, wealth creation, food security and nutrition, economic growth, and prosperity for Africa; The Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods is a set of new goals showing a more targeted approach to achievement of the agricultural vision for Africa, which is shared prosperity and improved livelihoods
Achievement of universal access to safe water and basic sanitation, and promotion of handwashing with soap	Public awareness campaigns; rural household and health facility safe water supply and sanitation; sanitary infrastructure in schools, with separate facilities for boys and girls; social marketing	SDG 6. Ensure availability and sustainable management of water and sanitation for all; 6-1 By 2030, achieve universal and equitable access to safe and affordable drinking water for 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	The Ngor Declaration on Sanitation and Hygiene, signed in May, 2015, with specific indicators on safe water, sanitation, and hygiene
Management and equipment of cities for better health	Incorporation of healthy living goals in planning of massive expansions of cities; healthy, energy-efficient durable housing; safe water and sanitation; safe roads and public transport; access for people with disabilities; green spaces and walking and cycling networks; control of environmental pollution. Pay particular attention to slums and informal settlements in the provision of basic services: upgrading vs social interventions to improve access to services and amenities; security of tenure. Promotion of good urban governance—issues around policies, land use, security, and waste management.	SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable; 11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums; 11.2 By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, people with disabilities and older people; 11.3 By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated, and sustainable human settlement planning and management in all countries; 11.6 By 2030, reduce the adverse per capita environmental effect of cities, including by paying special attention to air quality and municipal and other waste management; 11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older people and people with disabilities	The Healthy Cities Initiative in the African Region; The Sustainable Energy Fund for Africa, to support sustainable private sector led economic growth in African countries through the efficient utilisation of presently untapped clean energy resources
Mitigation of climate change and environmental degradation	Ensure healthy and environmentally sustainable cities, including public transport and waste management; investment in research, monitoring, and surveillance to respond to adaptation needs and ensure the potential health co-benefits of climate mitigation at the local and national level; adoption of policies and public education for reduction of food waste; promotion of healthy diets with low environmental effect; more efficient use of water; ending deforestation; appropriate management of chemicals; improvement of access to modern family planning and renewable energy; integration of environmental care with health systems	SDG 13. Take urgent action to combat climate change and its effects (acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change); 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; 13.2 Integrate climate change measures into national policies, strategies, and planning; 13.3 Improve education, awareness raising, and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning	Climate Investment Funds, the Global Environment Facility, the Sustainable Energy Fund for Africa, the Africa Water Facility, and the Congo Basin Forest Fund—all administered by the African Development Bank Group

SDG=Sustainable Development Goal.

Table 1: Strategic options to reach the health SDGs by 2030

one of evidence-based optimism, with caution. We recognise that major health inequities exist and that health outcomes are worst in fragile countries, rural areas, urban slums, and conflict zones, and among poor, disabled, and marginalised people. The future of health in Africa is bright, but only if no one is left behind.

Our Commission could not come at a more opportune time. It is the dawn of the UN 2030 Agenda for Sustainable Development and the African Union's Agenda 2063. The WHO's Regional Director for Africa, Dr Matshidiso Moeti, is providing much needed leadership; among other things, she is implementing internal reforms, strengthening accountability for results and resources, and urging African governments to follow her lead.⁹ What is missing is a comprehensive, inclusive, multisector strategy to improve the health and wellbeing of all people and all communities, everywhere in sub-Saharan Africa. Our report builds on numerous publications, including several African declarations and reports, and some *Lancet* Commissions (panel 1 and table 1).^{19–24}

The present Commissioners represent various disciplines and sectors and include current and former ministers of health, heads of medical schools and research institutes, scientists, and individuals from NGOs and the business world. The Commission met three times—in Accra, Ghana, on May 7–8, 2013; in Addis Ababa, Ethiopia, on Jan 14–15, 2014; and in London, UK, on May 15, 2015. From March–May 2015 most Commissioners were interviewed, either in person or by phone. Key themes were extracted and consolidated from the meetings and interviews, and key policy documents and reports and scientific publications were reviewed. Additional analyses were done to examine the dynamic nature and sustainability of African countries' health financing efforts towards universal health coverage (UHC) over time, and to assess trends in out-of-pocket payments and external funding. A core writing group assembled the information and drafted the Commission, which was then circulated to Commissioners for comments and revised accordingly.

Section 1: health in sub-Saharan Africa—current situation and projections to 2030

Life expectancy, mortality, and outcomes

Life expectancy in sub-Saharan Africa, although still far behind the rest of the world, has been steadily increasing since 2000. Figure 1 shows the variations in country trajectories since 1980. For example, in South Africa and Zimbabwe, AIDS led to a drop in life expectancy until the early 2000s, when the curve began to increase as antiretroviral therapy became more widely available, whereas Ethiopia has had 3 decades of steady increases and no dips. In a growing number of sub-Saharan countries, people born today can expect to live well into their 60s. In addition to increased access to health interventions, improvements in life expectancy have

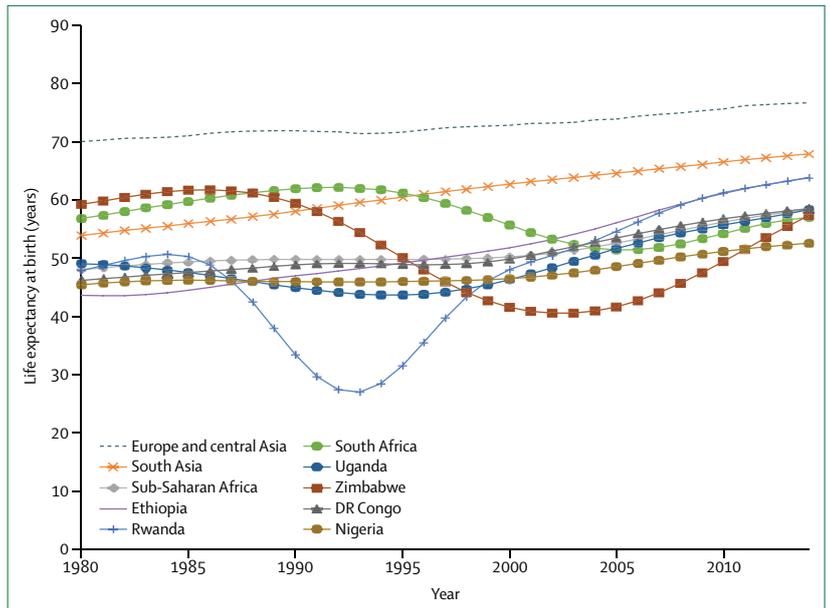


Figure 1: Life expectancy at birth in selected sub-Saharan countries and other regions, 1980–2014
Data from the World Bank World Development Indicators database.²⁵

been due to reductions in extreme poverty and hunger, more girls and boys spending more years in school, and increased access to clean drinking water.

Progress aside, the need for health improvement and disease prevention remains great. Tables 2 and 3 show key health-related data for all 49 sub-Saharan countries, and some substantial differences between countries. For example, in 2015 the estimated antiretroviral therapy coverage among adults with HIV was 78% in Botswana and 24% in The Gambia and Liberia; in the same year, the population using improved sanitation facilities was reported to be 98% in the Seychelles and 7% in South Sudan.

Most African countries now face a double burden of traditional persisting health challenges such as infectious diseases, malnutrition, and child and maternal mortality; and emerging challenges from a rising prevalence of chronic diseases, mental health disorders, injuries, and health problems related to climate change and environmental degradation.

Maternal, newborn, and child health

The under-5 mortality rate and the maternal mortality ratio in sub-Saharan Africa both fell by 49% between 1990 and 2013.²⁶ Projections by the Institute for Health Metrics and Evaluation for this Commission to 2030 suggest that the rates of projected decline will vary across and within the four sub-Saharan regions (figures 2, 3). Sharper declines in child mortality from 2013 are projected for central Africa and southern Africa compared with the other two sub-regions, and the projection for Southern Africa is expected to almost meet the Sustainable Development Goal (SDG) target of at least as low as

	Life expectancy at birth, 2015 (years)	Neonatal mortality rate, 2015 (per 1000 livebirths)	Under-5 mortality rate, 2015 (probability of dying by age 5 years/1000 livebirths)	Stunted children aged <5 years, 2007-15	Underweight children aged <5 years, 2007-15	HIV prevalence in adults aged 15-49 years, 2014-15*	Prevalence of smoking any tobacco product among male adults aged ≥15 years, 2008-15	Age-standardised prevalence of raised blood pressure among male adults aged >18 years, 2015	Age-standardised prevalence of obesity among female adults aged >18 years, 2014	Unmet need for family planning, 2007-14†
Angola	52	48.7	156.9	29.2%	15.6%	2.2%	..	29.6	14.2%	..
Benin	60	31.8	99.5	34%	18%	1.1%	17.7%	27.1	14.5%	32.6%
Botswana	66	21.9	43.6	31.4%	11.2%	22.2%	..	29.3	32.3%	..
Burkina Faso	60	26.7	88.6	35.1%	26.2%	0.8%	36%	31.3	9.2%	35.7%
Burundi	60	28.6	81.7	57.5%	29.1%	1%	..	27.3	4.5%	32.4%
Cape Verde	73	12.2	24.5	..	..	1%	22.2%	30.5	17.4%	..
Cameroon	57	25.7	87.9	31.7%	14.8%	4.5%	43.8%	24.9	17.1%	23.5%
Central African Republic	53	42.6	130.1	40.7%	23.5%	3.7%	..	31.4	8%	27%
Chad	53	39.3	138.7	39.9%	28.8%	2%	..	31.6	12.3%	28.3%
Comoros	64	34	73.5	32.1%	16.9%	..	23.1%	27.4	11%	31.6%
Congo (Brazzaville)	65	18	45	21.2%	12.3%	2.8%	43.2%	27.5	15.7%	18.2%
Côte d'Ivoire	53	37.9	92.6	29.6%	15.7%	3.2%	..	27.8	13.8%	22.2%
DR Congo	60	30.1	98.3	42.6%	23.4%	0.8%	..	29.3	7.1%	27.7%
Djibouti	64	33.4	65.3	33.5%	29.8%	1.6%	..	28.0	13.5%	..
Equatorial Guinea	58	33.1	94.1	26.2%	5.6%	4.9%	..	29.2	22.7%	33.8%
Eritrea	65	18.4	46.5	50.3%	38.8%	0.6%	..	28.2	6.9%	..
Ethiopia	65	27.7	59.2	40.4%	25.2%	1.2%	8.9%	28.8	6.6%	24.3%
Gabon	66	23.2	50.8	17.5%	6.5%	3.8%	..	27.8	22.5%	26.5%
The Gambia	61	29.9	68.9	25%	16.4%	1.8%	..	29.6	15.8%	21.5%
Ghana	62	28.3	61.6	18.8%	11%	1.6%	13.1%	24.6	18.9%	32.7%
Guinea	59	31.3	93.7	35.8%	16.3%	1.6%	..	29.0	10.3%	..
Guinea-Bissau	59	39.7	92.5	27.6%	17%	3.7%	..	29.7	10.8%	6%
Kenya	63	22.2	49.4	26%	11%	5.9%	24.6%	26.5	11.1%	18.6%
Lesotho	54	32.7	90.2	33.2%	10.3%	22.7%	55.1%	26.1	24%	18.4%
Liberia	61	24.1	69.9	32.1%	15.3%	1.1%	27.6%	28.2	10.6%	31.1%
Madagascar	66	19.7	49.6	49.2%	..	0.4%	..	27.8	8.6%	19%
Malawi	58	21.8	64	42.4%	16.7%	9.1%	25.4%	27.8	8.9%	19.4%
Mali	58	37.8	114.7	..	..	1.3%	36.8%	31.2	9.9%	26%
Mauritania	63	35.7	84.7	22%	19.5%	0.6%	44%	31.8	13.6%	31.1%
Mauritius	75	8.4	13.5	..	..	0.9%	40.1%	26.5	24.3%	..
Mozambique	58	27.1	78.5	43.1%	15.6%	10.5%	31.4%	28.1	8.7%	28.5%
Namibia	66	15.9	45.4	23.1%	13.2%	13.3%	38.9%	28.2	28.2%	17.5%
Niger	62	26.8	95.5	43%	37.9%	0.5%	18.6%	31.3	6.8%	16%
Nigeria	55	34.3	108.8	32.9%	19.8%	3.2%	17.4%	22.7	16.3%	18.9%
Rwanda	66	18.7	41.7	44.3%	11.7%	2.9%	..	25.2	6.6%	20.8%
São Tomé and Príncipe	68	17.1	47.3	17.2%	8.8%	..	..	26.9	18.2%	37.6%
Senegal	67	20.8	47.2	19.4%	12.8%	0.5%	23.4%	29.7	14.6%	29.3%
Seychelles	73	8.6	13.6	7.9%	3.6%	..	43%	26.4	35.9%	..
Sierra Leone	50	34.9	120.4	37.9%	18.1%	1.3%	60%	29.4	12%	25%
Somalia	55	39.7	136.8	25.3%	23%	0.5%	..	33.5	7.2%	..
South Africa	63	11	40.5	23.9%	8.7%	19.2%	31.4%	27.4	37.3%	..
South Sudan	57	39.3	92.6	31.1%	27.6%	2.5%	..	..	11.1%	26.3%
Sudan	64	29.8	70.1	38.2%	33%	0.3%	..	30.6	11.1%	28.9%
Swaziland	59	14.2	60.7	25.5%	5.8%	28.8%	19%	28.1	27.8%	13%

(Table 2 continues on next page)

	Life expectancy at birth, 2015 (years)	Neonatal mortality rate, 2015 (per 1000 livebirths)	Under-5 mortality rate, 2015 (probability of dying by age 5 years/1000 livebirths)	Stunted children aged <5 years, 2007-15	Underweight children aged <5 years, 2007-15	HIV prevalence in adults aged 15-49 years, 2014-15*	Prevalence of smoking any tobacco product among male adults aged ≥15 years, 2008-15	Age-standardised prevalence of raised blood pressure among male adults aged >18 years, 2015	Age-standardised prevalence of obesity among female adults aged >18 years, 2014	Unmet need for family planning, 2007-14†
(Continued from previous page)										
Tanzania	62	18.8	48.7	34.8%	13.6%	4.7%	27.5%	26.6	11.4%	25.3%
Togo	60	26.7	78.4	27.5%	16.2%	2.4%	..	28.3	11.9%	33.6%
Uganda	62	18.7	54.6	33.7%	14.1%	7.1%	16.4%	26.7	8.3%	34.7%
Zambia	62	21.4	64	40%	14.8%	12.9%	26.5%	27.6	14.3%	21.1%
Zimbabwe	61	23.5	70.7	27.6%	11.2%	14.7%	31.2%	26.9	18.5%	10.4%

Data taken from WHO Global Health Observatory, *UNAIDS and †UN Statistics Division.

Table 2: Infant, child, and adult key health indicators for 49 sub-Saharan countries (most recent year available, from 2007)

	Density of physicians (per 10 000 people), 2007-13	Births attended by skilled health personnel, 2007-15	Neonates protected at birth against neonatal tetanus, 2014	Immunisations against measles among 1-year-olds, 2015	Antiretroviral therapy coverage among people with HIV, 2015*	Case detection rate for all forms of tuberculosis, 2015	Population using improved drinking water sources, 2015	Population using improved sanitation facilities, 2015
Angola	1.7	46.7%	78%	55%	29%	60%	49%	51.6%
Benin	0.6	77.2%	93%	75%	49%	60%	77.9%	19.7%
Botswana	4.0	99.9%	92%	97%	78%	70%	96.2%	63.4%
Burkina Faso	0.5	..	89%	88%	55%	59%	82.3%	19.7%
Burundi	..	..	85%	93%	54%	53%	75.9%	48%
Cape Verde	3.1	92.3%	92%	92%	42%	39%	91.7%	72.2%
Cameroon	0.8	64.7%	85%	79%	27%	52%	75.6%	45.8%
Central African Republic	0.5	..	60%	49%	24%	57%	68.5%	21.8%
Chad	..	24.3%	60%	62%	36%	55%	50.8%	12.1%
Comoros	..	82.2%	85%	81%	..	56%	90.1%	35.8%
Congo (Brazzaville)	0.9	94.4%	85%	80%	..	58%	76.5%	15%
Côte d'Ivoire	1.4	..	82%	72%	35%	64%	81.9%	22.5%
DR Congo	..	80.1%	82%	79%	33%	48%	52.4%	28.7%
Djibouti	..	87.4%	80%	74%	21%	41%	90%	47.4%
Equatorial Guinea	..	68.3%	70%	27%	31%	88%	47.9%	74.5%
Eritrea	..	34.1%	94%	85%	60%	60%	57.8%	15.7%
Ethiopia	0.3	..	80%	78%	..	60%	57.3%	28%
Gabon	..	89.3%	85%	68%	58%	75%	93.2%	41.9%
The Gambia	1.1	57.2%	92%	97%	24%	76%	90.2%	58.9%
Ghana	1.0	..	88%	89%	34%	33%	88.7%	14.9%
Guinea	..	45.3%	80%	52%	29%	54%	76.8%	20.1%
Guinea-Bissau	0.7	45%	80%	69%	..	34%	79.3%	20.8%
Kenya	2.0	..	76%	75%	59%	80%	63.2%	30.1%
Lesotho	..	77.9%	83%	90%	42%	49%	81.8%	30.3%
Liberia	0.1	61.1%	89%	64%	24%	20%	75.6%	16.9%
Madagascar	1.6	44.3%	78%	58%	3%	51%	51.5%	12%
Malawi	0.2	..	89%	87%	61%	43%	90.2%	41%
Mali	0.8	57.1%	85%	76%	28%	59%	77%	24.7%
Mauritania	1.3	65.1%	80%	70%	18%	55%	57.9%	40%
Mauritius	..	99.8%	95%	99%	31%	46%	99.9%	93.1%

(Table 3 continues on next page)

For the WHO Global Health Observatory see <http://www.who.int/gho/en/>

For more on AIDS-related deaths in sub-Saharan Africa see <http://aidsinfo.unaids.org>

For UN Statistics Division data see <http://data.un.org>

	Density of physicians (per 10 000 people), 2007–13	Births attended by skilled health personnel, 2007–15	Neonates protected at birth against neonatal tetanus, 2014	Immunisations against measles among 1-year-olds, 2015	Antiretroviral therapy coverage among people with HIV, 2015*	Case detection rate for all forms of tuberculosis, 2015	Population using improved drinking water sources, 2015	Population using improved sanitation facilities, 2015
(Continued from previous page)								
Mozambique	0.4	54.3%	83%	85%	53%	39%	51.1%	20.5%
Namibia	3.7	88.2%	85%	85%	69%	67%	91%	34.4%
Niger	0.2	29.3%	81%	73%	26%	58%	58.2%	10.9%
Nigeria	..	35.2%	55%	54%	..	15%	68.5%	29%
Rwanda	0.6	90.7%	90%	97%	79%	81%	76.1%	61.6%
São Tomé and Príncipe	..	92.5%	..	93%	..	87%	97.1%	34.7%
Senegal	0.6	..	91%	80%	40%	66%	78.5%	47.6%
Seychelles	10.7	99%	..	98%	..	52%	95.7%	98.4%
Sierra Leone	0.2	59.7%	85%	76%	27%	64%	62.6%	13.3%
Somalia	..	..	64%	46%	8%	45%	..	..
South Africa	7.8	94.3%	80%	76%	48%	68%	93.2%	66.4%
South Sudan	..	17.2%	64%	20%	11%	48%	58.7%	6.7%
Sudan	2.8	..	74%	87%	8%	52%	..	..
Swaziland	1.7	88.3%	88%	78%	67%	60%	74.1%	57.5%
Tanzania	0.3	48.9%	88%	99%	53%	36%	55.6%	15.6%
Togo	0.5	..	81%	85%	41%	61%	63.1%	11.6%
Uganda	..	..	85%	82%	57%	72%	79%	19.1%
Zambia	1.7	64.2%	85%	90%	63%	59%	65.4%	43.9%
Zimbabwe	0.8	80%	75%	86%	62%	70%	76.9%	36.8%

Data taken from WHO Global Health Observatory and *UNAIDS.

Table 3: Health-care professional, disease, and sanitation key health indicators for 49 sub-Saharan countries (most recent year available, from 2007)

25 per 1000 livebirths. Maternal mortality ratios are projected to decline in all sub-regions except southern Africa, where the projection plateaued at the lowest level among the four sub-regions at 200 per 100 000 livebirths. Although the maternal mortality ratios in Central Africa are also projected to fall, they remain at very high frequencies of around 400 per 100 000 livebirths.

The biggest challenge for Africa in terms of child mortality is neonatal mortality—which has distinct causes and needs specific programmatic solutions—and stillbirths. During the Millennium Development Goal (MDG) era, the number of neonatal deaths in Africa actually increased because of slow progress in reduction of the neonatal mortality rate and ongoing increases in birth rates. At current rates of progress, it will be more than 110 years before African newborns have the same chance of survival as newborns in high-income countries.²⁷

These projected trajectories suggest efforts above and beyond those seen in the MDG era will be required by many sub-Saharan countries to meet the SDG targets to reduce the maternal mortality ratio to less than 70 per 100 000 livebirths and to end preventable deaths of newborns and children under 5 years by 2030. The 24 fragile states in sub-Saharan Africa (classified as on alert or worse in the Fragile States Index 2015) are least likely to achieve these targets; according to the World

Bank, by 2030, 11 fragile states will not have met the less ambitious MDG 4 target for child mortality and only 5 fragile states will have met the MDG 5 target for maternal mortality.²⁸

Although there have been substantial reductions in low birthweight, childhood underweight, suboptimal breastfeeding, and vitamin deficiencies (burdens have declined between 37% and 85% in the past 25 years), these risk factors remain prevalent, especially in poor communities and in lower-income countries.²⁹ Half of children aged under 5 years in sub-Saharan Africa are iron deficient and a quarter are deficient in vitamin A.³⁰ The prevalence of low birthweight ranges from 7–35%, and emaciation or wasting due to acute undernutrition ranges from 1–23%.²⁵ Stunting in children aged under 5 years due to chronic undernutrition, which has a long-term effect on personal and cognitive development, ranges from 8% in the Seychelles to 58% in Burundi; underweight in children aged under 5 years ranges from 4% in the Seychelles to 39% in Eritrea (table 2).

Infectious diseases

Infectious diseases remain the leading cause of morbidity and mortality in sub-Saharan Africa, with HIV/AIDS, lower respiratory infections, malaria, diarrhoeal diseases, and tuberculosis ranking 1–4 and 6 for age-standardised

For the Fragile States Index see <http://fundforpeace.org/fsi/>

disability-adjusted life-years (DALYs) in 2015 (figure 4). However, there are some success stories. Guinea worm, or dracunculiasis, is on the brink of becoming the second human disease to be eradicated, and Africa is close to being declared polio free. It is estimated that hepatitis B, *Haemophilus influenzae* type B, rotavirus, and *Streptococcus pneumoniae* vaccines have prevented more than 1 million deaths in successive birth cohorts in Africa.³² Vaccines are also responsible for substantial falls in measles, mumps, and rubella. New vaccines being introduced in the African continent include a pentavalent vaccine, meningococcal and pneumococcal conjugate vaccines, and rotavirus vaccines, and a malaria vaccine is being introduced in pilot projects. However, epidemics of vaccine-preventable diseases continue to occur, particularly in fragile states, as a result of low vaccine coverage and interruption of immunisation programmes, and as also illustrated by a 2016 epidemic of yellow fever in Angola and DR Congo.

Great strides have been made in control of malaria and HIV/AIDS. Malaria mortality in the WHO African Region was reduced by 48% from 2000–15; among the under-5 years age group mortality fell by 58% over the same period.³³ Malaria elimination is now a realistic goal in several African countries, though not yet in those countries in malaria's heartland where outbreaks continue to emerge—such as recently in Rwanda—illustrating that disease control and clinical strategies must adapt on the road to elimination. AIDS-related deaths in sub-Saharan Africa decreased by 36% between 2000 and 2015 to 800 000, and the number of new HIV infections decreased by 43% to 1.4 million. However, this number still represents over 65% of all new HIV infections globally,³⁴ and since 2005 the decrease has been negligible (an annualised rate of change in incidence of -0.03 from 2005–15) with most of the decline due to prevention of mother-to-child transmission. Reaching the UN's goal to end AIDS as a public health problem by 2030 will require more attention to combination prevention and increased treatment adherence. Increasing prices of treatments for comorbidities and opportunistic infections, such as ultra-resistant tuberculosis in South Africa, are also a concern. Ending HIV will require a vaccine.²¹

Although the overall downward trend in infectious diseases is encouraging, the gains to date are fragile and this is no time for complacency or scaling back programmes. If continued investment is not made in disease control there will be an upward surge, as seen with malaria in the 1960s, and with HIV in several communities on the continent.^{35,36} Looking forward, the biggest risks are resistance to antibiotics, artemisinin-based therapies and antiretrovirals, a rise in HIV incidence, regional conflicts leading to a breakdown in disease control programmes, and regional epidemics or a new pandemic. Climate change, habitat destruction, population growth, urbanisation, and international mobility favour the spillover of infections from animal reservoirs, the dissemination of

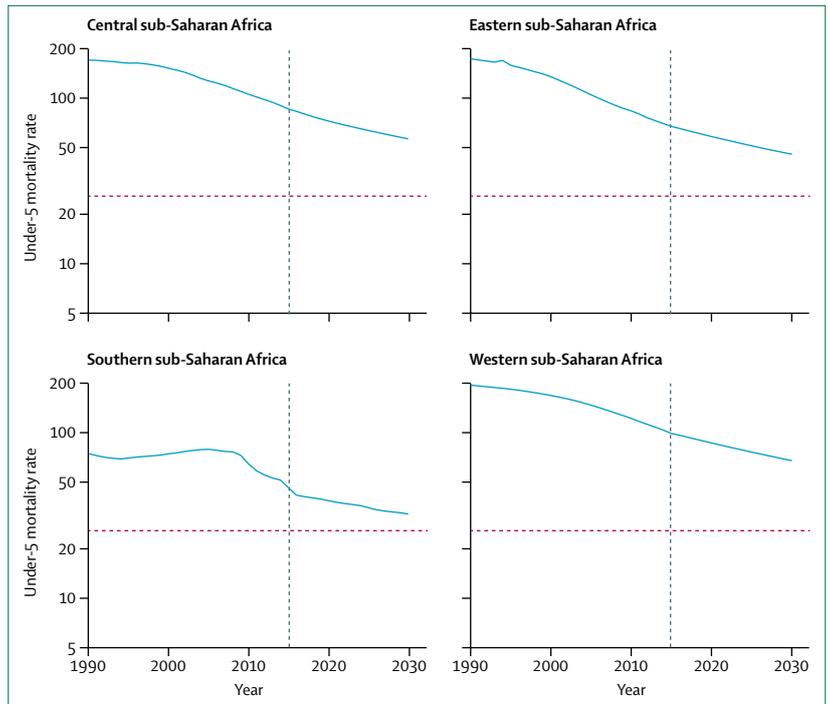


Figure 2: Under-5 mortality rates in four sub-Saharan regions, 1990–2015, with projection to 2030

Data from the Institute for Health Metrics and Evaluation Global Burden of Disease forecasting analysis 2016. The projections to 2030 (right of the vertical dashed line at year 2015) are generated based on a so-called past trends and relationship scenario, involving forecasts of total fertility, education, income, and several risk factors. The projected rates are essentially the expected outcome if the same trends in and relationships between the various factors continue to hold in the future. The y-axis is plotted in log scale. The dashed red line shows the SDG target for reduction of under-5 mortality to at least as low as 25 per 1000 livebirths for all countries.

disease vectors, and the spread of infections in human populations. Late detection and response, as seen with the West African Ebola epidemic, can lead to explosive epidemics, with devastating consequences for society.

A perverse convergence: the rise of chronic diseases and conditions

Sub-Saharan Africa is facing a growing burden from chronic disease, with ischaemic heart disease, stroke, diabetes, major depressive disorders, and chronic obstructive pulmonary disease ranking among the top 20 causes of health loss in 2015 (figure 4).³⁷ Sub-Saharan Africa has among the highest incidence rates of cervical and liver cancer because of high rates of human papillomavirus and hepatitis B infection, and breast cancer in women is low but incidence is increasing.³⁸ However, there is evidence that age-standardised death rates from cardiovascular disease might not be increasing in sub-Saharan Africa, and are actually falling in countries such as the Seychelles and South Africa.³⁹ These mortality trends indicate that the epidemic of cardiovascular disease could be prevented in sub-Saharan Africa if appropriate public health action is taken.⁴⁰

A combination of changing food habits due to urbanisation, increased income and affluence, an ageing population, more sedentary lifestyles, and insufficient

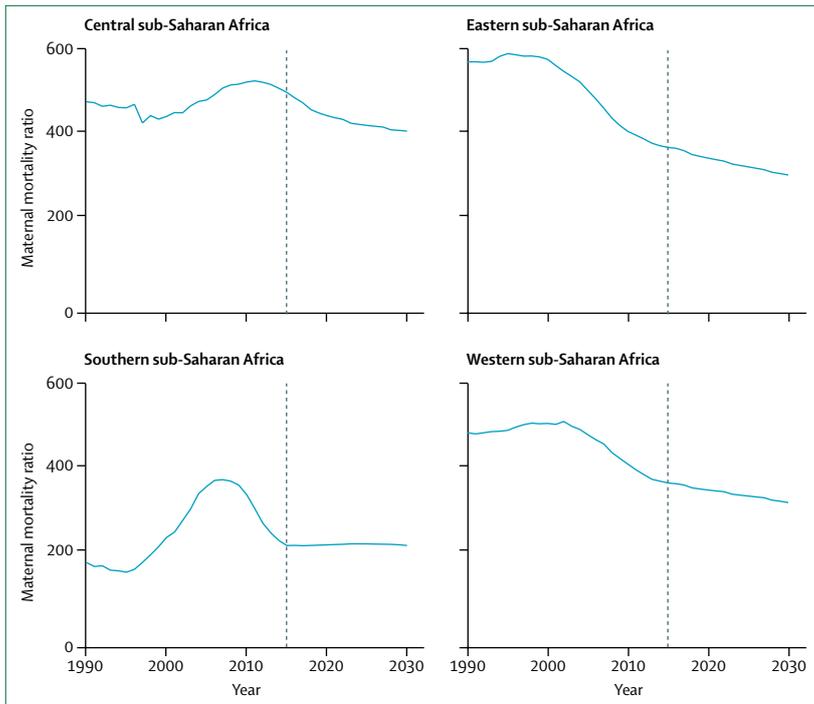


Figure 3: Maternal mortality ratios (per 100 000 livebirths) in four sub-Saharan regions, 1990–2015, with projection to 2030.
 Data from the Institute for Health Metrics and Evaluation Global Burden of Disease forecasting analysis 2016. The projections to 2030 (right of the vertical dashed line at year 2015) are generated based on a so-called past trends and relationship scenario, involving forecasts of total fertility, education, income, and several risk factors. The projected rates are essentially the expected outcome if the same trends in and relationships between the various factors continue to hold in the future. The y-axis is plotted in log scale.

preventive and treatment programmes means that risk factors for chronic conditions are present and on the rise in many African populations. Smoking rates, though lower than elsewhere, have been increasing in several African countries since 2000.⁴¹ Reviews⁴² have shown that hypertension is prevalent in nearly all studies conducted in sub-Saharan Africa (figure 5). Obesity is also rapidly increasing; a global survey found that in 2014 obesity rates in South African women were as bad as among American women, even if overall the body-mass indexes in African populations were below the global average (figure 6).

A major question for Africa is whether a rise in chronic conditions can be prevented, or whether a perverse kind of convergence will occur, with prevalence rates on par with the rest of the world. Together with prevention of a major tobacco epidemic—sub-Saharan Africa’s greatest historic public health opportunity—this perverse convergence can be averted, but countries will need to take decisive action now to reap the long-term health benefits.^{46,47} With the exception of some antismoking programmes, few countries have prevention and management strategies and plans of action in place. In a 2013 WHO survey, only 18% of respondent countries reported having an “operational multisectoral national policy, strategy or action plan that integrates several non-communicable diseases and shared risk factors”.⁴⁸ Operational and health systems research is

urgently needed to develop an African evidence base for practical policies to prevent and treat chronic conditions, especially in countries with weak governance structures, weak accountability mechanisms, and weak health systems.

Scarce information on mental health in sub-Saharan countries suggests that mental health disorders are rising and that the overall majority of treatable cases are untreated, with gross violations of human rights at times. This treatment gap could be more than 90% for schizophrenia, psychoses, and other severe and disabling mental disorders, due in part to chronic under-investment.⁴⁹ In addition, several countries in Western and Eastern Africa are experiencing emerging drug use epidemics. The burden of mental and substance use disorders is set to grow by 130%, according to one estimate.⁵⁰ Researchers have proposed novel training initiatives to tackle the substantial shortfall in service provision and workforce in this area,⁵¹ and a formal role for traditional practitioners remains largely unexploited.

Injuries are also increasing. Between 1990 and 2015 the number of deaths in sub-Saharan Africa due to injuries rose by 20%, to over 614 000 (15% rise in DALYs).^{37,52} The three leading causes were road injuries (33% increase), self-harm (87% increase), and interpersonal violence (58% increase). The amount of burden differed by cause, gender, and age. For example, four-fifths of road injury deaths among adults aged 15–49 years were men, and half of fall-related deaths among women occurred in those aged 70 years or older.⁵² Personal safety has become a major issue in several countries, particularly in urban areas. Violence not only affects people directly, it can also be a major obstacle to access to health services and prevention programmes.

Occupational safety and health issues contribute to injuries and ill health. In rural areas, for example, agricultural workers are known to mishandle agricultural chemicals, with dire carcinogenic effects. Poor handling of electronic and electrical waste presents major health challenges among those who make their living close to urban dumps and peri-industrial clusters. Most African artisanal mechanics and sanitation workers use no protective clothing.⁵³ To address the complex causes of different injuries, intersectoral and targeted prevention strategies should be identified and implemented.

Sub-national health inequities

National data often hide substantial and inequitable sub-national differences in health outcomes. For example, the 2008 Ghana Demographic and Health Survey⁵⁴ showed a range in under-5 mortality from 50 per 1000 livebirths in the Greater Accra and Volta regions to 142 per 1000 livebirths in the Upper West Region, and the Ghana Maternal Health Survey⁵⁵ of 2007 showed pregnancy-related mortality ratios varying from 308 per 100 000 livebirths in the Ashanti region to 594 per 100 000 livebirths in the Eastern region.

Poverty, ethnicity, living in rural areas, and absence of education contribute to health inequities within countries. For example, in Cameroon 49% of children aged under 5 years in the lowest wealth quintile are stunted versus 12% in the highest wealth quintile; in Nigeria the under-5 mortality rate is 188 per 1000 livebirths among those in the lowest wealth quintile and 72 per 100 livebirths for those in the highest wealth quintile; in Ethiopia the percentage of births attended by skilled health personnel is 5% in rural areas and 52% in urban areas (tables 4, 5). In South Africa, the distribution of combined acute and chronic conditions displays socioeconomic disparities, with the heaviest burden for poor black communities in urban areas, which reflects the historic racial disparities under apartheid.^{56,57} In Kenya, 52% of women with secondary or higher education reported use of modern contraceptive methods compared with only 12% among those who never went to school; in Madagascar, the DTP3 (three doses of diphtheria, pertussis, and tetanus) immunisation coverage is 89% among 1-year-olds whose mothers completed secondary or higher education and 50% for those whose mothers had no education (tables 4, 5). Additional years of education beyond primary school have a substantial effect on demand for health services, as women with more education are better informed and empowered to participate in decision making.⁵⁸

A full understanding of health outcomes and disparities within and between sub-Saharan countries is difficult. This is because many national health information systems are unable to provide reliable, up-to-date data, and data are often not disaggregated by gender, age, race, and ethnicity. Moreover, service coverage monitoring frameworks only capture a limited perspective, as they often do not include indicators related to hypertension, diabetes, and mental health services, among others.

The broader context: opportunities and challenges

We conclude this section by briefly describing transitions and megatrends that will have an increasingly important effect on health in sub-Saharan countries over the next few decades.

Economic growth

Gross domestic product (GDP) in sub-Saharan Africa grew by 4.5% in 2014 and 3.0% in 2015.⁵⁹ GDP growth for 2016 and 2017, although still projected to be faster than in most other regions of the world, has been downwardly revised because of low commodity prices, tightening global financial conditions, and drought in parts of the region. Sub-Saharan Africa’s collective annual GDP—US\$1.573 trillion in 2015²⁵—is expected to rise to \$3.5 trillion by 2025, according to one estimate.⁶⁰ Gross national income (GNI) per capita has increased from \$505 in 2000 to \$803 in 2005 to \$1628 in 2015.²⁵ However, economic growth and per capita GNI vary greatly among and within countries, and large portions of the sub-Saharan African population continue to live in

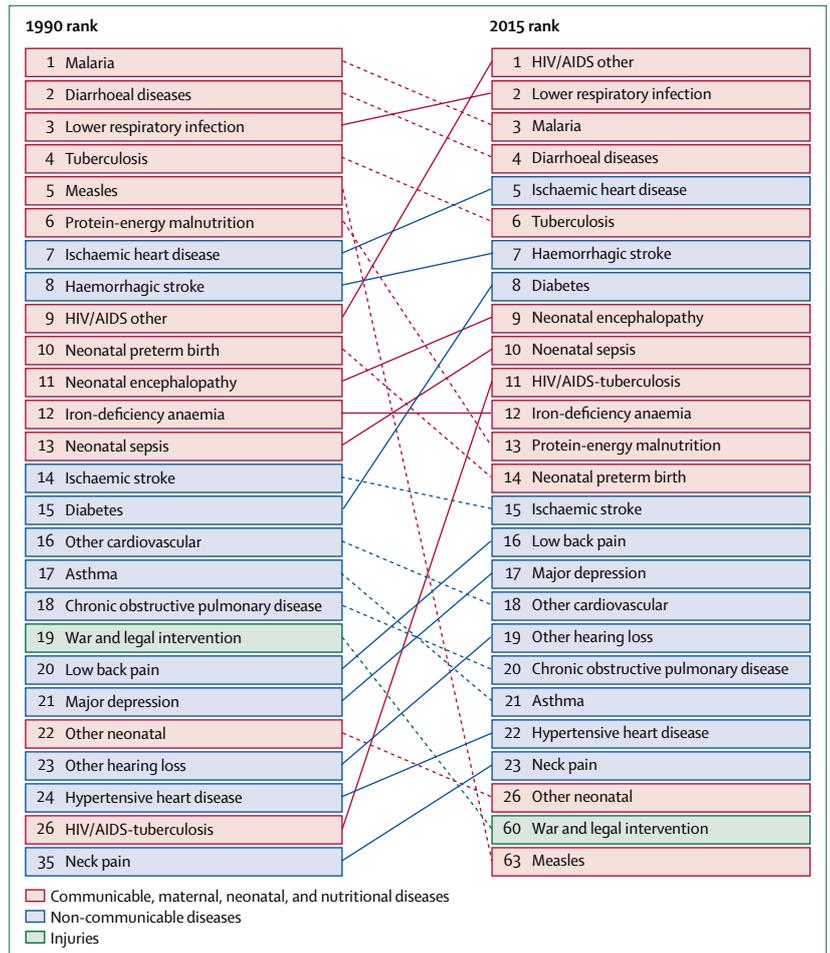


Figure 4: Leading causes of age-standardised disability-adjusted life-years per 100 000 people for both sexes in sub-Saharan Africa, 1990 and 2015. Data from the Institute for Health Metrics and Evaluation.³¹

poverty. To improve health outcomes, the benefits of economic growth need to be more equitably distributed, and government spending on the health sector and sectors that enable health needs to increase, at least in line with increases in GDP. The case for investing in health, particularly in low-income and middle-income settings, has most recently been made in *The Lancet* Commission on Investing in Health¹⁹ and the report of the High-Level Commission on Health Employment and Economic Growth.⁶¹ Overall, this economic growth makes an increase in domestic resources for health very realistic.

Demographic transition

Sub-Saharan Africa’s population is expected to rise from 1.02 billion people in 2017 to 1.42 billion by 2030. More than half of the world’s population growth from 2017–50 will be concentrated in ten countries, and five of these are in sub-Saharan Africa: Nigeria, DR Congo, Ethiopia, Tanzania, and Uganda.⁶² The demographic transition in sub-Saharan Africa has been much delayed, primarily

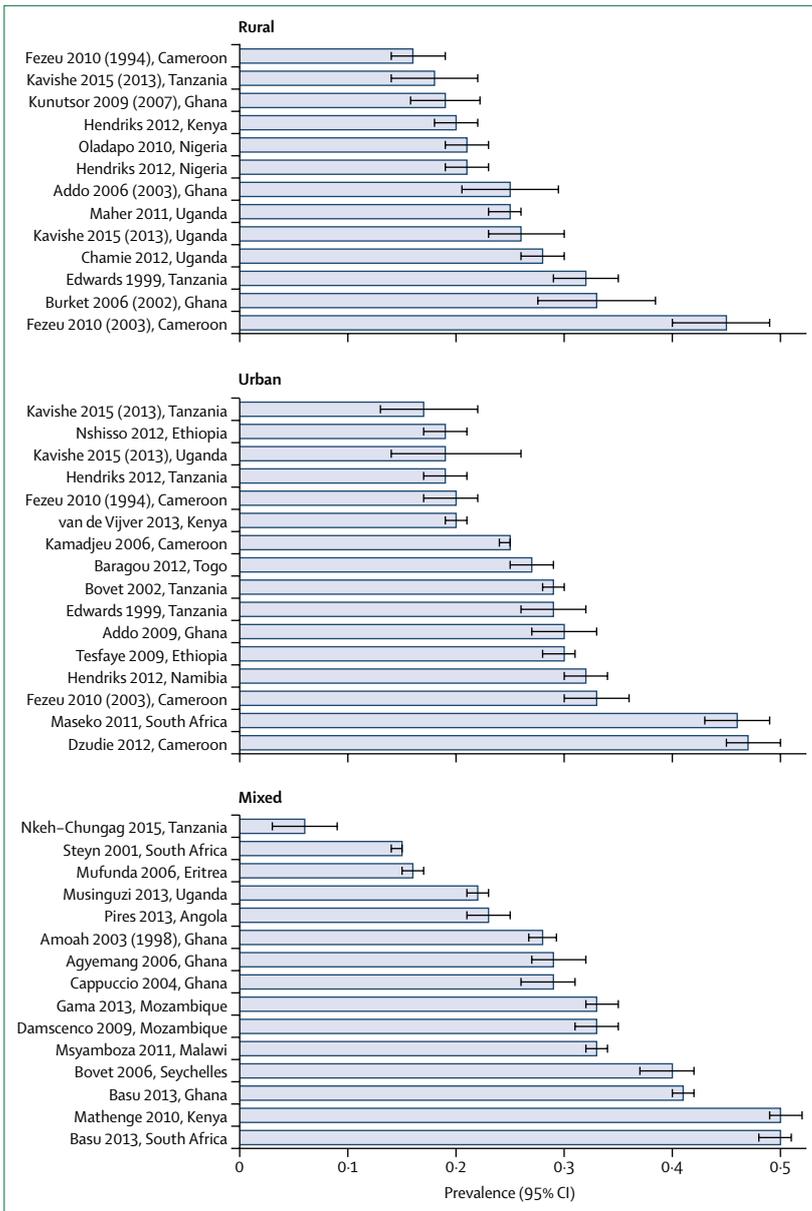


Figure 5: Prevalence of hypertension across sub-Saharan Africa by rural, urban, or mixed setting
 Data from Addo and colleagues,⁴³ Ataklte and colleagues,⁴⁴ and Kavishe and colleagues.⁴⁵ The bars represent prevalence estimates (with 95% CIs) from population-based surveys reported in various data sources. Study author name, year of publication (and year of fieldwork in parentheses if different), and country of fieldwork are shown on the left of the bars. Studies with fieldwork conducted in a mixture of rural and urban settings are described as mixed, whereas studies conducted entirely in rural or urban settings are described accordingly.

because of its high fertility rates (5.1 children per woman). However, population growth rates are projected to decline (figure 7). Some African countries are closer to completing the transition than others.⁶³ All five countries in sub-Saharan Africa with current fertility rates less than 4.0, and thus with a completed or nearly completed demographic transition, are in southern Africa: Botswana, Lesotho, Namibia, South Africa, and Swaziland. Fertility rates were higher and varied across the other sub-regions,

due in part to different cultural ideals of family size. The ideal number of children reported ranged from 4.6 among eastern African women, to 5.9 for western African women, and 6.0 for central African women. The total demand for family planning among married women was also found to be higher in eastern Africa (63%) than the other two sub-regions (52% for central Africa and 42% for western Africa).⁶⁴ By 2035, more than 30 sub-Saharan countries will have fertility levels below 4.0, and 11 countries will have fertility levels lower than 3.0.

Demography is now more aligned to support health investments as a means to increase individual welfare and social welfare than it has ever been.⁶⁵ Sub-Saharan Africa has the largest cohort of young people in history—405 million people aged 0–14 in 2014—and by 2040, its labour force will be bigger than that of India and China.⁶⁶ Acceleration of the transition of a dependent, youthful population to less dependency brings prospects of the demographic dividend. Up to 30% of the increase in GDP growth in the East Asia Tigers (Hong Kong, Singapore, South Korea, and Taiwan) was attributed to the demographic dividend. Improved nutrition can supercharge the dividend by an additional 1–3% growth through better cognitive capacity, school enrolment and completion, jobs, and lifetime income.⁶⁷ Additionally, more attention to adolescent health will be necessary to give young people maximal opportunities in life and ensure healthy adulthoods. However, ensuring relevant good quality education, jobs, and meaningful democratic participation will be essential in securing Africa’s peaceful future and development, and could represent one of the continent’s greatest challenges.

Urbanisation

People are increasingly concentrated in urban areas; the number of megacities in sub-Saharan Africa rose from 10 in 1990 to 28 in 2014.⁶⁸ 37% of the population in sub-Saharan Africa lived in urban areas in 2014, a figure that is projected to rise to 45% by 2030, and continue to rise thereafter. As many of Africa’s future megacities do not yet exist, there is an opportunity to build a healthier urban environment and an urban health system, learning lessons from Latin America’s and Asia’s experience. However, much of Africa’s urbanisation to date, including Africa’s largest city Lagos—with an estimated population of 21 million in 2016—has been rapid and unplanned. This has led to an increase in slum dwellers (an estimated 62% of sub-Saharan Africa’s urban population live in slums⁶⁹), gridlock on roads, a worsening of air pollution, and inadequate public transportation, water supply and sanitation, all of which increase the risk of illness and preventable death. If the inexorable rise of Africa’s megacities translates into more of the same issues, there will be major negative repercussions for health.⁷⁰ New solutions are needed; cities are growing so quickly that plans developed even a decade ago are now obsolete. Better convergence between urban planners’

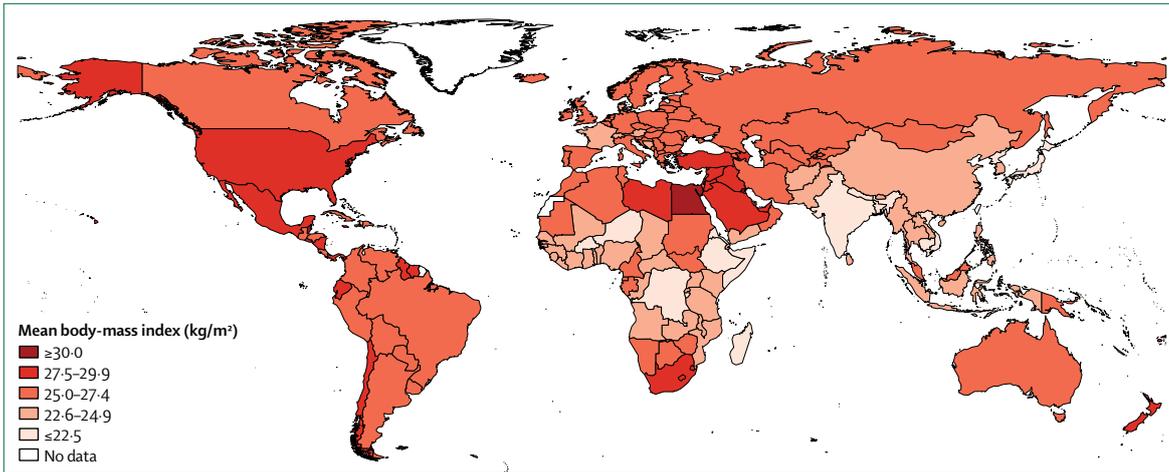


Figure 6: Age-standardised mean body-mass index of women globally, 2014
 Data used by permission from WHO Map Production: Health Statistics and Information Systems. For mapping purposes, the map shows identical values for Sudan and South Sudan. These values concern the former Sudan as it existed prior to July, 2011.

	Contraceptive prevalence: modern methods			Antenatal care coverage: at least 4 visits			Births attended by skilled health personnel		
	Residence*	Wealth†	Educational level‡	Residence*	Wealth†	Educational level‡	Residence*	Wealth†	Educational level‡
Cameroon, 2011	9%/21%	2%/26%	3%/25%	50%/77%	33%/86%	35%/82%	47%/87%	19%/97%	23%/93%
Ethiopia, 2011	23%/50%	13%/48%	22%/55%	14%/46%	8%/46%	12%/65%	5%/52%	2%/46%	5%/74%
Kenya, 2008–09	37%/47%	17%/48%	12%/52%	44%/60%	36%/63%	35%/64%	37%/75%	20%/81%	19%/73%
Madagascar, 2008–09	28%/36%	18%/36%	18%/34%	46%/71%	35%/75%	37%/67%	39%/82%	22%/90%	23%/76%
Nigeria, 2013	6%/17%	1%/23%	2%/20%	38%/75%	18%/86%	28%/80%	23%/67%	6%/85%	12%/76%
Zambia, 2013	39%/53%	31%/58%	33%/54%	55%/56%	52%/66%	49%/58%	52%/89%	45%/94%	46%/83%

Data taken from WHO Global Health Observatory. *Place of residence shown as rural/urban. †Wealth quintile shown as lowest/highest. ‡Educational level of mother shown as none/secondary education or higher.

Table 4: Pre-birth health inequities in sub-Saharan Africa for selected indicators and countries

policies and the health sector is imperative and will require visionary leadership and effective governance, in addition to development of a stronger evidence base.

Environmental degradation and climate change

The combination of rapid economic growth, urbanisation, and a growing population that is increasingly dependent on natural resources might lead to an increase in diseases and illnesses related to environmental degradation. Moreover, climate change has several direct and indirect impacts on health in sub-Saharan Africa. Directly, higher temperatures can increase mortality. For example, studies⁷¹ from the INDEPTH network in Burkina Faso have shown associations between higher temperature and the daily mortality rate, with a particularly strong effect on under-5 mortality. Indirectly, especially in fragile or conflict-affected states, extreme weather can gravely affect health by exacerbation of food and water insecurity. For example, drought in the Horn of Africa region

in the 2010–12 famine is estimated to have caused 258 000 deaths in Somalia, over half of whom were children aged under 5 years.⁷² Research on the links between weather patterns and malnutrition also suggests that in central, southern, and eastern Africa, the effects of climate change might offset expected reductions in child stunting linked to socioeconomic development.⁷³

Climate change is also likely to exacerbate existing vulnerabilities to various infectious and chronic diseases, including outbreaks of cholera and cardiovascular disease.⁷⁴ Modelling suggests that highland areas above 2000 m, especially in east Africa, are likely to become malarial zones.⁷⁵ More research is needed to strengthen the evidence base around climate change and risk of specific diseases; and to quantify the co-benefits of climate adaptation and mitigation measures for both the environment and public health (such as clean cooking fuels, which reduce climate-altering pollutants and disease from air pollution).

	DTP3 (three doses of diphtheria, pertussis, and tetanus) immunisation coverage among 1-year-olds			Children aged <5 years who are stunted			Under-5 mortality rate (per 1000 livebirths)		
	Residence*	Wealth†	Educational level‡	Residence*	Wealth†	Educational level‡	Residence*	Wealth†	Educational level‡
Cameroon, 2011	61%/80%	45%/88%	46%/84%	40%/21%	49%/12%	46%/19%	153/93	184/72	175/76
Ethiopia, 2011	33%/62%	26%/64%	32%/73%	46%/31%	49%/29%	47%/20%	114/82	136/84	120/36
Kenya, 2008–09	86%/88%	78%/90%	82%/92%	37%/27%	44%/25%	39%/25%	85/75	97/69	86/58
Madagascar, 2008–09	71%/89%	54%/93%	50%/89%	51%/43%	48%/43%	49%/46%	84/63	106/48	97/54
Nigeria, 2013	25%/62%	7%/80%	12%/74%	43%/26%	54%/18%	50%/21%	166/99	188/72	178/85
Zambia, 2013	84%/93%	80%/95%	77%/92%	42%/36%	47%/28%	45%/35%	84/72	99/58	108/64

Data taken from WHO Global Health Observatory. *Place of residence shown as rural/urban. †Wealth quintile shown as lowest/highest. ‡Educational level of mother shown as none/secondary education or higher.

Table 5: Post-birth health inequities in sub-Saharan Africa for selected indicators and countries

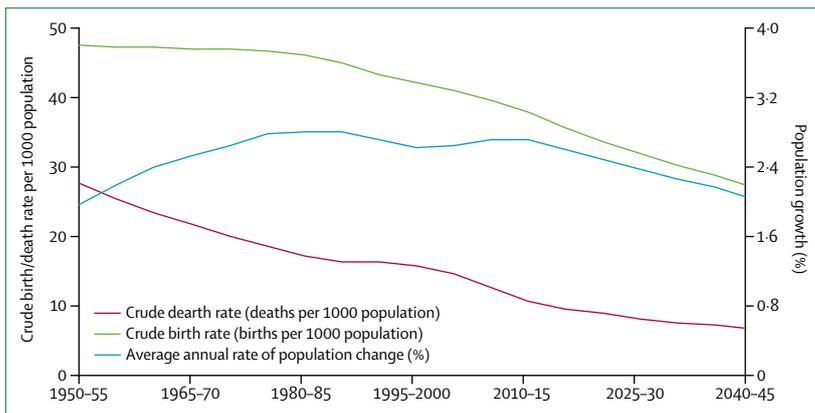


Figure 7: Demographic transition in sub-Saharan Africa, estimates (1950–2015) and projections (2015–50). Data used by permission from United Nations Department of Economic and Social Affairs Population Division.⁶³

Information and communications technologies

Information and communications technologies and social media have been and will continue to be important enablers of Africa’s transformation. African countries are experiencing an unprecedented increase in mobile phone subscriptions, internet connections, and mobile phone financial transactions, and a decline in the price of devices and services. There are an estimated three mobile phones for every four people in sub-Saharan Africa, with variations across regions (figure 8). Mobile phone-based money transfer services such as M-pesa (launched in Kenya in 2007) and others are revolutionising business and power relations. Information and communications technologies can transform the work environment, introducing flexibilities that encourage positive lifestyles. Mobile phones and wearable devices can help people exercise and make other healthy behaviour choices, and thus affect the burden of chronic conditions. But information and communications technologies can also lead to sedentary behaviour in young children, adolescents, and adults, and thus precipitate exactly the opposite

outcome. The potential of information and communications technology innovations for leapfrogging opportunities in Africa, by adopting more advanced technologies rather than following slow, classic paths to address health workforce constraints and improve people’s access to quality health services, is discussed in section 10.

Civil society, peace, and security

Alongside African countries’ deepening democracy, citizens in several countries are finding their voices and exercising their power (eg, the ousting of Blaise Compaoré in Burkina Faso, peaceful democratic elections and handover to the opposition in Nigeria, peaceful democratic transitions in Senegal and Botswana since independence, and six peaceful back to back elections in Ghana with handover to the opposition in two cases). Local conflicts still occur, but wars have become less deadly. Age-standardised DALYs per 100 000 due to war and legal interventions fell markedly from a rank of 19 in 1990 to 60 in 2015 (figure 4). However, some African countries have been chronically politically unstable and in a fragile situation for decades, terrorism is on the rise in some parts of sub-Saharan Africa, and continuing civil unrest in some areas has damaged the health system’s capacity to deliver basic health care, with health systems in countries such as Central African Republic and South Sudan being reduced to a bare minimum. Large numbers of disenfranchised unemployed youth might represent another risk for civil unrest.

In summary, sub-Saharan countries are undergoing a convergence of old and new challenges and opportunities, which require a long-term vision and resolute action on health adapted to the new realities.

Section 2: the path to long and healthy lives for all Africans by 2030

This Commission’s vision and aspiration is that by 2030 Africans should have the same opportunities for long

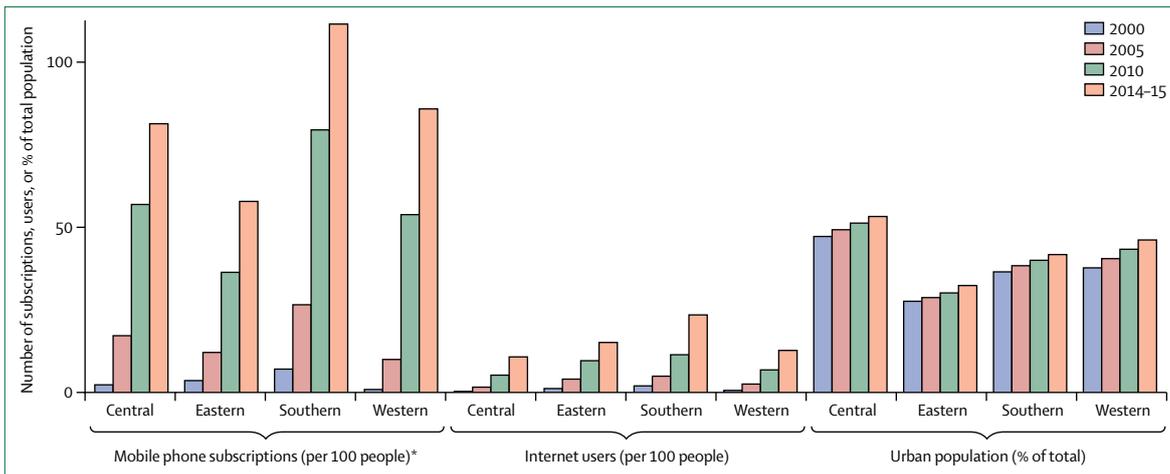


Figure 8: Mobile telephones, internet users, and urban population per sub-Saharan region, 2000–15

Data from World Bank World Development Indicators.²⁵ Y-axis represents averages of the reporting countries in the four sub-Saharan regions. Latest data available on urban population are for 2015. *Some countries in the region have exceeded one cellular subscription per person in recent years.

and healthy lives that new technologies, well-functioning health systems, and good governance offer people living on other continents. There are 12 strategic options that all African countries should consider in their policies and plans (table 1). These options are connected to the SDGs and integrate commitments made by regional African bodies. The strategic options represent a combination of the unfinished agenda of infectious diseases, maternal and child health, malnutrition, and new health challenges. The strategic options are as much about promotion of health and prevention of disease as they are about expansion of access to treatment. These options are a mixture of health outcomes and ways of achieving health. Moreover, although some options are health sector led and primarily Ministry of Health responsibility, more than a half are determined in large part by the policies and programmes of ministries other than health. The options are not listed according to any particular priority, as relative needs might vary by country. We recognise that progress will be unequal among countries and that some countries, particularly those in continuing conflict, will probably not reach the SDGs by 2030. However, all countries can and should reduce health inequities.

To realise the health outcomes and SDGs in an equitable and accelerated way, there is a need for a framework shift in health systems. A renewed and multi-pronged approach focusing on outcomes—with people at the centre—is necessary to achieve better health and wellbeing. Continuing to build health systems at the current pace of progress, and use of models of service delivery and population health that are struggling with results, equity, and sustainability across the world, including in high-income countries, is a recipe for failure.

African countries have a historic opportunity to build health systems commensurate to the challenges of

21st century Africa. This will require all sub-Saharan countries to take action in the crucial areas of:

- people-centred health systems, UHC, the social determinants of health, and health outcomes.
- leadership, stewardship, civil society engagement, and accountability at all levels.
- financing for health.
- commodity security (eg, medicines, technologies, essential equipment, tools, and supplies).
- public health systems.
- health workforce development.
- research and higher education.
- innovation in products, service delivery, and governance.

These interconnected areas are covered in sections 3–10, the operational part of the report. We describe the areas where changes are needed and make recommendations for the way forward, recognising the great diversity within sub-Saharan Africa. This Commission strongly emphasises that health systems require country-born solutions that relate to specific contextual factors. We strongly endorse the high premium both the African Union's Agenda 2063 and the UN's 2030 Agenda for Sustainable Development have given to strengthening regional action and cooperation, and this is a recurring theme in several sections of the Commission.

Section 3: people-centred health systems

Health systems in sub-Saharan Africa

Despite progress in virtually all types of performance indicators during the last decade, health systems in sub-Saharan countries remain weak. Details are provided in the following sections but in short, health expenditure, health infrastructure, and skilled health professionals are insufficient relative to population needs, resulting in poor coverage and poor quality of health services. Population

coverage of most essential health services ranges between 40% and 50%, below both WHO recommended levels and other regions, with only one indicator (diphtheria-tetanus-pertussis immunisation) approaching the recommended coverage level of 80%.⁷⁶ Less than a half of children aged under 5 years with acute respiratory infection, diarrhoea, or fever receive appropriate care.²⁵ Financing and service delivery for chronic diseases⁷⁷ and palliative care⁷⁸ have received little attention compared to infectious diseases, leaving a gap which patients who suffer from complex comorbidities (eg, patients with HIV and mental health disorders⁷⁹) feel the most.

Inequity is a major concern, as the little available resources tend to be concentrated to favour wealthier groups. Poor governance affects health systems' performance⁸⁰ and their ability to cope with shocks. As such, not only do insufficient and suboptimally allocated resources attend the health needs of populations with more complex health challenges in the world, but people's trust in health systems is shaken by frequent stock-outs of essential medicines⁸¹⁻⁸³ and overstretched health personnel, particularly in low level health facilities and poor areas.^{84,85} In many cases, access to health services is further obstructed by long distances, high travel costs, high out-of-pocket payments, cultural beliefs, and queues. Barriers to access health care have been primarily researched for rural settings, but are equally relevant for those hard to reach in urban settings.⁸⁶

Insufficient financial protection is a significant barrier to access and can lead to catastrophic health expenditures. Available data for eight sub-Saharan countries (Ghana, Kenya, Malawi, Niger, Senegal, Uganda, Tanzania, and Zambia) suggest that more than a quarter of the population might be further pushed into poverty by out-of-pocket payments on health services.²⁶ Although some sub-Saharan countries have health financing social protection mechanisms in place (often using mixed financing approaches) either as a national integrated policy or as specific schemes, very few countries have attained near universal coverage (80% or more coverage).

Building adequate health systems and overcoming inequalities in access to quality health services, including promotion and prevention, remain among the biggest challenges to achieving this Commission's vision.

UHC as a vehicle for achieving equity

The pursuit of UHC is one of the key health targets in the SDGs and has featured highly on health policy agendas, following its initial endorsement by WHO in 2005,⁸⁷ its prominence in the WHO World Health Report 2010,⁸⁸ and its endorsement by the UN General Assembly in 2012.⁸⁹ Many sub-Saharan countries now have a UHC agenda, or are thinking about UHC and have some kind of policy documents or statements on the issue. Defined as enabling all (universal) to access quality health services and interventions when they need them, without undergoing undue financial hardship, UHC is a concept

that has equity at its core. It is predicated on the basic assumption that equitably improving health-care and intervention access for those in need, and ensuring equitable financial protection, also leads to better population health. This can only be the case if population health, prevention, and health promotion are an explicit and fully funded part of UHC. Unfortunately, this is usually not the case in terms of policies and practice. For a healthy future in sub-Saharan Africa, it is important that conceptualisation of UHC is along these broad lines that encompass public (preventive as well as promotive) health, and not only narrowly focused on curative care (see section 7 for more on public health systems).

There is no one size fits all UHC implementation approach. Each country has to identify its own needs, priorities, resources, and approaches to pursuing UHC.⁹⁰ Although South Africa is reforming its health system by introducing a national insurance programme, with the aim of achieving UHC, its path will be distinct from other sub-Saharan countries. In this case health system reform will be shaped by South Africa's political history, the considerably big size of its private sector, and the predominance of a decentralised approach.⁹¹ Therefore, to ensure that UHC is a key instrument to advance population health and equity in Africa for decades to come, it should be complemented with strategies that address its conceptual shortcomings. It remains uncertain how the three key dimensions of UHC—service coverage, population coverage, and financial protection—are to be achieved in countries with largely different levels of development and health indicators.⁹² The conceptualisation of UHC has come under criticism⁹³ for imposing an overly medicalised model of care to the detriment of prevention and health promotion. Furthermore, some service coverage expansion interventions might actually accentuate inequities by tending to favour the wealthy over the poor, at least in the short term. Most importantly, UHC is ultimately a process and focusing on its delivery might completely lose what matters the most, namely improving health outcomes.

By definition, UHC increases access to health-care services, but the effects of universal coverage schemes on health outcomes and financial protection are highly variable across settings.⁹⁴ The pragmatic how of implementation of UHC reforms, particularly financing, service delivery, and governance arrangements, makes the difference between UHC reforms achieving their stated objectives or not. For example, cross-country evidence suggests a causal link between higher levels of publicly pooled health spending and better mortality outcomes,⁹⁵ but experiences in sub-Saharan Africa show that only a full understanding of the barriers to benefits of UHC reforms, which go beyond financial access and are faced by the disadvantaged in particular, can hope to fully deliver the UHC promise.⁹⁶

Overall, there is wide consensus that pursuit of UHC makes economic sense⁹⁷ and the commitment to achieving

UHC in sub-Saharan Africa is firm.⁹⁸ There is also agreement on UHC as a social and technical goal that can only be achieved if the drive for attainment is country led. For example, Ghana's UHC journey started in 2003, when the National Health Insurance Act was passed by parliament, with a coalition of social, technical, and political forces that have driven UHC and continue to drive it.⁹⁹

Although the experience in Africa is still emerging, experience from high-income countries, Latin America, and countries in Asia that achieved UHC while still in the middle-income country bracket (eg, South Korea, Sri Lanka, Taiwan, and Thailand) show that public financing and public regulation of resource allocation—whether funds are raised through taxes, social insurance contributions, or a mix—is a must if equity is an objective. Private insurance funding arrangements cannot be relied upon as the vehicle for UHC, although they can be considered for supplementary packages. However, service provision could be public, private, or a mix, and equity objectives could still be attained with the right choice of regulatory mechanisms and strategic purchasing approaches.

People-centred health systems are the way forward

At the heart of health systems are people in varying and interdependent roles, and their interactions and relationships. Essentially “health systems are also human systems”.^{100,101} This Commission proposes development of people-centred health systems, underpinned by the principles and values of public health and primary health care—including the values of respect, dignity, and compassion—as critical for a healthy future in sub-Saharan Africa. Central elements of such systems include strong household, community, and patient engagement, and a chain of accountability throughout the system. These values also need to be held internally within ministries of health, health directorates, hospitals, and health centres. The required new approach understands innovation as a catalyst for people-centeredness, and advocates for nationally bred solutions that are embedded in the realities of each country and community.

People-centeredness involves a recognition of the importance of people, processes, systems, power relations, and values in the foundation and pillars of any effort to improve health and wellbeing. Sub-Saharan countries need to recognise the centrality of health systems software (people and processes) to determine what the hardware (the WHO building blocks of financing, governance, information systems, human and other resources) is able to achieve, to transform health systems to benefit people's health. The tendency to focus on building blocks to the neglect of the people dimension of the how and why of the functioning and ultimate outcomes of health systems is a major challenge in Africa, as in the rest of the world.

WHO has been working on an integrated, people-centred health services framework, which was adopted by the Sixty-ninth World Health Assembly.¹⁰² The framework

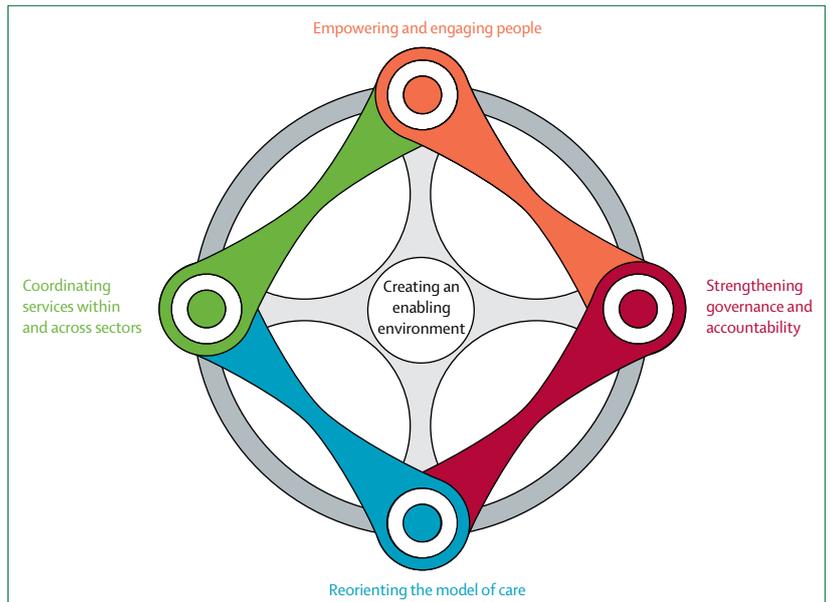


Figure 9: WHO's integrated people-centred health services framework
Data used by permission from WHO.¹⁰³

starts from the premise that development of more integrated people-centred health care systems has the potential to generate benefits to the health and health care of all people. It also acknowledges, as this Commission does, that people-centeredness is an approach that adopts individuals', carers', families' and communities' perspectives as participants and beneficiaries. The framework comprises five interdependent strategies to build more effective health services: empowering and engaging people and communities; strengthening governance and accountability; reorienting the model of care; coordinating services within and across sectors; and creating an enabling environment (figure 9).

Many sub-Saharan countries are already experimenting with people-centred approaches, with some countries introducing several initiatives. Examples include: introduction of community led initiatives with innovative approaches present in many countries (eg, Senegal, Ethiopia, Ghana, Mali, Rwanda, Malawi, and South Africa); adaptation of local human resources and introduction of task sharing (eg, Uganda, Tanzania, Liberia, Sierra Leone, Senegal, Malawi, South Africa, Ethiopia, Ghana, and Zambia); provision of specific training to health-care professionals on people-centred approaches (eg, South Africa); and incorporation of patients and families into management of their conditions (eg, DR Congo, Malawi, and Swaziland). Although these are only illustrative examples, and many other initiatives exist across sub-Saharan Africa, it is also true that these programmes are often small scale and in most cases are yet to be incorporated into health systems or national programmes in other departments with adequate governance, funding, and human resource management.

It is well illustrated by several lessons from the Ebola epidemic in West Africa that decision makers and implementers need to change the angle from which they think about and address health systems in sub-Saharan Africa. Beyond the virus itself, and beyond any medical interventions to contain the epidemic, historical, contextual, socioeconomic and sociocultural factors, trust, power and politics at the global, national and sub-national levels all influenced the processes and outcomes.¹⁰⁴ Communities and citizens can also influence these systems by shaping the social norms and contexts in which they operate, and can help hold systems accountable.

Key actions to promote people-centred health systems include softening institutional and social hierarchies that tend to concentrate power and resources at the centre, by giving a real voice to people at all levels of the health system, such as patients, family and community members, front-line purchasers, and providers. This includes decisions related to all aspects of health systems and the services delivered, from agenda setting to implementation and management of programmes. Such reshaping of power relations and giving people at the bottom, front-line, and top a voice would strengthen community participation to improve health. Citizens' voice could be fostered by supporting citizens' hearings, community score cards, and other citizens' platforms. Design of supportive services with clear pathways, continuity of care, integrated service delivery, and strong community based health programmes will also be important. Dismantling of the current fragmented project approaches, and an integration of such programmes into national policy agendas and action will be critical to this.

Private sector engagement and accountability

Although the role of the private sector in health systems in sub-Saharan Africa is highly controversial among health system experts, particularly in achieving UHC, various forms of private health-care provision are part of the reality in most countries. In countries as diverse as DR Congo, Malawi, and Nigeria, the majority of health care is provided by the private sector, including faith-based NGOs and traditional healers, and numerous community and prevention programmes are run by NGOs.¹⁰⁵

A 2016 *Lancet* series¹⁰⁶ that discussed the role of the private sector in delivering health care highlighted the need to assure UHC as a collective goal, independently of the private and public provider mix available in each country. The authors argue that the private sector has a role to play in health systems of low-income and middle-income countries, and that the private and public sectors do not have to be mutually exclusive. A key concern raised across all papers in the *Lancet* series¹⁰⁷⁻¹¹⁰ is that the evidence available on the merits and shortcomings of the private sector is weak or absent, and therefore thwarts the possibility of drawing sound policy options.

Three of the five types of private sector provision that have been identified in the *Lancet* series are present in sub-Saharan Africa.¹⁰⁷ The first type, which includes DR Congo and Nigeria, has a private sector that is dominant in primary and secondary care; a high share of out-of-pocket spending as a percentage of total health expenditure; and a public sector often deteriorated and reliant on some form of fee charges. The second type, represented by South Africa, includes countries with a high reliance on the private sector for primary and secondary care; some type of private and social insurance; and a public sector that does not rely on fee charges. The third type, which includes countries such as Ghana, Malawi, and Tanzania, is characterised by high private expenditure falling over time; a stratified private sector available for those who can afford it; and a fluctuating public sector reliance on fees and charges.¹⁰⁷ The two types of private sector provision that are absent in Africa are a non-commercialised public sector with a complementary private sector, and a highly commercialised public sector.

When comparing the different types of private service provision, the *Lancet* series¹⁰⁷ argues that when the private sector dominates the health system, the poor struggle to access fee-for-service care. Second, making the public sector more accessible, particularly for the poor and most vulnerable, can reduce reliance on private providers who are less likely to provide affordable and good quality services. Third, a good quality and highly accessible public sector system can lead to a complementary private sector with similar characteristics. The evidence presented suggests that governments should choose policies to cover the performance of the private sector as a whole and not focus on its specific parts.¹⁰⁸

It is also important to understand the interactions of any private sector initiative with the public sector, as the effects on the overall health system can be much more complex. For example, one might argue that dual practice (ie, a general practitioner working both in the public and the private sector) has negative effects on the health system, as it increases private sector referrals and costs for the patient; however, it might also allow for health-care professionals to remain in the country and avoid migration to better paid health systems.¹⁰⁹

Public and private sectors should be considered as part of a national health system, with the government having a key role in assurance of quality, access, and equitable services for the whole population. Governments should take into account three premises. First, a well-functioning public sector will facilitate the appropriate functioning of an emerging or existing private sector. Second, any approach or policy considered to improve the performance of the private sector needs to adopt a broad health systems perspective and explore all complex interactions and effects as illustrated earlier. Third, and most importantly, African governments looking at reforming or improving the private sector should introduce appropriate mechanisms to minimise the many challenges faced by the poorest and most vulnerable.

The private sector's role in health systems and its influence on health outcomes extends beyond health service provision. For example, with their track record of effective marketing and advertising, multinational companies can either have a negative effect on health (eg, the sale of cigarettes, unhealthy foods, and alcohol) or they can use their distinct advantages to improve health. Through innovative initiatives, sometimes in partnerships with governments, NGOs and corporations can increase access to essential medicines and commodities, improve hygiene and nutrition, and encourage the institutional and individual behaviours that make these changes sustainable. One of the oldest examples of a business having a positive effect on health is the addition of iodine to commercial salt to reduce goitre. Social marketing, pioneered by organisations such as Population Services International, plays a major part in family planning, condom, and bednet promotion, and access to safe drinking water.¹¹¹ Soap manufacturers are embedding handwashing with soap habit building in marketing strategies, and working through health and education systems.¹¹² Two examples are: participation in the large-scale hand sanitation that was part of the Ebola response in West Africa, and programmes in partnership with Ministries of Health that target reduction in neonatal mortality by training health workers and ensuring access to soap in health facilities.

Addressing social determinants of health

Ensuring better health and wellbeing depends on more than just the health system. That is why the values and actions that refer to addressing the social determinants of health and linking health systems with other systems must pervade. To address the social determinants of health, one needs to take into account that lifestyle factors and the socioeconomic, cultural, and environmental conditions of an individual throughout their lifecycle can influence health outcomes. For example, for some groups, particularly those living in poverty, the risks of adverse health outcomes are higher than for those who are more advantaged economically,¹¹³ but influencing these risk determinants might often be outside the immediate power of the most marginalised or discriminated individuals, including women in some societies.

Acting upon the social determinants of health and addressing health inequities relies on understanding that social and economic needs of patients and communities ought to be addressed in conjunction with their medical needs. However, most of the effective actions on social determinants can only happen outside the health sector, and rely on evidence from informed social and economic policies. A WHO review¹¹³ on the social determinants of health concluded that not acting on health inequities can be, in the long term, detrimental in economic terms, causing lost productivity and government revenue, and representing a cost for health services. Examples of introduction of specific societal approaches to address social determinants of health and their related health

inequities include: promotion of school enrolment for girls through cash transfers; ensuring schools and homes have adequate toilet facilities, particularly for girls and women; provision of social protection to older people and their families (eg, Lesotho, Malawi, and South Africa), and promotion of antidiscrimination campaigns as part of the HIV/AIDS response. Enabling citizens' participation and voice is as important for addressing social determinants as it is for improving access to and quality of health services.

Actions to address the social determinants of health and their related health inequalities and to tackle social exclusion are needed at three levels: first, to address the health and social needs of individuals and communities by dedicated teams coordinating and proposing joint care and prevention; second, to tackle social exclusion and help vulnerable groups to mitigate some of the adverse health outcomes through the provision of adequate social protection according to need; and finally, to develop and promote multisectoral interventions to address the social determinants of health, health promotion, and health in all policies, including introduction of broader programmes to access employment opportunities, poverty alleviation schemes, housing, sanitation, and education.

A focus on health outcomes to guide policies, management, and funding

The ultimate objective of any health system is to achieve better health for all members of the population it serves. As noted, wide-ranging concepts such as UHC and health system building blocks focus on implementation and evaluation of key processes, at the risk of loss of focus on the health outcomes themselves. The reality is that core health indicators (eg, life expectancy and mortality rates) in sub-Saharan Africa are indeed better than they were 20 years ago, but have at best evolved in line with global trends. Closing the gap separating sub-Saharan countries from other low-income and middle-income countries in terms of healthy life expectancy will require, among other things, bringing health outcomes to the forefront of the design, implementation, and evaluation of all health-related policies to ensure that progress is indeed being made.

Most attention in this area has gone to financing (see section 5)—the use of health outcomes for policy, planning, resource allocation, monitoring, and evaluation is still in an early stage. As a basic principle, health outcomes can induce a cultural change, in terms of patient care, prevention activities, and management, which all are often driven by process outcomes. Inclusion of health outcomes measurement at all health system levels, and incorporation of health outcome measures in staff training and evaluation are equally important. However, it is also important to note that health outcomes are experienced a long time after the service is provided, which makes it difficult to provide rewards based primarily on health outcomes. For real and sustained change to happen there

is a need for sub-Saharan countries to have ownership over the implementation of such programmes.

Health outcomes should be brought to the heart of design and evaluation of health policies by incorporation into existing accountability frameworks for public health providers. This approach involves explicitly coupling health outcomes with financing, management, and service delivery. Three directions can be considered in particular. First, we advocate for a move towards explicitly including health outcomes in evaluation frameworks of all types of providers, commensurate with their capacity and responsibilities. Second, we advocate investment in coupling demand-side and supply-side interventions to achieve the targeted health outcomes and avoid formulation of such policies in isolation. However, on the whole there have been too many partial successes (or downright failures) caused by failure to address root problems jointly. Third, we advocate investment in outcome monitoring and surveillance systems, and provision of feedback to both providers and people in the community.

Above all, countries should decide on the right mix between different policy interventions and actions. Although some countries have insufficient health policies, in many countries the fundamental problem is the absence of managerial and administrative capacity to implement policy and translate good intentions into practical programmes and services. Moreover, health data and information systems will be critical for monitoring progress towards UHC and people-centred health systems, reviewing achievements and failures, and promoting accountability. Countries and global health leaders generally agree it is imperative to improve data quality, promote alignment and coordination of data, and strengthen statistical capacity for measurement and performance. The Health Data Collaborative, the Global Partnership on Sustainable Development Data, the Service Delivery Indicators, and the Afro Barometer project are examples of initiatives supporting country efforts to improve data collection, reporting, and use.

Section 4: stewardship to shape the future of health in sub-Saharan Africa

Effective stewardship, leadership, and governance are needed to drive the development of people-centred health systems across sub-Saharan Africa, and the attainment of the SDGs and the African Union's Agenda 2063. This section briefly discusses these inter-related concepts, including fostering inter-ministerial action and the engagement of non-state actors, tackling corruption, strengthening accountability, and changing development cooperation.

Strategic leadership

Health systems in sub-Saharan countries often exist in contexts of turbulence, ambiguity, and resource challenges. In these environments, strategic leadership requires

adaptive capacity, absorptive capacity, and managerial wisdom.¹¹⁴ Policies and strategies that do not adequately take into account the complex adaptive character of health systems can lead to the kinds of crisis the Ghana health sector went through for almost a decade in relation to the additional duty hours allowance policy, a costly scheme which compensated doctors for hours worked beyond the standard 40 weekly hours.¹¹⁵ An example of adaptive leadership capacity in the face of instability is the experience of Mozambique, where the Minister of Health at the time of independence, Dr Pascoal Mocumbi, helped mitigate the effect of an exodus of doctors and severe staff shortage by training surgical technicians to care for pregnant women and war casualties.¹¹⁶

Absorptive capacity requires willingness to tolerate and learn from failures. An example of an initiative to build absorptive capacity is a leadership hub programme for nurses in Kenya, South Africa, and Uganda to improve HIV care through improved use of evidence. Action research on the initiative suggests absorptive capacity can be strengthened and consequently improve evidence-based HIV care, but only if the initiatives are formally mainstreamed into the health authorities that can sustain them.¹¹⁷

A qualitative study¹¹⁸ involving interviews with health-care leaders in Ethiopia, Ghana, Liberia, and Rwanda identified five key themes central to effective leadership: "having an aspirational, value-based vision for improving the future health of the country, being self-aware and having the ability to identify and use complementary skills of others, investing in and managing relationships, using data in decision making, and sustaining a commitment to learning". The study identified a gap in the use of data to monitor and improve performance. Health leadership capacity strengthening has generally focused more on boosting technical competencies rather than softer leadership skills, such as relationship management.¹¹⁹ This area needs to be prioritised in future.

Using data from a 360° feedback instrument in Egypt, and countries in west and southern Africa, the Center for Creative Leadership found much innovation and creativity, but also that talented leaders were not receiving much structured support to develop their full leadership potential.¹²⁰ In a baseline assessment of the needs and competencies for strategic health sector leadership development in Ghana, South Africa, and Uganda, respondents were overwhelming in support of the need for a structured long-term capacity building effort that used a mix of formal and informal mechanisms, including coaching, mentoring, and peer-to-peer and peer-to-facilitator learning (unpublished). Capacity building approaches have tended to focus on disjointed short courses, often driven by the availability of donor funding or particular interests, rather than a systematic long-term sector building approach,¹²¹ and this needs to change.

For health to improve, leadership needs to be strengthened at team, operational, and strategic levels and

For the **Health Data Collaborative** see <https://www.healthdatacollaborative.org>

For the **Global Partnership on Sustainable Development Data** see <http://www.data4sdgs.org>

For **Service Delivery Indicators** see <http://www.sdindicators.org>

For more on the **Afro Barometer project** see <http://afrobarometer.org>

Panel 2: Engagement of community leaders in polio eradication in northern Nigeria

Wild polio virus continued to spread in all parts of Nigeria and to other countries because of unfounded conspiracy theories, institutional and leadership weaknesses in implementation agency, and absence of effective community engagement in northern Nigeria—until 2008, when a new Federal Government paved a way for solving the seemingly intractable problem of polio eradication in Africa's most populous country. By 2010, Nigeria had reached its lowest ever wild polio virus incidence count, population immunity had increased, household non-compliance reduced, and circulating clades of the wild polio virus had declined from 34 to two. In September, 2015, Nigeria was removed from the list of polio endemic countries. The key game changer was engagement of the northern Nigerian traditional leadership.

After months of quiet diplomacy and a visit to northern Nigeria in early February, 2009, by Bill Gates, cofounder of the Bill & Melinda Gates Foundation, in June, 2009, the Sultan of Sokoto hosted all traditional leaders from northern states of Nigeria. The Sultan announced a so-called task team of Emirs to work with the National Primary Health Care Development Agency to complete polio eradication, enhance routine immunisation, and strengthen primary health-care systems. The Task team of the Northern Traditional Leaders Committee on Primary Health Care Delivery commenced systematic community engagement; this event was the first time that this group had come out strongly in support of a major governmental or developmental programme. This support provided an influential platform to engage systematically with the network of traditional institutions, spanning more than 150 000 units spread across 19 northern Nigerian states and the Federal Capital Territory.

Partnership with the northern traditional institutions led the national polio eradication programme to push ahead with

improvement of the quality of its operations and service delivery, raising domestic and external financing, making better use of vaccines and technical tools, and enhancing management practices.

Key elements of the community leaders' engagement include:

- **Communication and mobilisation**
With the space created through public involvement of the Northern Traditional Leaders Committee, most of the entire network of traditional leaders from Sultan, to Emirs, Chiefs, District Heads, Village Heads, Settlement Heads, Imams, and Pastors have been actively involved, before and during polio campaign efforts. These individuals participated in flag offs, team deployment, kick offs, resolution of non-compliance, evening reviews, and supervision, and have been veritable channels for community education on polio eradication. Other community institutions, faith-based organisations, and women's groups followed suit, given the wide recognition of the mandate indicated by the traditional leadership network.
- **Planning and implementation**
The hierarchy of the traditional institutions network participated at appropriate levels in campaign planning through State and Local Government Area Task Forces, data sharing sessions, reports and post-reviews.
- **Monitoring and accountability**
By being part of the Presidential Task Force on Polio Eradication, and existing as its own committee, the Northern Traditional Leaders Committee and wider traditional structure participates in overall polio eradication coordination, monitoring, and supervision, and contributes to accountability at all levels.

to work in synergy. Tensions between and within these different levels of leadership can limit performance. For example, in The Gambia, research shows a “complicated power tussle”¹²² between leaders at the national government and sub-national level, particularly around how centralised budgetary control limits sub-national managerial capacity and decision-making capabilities.

Interministerial and multistakeholder engagement

All levels of leadership, both within the health sector and between health and other sectors and institutions that determine health outcomes (such as ministries of agriculture and education), interconnect and succeed if provision is made for intersectoral collaboration and governance. Collaboration with the specific country's ministry of finance is particularly crucial. There are numerous long-standing examples of intersectoral HIV prevention programmes in Africa—Kenya's comprehensive HIV prevention roadmap¹²³ is a strong and effective model.

Leadership and interministerial action are also required to tackle risk factors for chronic diseases, especially smoking, alcohol, and high fat, sugar, and salt intake. For example, in 2013, South Africa enacted legislation requiring the food industry to reduce the salt content of a number of food products¹²⁴ as part of a strategic plan to reduce the burden of chronic conditions.¹²⁵ Leadership from several ministries is needed to establish and enforce legislation and public education to avert an epidemic of tobacco-related diseases, and to intervene with the local and multinational fast food industries, as it is likely that this food will become more popular, even if today only 5–10% of the food that people eat in countries such as Ghana is fast food. A high-profile health minister in the cabinet's inner circle is necessary to mobilise support for health in other ministries.

The landscape for health leadership is further complicated by the role of other stakeholders outside the government, such as foreign donor agencies, traditional medicine practitioners, NGOs, and for-profit

and faith-based organisations, which provide or fund a high percentage of health services (see section 3). Leaders in all these stakeholder groups need to be engaged. For example, a study¹²⁶ in South Africa reinforced the need to engage religious leaders in overweight and obesity prevention. The systematic engagement of community leaders in northern Nigeria proved pivotal in the success of the Global Polio Eradication Initiative in Nigeria, a lesson for other mass public health programmes in Africa (panel 2). With growing for-profit health-care provision, a key leadership challenge for governments and ministries is to pluralise leadership and ensure “the spread of leadership is channelled, rather than contested, for a coherent, lasting effect”.¹¹⁹

Addressing corruption and strengthening accountability

Corruption is the “abuse of entrusted power for private gain. Corruption can be classified as grand, petty and political, depending on the amounts of money lost and the sector where it occurs”.¹²⁷ By diversion of resources from desired public policy goals and creation of perverse incentives for behaviour and related outcomes, corruption works against effective processes, outputs, and outcomes in all sectors, including health and health-related sectors. Although corruption is not unique to sub-Saharan Africa or to any particular time, age, or civilisation, corruption is considered rife in the health sector in many African countries.¹²⁸

In the socioeconomic and political realm, corruption is an adaptable moving target, requiring constant vigilance to thwart rather than any single unchanging measure. The published empirical literature on health leadership, governance, and corruption in Africa remains scarce. However, there is enough evidence to show that corruption leads to inequities, inefficiencies, and poor responsiveness of services to people, making health systems less rather than more people-centred. The negative effects on processes and outputs affects outcomes.^{129–131} For example, research in South Africa illustrates the siphoning off of scarce resources can gravely affect health, with sorely needed health equipment failing to reach remote areas, thus increasing the chance of adverse events for which front-line health workers will be held responsible.¹³⁰ In Chad, a study¹³² showed less than 1% of the non-wage funds allocated to regions by the Ministry of Health reached local health facilities because of a high level of resource leakage at the regional level. A review¹³³ of gaps in health systems research identified corruption as an area in which there has been remarkably little research relative to its effect on sub-Saharan health systems.

Corruption is an important area to address in any recommendations for the future of health in Africa.^{134,135} Tackling corruption in the health sector requires a stronger stance from sub-Saharan African governments and local health leaders that translates beyond rhetoric and into implementation. The governments of high-income countries and other donors also need to do the same.¹³⁶ For

example, the Global Fund to Fight AIDS, Tuberculosis and Malaria has taken a proactive stance in the investigation and documentation of large-scale corruption¹³⁷ and dissemination of case studies of the deleterious effects corruption can exert on health. At the level of service delivery, lower-scale corruption, such as so-called as quiet corruption—in which public servants fail to deliver services or inputs that have been paid for by the government—gives way to a vicious cycle of low service utilisation by the public. This, in turn, reinforces the poor attendance or absenteeism of some health workers.¹²⁸

Corruption is often not driven by a single cause, but rather by a constellation of factors, and any effort to reduce it requires a multifaceted approach.¹³⁸ Social norms, moral and ethical beliefs, and values, attitudes, and personality can all contribute to the rationalisation of behaviours that favour corruption. Opportunities to abuse depend on the extent to which there is monopoly, accountability, citizen voice, transparency, and enforcement in a given health sector.¹³⁸ These tools are an important part of ensuring people-centred health systems and provide a pathway to reduction of corruption.

Accountability is part of health system governance, and involves the obligation of individuals, ministries, departments, and agencies to justify and provide information about their actions, and outputs to others. Ultimate accountability of the health system should be to parliament, representing the people, and to local governments and community organisations. Strengthening political and social accountability has clear effects on quality of care. For example, community involvement in the maternal death review process in Mchinji District, Malawi, identified twice as many maternal deaths as the previous existing facility review process, and encouraged multiple community actions to improve maternal health.¹³⁹ Regular reporting, transparency of accounts, and public hearings should be an integral part of the responsibilities of health leaders and managers.

The commitment of heads of state and government is necessary to drive progress in health.¹⁴⁰ Parliamentary support and debate are required to ensure that health is prioritised, even in times of economic hardship. Fortunately, health issues are increasingly becoming part of the political debate, both inside the parliamentary system, and in the media and civil society. This should benefit greater accountability in health. Civil society and communities should become advocates, voicing their needs, demanding their right to health, and holding decision makers to account for the commitments they make and for how resources are spent, particularly when political commitment is insufficient, or service delivery is absent or of poor quality. Much can be learned from the remarkable achievements of people affected by HIV and their concerned communities, which include a shift to the framework of human rights in health service delivery, affordable antiretroviral drugs, and the scale-up of HIV treatment in Africa.²¹ The report of the

Panel 3: China, India, and Brazil—forging new partnerships in Africa

China has been offering health assistance to Africa ever since its first deployment of Chinese medical teams to the newly independent Algeria in 1963. Chinese health assistance was primarily driven by ideological and diplomatic factors in the two decades that followed. Market-oriented reforms in China in the 1980s and 1990s saw a decline in Chinese aid to Africa; however, China's interest in Africa has been rekindled since the 2000s, partly in response to its rapid economic growth, which necessitates demand for commodities, agriculture, and food securities. With a new emphasis on mutual benefit and trade through south–south cooperation and self-sustaining economic development, China pursues a blend of mixing aid, commerce, and politics in its approach to the African continent.¹⁴³ More recently, the major role that China played in the response to the Ebola epidemic in west Africa in 2014 marked its largest humanitarian mission overseas to date. It was also the first time China built a Biosafety Level 3 laboratory and set up an infectious disease medical centre in another country.¹⁴⁴

Although historically China–Africa cooperation tends to be bilateral, China's readiness to engage with wider stakeholder communities is evidenced by the International Roundtables on China–Africa Health Collaboration hosted in Botswana and Beijing in 2013 and 2015. These roundtables brought together government officials from China and African countries, UN agencies, development partners, and industry to explore how increased investment and scientific and industrial collaboration can contribute to universal health coverage and expansion of access to essential medicines.¹⁴⁵ Such multilateral engagement

might help improve the transparency of China's development activities in Africa and minimise duplication of efforts by other stakeholders. China's own experience in infectious disease control, such as schistosomiasis and malaria, coupled with its vast manufacturing capacity, is anticipated to make substantial contributions to expansion and reduction of the costs of various health programmes across the African continent.

Other emerging powers, such as India and Brazil, are pursuing varied modalities in their development cooperation with Africa. Indian pharmaceuticals have a crucial role in HIV/AIDS treatment programmes by making low-cost antiretrovirals and other medicines. More recently, the Pan African e-Network launched by the African Union and the Indian Government seeks to connect universities and hospitals in 53 member states by harnessing India's expertise in information and communication technology, to boost Africa's capacities in health informatics, education, and other areas that benefit from high-speed internet connection.¹⁴⁶

Brazil has been a leader in a number of public health policies and programmes, such as HIV/AIDS and nutrition. Brazil's development cooperation in Africa tends to focus on export of its technical knowledge and training in Portuguese-speaking countries. An example of this focus is support of the development of a US\$21 million antiretroviral factory in Mozambique for domestic supply and provision to other African countries.¹⁴⁷ However, Brazil's short-term to medium-term role in health in Africa might depend on the outcome of its political turmoil and economic woes.

UNAIDS–*Lancet* Commission on HIV/AIDS explicitly recommended financial support to activist groups as a public good in health.²¹ Another lesson from the AIDS response is that community involvement in the design and implementation of health promotion, prevention, and treatment programmes leads to better results.²¹

Governments and non-state actors can be more effective working together than in isolation.¹⁴¹ For example, in Ethiopia, Community Advisory Boards were set up to inform mental health-care research and delivery, leading to community-led prioritisation of health needs and better understanding of the potential risks of implementation of specific programmes. In Senegal, the Society for Women and AIDS in Africa engages closely with government and health officials as partners, strengthening their legitimacy to support health sector programmes.¹⁴² The community structures that are already in place in sub-Saharan countries can be built on and further empowered to support local health-care delivery and strengthen accountability.

Towards a new era of development cooperation

The post-colonial and post-cold war relationship between international donors and African countries is slowly

evolving into a situation with African countries taking leadership of their own development agendas. African countries have more awareness of their sovereignty, more capacity to negotiate, clearer plans, and higher budgets for health in many countries. In general, international financing represents a minority of a country's health expenditure, although it can be crucial in particular issues, such as HIV treatment or women's and children's health (see section 5). Sub-Saharan Africa remains by far the major beneficiary of health-related official development assistance from the UK, USA, EU and, notably, Japan, which through International Conference on African Development related initiatives is trying to match China's growing influence in Africa. The Global Fund to Fight AIDS, Tuberculosis and Malaria and Gavi, the Vaccine Alliance are innovative forms of multilateral cooperation. The ultimate scope of China's, India's and Brazil's involvement in health in Africa might take time to clarify as a new model of bilateral cooperation (panel 3).

The New Partnership for Africa's Development (NEPAD) was ratified by the African Union in 2002 in order for African countries to take full control of their development agenda, to work more closely together, and to cooperate more effectively with international partners. One of

NEPAD's objectives is to ensure that Africa's health, education, and sciences agendas are determined by and driven from within the continent. In 2011, The Busan Partnership for Effective Development Co-operation shifted the narrative from aid to development cooperation and set out common principles for all actors, including mutual benefit and equality between partners. The International Health Partnership Plus (IHP+) was launched in 2007 to accelerate progress on the health MDGs and is now called the International Health Partnership for UHC 2030. Its signatories commit to moving towards use of country systems. However, many of the envisaged changes have yet to materialise, and in several sub-Saharan countries there remains a lot of influence from donors on resource allocation and priority setting, some of which adversely affects coordination and programme effectiveness. Part of the reason for the absence of change is limited capacity in many African administrations, but also complex international political considerations. IHP+'s seven behaviours for how development partners should act remain highly relevant and merit renewed action:¹⁴⁸

- support a single national health strategy
- record all funds for health in the national budget
- harmonise and align with financial management systems
- harmonise and align with national procurement and supply systems
- use one information and accountability platform
- support south-to-south and triangular cooperation
- provide well-coordinated technical assistance.

Alignment of donor priorities with those of governments is an important principle, although direct external support to NGOs might sometimes be justified in countries in fragile situations, or to reach marginalised populations that the government might not want (or be able) to reach out to. In addition to aligning with the host country's priorities, harmonising the different global health mechanisms is key to reducing transaction costs of service delivery and reporting. Getting donors to agree to country led evaluation frameworks has been a major difficulty, because in some cases parliament or the administration of the donor country only accepts its own conditionalities and accountability frameworks.

The Lancet Commission on Investing in Health proposes reorientation of international development financing for health from direct investments in country-level services to core global functions, such as pandemic preparedness and research and development for neglected diseases.¹⁹ However, countries in crisis or in fragile situations will require more classic development assistance—for example, direct assistance from international staff, funding of recurrent costs, and working through NGOs—for the foreseeable future. The future of health in Africa also depends on redefining development cooperation to be broader than just traditional aid (ie, grants, loans, and projects) to also include non-traditional actors. Examples include: investment vehicles

such as private equity¹⁴⁹ and trade in products and services; the role of universities, institutions, and NGOs in research, problem identification, and partnerships for delivery; and private corporations as investors and employers. At the same time, sub-Saharan countries need to be clear on the centrality of domestic financing into the future, both in terms of its quantity and its quality, and also on what evolving non-traditional partnerships mean for governance of the health sector.

The best guarantee that African countries are in control of their health financing, policies, and services is to strengthen their own governance and managerial and technical capacity, and ensure substantive government budgets for health.

Section 5: towards sustainable financing for health

What are the funding needs?

Enacting the vision outlined in this Commission will require political commitment, inspired leadership, unprecedented depth of cooperation, and financial and human resources. Despite ongoing political commitment towards allocation of appropriate resources for health, from Abuja (2001) to Addis Ababa (2015), and an overall increase of public resources for health over time, the funding gap between current health expenditure and the needs for delivering at scale basic health interventions has remained substantial for most sub-Saharan countries. The 15% of government spending for health target in the Abuja Declaration was implemented incompletely and achieved little gains.¹⁵⁰⁻¹⁵² In 2014, half the countries in sub-Saharan Africa reported health funding allocations below the 10% mark.

Although the central role of public spending for progress towards UHC is undisputed, there is no single benchmark to determine funding needs.¹⁵³ The Africa Scorecard on Domestic Financing for Health,¹⁵⁴ launched by the African Union in September, 2016, aims to drive domestic investment in health, improve accountability, and show how realistic it is to meet domestic funding targets. The Scorecard tracks national health spending against multiple targets: the Abuja Declaration 15% target (2001), the per capita target proposed by the Commission on Macroeconomics and Health (2001),¹⁵⁵ the per capita target proposed by the High Level Taskforce on Innovative International Financing for Health Systems (2005, updated in 2009), and the two targets proposed in the McIntyre and Meheus study¹⁵⁶ for Chatham House (US\$86 public spending per capita and 5% of GDP for health; 2014). The Scorecard shows that most sub-Saharan countries still require a major effort to achieve domestic funding targets, although there are also countries that are on track to achieve several of the financial targets (eg, Namibia, DR Congo, and Swaziland).

The targets suggested by McIntyre and Meheus¹⁵⁶ refer to achievement of a package of services, which includes primary care for chronic conditions and mental health,

reproductive, maternal, newborn and child health (RMNCH), and communicable diseases (appendix). However, this package does not include hospital care and public health activities, therefore the \$86 public spending per capita is by any account an underestimate of provision of services across the entire spectrum. In 2014, 32 sub-Saharan countries spent less than 3% of GDP on health, which suggests the 5% target remains aspirational, particularly for low-income countries. For many African countries, even reaching such a spending level would leave them substantially below the minimum \$86 per capita spending level. Furthermore, this spending gap remains conservative because primary health care spending—to which the \$86 value refers—represents only a share of total public spending for health.

The Global Health 2035 report¹⁹ used One Health Tool¹⁵⁷ to estimate the absolute costs of scaling up selected health interventions to reduce mortality rates from infections and RMNCH disorders in low-income and middle-income countries to the levels of four high-performing countries (Chile, China, Costa Rica, and Cuba) by 2035. For the 23 low-income sub-Saharan countries modelled in the Global Health 2035 exercise, programme scale-up costs for a small number of infectious disease and maternal and child health interventions alone ranged from less than 10% of the current total health expenditure in countries like the Comoros, Nigeria, and Rwanda, to as high as 47% in Malawi (figure 10). For seven countries (Burundi, Central African Republic, DR Congo, Eritrea, Guinea, Madagascar, and Malawi) annual health expenditure must double or even triple (Central African Republic) to reach target levels. It should be acknowledged that this figure does not account for a range of other areas like adult malnutrition, injuries, and surgery, and therefore it is an underestimate of true scale-up costs, even for basic care.

Progress on raising funds for health has been markedly unequal across sub-Saharan countries. Closing the funding gap from domestic sources is now within reach for some countries, but others will continue to require sustained health financing reform and development assistance for health (DAH). Going forward, governments need to see beyond domestic public funding, which is set to be at the centre of financing efforts,¹⁵⁹ and DAH, which will remain important to some countries. Channelling contributions from philanthropists might also play a part,¹⁶⁰ but is unlikely to ever be a substitute for government or individual contributions. Nevertheless, harnessing this potential will require sustained stewardship efforts from governments, to engage in coordination and maintenance of dialogue with such actors and other partners, to ensure alignment with national priorities.¹⁶¹

Financing national health

Health financing arrangements across sub-Saharan Africa are as diverse as health financing needs. Health financing directions to maintain progress towards UHC are known from WHO work on public financing for health in Africa:

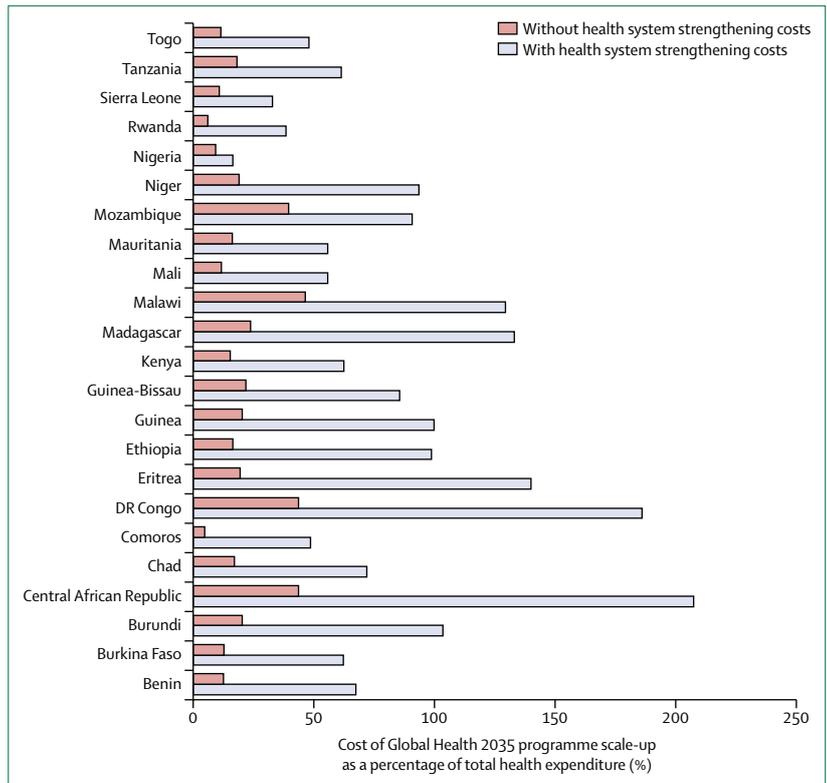


Figure 10: Global Health 2035 programme scale-up costs of interventions for maternal, newborn, and child health, tuberculosis, and HIV/AIDS¹⁵⁸ as a proportion of total health expenditure in 2013 (WHO Global Health Observatory data) in 23 low-income sub-Saharan countries

prioritise health even when the economic prospects deteriorate; ensure consistency of funding, both domestic and external; improve budget execution; and improve resource allocation with a focus on primary care and service coverage for the poor.¹⁵⁹ Fiscal policy choices that improve the efficiency and compliance of tax collection without compromising equity will be essential going forward.^{162,163}

See Online for appendix

Two issues are prominent and relevant to all countries from a sustainability perspective: the reliance on out-of-pocket payments and the substantive contribution of external funding. Out-of-pocket payments remain a major contributor to financing health services; despite overall progress during the past decade, some sub-Saharan countries have had little reduction in out-of-pocket payments as a share of total health expenditure. In more than a third of such countries, these payments make up more than 40% of total health expenditure.¹⁶⁴ In only five countries (Botswana, Mozambique, Namibia, Seychelles, and South Africa) out-of-pocket contributions represent less than 10% of total health expenditure.

The volume of external resources for health as a percentage of total health expenditure has grown to four times baseline in the entire African region over the past two decades, and remains comfortably higher than in

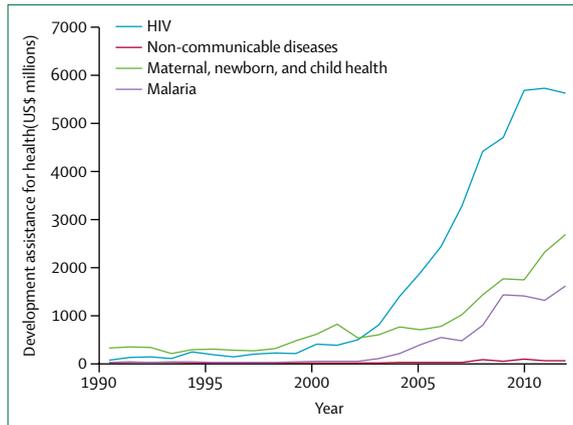


Figure 11: Total development assistance for health by disease area in sub-Saharan Africa
Data are based on calculations using the Institute for Health Metrics and Evaluation Development Assistance for Health Database 1990–2012.¹⁶⁶

countries and determining eligibility for external financial support.¹⁷⁰ The report proposes a new policy framework based on a broader set of economic and health indicators to guide health financing decision making. Renewed and accelerated DAH commitments for sub-Saharan Africa—to meet the chronic conditions challenge and to strengthen health services—are complicated by a focus on short-term outcomes and the need to reform the DAH system itself towards better governance and increased predictability.¹⁷¹ Furthermore, it is necessary to couple the transition agenda with the efficiency improvement agenda to fully address the challenge and avoid the pitfall of seeking more resources in the future for the same approach of organising service delivery as today. Although a generous range of proven, facility level efficiency-improving strategies are available,¹⁷² their implementation is unlikely to be the only challenge. The African experience with integrating HIV services and reproductive health services highlights the bigger challenge of ensuring alignment between such strategies and broader health system functions, which invites rigorous research and careful planning before assuming that such gains are within reach.¹⁷³

Progress towards UHC depends to a large extent on sustaining health financing. Improvement of the consistency of funding is a key direction for African countries.¹⁵⁹ Furthermore, sustainability goes beyond ensuring necessary funding (eg, increasing the share of domestic funding in total health expenditure and reducing dependence on external aid) and equally applies to reforms that aim to improve financial risk protection and equity. To complement the cross-sectional nature of existing progress-tracking instruments such as the Africa Scorecard, we examined the dynamic nature of African countries' health financing efforts towards UHC over time. Specifically, we used the 2009–14 WHO Global Health Expenditure Database data on three indicators—share of out-of-pocket payments from total health expenditure, share of external resource from total health expenditure, and share of government health expenditure from general government expenditure—and calculated an average measure of the trend in each indicator over the 2009–14 interval, namely the average of year-on-year percentage change. Furthermore, we classified average percentage change in three categories (table 6). The 5% cutoff was informed by the median progress or regress of countries in the sample for the three indicators. Most countries have been able to sustain progress in at least one of the indicators (figure 12). For example, 16 countries have consistently allocated more resources for health as a share of government expenditures at annual increase rates higher than 5%. The share of external resources for health offers the most mixed landscape, with some impressive progress (eg, Namibia 8% average annual decrease as a share of total health expenditure, and South Africa 7%). By contrast, Senegal and Swaziland have increasingly used external resources, thus increasing donor dependency, by an annual average of 11% and 21%, respectively. Stability is

	Sustained progress	Stable trend	More efforts required
Out-of-pocket payments as a share of total health expenditure (%)	<-5% average annual change	Between -5% and 5% average annual change	>5% average annual change
External resources for health as a share of total health expenditure (%)	<-5% average annual change	Between -5% and 5% average annual change	>5% average annual change
General government health expenditure as a share of general government expenditure (%)	>5% average annual change	Between -5% and 5% average annual change	<-5% average annual change

Table 6: Classification of health financing efforts indicators

any other region.¹⁶⁵ Some countries have had constant external assistance relative to total health expenditure since 2000 (eg, Cameroon and Malawi), others have seen substantial increases (eg, DR Congo, Kenya, and Mali), and others have relied less and less on external funding (eg, Chad). HIV, malaria, and RMNCH have received the most attention, with some countries highly dependent on foreign funding for their HIV treatment programmes, but DAH for non-communicable diseases has been minimal (figure 11).

However, the global outlook of health aid is uncertain and this absence of predictability threatens progress made to date. Funding for HIV from donor governments decreased in 2015 (for the first time in 5 years) by more than \$1 billion compared to 2014, after accounting for dollar appreciation and delays in payments.¹⁶⁷ In the short-term, plateaus or even drops are projected for the African region.¹⁶⁸ Long-term projections point to overall increases, albeit with substantial uncertainty around estimates.¹⁶⁹ As countries in Africa become classified as middle income, the requirement to transition or graduate to financing from domestic sources might limit the sustainability of achievements and gains. Recognising this risk, the report from the Equitable Access Initiative recommends not using GNI per capita as the principal basis for classifying

arguably more important than progress in either direction to ensure funding predictability. Most countries have had stable progress in the proportion of out-of-pocket payments, which is in line with the slow decreasing trends at a regional level referred to previously. However, several countries stand out. Chad and DR Congo have had continuous reductions in out-of-pocket payments, and Botswana, Mozambique, and Tanzania have had substantial increases.

The results of this classification into three categories for percentage change should be read in conjunction with absolute values of key indicators, such as those in the Africa Scorecard and country financing profiles. The classification attempts to quantify and present in context the extent to which progress in health financing reforms towards UHC has been sustained over time. The classification is designed to be an aid for national-level decision makers, to help them identify health financing objectives that require either stability to ensure predictability or sustained action to turn around a negative trend. However, the classification should be read with caution, as it does not claim to capture the entirety of governments' efforts in the area of health financing. Evolutions in the three indicators also need to be read in conjunction, not in isolation, for a given country: for example, a relative decrease in the proportion of out-of-pocket payments might be linked to a comparable increase in external support. Furthermore, cross-checking the data against National Health Accounts data would provide additional reassurance towards its validity and interpretation; however, few countries have recently completed National Health Accounts.

Progress in improving financial risk protection

For service users, ensuring financial risk protection against catastrophic and impoverishing health spending is integral to achieving UHC. However, the representative data required to measure financial risk protection robustly at a national level are often insufficient—in the First Global Monitoring Report of UHC⁷⁶ such data were available only for 37 countries (2002–12), and only nine in sub-Saharan Africa. More broadly, many African governments have embarked on reforms towards reducing reliance on out-of-pocket expenditure and increasing the share of prepaid contributions under public pooled insurance.

The effect of user fee removal on service utilisation has generally been positive, despite implementation with insufficient preparation in most African countries,¹⁷⁴ but the evidence is mixed at best for improved equity, quality,

	Out-of-pocket payments as a percentage of total health expenditure	External (donor) resources as a percentage of total health expenditure	General government health expenditure as a percentage of general government expenditure
	■ Sustained progress	■ Stable trend	■ More efforts required
Angola	-2.7%	-2.8%	3.9%
Benin	-1.5%	-0.2%	2.6%
Botswana	5.5%	2.8%	4.7%
Burkina Faso	2.3%	0.8%	-6.7%
Burundi	-10.1%	4.0%	13.9%
Cameroon	0.6%	N/A	-1.4%
Cape Verde	0.4%	98.9%	-1.2%
Central African Republic	-0.8%	29.1%	5.5%
Chad	-6.3%	13.4%	10.0%
Comoros	-1.0%	39.6%	-4.8%
Congo (Brazzaville)	-17.7%	11.9%	12.0%
Côte d'Ivoire	-2.3%	-5.1%	2.1%
DR Congo	0.7%	4.4%	4.6%
Equatorial Guinea	8.7%	-15.7%	-0.3%
Eritrea	-1.2%	-1.8%	0.0%
Ethiopia	-3.2%	-1.9%	7.8%
Gabon	-7.8%	-32.6%	15.4%
Gambia	-3.8%	13.0%	-2.6%
Ghana	11.9%	-5.1%	-2.0%
Guinea	-4.2%	10.6%	17.4%
Guinea-Bissau	3.3%	-1.1%	30.8%
Kenya	-9.9%	4.5%	21.4%
Lesotho	-3.3%	20.9%	6.0%
Liberia	6.1%	0.8%	-8.7%
Madagascar	2.8%	7.1%	6.8%
Malawi	0.0%	2.7%	-2.6%
Mali	-6.7%	3.1%	-2.3%
Mauritania	-1.9%	-3.2%	5.7%
Mauritius	-1.9%	21.9%	4.1%
Mozambique	7.4%	-3.4%	-1.8%
Namibia	-2.3%	-8.1%	0.0%
Niger	-0.4%	-2.8%	-7.5%
Nigeria	1.9%	12.5%	-1.7%
Rwanda	-1.5%	1.2%	-2.5%
São Tomé and Príncipe	-15.2%	6.4%	23.2%
Senegal	0.0%	10.9%	-3.5%
Seychelles	-12.4%	1289.6%	9.6%
Sierra Leone	-0.9%	63.6%	0.5%
South Africa	-3.4%	-7.4%	1.1%
South Sudan	N/A	N/A	N/A
Swaziland	-5.3%	20.9%	6.5%
Togo	4.1%	4.2%	-5.8%
Uganda	0.7%	3.0%	-1.6%
Tanzania	9.9%	-1.5%	-0.7%
Zambia	-3.1%	0.2%	-0.1%
Zimbabwe	-4.5%	N/A	12.8%
Djibouti	6.4%	-4.6%	0.0%
Sudan	2.4%	818.8%	3.3%

Figure 12: Outlook of sustainability of health financing efforts

Figure shows the average annual change in three indicators (out-of-pocket payments as a percentage of total health expenditure; external [donor] resources as a percentage of total health expenditure; and general government health expenditure as a percentage of general government expenditure) in 2009–14. N/A denotes insufficient data were available.

and financial risk protection. In Zambia, for example, there are indications that removal of user fees in primary care facilities starting from 2006 benefited rich people much more than poor people.¹⁷⁵ The risk of catastrophic health payments remains concentrated among the poorest people, and transport cost is the main determinant of limited protective effect.¹⁷⁶ Acknowledgment that financial barriers are one of many considerations for inadequate access to care is important; other considerations include different price elasticities across health services, the opportunity cost of time for the poor, high non-medical direct costs (eg, transport) or medical costs borne outside facilities (eg, drugs), and perceptions of poor quality of care.¹⁷⁷

Removal of financial barriers to access is important, but should be complemented by broader measures that address relevant causes. Findings from the evaluation of Sierra Leone's user fee removal initiative—the Free Health Care Initiative—point to important lessons; despite a comparably hasty implementation, the Free Health Care Initiative took a systemic approach and used the initiative as a platform to trigger sector-wide reforms (eg, human resources for health, introduction of performance-based financing to replace resources foregone in facilities).¹⁷⁸ Maintenance of quality of care is another key consideration when introducing such policies. In Niger, user fee removal and improvements in use of health-care facilities came at the cost of deterioration of quality of service, particularly in areas where health facilities were not supported by NGOs. These shortcomings might seem unintended consequences, but were in place long before the implementation of fee exemption policies, which only made them more visible. More broadly, governments should safeguard against the risks of creating a two-tier system, comprising free and low quality services for poor people, and paid for and better quality services for non-poor people.¹⁷⁹

The uptake of various health insurance models has increased in sub-Saharan Africa since 2000. Community-based health insurance has proven more popular, with adopters including Burkina Faso, Ethiopia, Rwanda, and Senegal, and social health insurance has been rolled out in countries such as Ghana (panel 4). Evidence of the effect of health insurance in African countries has generally been mixed.¹⁸⁶ Although both community-based health insurance and social health insurance are associated with improved financial protection and service use for enrollees, there is no guarantee that introduction of health insurance increases service quality, ameliorates inequity or—in the case of community-based health insurance—empowers communities. Given the exceptionally high cost of introduction or scaling up of national health insurance schemes, governments need to have clarity on the exact purposes of insurance schemes and approach the issue from the perspective of assessment of the opportunity costs relative to reformation of existing systems. For example, strengthening financial

management and contracting capacity in African ministries of health might prove to bring more substantial equity gains than rolling out a full-blown insurance scheme, depending on the context.

Two broad categories of challenges remain particularly relevant: ensuring that individuals who would benefit most from having insurance enrol; and ensuring that people can access the benefits that are relevant to them once enrolled.¹⁸⁷ When national health insurance plans start with enrolment of formal and civil sector workers, it later becomes difficult to extend the scheme to other groups, which undermines the equity objectives of the entire scheme.¹⁸⁸ The National Health Insurance Scheme in Nigeria provides a useful example—launched in 1999, the scheme covers less than 5% of the population and expansion into the informal sector has been low to date. The financial, institutional, and communication efforts required to extend coverage towards poor people are substantial, irrespective of the approach, and there is no substitute for full commitment towards this goal. Despite health insurance enrolment camps, heavy subsidisation, and exemptions from contributions, poor people are still at least two times less likely to be enrolled in Ghana's National Health Insurance Scheme than are rich people.¹⁸⁹ This is partly because of policy incoherence, for example, one of the stipulated criteria to identify the core poor is the absence of a fixed place of residence, which is only rarely the case and in effect disqualifies many poor people. Low awareness among poor people of exemptions they are entitled to is another contributing factor.¹⁹⁰ Furthermore, poverty identification strategies should combine statistical information, relevance, and community acceptability to be viable.¹⁹¹ As such, translation of pro-poor policies in practice is often a matter of implementation. Without close consideration of all relevant aspects, the effect of pro-poor policies might well depend on the initiatives of district health managers or administrators and front-line workers.¹⁹²

Enforcement of the mandatory character of insurance comes with political and operational challenges, hence pooling remains fragmented in many African countries. This fragmentation raises issues of adverse selection, inequity, and financial viability, particularly for voluntary schemes addressing the informal sector. Reduction of fragmentation by merging different insurance pools is essential to promote equity in the use of health services, create opportunities for cross-subsidisation, and ensure the financial sustainability of the schemes. However, reduction of fragmentation also raises significant challenges and is a key consideration for countries that are yet to pursue national health insurance schemes and face a choice between the pragmatism of starting with enrolment of the formal sector and the difficulties of enforcing nationwide enrolment. Tanzania began steps towards bringing together its two major health insurance schemes—the National Health Insurance Fund, the compulsory formal sector scheme, and the Community

Panel 4: Examples of health insurance in Ghana, Rwanda, and Senegal

Ghana passed National Health Insurance legislation in 2003, which established the National Health Insurance Scheme. This scheme is primarily funded through a National Health Insurance Levy (2.5% value added tax on most goods and services, with exemptions for basic foodstuffs and products consumed primarily by the poor), payroll contributions from formal sector employees, and contributions from informal sector enrollees (premiums and registration fees). Enrolment is legally mandatory, but difficult to enforce given the size of the informal sector. Falling enrolment is a major challenge for the National Health Insurance Scheme—having reached peak coverage at 66%, enrolment is now estimated to be less than 40%, with the wealthier population quintiles twice as likely to be enrolled compared with the least wealthy.¹⁸⁰ Unaffordable premiums and not getting sick have been invoked as major self-reported determinants of non-renewal of membership. However, research suggests that 66% of uninsured households could actually afford health insurance,¹⁸¹ which can be corroborated with data suggesting that a third of the population exempted from premiums could also afford contributions.¹⁸² The financial sustainability of the National Health Insurance Scheme is now a key consideration, as two-thirds of beneficiaries are exempt.¹⁸³

The Rwandan community-based health insurance scheme, piloted in 1999 and fully implemented at a national scale by 2006, reported enrolment rates as high as 85% in 2008. More recent national health accounts data indicated a slight drop in enrolment to 74% for community-based health insurance. Other health insurance schemes for civil servants, the military, and private insurance bring the total enrolment in health insurance to 80%. This enrolment has all been on an individual, voluntary basis, as Rwandan law on mandatory

health insurance has not yet been enforced. Evidence suggests the community-based health insurance scheme has increased service use and provides protection from catastrophic expenses, although poor people still remain at a disadvantage compared to non-poor people, allegedly because of remaining co-payments.¹⁸⁴ However, the scheme proved not sustainable and was terminated. Community-based health insurance was replaced by a centralised insurance system on July 1, 2015.

Senegal started with mandatory insurance for civil servants more than 50 years ago, followed later by formal private sector insurance. In the 1990s, community-based health insurance called *mutuelles de santé* started to slowly reach 5% of the population. In 2012, when the newly elected President promoted universal health coverage, only 20% of the population was covered by any insurance. The decision was taken to go to scale step by step using voluntary community-based health insurance and particularly targeting the informal private sector and rural sector. The government contributes 50% of the payment and 100% of the payment for the poorest people and disabled people. Basic care and immunisation for children aged under 5 years are free of charge. Insurance coverage was 32% at the end of 2014, and is expected to reach 45% by 2015, and 75% by 2017.

Community-based health insurance is likely to favour those who are already part of social networks and have access to social, economic, cultural, and other forms of capital.¹⁸⁵ The Senegalese Government reaffirmed its commitment towards the community-based health insurance scheme as a key mechanism of achievement of universal health coverage; however, much needs to be done towards extension of effective coverage in the population.

Health Funds, the voluntary scheme for those in the informal sector—in a move to increase insurance coverage. In 2009, the National Health Insurance Fund took over the management of Community Health Funds, and an early evaluation suggested an increase in insurance coverage, particularly in the informal sector; however, the evaluation also concluded that harmonisation of legal frameworks is an essential precondition and administrative costs might not decrease.¹⁹³

Progress to date in improvement of financial risk protection needs to be sustained further. In sub-Saharan Africa, poor people still have disproportionately less access to health services and are more exposed to impoverishing expenditure compared to the non-poor. First, capitalising on the existing health financing learning network is essential to take stock of lessons learned. Second, the design of insurance schemes can be further improved. For example, group enrolment (rather than individual or household) and incorporation of lead-in time following enrolment have been found to be effective against adverse selection. Third, a systemic view

of reforms aimed at improving coverage and financial risk protection is required, which includes combined action on demand-side determinants (eg, improved targeting) and supply-side determinants (eg, partnering with faith-based and private sector providers in areas with poor coverage by government facilities and use of performance-based financing to stimulate enrolment and improve health services).

Improving health spending efficiency

Sub-Saharan countries have lower per capita spending on health than most countries in other regions. However, spending more money on health is only part of the answer to achievement of UHC and, ultimately, better health; efficiency, understood as achieving better health outcomes with the same resources, is crucial.⁸⁸ The consequences of inefficiency are anything but trivial—it has been estimated for Organisation for Economic Co-operation and Development countries that improvement of efficiency to the standard of the best performing countries would bring, on average, an increase of 2 years

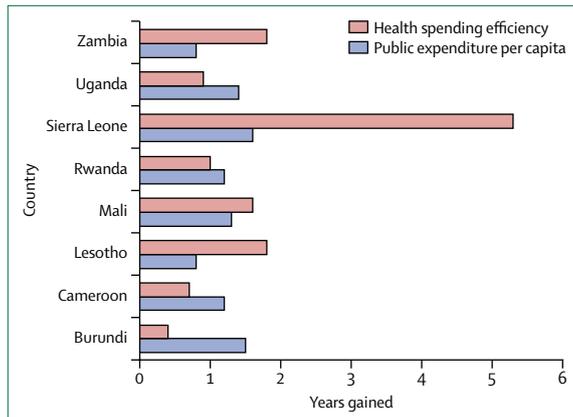


Figure 13: Potential gains in health adjusted life expectancy (years) from reaching the regional average in public health expenditure per capita and health spending efficiency in selected sub-Saharan countries
Data from Grigoli and Kapsoli and used by permission of the IMF.¹⁹⁶

in life expectancy, compared with a 4-month increase in life expectancy brought by a 10% increase in public health expenditure per capita.¹⁹⁴ Investment in efficiency and demonstration of value can strengthen the dialogue between African Ministries of Health and Ministries of Finance¹⁹⁵ and help convince Ministers of Finance of the returns associated with allocation of much needed resources for health.

Evidence suggests that the African region has the least efficient health spending in the developing world.¹⁹⁶ Africa reports higher per capita health spending and worse health outcomes than South Asia, the most comparable region in terms of health expenditure.¹⁹⁷ This categorisation again masks important between-country imbalances: Namibia and Togo are among the most efficient spenders, and Lesotho, Mali, and Sierra Leone lie at the other extreme. When contrasting additional years to be gained in health-adjusted life expectancy from increasing public health expenditure per capita and more efficient health spending to continental averages, it is clear that improved efficiency would bring at least comparable gains to increased spending (figure 13). In countries such as Lesotho, Sierra Leone, and Zambia, addressing inefficiencies would largely outweigh benefits from spending increases. As such, health spending efficiency must become as high a priority in sub-Saharan countries as increasing public health spending itself. Simply spending more without improvements in efficiency would yield less benefits than maintaining spending at today's rates, but with improved efficiency.

Low budget execution (an estimated \$10–100 million in unused fiscal space for health across African countries),¹⁹⁹ disproportionate spending on tertiary care to the detriment of primary care, procurement, inappropriate workforce distribution and motivation (financial and non-financial), medical errors, and corruption have all been indicated as key inefficiency sources.⁸⁸ Emerging evidence suggests that African countries with higher corruption levels also

experience lower health outcomes.^{198,199} An area of interest concerns the purchasing of health services, which ensures the link between revenue generation and service delivery. The term strategic purchasing was coined as early as 2007²⁰⁰ with reference to maximising health system performance by continuously optimising how interventions are purchased, and has been highlighted as a means to support UHC advances.²⁰¹ However, research on the extent to which strategic purchasing is actually conducted and guidance on how strategic purchasing practices can be adopted in public, integrated systems (the model in most sub-Saharan countries) is scarce.²⁰² Experiences from countries like Nigeria,²⁰³ Kenya,²⁰⁴ and South Africa²⁰⁵ suggest that although some elements of strategic purchasing are in place, they fall short of the strategic purchasing ideal and much more progress is needed. Ghana's experience with a series of reforms comprising the introduction of Diagnosis Related Groups and, more recently, capitation also offers insights into how the public discourse on strategic purchasing is shaped.²⁰⁶

Several priorities for improving efficiency have emerged. First, improvement of financial management of health resources is key.¹⁵⁹ Second, a systemic approach to reform should be taken.²⁰⁷ This approach entails linking, among other things, health financing with service delivery, domestic funding with donor funding, and financial resources with human resources. DR Congo offers an example of substantial gains following reforms in the pharmaceutical sector, which came as part of a comprehensive domestic effort that reclaimed leadership and governance of the health sector, leading to better alignment of international partners' resources through concerted reforms in financing, service delivery, and governance. Before the National Health Sector Development Plan 2011–15 there were close to 100 drug distribution channels and 85% of health sector partners used their own channel. There was substantial duplication and wastage, and the government had little control over drug distribution. By alignment of donors with the national procurement and supply system, injection of domestic resources into the national procurement and supply system, and pooling of resources for the transport of supplies, drug transport costs decreased, leading to an estimated \$3.5 million annual savings.²⁰⁸ Third, using regional networks can enable governments to build capacity quicker and undertake essential functions more efficiently. To take the example of pharmaceutical spending further, domestic initiatives such as those in DR Congo can be complemented with regional efforts in improved procurement and knowledge sharing, illustrated by initiatives such as the Southern African Development Community's Strategy for Pooled Procurement of Essential Medicines and Health Commodities.²⁰⁹

Section 6: access to essential health commodities

Achievement of UHC will require access to good quality and affordable drugs and vaccines, medical devices, and

medical consumables. At the same time, the issue of antimicrobial misuse due to unregulated access to pharmaceuticals through unauthorised access points, without prescriptions, or inappropriate prescription is clearly one of Africa's major problems. Antimicrobial misuse is a threat for the development of antimicrobial resistance, and therefore a threat to the treatment and control of many diseases including malaria, HIV/AIDS, and tuberculosis (multidrug-resistant tuberculosis and extremely drug-resistant tuberculosis). Furthermore, misuse of antimicrobials is related to inefficiencies in the health system.

Sub-optimal access to essential health commodities has long been a serious issue in sub-Saharan Africa due to an unwanted nexus of high commodity costs relative to local purchasing power, inefficient procurement practices (eg, multiple tendering processes each year), counterfeit medicines, and stock imbalances.^{210,211} In general, the availability of essential medicines has been problematic in sub-Saharan Africa, more so than in any other region.²¹² The average availability of essential medicines in sub-Saharan Africa is around 40% in the public sector and 60% in the private sector, substantially below the WHO target of 80% medicines availability in all sectors.²¹³ The target is nearly met in countries such as Sudan²¹⁴ and Burkina Faso,²¹⁵ but not in others, such as Malawi,²¹⁶ and data gaps remain pronounced for many countries (table 7).²¹⁷ Moreover, the availability of essential medicines is often superior in the private sector compared with the public sector, for essential medicines compared with non-essential medicines, and in urban compared with rural settings.^{218,219}

Medicine procurement also appears to bear a strong link with historical disease burden trends—medicines for the treatment of chronic conditions have on average nearly 40% less availability (absolute terms) in the public sector compared to medicines for the treatment of acute conditions,²¹⁸ a reflection of health priorities to date. In terms of affordability, buying medicines in sub-Saharan Africa can have devastating impoverishing effects for households.²²⁰ There is evidence that large-scale multi-stakeholder initiatives like the Affordable Medicines Facility-malaria can lower prices and improve access through manufacturer negotiations, subsidies, and communication campaigns, but cannot be reproduced to cover the entire spectrum of health needs.²²¹ The rise of chronic conditions will add to the growing need for affordable quality medicines, although most of the drugs needed to treat common chronic conditions are available as generics.

Although the principles of ensuring health commodity security are well known,²²² the practical realities of sub-Saharan Africa call for enduring political commitment and targeted financial investment to enact these principles. A 2017 report²²³ by the *Lancet* Commission on Essential Medicines for universal health coverage estimated that between \$13 and \$25 per capita is required

	Median availability of public facilities	Median availability of private facilities
Burkina Faso	87.1%	72.1%
Congo (Brazzaville)	21.2%	31.3%
DR Congo	55.6%	65.4%
Malawi	63.3%	55.6%
Niger	35.0%	65.8%
Rwanda	46.3%	80.0%
São Tomé and Príncipe	56.3%	22.2%
Sudan	77.1%	91.7%
Uganda	70.0%	78.0%
Tanzania	37.8%	50.0%
Zambia	74.0%	81.3%

Systematic data are scarce. Data taken from World Health Statistics 2015.²¹⁷

Table 7: Median availability of selected generic medicines in public and private facilities in a selection of sub-Saharan African countries, 2007–13

to finance a basic package of essential medicines in all low-income and middle-income countries, but most low-income countries were spending less than \$13 per person. Several directions have strategic value to improve commodity availability and affordability, stimulating local commodity production, harmonising legislation, and investing in regulatory capacity. These directions are amenable to direct government intervention, but others depend more on joint action from governments and private sector partners. An example of dependency on action from governments and private sector parties is overcoming the dysfunctionalities of pharmaceutical supply chains in sub-Saharan Africa. High rates of fragmentation in the distribution chain prevent drugs from achieving the scale required to obtain optimal efficiency. Some of this fragmentation is a result of conditionalities imposed by external donors. Furthermore, low multiplicity (usually one distributor covers a given geographical area) hinders competition and innovation.²²⁴ Both fragmentation and low multiplicity directly affect affordability and availability through high mark-ups and frequent stock outs, respectively. The stewardship role of governments is essential in recognition of the particular supply chain model that applies to given countries and formulation of policy that stimulates uptake of technological innovation and market consolidation.

From the perspective of production capabilities, approximately 70% of the African pharmaceutical market is imported and although more than 30 sub-Saharan countries have some form of pharmaceutical production capabilities, only South African companies produce active pharmaceutical ingredients.²²⁵ Substantial foreign aid received by African countries during the past decades to support tuberculosis, HIV, and malaria medicines has led to large-scale generic drug imports, primarily from Indian companies.^{226,227} Although the availability of bona fide generic antiretrovirals from India has made it possible to treat over 10 million people with HIV in

sub-Saharan Africa, a pilot study found that antibiotics and tuberculosis drugs of Indian origin are more likely to be of substandard quality in Africa compared to other markets.²²⁸ More broadly, the issue of counterfeit medicines has global proportions but is even more stringent in sub-Saharan Africa than in other regions,^{229,230} with a median of 20% of the population reporting to have been a victim of counterfeit drugs.²³¹ In theory, more reliance on locally produced generic medicines could lower consumer prices via shorter supply chains, and would stimulate local economies. Despite the strong intuitive appeal of such mechanisms and supporting evidence from high-income settings, they are yet to be backed by evidence in sub-Saharan Africa and must be advanced with due caution.²³²

Investing to harmonise production with international industry standards will be a necessary and difficult first hurdle. The African Union's Pharmaceutical Manufacturing Plan for Africa¹³ aims to support the local industry to reach international standards of production through an array of initiatives, which include a good manufacturing practice roadmap, specialist human resource development policies in African universities, and lobbying to extend the Trade-Related Aspects of Intellectual Property Rights agreement flexibilities beyond 2016. Compliance with international production standards and production at competitive costs is achievable for African pharmaceutical companies, although by no means easy,²³³ and can also generate positive spillovers. Evidence from Tanzania suggests that locally produced medicines are less subject to the so-called urban bias (higher availability in urban vs rural settings) compared to imported medicines, even when import prices and purchasing power are accounted for, thus suggesting that locally produced medicines are more trusted by purchasers and therefore more accessible than imports.²³⁴ However, the time to strengthen local production capacity is now. More than 30 sub-Saharan countries are classed by the UN as least developed countries and, as such, are eligible to refuse to grant patents for pharmaceuticals until July, 2021, under the transitional provisions in the Trade-Related Aspects of Intellectual Property Rights agreement.²³⁵

Regulatory capacity building requires substantial investment. Most national regulatory agencies in sub-Saharan countries do not have the capacity to perform their basic functions, such as conducting timely, good quality technical assessments of product dossiers and verifying the marketing authorisation of products on importation.²³⁶ To give just one example, only five countries (Kenya, South Africa, Tanzania, Uganda, and Zimbabwe) have WHO prequalified laboratories for drug quality testing.²²⁴ Staff shortages, insufficient and fluctuating funding, and precarious information management systems directly affect medicines availability and patients' health. For medicines to become available for African patients can take 5 years or longer than in other parts of

the world.²³⁷ Regulatory power is only starting to consolidate, for example, in the form of the African Vaccine Regulatory Forum, the Developing Country Vaccine Regulators' Network, and the First Scientific Conference on Medicines Regulation in Africa,²³⁸ but efforts should be thoroughly supported and accelerated by national governments. Countries in the East African Community, the first sub-regional entity to set up a harmonised medicines registration system, demonstrate that regulatory strengthening is possible through coordinated regional initiatives, although legislative and capacity challenges remain prominent.²³⁹

Substandard and counterfeit medicines continue to pose severe threats to human health in Africa.^{240,241} More than 100 000 deaths in children aged under 5 years in sub-Saharan Africa were estimated to be associated with poor quality antimalarials in 2013 alone.²¹⁷ Although the scope of this problem is enormous, it remains difficult to quantify with precision. For example, a 2014 review²⁴² of the Worldwide Antimalarial Resistance Network's quality database found no information for 17 of the 44 malaria-endemic sub-Saharan countries. NGO initiatives such as the Ghanaian-born mPedigree Network (panel 5) empower patients and health professionals to identify falsified drugs and are an excellent example of health-care innovation in practice. These initiatives cannot substitute the functions of central regulators, but are an additional tool to enhance regulatory effectiveness.

Reforming central medical stores towards granting them more autonomy to improve their performance has yielded encouraging results.²⁴⁴ However, central medical stores in many countries continue to face challenges in infrastructure, human resources, management, and operational capacity. Furthermore, there is no guarantee that improvement of central medical stores' overall performance automatically leads to improvements in perceived availability of drugs (or at least of all drugs) by front-line staff.²⁴⁵ Alignment of the incentives of the many stakeholders in the supply chain is essential, and introduction of performance-based financing in supply chains is an alternative worth considering,²⁴⁶ as illustrated by encouraging results from Mozambique.²⁴⁷

Finally, national legislation requires alignment with efficient purchasing objectives. The UN Commission on International Trade Law Model Law on Public Procurement²⁴⁸ provides countries with a template for national procurement legislation, generally under a decentralised procurement system with central oversight. Framework agreements, which can be used when the procuring entity expects the need for procurement to arise on a repeated, indefinite, or urgent basis during a given period of time, are an effective and cost-effective option to ensure predictability and competitive prices given the long-term and price discounts. Such contractual arrangements are suitable for generic drugs and routine consumables, but less so for medical devices, as they also tend to limit competition and are, thus, suitable for

For more on the mPedigree Network see <http://mpedigree.net>

mature products where new entrants are not expected to enter the market during the contract's enforcement duration. Framework contracts are already enacted in countries like Ghana, Kenya, and Zambia, although in other countries, such as Mozambique, legislative barriers still prevent their enactment.²⁴⁹ Even where procurement itself is effective, post-procurement management of commodities is crucial, as the experience of Ghana's central medical stores illustrates.

This Commission advocates for an integrative approach towards achievement of commodity security and access to essential medicines in sub-Saharan Africa, an approach that considers the commodity pathway in its entirety, through manufacturing and importation, market registration, procurement, and purchasing. This Commission also supports the main recommendations of the *Lancet* Commission on Essential Medicines for UHC,²²³ such as paying for a basket of essential medicines, making essential medicines affordable, assuring the quality and safety of medicines, promoting quality use of medicines, and developing missing essential medicines. Achievement of sustainable inflows of good quality, affordable medical products cannot happen overnight, but, as shown by examples of successful initiatives mentioned here, solid progress is already taking place. Capitalising on this progress can immediately deliver better public health outcomes, but only with continuous commitment and leadership on all fronts—industry, regulatory capacity, and legislation—as well as strengthened institutional and regional cooperation. This should also be a priority for international support and highlights the importance of using evidence to inform policies and practice as an approach to improving efficiency in service delivery to improve outcomes.

Section 7: strengthening public health systems and containing epidemic threats

Public health systems are an essential part of health systems because of their focus on prevention of disease and promotion of health among the population as a whole. Among other things, public health systems provide much needed data on population health and epidemic threats, informing the need for, and evaluation of, health interventions, thus facilitating evidence-based decision making.²⁵⁰ Multidisciplinary and multisectoral in nature, public health systems should work closely with treatment and caring for sick people, as has been the hallmark of HIV control programmes, and now is also needed to deal with chronic diseases. In addition to traditional prevention and management, sub-Saharan countries might have to meet the needs of patients with chronic diseases outside traditional clinical care, which will require innovative public health systems.

Historically, very different public health systems emerged in Africa, with francophone countries often having very centralised services, quite independent from

Panel 5: mPedigree anti-counterfeiting technological innovation

Counterfeit medicines are widely available in sub-Saharan Africa. These medicines pose a serious health threat to clients in many countries. Ghanaian firm mPedigree, which was founded in 2007, has developed an anti-counterfeiting solution that allows patients purchasing drugs to confirm via text message whether the medicine they are buying is fake or original.²⁴³ mPedigree, in collaboration with pharmaceutical manufacturers and drug regulatory agencies, generates 12-digit codes which are applied to a product, and provides a toll-free service whereby a patient can verify whether the code is legitimate (Simons B, unpublished). A positive verification means that the product is genuine. The verification response also contains information such as the brand name, batch number, expiry date, and active ingredient of the product. If the verification response is negative, the patient will be prompted to call a local alert line.

Manufacturers pay for the cost of the mPedigree service, from the printing of the special labelling used for the codes to the text message deployment costs. The platform management costs and other incidentals are all bundled in a simple unified price format for pharma manufacturers and distributors.

In Africa, mPedigree currently operates in Egypt, Ghana, Kenya, Nigeria, Rwanda, and Uganda, with plans to move beyond pilots in Sierra Leone, South Africa, Tanzania, and Zambia. The mPedigree application is versatile, as it can also be used to verify all kinds of products sold on the retail market, including cosmetics, electrical gadgets, and mobile phones. In Ghana, a local electrical cables manufacturer is using the application to protect his cable brand and patrons from fake versions of the product (Simons B, unpublished).

mPedigree also has the capacity to track wholesale consignments and major distributors and is an end-to-end enterprise system for tracking and serialising products, with a consumer-based interface, especially useful for markets where tracking of products is a challenge, like most typical markets, jurisdictions, and borders in sub-Saharan Africa and other developing countries (Simons B, unpublished). mPedigree has applications in other sectors, such as agriculture, where counterfeiting in the seed industry is an important issue, as it presents a threat to food security and livelihoods, in a region where agriculture is a major economic activity. In Nigeria and Uganda, regulators use the mPedigree Goldkeys software to locate counterfeiting hotspots and target their scarce resources appropriately.

mainstream health-care services. Investments in public health systems have frequently been driven by efforts to control infectious diseases such as HIV, polio, and malaria. More recently, the US-inspired global health security agenda²⁵¹ has driven public health systems development in response to concerns relating to emerging infections with pandemic potential and bioterrorism.

Lessons from Ebola

The importance of public health systems is most strikingly illustrated by the Ebola epidemic in west Africa, a part of Africa which had not previously experienced outbreaks of the virus. Ebola caused over 11 000 deaths (compared with >300 deaths for the largest outbreak in central Africa), involved almost the entirety of three nations (Guinea, Liberia, and Sierra Leone)—including their capitals, and lasted more than 2 years.²⁵² The Ebola outbreak illustrated that a “perfect storm”,²⁵³ which might not be repeated as such, can turn a limited outbreak into a humanitarian crisis. This outbreak exemplified how grave deficiencies in public trust,

national and global leadership, epidemic preparedness, and health systems can have catastrophic health, social, political, and economic consequences.²⁵⁴ Additionally, a legacy of civil war and corrupt dictatorship in Guinea, Liberia, and Sierra Leone made these countries ill prepared for any catastrophic event, even if they were all on the road to economic and societal recovery.

Delays in detection and response allowed the Ebola outbreak to spiral out of control, overwhelm local health systems, and disseminate regionally and globally. Fear of the economic and political consequences of declaring a public health emergency of international concern by WHO further delayed the response. Actions such as halting international flights and travel restrictions, clear violations of the International Health Regulations (IHR),²⁵⁵ had a punitive impact on the affected countries and could be seen as a major disincentive for openness about future epidemics. Countries should be supported to declare public health threats early, so as to ensure timely mobilisation of international resources for containment, both in the affected country, and in countries at risk of importation.

Poor infection control practices and insufficient resources increased the risk of health-care worker infection and death (>500 health-care workers were killed by Ebola in west Africa),²⁵² further depleting the already scarce workforce.²⁵⁶ Health facilities became a source of transmission for the virus.²⁵⁷ Consequently, uptake of routine services declined because of fear of contagion,²⁵⁸ with expected increases in non-Ebola related morbidity and mortality likely to exceed the direct effects.

Community distrust and resistance severely hampered control efforts, thus illustrating the importance of community engagement in the design and delivery of disease control programmes. Early engagement of communities and civil society organisations is a critical component of any effective public health response and should be done as a matter of routine.^{259,260} Such community action and “people’s science”²⁶¹ played a major part in several areas to control the epidemic.

On a positive note, just as in the AIDS epidemic in Africa, for the first time during an outbreak of haemorrhagic fever, research was conducted successfully on vaccines, therapeutics, diagnostics, and social behaviour.²⁶² A public–private partnership called the Coalition for Epidemic Preparedness Innovations was launched to finance research on vaccines against diseases with epidemic potential, and to address the need to provide incentives for the development of vaccines where there is market failure.²⁶³ Although the conduct of research during the Ebola epidemic set an important precedent for incorporation of more proactive clinical, epidemiological, and social science research in future outbreaks, it is sobering to reflect on the number of unanswered questions on critical topics such as the best approach to supportive care, the long-term consequences, the potential for endemicity, and the virus reservoir.

Examples such as the African Vaccine Regulatory Forum, which expedited the regulatory review of Ebola candidate vaccines,²⁶⁴ show the importance and utility of regional collaboration in mobilisation of resources and technical expertise, and in support of public health systems. Countries such as DR Congo and Uganda have extensive experience in promptly and successfully responding to outbreaks of Ebola and Marburg virus infections, and their experience should be capitalised on more.²⁶⁵ Similarly, it will be important to learn from attempts to control a 2016 yellow fever outbreak in central Africa²⁶⁶ and from responses to the re-emergence of wild poliovirus in northern Nigeria.²⁶⁷

In addition to robust public health systems, strong national leadership at the highest levels is critical to respond effectively to epidemic threats. In Senegal, the resolute leadership of the government was effective in limiting the spread of Ebola from an imported case. In Nigeria, the emergency operations centre established for polio eradication, and the availability of a sufficient number of trained public health staff experienced in its operation, enabled rapid containment and elimination of the Ebola virus.²⁵¹

It is notable that both Sierra Leone and Guinea suffered from a large-scale cholera outbreak in 2012. In Sierra Leone, the outbreak lasted almost a year, affected almost 23 000 people across 12 of the country’s 13 districts, and was declared a humanitarian emergency by the President.^{268,269} Although cholera differs substantively from Ebola, the epidemic response was in some ways similar, involving the establishment of an emergency operations centre, and enhanced processes for outbreak management, surveillance, data management, community mobilisation, behaviour change, and treatment.²⁶⁹ However, it is questionable whether this capacity was sustained and available in-country at the time of the Ebola outbreak. Despite clear heterogeneity in the risk of viral haemorrhagic fever and other epidemics across the continent,^{270,271} it is highly likely that such epidemics will occur again in Africa, in addition to pandemics such as influenza.

Public health capacity in sub-Saharan Africa

According to WHO, many African countries do not have adequate, functioning, and resilient public health systems. In general, African public health systems are often fragmented and under-resourced, and often have a disease-specific focus, with multiple systems running in parallel.²⁷² Many countries have insufficient capacity for timely surveillance, preparedness, and response to public health emergencies, and have yet to fully develop the required core capacities as stipulated by the IHR. In the 2013 IHR report,²⁷³ data on compliance with the regulations are missing for almost 25% of African countries, and compliance is less than 70% across all indicators for those countries self reporting data, probably providing an optimistic picture of the realities on the ground.

Delivery of an effective public health service is dependent upon adequate public health infrastructure, a competent workforce, and core health promotion, epidemiological, surveillance, and laboratory capacity. Of the 47 countries in the WHO African region, only 17 have designated national institutes of public health,²⁷⁴ and fewer than 400 laboratories are accredited to international standards, of which 90% are in South Africa.²⁷⁵ Almost half of all African countries do not have basic capacity for public health workforce training and development, only 23 countries offer postgraduate public health education, and only 18 offer field epidemiology and laboratory training programmes.²⁷⁶

Health promotion to address risk behaviours for ill-health is an important but under-resourced component of public health systems in the African region. In the past 10 years, WHO Regional Office for Africa has assisted 28 countries in the development of national health promotion policies and strategic plans.²⁷⁷ Challenges to the implementation of effective health promotion include: inadequate leadership; disengagement of community groups, civil society, academia, and regulatory and legislative organisations; an absence of skilled practitioners at the community level; insufficient financing; and an absence of evaluation of interventions.²⁷⁷

Many sub-Saharan countries do not have adequate information systems to support public health. An assessment of civil registration and vital statistics systems indicated that 16 of 47 countries had very low quality systems and no data were available for a further 28 countries.²⁷⁸ In the absence of such systems, alternative approaches to the acquisition and reporting of valuable population level health data have been developed, despite limited resources. Examples include retrospective household surveys, such as demographic and health surveys, multiple indicator cluster surveys, and health and demographic surveillance systems.

Routine disease surveillance is largely implemented through the integrated disease surveillance and response system (currently in 43 sub-Saharan countries).^{250,272} Unfortunately, implementation of disease surveillance has been limited by a number of systemic challenges.²⁷² For instance, systems suffer from insufficient core funding for basic resources such as laboratories, communication systems, and transport, and for their day-to-day operation.²⁷² There are severe shortages of basic equipment,²⁷⁹ trained surveillance staff, epidemiologists, and laboratory staff.^{250,275} Surveillance systems frequently exclude private health-care providers, despite the fact that a substantive and increasing proportion of health care in Africa is delivered privately.²⁷² Community-based surveillance is insufficient, and surveillance systems are primarily passive.²⁷² Laboratory data are underused to inform surveillance,²⁷² the quality of testing is frequently unacceptable, and data on antimicrobial resistance are scarce.²⁷⁹

Coordination across different elements of the disease surveillance system is generally poor and there is rarely any evaluation of the system, nor are data collected to facilitate

such an evaluation.²⁷² Furthermore, information technology is underused for collection, analysis, and interpretation of data.²⁷² Systems mostly focus on human diseases, despite the large burden of emerging infections caused by zoonotic and vector-borne pathogens.²⁷² The One Health Initiative aims to unite human and veterinary medicine. Surveillance systems generally exclude chronic conditions, maternal and child health, and environmental risks,^{250,272} thus impeding effective planning, management, and development of interventions to address these problems.

Strengthening public health systems in Africa

Generally and throughout the world, far less attention and fewer resources are devoted to population health and disease prevention than to clinical care, even if many preventive interventions have been shown to be highly cost-effective and beneficial.²⁸⁰ Sub-Saharan countries will have to invest much more in development of effective public health systems—including development of the requisite IHR core capacities, which is a matter of priority—to achieve this Commission's vision and the health-related SDG targets listed in table 1.

Effective models for public health system development in sub-Saharan Africa do exist, such as the integrated disease surveillance and response system. An assessment of existing public health systems capacity should be undertaken by each African country to identify gaps and needs for systems development and improvement, and these gaps and needs should be systematically addressed within a broader programme of health system strengthening.^{250,281}

Disease-specific programmes might provide opportunities to evolve into a broader public health focus, but this intent will need to become a core goal of such programmes, as the risk exists that they are disconnected from the broader health agenda. For example, funding from the US President's Emergency Plan for AIDS Relief (PEPFAR) was used for multi-disease laboratory system strengthening.²⁵⁰ The upcoming end of the polio eradication programme provides an opportunity to repurpose and transfer its infrastructure and capacity to the general public health system.²⁸² Capacity developed to prepare and respond to the Ebola epidemic in both affected and non-affected countries, such as community event based surveillance systems, could also be used as a foundation for public health system development.²⁸³

Given the weakness of public health systems, the absence of critical mass in many countries, and the potential for infectious disease threats to cross borders, there is much to be gained from more proactive sharing of data and regional and international technical expertise. Pooling resources among countries and adoption of common regional standards and approaches for training, disease surveillance, emergency response, governance and regulatory procedures, and research and development would benefit countries and the African region as a whole.

For more on the **One Health Initiative** see <http://onehealthinitiative.com>

Numerous initiatives are underway to strengthen capacity across the African region (table 8). These collaborations can help to address specific gaps in public health infrastructure and capacity through training and development and are particularly useful for infectious disease outbreaks.²⁸⁸ Political and economic regional alliances, such as the African Union and Economic Community of West African States, can greatly help in removal of political and economic barriers to resource mobilisation and in fostering cooperation between member states, and were active in the Ebola response in West Africa.²⁸³

Most important for Africa's epidemic preparedness is the launch of the Africa Centres for Disease Control and Prevention by the African Union under the leadership of John Nkengasong, subregional hubs, and centres of

surveillance and disease control by the West African Health Organisation, and the establishment of WHO's African Public Health Emergency Fund²⁸⁹ to support national efforts to respond to public health emergencies. Engagement of global partners, such as philanthropic organisations, NGOs, and technical organisations, is also essential for system development and mobilisation of technical experts in public health emergencies, as exemplified by the work of the WHO Global Outbreak Alert and Response Network.²⁸⁸ Some countries, including Nigeria, Senegal, Liberia, Sierra Leone, and Guinea are consolidating or building national centres for epidemic preparedness and response. As these centres are in their infancy, much will depend on support and commitment from the African Union and WHO and its member states.

The Ebola crisis in west Africa has clearly demonstrated the value of even rudimentary public health systems in the detection of, response to, and management of public health emergencies. Sub-Saharan countries need to invest much more in development of robust and resilient public health systems, not only for preparedness, but also for prevention of chronic diseases, improvement of health in general, and decreasing the burden on expensive health-care services and hospitals. Above all, efforts to ensure UHC in Africa should include a strong and protected population health and disease prevention agenda.

Section 8: a health workforce commensurate with Africa's health needs

It is widely recognised that all cadres of health workers in sub-Saharan Africa are in very short supply, particularly in rural areas. Of the 57 countries with a health workforce shortage in 2006, 36 were in sub-Saharan Africa.²⁹⁰ For many years, several African and global reports and declarations have documented the extent and effect of health workforce shortages and proposed solutions, including scaling up and transforming the education and training of health workers.^{150,291–294} Many African countries are implementing national human resources for health plans, and there has been progress. However, as figure 14 shows, Africa still lags far behind other WHO regions. We hope that the recommendations from the High-Level Commission on Health Employment and Economic Growth,⁶¹ chaired by the Presidents of France and South Africa, and the global strategy on human resources for health²⁹⁶ adopted by the World Health Assembly in 2016, will catalyse action. We also support the refreshing perspective of Mandeville and colleagues,²⁹⁷ who stated that “after a decade of advocacy with limited success, it is time to move out of the crisis mode and towards sustainable solutions” and calling for “long-term local responses aligned with available evidence and resources”.

Health workforce shortages vary widely among and within African countries. For example, the number of physicians per 10 000 people ranges from as low as 0·1 in Liberia, and 0·8 in Cameroon and Mali, to 4·1 in Nigeria,

For the One Health Central and Eastern Africa Network see <http://ohcea.org>

For the African Society for Laboratory Medicine see <https://www.aslm.org>

	Essential public health capacity	Capacity strengthening initiative
WHO Regional Office for Africa	Health improvement	Launched health promotion strategy for Africa with specified targets including: development of a framework for planning, implementation, and evaluation of health promotion interventions; development of health promotion plans in at least 30 countries; establishment of national associations and networks of health promotion practitioners in at least 15 countries; working to enhance financing and training for health promotion in at least 10 countries ²⁷⁷
Africa Centers for Disease Control and Prevention	Disease prevention, surveillance, and epidemiology	Establishment of Africa Centers for Disease Control and Prevention by the African Union to enhance surveillance and emergency coordination and to allow rapid deployment of experts to respond to outbreaks across the African continent ²⁸⁴
One Health Central and Eastern Africa Network	Disease prevention and surveillance	Training future leaders to address public health threats at the human–animal–environment interface
Economic Community of West African States	Surveillance	An integrated disease surveillance network to enhance early warning and response capacity in the African region ²⁸³
East African Integrated Disease Surveillance Network	Surveillance	A collaborative effort of the Ministries of Health of Kenya, Tanzania, and Uganda that aims to improve the quality of data on communicable diseases and information sharing
Bill & Melinda Gates Foundation	Surveillance and laboratory	Funding for the Child Health and Mortality Prevention Surveillance Network, a network of disease surveillance sites to build capacity in information management, laboratory infrastructure, and workforce development ²⁸⁵
Consortium including the UK Government, the Wellcome Trust, the Bill & Melinda Gates Foundation, and the Institut Pasteur	Surveillance and laboratory	Establishment of the Fleming Fund to strengthen laboratory and surveillance capacity for tracking antimicrobial resistance ²⁸⁶
African Society for Laboratory Medicine	Laboratory	Laboratory strengthening and accreditation
African Field Epidemiology Network	Laboratory and epidemiology	Field epidemiology and laboratory training programmes, which provide hands-on multidisciplinary training in public health surveillance, outbreak investigation, laboratory management, programme evaluation, research, and other aspects of epidemiology ²⁷⁶
WHO and World Bank	Epidemiology	US\$3·82 billion plan to scale up and maintain civil registration and vital statistics systems across 73 countries, including all sub-Saharan African countries except Namibia ²⁸⁷

Table 8: Selected organisation initiatives for public health capacity building in Africa

7.8 in South Africa, and 10.7 in the Seychelles (table 3). The disparities are similar for nursing and midwifery personnel; with the exception of Gabon and South Africa, African countries have less than 50 nurses per 10 000 people,²⁹⁸ with ratios ranging from 1.4 in Niger, to 8.6 in Kenya, to 33.5 in Botswana.²⁹⁵ Furthermore, urban and rural and public and private maldistribution of health workers is a huge problem across sub-Saharan Africa. According to an International Labour Organization report,²⁹⁹ an estimated 77% of the rural population in Africa went without access to health-care services in 2015 because of health worker shortages (compared with 50% of people in urban areas). This shortage is compounded by a high level of absenteeism of health workers from public facilities in sub-Saharan Africa, for example, Uganda (52%) and Kenya (29%), with the highest absence rate for Kenya in larger urban health centres.^{128,300,301}

Two examples highlight the multiple reasons behind the maldistribution of physicians within African countries. A study in Togo³⁰² found that of 890 trained doctors, 250 migrated, 20 retired, 20 were unemployed, 200 had full-time employment in the private sector and were concentrated in the capital city where 20% of the population live, and 400 worked full-time in the public sector. Only 150 public sector doctors worked in rural areas, where 80% of the population lives.³⁰² The sub-Saharan medical school study³⁰³ shows where doctors were 5 years after graduation (figure 15).

Business-as-usual projections are dire. An analysis³⁰⁴ put the health worker deficit in sub-Saharan Africa at 2 103 770 in 2012, rising to 3 757 522 in 2030 by use of the International Labour Organization's proposed threshold of 3.45 health professionals per 1000 people. This means a 10.21% average annual growth rate is required to meet the need for physicians, nurses, and midwives by 2030.³⁰⁴ Few African countries are on this growth trajectory. A study³⁰⁵ looking at current and projected density of health workers in selected countries estimated the following increases would be required to meet the 3.45 per 1000 people threshold by 2035: 2100% in Ethiopia; 386% in Ghana; 528% in Kenya; 1864% in Mozambique; 1307% in Senegal; and 383% in Sudan. The authors of the study³⁰⁵ concluded that the feasibility of achieving these thresholds was "least likely".

These and other estimates show that even with massive financial and time investment many African countries will struggle to produce, employ, and retain the health workers needed to achieve UHC and the other health-related SDG targets.^{84,306} In some African countries, it will be decades before the minimum thresholds are reached. Therefore, much more investment is needed in pre-service education and training to increase the supply of all types of health workers, including less familiar cadres that are relatively quick to train and able to meet local health needs.^{61,297} It

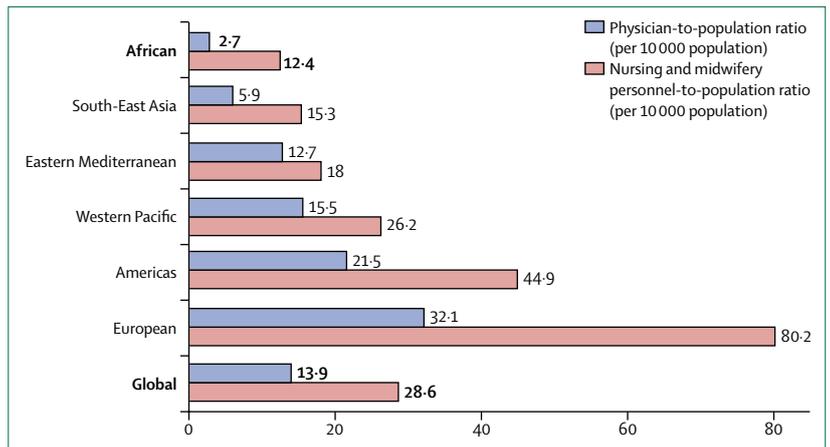


Figure 14: Health workforce to population ratios, by WHO region, 2007-13
Data from Atlas of African Health Statistics used by permission of WHO Regional Office for Africa.²⁹⁵

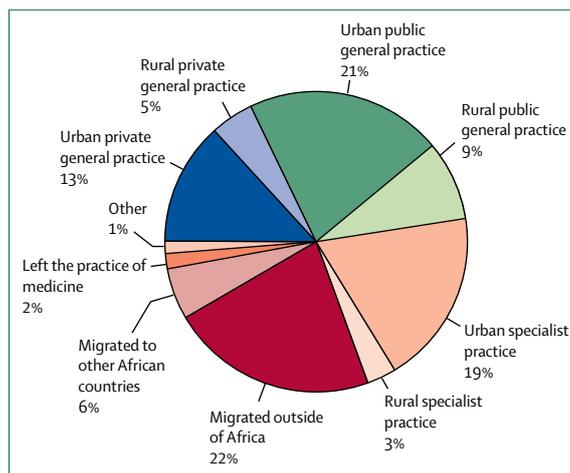


Figure 15: Location of doctors 5 years after graduating from medical school in sub-Saharan Africa
Reproduced from Mullan and colleagues³⁰³ by permission of Elsevier.

is clear that the health outcomes promoted by this Commission cannot be achieved without improvements to the working environment of health-care workers in rural areas and development of new approaches to health service delivery that are not centred exclusively around physicians and nurses.²⁹⁷ For example, the more the private sector integrates the SDGs into their business models, the more they might bring workforces that can be useful, especially for health promotion. Corporate brands can talk about nutrition, hygiene, and water saving, and can help bring resources that did not exist in the health sector.

The High-Level Commission on Health Employment and Economic Growth's recommendations⁶¹ include shifting education models "away from narrow specializations to focus on lifelong building of locally relevant competencies", relaxing unnecessary barriers to entry, and attracting young people to careers in the health

sector. Furthermore, task shifting, task sharing, and alternative modes of health-care delivery that make optimal use of the available workforce, including clinical officers, community health workers (CHWs), pharmacy assistants, chemists, and informal health-care providers, should urgently be pursued. Attainment of UHC and improvement in health care can be accelerated by sustained political commitment and leadership, to match population health needs with a health workforce that is fit for purpose and fit to practise.³⁰⁷

However, this approach should not be at the expense of training more highly qualified types of personnel, because these are required to plan for the health system, and provide much needed leadership, guidance, support, and supervision of less trained health workers.

Amidst the pressing demands for health service providers in sub-Saharan Africa, researchers and research managers and administrators are almost always forgotten. The need to invest in these essential health workforce cadres is discussed in more detail in Section 9.

All health workers need to be supported, able to work (and live) in decent environments, and earn decent salaries, a much neglected aspect of the workforce literature, especially in the African context. A carefully considered package of financial incentives (eg, hardship allowances) and non-financial incentives (eg, enhanced scopes of practice) are required to better support health workers and reduce attrition among those employed in remote and rural areas.³⁰⁸

Health workforce education capacity

The number of health workforce training institutions is rapidly increasing in sub-Saharan Africa, although quality is highly variable.²⁹³ For example, a study³⁰³ into medical schools in sub-Saharan Africa found a rapid expansion of medical schools between 1990 and 2009; 58 responding schools opened since 1990, and 43 of 168 medical schools in 2009 were private institutions (for profit and non-profit, including faith-based). However, among sub-Saharan countries with populations of 2 million people or more, one had no medical school and 14 had only a single medical school.³⁰³

A study³⁰⁹ in Kenya found the annual student enrolment in nurse training to have doubled between 1999 and 2010. The number of training places for family medicine specialists in Africa has also increased through initiatives such as the Primary Care and Family Medicine Education Network,³¹⁰ a south-south collaboration. The Government of Ethiopia pursued a rapid workforce scale-up by mandating increases in class sizes in medical schools and investing in physical infrastructure, including a new teaching hospital. First-year enrolment in one medical school rose from 250 in 2009 to 400 in 2013.³¹¹ In Tanzania, government loans and grants have helped more students take up the increasing numbers of private training places since 2010. Innovation in curricula, such as the community-based and field-based training programmes in Malawi,

expose students to locally relevant health and health-related managerial issues and prepare them to serve those most in need in their communities.³⁰³ These training programmes and the health science institutions that host them show their social accountability as described in the Global Consensus on Social Accountability for Medical Schools, by aligning their training programmes and curricula with pressing local health needs and anticipated health priorities.³¹²

However, up-to-date data are needed to enable comprehensive assessments of trends in training facilities and programmes for doctors, nurses, midwives, dentists, and other types of health workers in sub-Saharan Africa.

Insufficient numbers of qualified teachers, poor infrastructure, and inadequate coordination between African ministries of education and health were amongst the most significant deficiencies identified by the authors of the sub-Saharan medical school study.³⁰³ The authors made ten recommendations to promote and improve medical education and population health in sub-Saharan Africa including: launching campaigns to develop capacity of medical school faculties; increasing investment in medical education infrastructure; promoting inter-ministerial collaboration for medical education; and promoting community-oriented education based on principles of primary health care.³⁰³

Sub-Saharan African educational institutions should increase their capacity in the disciplines of medical and other health professional education to ensure effective approaches to health workforce development. Examples include the US-funded Medical Education Partnership Initiative and the Foundation for Advancement of International Medical Education and Research, both of which supported capacity development in this direction. The Nursing Education Partnership Initiative has formed partnerships with governments and key stakeholders to address the chronic underinvestment of pre-service nursing and midwifery education.³⁰³ But this is only the beginning and much more needs to be done.

There is great value in collaboration of African medical schools and other health professional schools within and across countries on issues such as educational standards, curriculum development, common exams, and capacity building. This collaboration approach enhances the quality of medical and health professional school outputs and increases the relevance of their work. For example, the Medical Education Partnership Initiative has supported the Medical Education for Equitable Services for All Ugandans consortium, which is helping training institutions address their challenges and needs in medical education by sharing resources, ideas, and innovations.^{313,314} In west Africa, several colleges—including of surgeons, physicians, nurses, and pharmacists—have successfully established a standardised curriculum for all these specialties. With help from the Royal College of Physicians, London (UK), an East African College of Physicians has been established.

Given the ongoing harmonisation of training curricula by sub-regional health organisations and assuming quality standards are harmonised across training institutes, the expansion of health professional schools is an encouraging sign in relation to the needs that sub-Saharan Africa faces and will face in the coming years. At the same time, there is also a need to establish or strengthen transparent regulatory processes and professional accreditation mechanisms, and to enforce them.

Innovation is key

Distance learning (both so-called e-learning and mobile learning) is one way to increase student intake and strengthen pre-service and in service education and training. In Ethiopia, for example, a mobile phone app has been developed for the official upgrade training programme for health extension workers. Findings from a systematic review³¹⁵ of studies, mostly from high-income countries, showed that students acquire knowledge and skills through e-learning as well as or better than they do through traditional teaching. The authors concluded that e-learning has an “under-exploited potential to support health workforce capacity building in different contexts, and can empower health workers to take charge directly of their own competency development”.³¹⁵ However, this will require a major investment in courses that are fully adapted to the realities of working in various African contexts. Furthermore, clinical skills acquired through interactions with patients cannot be completely substituted by distance learning.

Innovative approaches to education and training of health personnel with competencies that correspond to local needs and who are more likely to work in rural and underserved areas can be found across sub-Saharan Africa. Rural placement is increasingly part of the curricula for different cadres of health workers. For example, at Makerere Medical School in Uganda the medical, nursing, pharmacy, and dental curriculum revolves around innovative student-centred learning that includes a 2–3 month compulsory placement in rural communities. Furthermore, the Makerere Medical School Master of Public Health is based on the so-called School of Public Health Without Walls concept, whereby students learn as they work with district-level managers and practitioners to identify and solve health issues in real time.³¹⁶

Targeted admission policies to increase enrolment of students from rural areas, scholarship schemes aimed at disadvantaged rural students, and location of health professional schools outside the capital are among the approaches being used to address the urban and rural maldistribution.³⁰⁷

Engagement of less costly to train and employ clinical officers (also known as accelerated medically trained clinicians) has traditionally been a feature of health services in many countries on the continent (panel 6). It is vital that these cadres are valued in the health system,

and complement traditional health professionals.³¹⁹ A systematic review³²⁰ showed that with the right approaches, mid-level health workers provide effective care. The right approach is the same as for all health-care professionals and other health workers: formal guidelines for education and training, registration, licensing, practice regulated by a national authority, appropriate supervision, and continuing professional development. However, in much of sub-Saharan Africa these different components of the right approach do not exist at all or are not well implemented for these lower-level health or allied health workers.

CHWs might also improve access to and affordability of health services, although there has been little formal evaluation of this and results have been mixed. CHWs who provide basic primary care, modern contraceptives, and advice on healthy lifestyles, HIV testing and care, nutrition, water, sanitation, and hygiene—all of which are traditionally delivered by nurses, health visitors, or environmental health officers—have been part of various health programmes in sub-Saharan Africa for many years.³²¹ Examples include Mozambique’s *Agentes Polivalentes Elementares Programme* and Uganda’s

Panel 6: Examples by country of accelerated medically trained clinicians in sub-Saharan Africa

Zambia has been training Associate Clinicians (3–4 years post-secondary education) since 1936; Medical Licentiate Practitioners were introduced in 1989 (4-year BSc) to work in level 1 Referral District Hospitals, providing paediatric care, medical care, comprehensive emergency obstetric care, and selected general surgery.

In Ghana, Medical Assistants have been part of the health system since the 1960s, when professional nurses received an additional 18 months training and were deployed to work in rural health centres.

In Liberia, Physician Assistants, a profession since the 1960s, provide medical services except for surgery.

Malawi has Medical Assistants (2 years training, no surgery) and Clinical Officers (4 years training, including to perform caesarean sections and other surgical procedures).

Sierra Leone is planning to upgrade its Community Health Officers (formerly Medical Assistants) from 3 years training to a 4-year BSc degree, and specialised Community Health Officer cadres are being piloted, including for surgery, ophthalmology, and mental health.

South Africa introduced Clinical Associates as a new profession in 2008, with the first graduates in 2011. The curriculum is structured around the needs of district hospitals, and most students are recruited from rural areas and required to work in their communities for 3 years after graduation.

In Mozambique, surgically trained non-physician health workers have been performing major surgeries for over 20 years. Training of these health workers began in 1984, and by 2002 over half of all major obstetric operations in hospitals were performed by them. Non-physician health workers were also found to stay in rural areas longer than physicians.³¹⁷

In Rwanda, The University of Rwanda has trained clinical officers since 2011. The 4-year clinical officer training programme includes theory, practical laboratory training, clinical exposure, community attachments, and skills to manage health centres.

Data for this panel are from Transformative Education for Health Professionals Case Studies.³¹⁸

Village Health Teams. Ethiopia's Health Extension Programme was introduced to provide a package of quality health services at the community level.³²² This set of health interventions included basic and essential preventive and curative services to reach all households, with a particular focus on mothers and children. 35 000 health extension workers—women aged 18 years or older with at least grade 10 secondary education, and selected by the community in which they live—received 1 year of training and then were deployed to provide these services to households and to train voluntary CHWs to assist them. As part of the Health Extension Programme, Ethiopia also began training health officers on a mass scale in 2004 and there are now more than 5000 in service, mostly working in rural health centres.

A growing body of evidence confirms that CHWs can improve health and nutrition outcomes and provide an important link between communities and health and social services.³²³ However, the performance of interventions and programmes is greatly influenced by numerous contextual factors, an area that requires further study.³²⁴ It is important to distinguish between community members who volunteer for a few hours a week and full-time CHWs. All CHWs need adequate training, certification, and supervision; full-time CHWs should be remunerated, have opportunities for career advancement, and be formally recognised as part of the health system.³²³

In summary, every sub-Saharan country needs a health workforce strategy (based on national data) that will lead to the right quantity and quality of health workers, and the appropriate mix of different cadres of health workers, that are fit-for-purpose to work in rural and urban environments and can be retained within their boundaries or regions. This strategy involves a considerable amount of forecasting (eg, future population needs and economic growth). Countries need to develop capacities over time to be able to do this but initially need support from the international community. The planning and implementation of national health workforce strategies should involve ministries of education, health, finance, labour, and public service, local governments, the private sector, health professional associations, and civil society organisations. Finally, the place and importance of research should be elevated. Research is vital to inform what kind of health workforce a country should pursue; to develop innovative approaches to education, recruitment, and retention; to evaluate performance against set targets; and to determine whether both pre-service and in service education are producing health workers with the right competencies to meet people's health needs.

Section 9: research and higher education are key drivers of better health and sustainable development

Higher education is at the centre of nation building processes, and is also crucial for health workforce development and informing policy and action on health.

All health professionals should have opportunities for higher education and research as part of their career paths. Within Africa's so-called youth bulge are the next generation of health professionals, researchers, and entrepreneurs who will help solve some of the continent's greatest health and development challenges. Taking advantage of this opportunity will require increasing the number of secondary school graduates, increased investment in higher education and research, and more attention to quality. Sub-Saharan countries that fail in these areas face a high risk of not becoming competitive on a global scale.

There are some positive signs. A growing number of African-based institutions are advocating change, including African universities themselves, the African Union, the African Academy of Sciences, and the Planet Earth Institute—an Angola-based international NGO working for scientific independence for Africa. Fifteen universities from 8 countries have formed the African Research Universities Alliance, with the aim of strengthening research and postgraduate training in Africa. The first African Higher Education Summit on Revitalizing Higher Education for Africa's Future held in Dakar, Senegal in 2015 produced a detailed action plan to expand, transform, and increase investment in higher education and ensure African universities become engines of socio-economic growth and development.³²⁵ A key concern is the low number of qualified instructors and the potential effect on education quality.

Health research in Africa today

Research for health spans multiple disciplines including biomedicine, epidemiology, physical sciences, and social sciences. Research provides the evidence base for national policies that effect health directly (eg, clinical research and health systems research) or indirectly (eg, research on the effect of climate change on health, agriculture, and food policies). Because of the importance of context in promotion of health and delivering health services, local research is the main way to identify challenges, set priorities, devise solutions, and make the best use of limited resources. Local research is also needed to understand and address health priorities, service problems, and socio-cultural issues of vulnerable groups.^{323,326}

Although Africa is starting from a very low base, there are glimmers of hope that research will be one of the drivers of the region's progress towards better health and sustainable development, as envisaged in WHO Regional Office for Africa's 10-year research for health strategy³²⁷ and the African Union's 10-year Science, Technology and Innovation Strategy for Africa.³²⁸ A bibliometric analysis³²⁹ of PubMed articles from the WHO African Region published between 2000 and 2014 found the number of publications increased from 3623 in 2000 to 12 709 in 2014. This is a relative growth of 251% compared to 96% globally. However, Africa only accounts for 2.4% of the

world's output of scientific papers and most of this output is from South African universities.³³⁰

Part of the problem is Africa's critical shortage of researchers—there are about 80 researchers per 1 million people compared with a global average of 1081 researchers per 1 million people—and an absence of reasonably paid career paths. Another challenge is that a large percentage of researchers spend less than 2 years in African institutions.³³¹

Financial support for science in Africa varies widely, with countries contributing between 0·01% of GDP (Lesotho) and 0·89% of GDP (South Africa) per annum between 2007 and 2014.²⁵ Almost all political commitments to increase investments in research have yet to be honoured by most African governments.^{332–335} As a result, gross domestic spending on research and development as a percentage of GDP in sub-Saharan countries is among the lowest in the world. Some African countries are on par with Latin American countries (eg, 0·38% in Chile, 0·54% in Mexico, and 0·61% in Argentina), but all countries invest far less than Asian countries (eg, 4·29% in South Korea, 2·19% in Singapore, and 2·05% in China). The world average for gross domestic spending on research and development as a percentage of GDP is 2·12%.²⁵

Lessons can perhaps be learnt from southeast Asian countries' experience in increasing spending on research and development, especially given that they were low-income countries at the time African nations gained independence; for example, in 1965 South Korea's GDP per capita (US\$105 in 2016's value) was lower than that of Senegal (\$262).²⁵ Strong government leadership in expansion of all levels of education and building research capacity, particularly in the science, technology, engineering, and mathematics fields, has been prominent in South Korea since the end of World War II and in China since Deng Xiaoping's Open Door Policy from the late 1970s. Similarly, strong leadership adapted to African countries' realities is essential if African research institutes and universities are to become research engines contributing to national development. Effectively harnessing the energy and aspirations of Africa's youth has enormous potential to enable rapid acceleration in health research in Africa.

A major constraint on health research is that the power relations in terms of setting the research agenda are still very uneven. Most research in Africa is still conceived outside of Africa and published by non-Africans.³²⁹ This imbalance needs to shift. Leadership on Africa's health, scientific, and development challenges must come from Africans, in close collaboration with the global research community. The African diaspora could play a part in enabling such a power shift and reversing the so-called brain drain into brain circulation. For example, initiatives such as the Alumni Diaspora Programme by the University of Witwatersrand has shown the potential to capitalise some of the intellectual capacity lost to migration by

fostering international collaborations between medical and health sciences alumni with current faculties in sub-Saharan Africa to strengthen local research capacity.³³⁶

National research agendas with clearly formulated aims, national health research systems, and networks of regional research institutions and centres of excellence all deserve more support. Some countries are leading the way. For example, the National Health Research Committee of South Africa has, in consultation with stakeholders, developed a set of strategic priorities to be implemented by 2020.³³⁷ Ghana, Kenya, Rwanda, Senegal, and Tanzania, among others, have taken a similar approach to developing national health research agendas and defining research priorities. However, according to WHO Regional Office for Africa, 23 out of 47 African countries do not have a functional health research system, and 24 out of 47 African countries have no health research policy; even in countries with a research strategy, investments remain very low.

All African countries need a 10–20-year strategic plan for national health research, coupled with a financing strategy, and advocacy for creating and strengthening ministries or departments of research, science, and technology that are responsible for all areas of research. WHO Regional Office for Africa's research for health strategy 2016–25³²⁷ offers a template for countries to create an enabling environment for research, including governance (plans, priorities, legal frameworks, regulations, and ethics), building and sustaining research capacities (researchers and institutions), production of high-quality research, translation of research findings into policy and practice, financing, coordinating, and tracking investments. This template has broad support from members of this Commission.

The need for investment in health research and institutional strengthening

At an African Union summit in Algiers in 2008, African governments agreed to increase research and development funding to at least 1% of GDP and to “allocate at least 2% of national health expenditure and at least 5% of external aid for health projects and programmes for research and to research capacity building and to invest more in research aimed at improving health systems”.³³² Governments need to set targets for progressive increases in research and development investment and also to create national research funds (eg, South Africa and, more recently, Kenya). Data from South Africa show that increased funding and funding mechanisms can lead to a rapid rise in research output—gross expenditures on research and development rose from around US\$2 billion in 2001 to \$4·3 billion in 2008, and the number of publications doubled from around 4500 to 9000.³³⁰

In relation to strengthening research capacity, institutional arrangements should be in place to bring together a critical mass of skilled individuals working together across disciplines. There are two main models for research capacity strengthening: part of a university and

specific research institutions. Specific research institutions should be closely linked with higher education, as this supports excellence in teaching and will attract young people into research. Individuals chosen to lead these research centres should be selected on the basis of their merit and competencies (ie, not political appointments), and be accountable to a board of directors.

Provision of better research opportunities and improving the supporting culture will encourage more of the best African researchers to stay in their respective countries. At present, many researchers find institutions in Europe and North America more attractive places to work. Joint PhD programmes are beneficial, in which students spend most of the time in an African university, with a stay in a non-African university. Expansion of post-doctoral programmes on the African continent is key to raising the quality of higher education and developing early stage researchers, so that they have the opportunity to grow into scientific leaders able to identify and advance local research agendas. Paid post-doctoral positions are necessary stepping stones for researchers' career progression from PhD students to scientists who win international competitive grants, are principal investigators, and who do world-class health research in Africa, for Africa.

Going forward, it will be important to develop expertise in knowledge translation to strengthen links between researchers and policy makers and increase the uptake of research results into policy and action.^{338–341}

Although international agencies are increasingly investing in research in Africa, they rarely provide core funding to strengthen institutions involved in such research. In addition, caps on overheads by some western research funders for African research institutions limit institutional development. It is now imperative that external funders support strengthening of higher education capacity in sub-Saharan Africa as part of their development agenda. Some encouraging progress is happening on this front. For example, the World Bank's Africa Higher Education Centers of Excellence Project³⁴² has been supporting universities in western, eastern and southern Africa. The US PEPFAR and the National Institutes of Health's Medical Education Partnership Initiative is strengthening research capacity in African medical schools by twinning them with American universities. The European & Developing Countries Clinical Trials Partnership supports phase 2 and 3 clinical trials of new or improved vaccines, treatments, and diagnostics for HIV/AIDS, tuberculosis, malaria and other prevalent infectious diseases in sub-Saharan Africa. The UK's Wellcome Trust supports individuals as part of its long-standing programmes on medical research capacity building. The Developing Excellence in Leadership, Training and Science initiative, funded by the Wellcome Trust and the UK's Department for International Development and managed by the African Academy of Sciences Alliance for Accelerating Excellence in Science in Africa, aims to establish world class research

environments at African universities while focusing on creation of training opportunities for the next generation of African research leaders.³⁴³

Research collaborations and networks

Africa's research transformation will only happen through investment, collaboration, and partnerships. In 2012, 79% of research in east Africa, 70% of research in southern Africa outside South Africa, and 45% of research in west and central Africa and South Africa was produced through international collaborations.³³⁰ It is striking that collaboration by African-based institutions on African health issues is overwhelmingly with non-African institutions, rather than with other African countries. Some exceptions include the Africa-led research networks on tuberculous pericarditis and rheumatic heart disease, which have linked multiple African and other global institutions to combat poverty-related heart diseases.^{344,345}

National science and medical academies around the world, especially in high-income countries, are contributing to advancement of health in an unbiased manner and could play a similar part in Africa in the coming decades. Already there are 23 African science academies, which are united through the Network of African Science Academies. This, and other African research networks, should be nurtured and supported, including, where appropriate, by fostering collaboration across industry, academia, national medical regulatory agencies, laboratories, and hospitals.

Research partnerships between African and non-African universities are rich opportunities for mutual gains and bringing together complementary resources. One of the greatest merits of research partnerships is that they motivate young African researchers to remain in their countries. However, at present many international research collaborations outside South Africa are characterised by a power imbalance due to the African partner's limited institutional capacity and very unequal resources.³²⁹

International partnerships should be reshaped around two principles: mutual agenda setting and benefit, and equality in decision making between partners (panel 7). Overseas partners could do more to foster accountability and to promote leading roles for African institutions in such collaborations; African partners need a greater sense of ownership and the ability to initiate action. Improvement of country capacity should be a primary purpose of any research partnership or collaboration.

Although inter-Africa collaborations (without South Africa) around higher education and research are getting stronger, they account for less than 3% of Africa's total research output and depend largely on personal relationships. More formal institutional arrangements and agreements are necessary. The WHO Regional Office for Africa, the African Union, and the four sub-regional political entities all have parts to play in fostering long-term, sustainable collaborations, including strengthening

regional networks of centres of excellence, coordination of research within Africa, actively building research to policy and practice links, and funding research.³²⁷

In conclusion, higher education and research are critical for planning, monitoring, and evaluating a country's health system, and moving forward the quality and quantity of health services, hence, are central to addressing inequities. Research gives important evidence that should be used to inform health services, policies, and practice as one approach to improvement of health outcomes. Both African governments and international donors should increase their support for higher education institution building as part of a long-term development and anti-poverty agenda.

Section 10: embracing innovation

Innovative tools and approaches can greatly reduce the managerial, geographical, and financial barriers standing in the way of improving health in sub-Saharan Africa.³⁴⁶ Innovation is essential to all of our 12 strategic options covered in this Commission and to achievement of the health-related SDGs, especially as it is highly unlikely that sufficient health professionals can be trained for many decades. It is reasonable to hope for leapfrogging in health, and for sub-Saharan Africa to industrialise new approaches ahead of the rest of the world.

Innovations in health should cover development of new services (prevention and treatment), new ways of working, and new technologies to achieve improved health, reduced illness, improved value for services (efficiency and cost-effectiveness), and improved coverage and quality.

Despite the potential of technological innovation to transform health outcomes, it also poses a number of challenges. First, the uncontrolled proliferation in the use of technologies such as information and communication technology, e-health, and m-health to improve health service delivery makes it difficult to assess usefulness and effectiveness.^{346,347} There are some 40 000 mobile health apps, hundreds of platforms aimed at improving health-care communications and coordination, and new types of medical sensors or wearable devices making headlines every week.³⁴⁷ Second, there are substantial barriers to the adoption of such technologies, including a dearth of evidence of their effect on cost and outcomes, and insufficient collaboration between health providers and technologists in product development.³⁴⁷ Third, there is an absence of standardisation, regulation, and coordination in the use of innovation within health systems.

The following are examples of innovations that might be particularly useful for African countries.

Improved access

- Extension of geographical and population access to services and prevention programmes through the use of non-traditional outlets, such as private chemists in Ghana screening for hypertension (panel 8), and through mobile phones, the radio, and telemedicine.

Panel 7: Factors for a successful research collaboration

- Good leadership and effective communication
- Shared passion, and commitment by all
- A foundation on the principle of mutual reciprocal benefit, creating a win-win situation for all
- Understanding of the economic, social, cultural, and political realities of the host environment
- Long-term partnerships
- Mutual respect and accountability
- Adequate resources matching the task
- Sensitivity and responsiveness to local needs
- Equitable distribution of risks and benefits

- Providing patients and communities with easier access to information about their health, their rights, and the health system, including through social marketing and social media.
- Introduction of health insurance cards, particularly for poor people, to increase effective coverage and raise awareness about the benefits and entitlements of health insurance.

Improved tools

- More effective preventive technologies, such as new and more stable vaccines, simpler immunisation devices, and more effective cold chains and circumcision devices.
- Improvements to diagnosis at various levels of the health system through the use of rapid and simple point-of-care tests (eg, for malaria and HIV viral load) and portable devices for reading and interpreting diagnostic microscopy.³⁴⁹
- Smart phones equipped with special devices (eg, PEEK Retina [Peek Vision, London, UK] for eye examination, and Cardio-Pad [Himore Medical Equipment, Yaoundé, Cameroon] for cardiac monitoring,³⁵⁰ miniaturised ultrasound, and other imaging devices).
- Wearables and applications to promote healthy living and behaviour (eg, solar-powered digital hearing aid units [Solar Ear, São Paulo, Brazil]³⁵¹).

Better quality of services

- Improving decision making, resource allocation, and monitoring and evaluation of health services through web-based health information and data management systems, particularly at facility and district level.³⁵²
- Improving efficiency of distribution of essential medicines and family planning commodities in lower-level health facilities (eg, Kenya's Mobile Inventory Management System).
- Strengthening patient adherence to antiretroviral therapy and treatment for diabetes and other chronic conditions through patient clubs and mobile texting.
- Mitigation of fraud and abuse by verifying medical products (eg, anti-counterfeiting technology, panel 5) and patient identity.

Addressing health workforce constraints

- Task shifting and task sharing to increase coverage of essential health services, part of an increasing number of national health plans in sub-Saharan Africa including Ethiopia, Ghana, Malawi, Mozambique, Rwanda, and South Africa (eg, nurses instead of only physicians for cervical cancer screening; nurses and midwives instead of only specialist physicians for basic emergency obstetric and neonatal care; and CHWs instead of only nurses and midwives for HIV counselling and rapid diagnostic testing).
- Training and education of health professionals and continuing professional education through online courses and interactive training programmes (eg, e-learning and Massive Open Online Courses).
- Supervision and support to staff through the use of tablets at health centres (eg, pilot projects in Ghana and Tanzania), telemedicine networks to reduce isolation of health-care professionals in remote areas (eg, Réseau en Afrique Francophone pour la Télémédecine network³⁵²), and mobile phones for CHWs.

Panel 8: Innovative integration of private and public services—use of community health nurses and private drug outlets to control hypertension in Ghana

The Community Hypertension Improvement Project combines various innovative ideas to address key challenges in the delivery of health care in Ghana, such as universal access, affordability, and quality of care.³⁴⁸ This project comprises a set of complex interventions that use process, product, marketing, and organisational innovation to improve self-management and control of hypertension in a district in Ghana. The project uses a quasi-experimental design, a cohort analysis, and a cost-effective analysis to generate evidence of effectiveness of the intervention and innovations.

The project uses technological innovation to improve communication, patient education, clinical management, adherence to therapy, and health information management (Lamptey P, unpublished).

The Community Hypertension Improvement Project also uses organisational innovation such as task shifting of hypertension screening to community health workers and private drug outlets (licensed chemical sellers); task shifting to community-based nurses to manage non-complicated hypertension; and dispensing of blood pressure medication to private drug outlets. The project has established a direct referral linkage for management between private drug outlets and the public health system, and minimises out-of-pocket costs to the patient by ensuring the provision of health coverage by the National Health Insurance Scheme.

The duration of the Community Hypertension Improvement Project is from 2014 to 2017. It is expected that this project will: reduce the burden of hypertension and other cardiovascular disease risk factors; improve value for services (efficiency, cost-effectiveness) and provide a viable platform for chronic conditions in Ghana; improve coverage of underserved communities; and be affordable and sustainable. The project will also generate a model for self-management, improve data management, and reduce out-of-pocket costs to patients.

The outcomes of the Community Hypertension Improvement Project can help inform the design and implementation of community-based interventions to control hypertension and reduce the burden of cardiovascular diseases in sub-Saharan African, and other low-income and middle-income countries.

Invention is hard but adoption might be even harder, as it requires investment. Public and professional perceptions and trust are key for adoption. For example, health professionals might feel threatened by new delivery modes or could feel disempowered by some innovative approaches that bypass classic medical expertise. Therefore, it is as much about delivery of innovation as innovation of delivery.

Section 11: securing the future—an agenda for action

Sub-Saharan countries have unprecedented opportunities to substantially improve health outcomes within a generation, largely with their own resources. The path to longer and healthier lives for all Africans by 2030 that is set out in this Commission requires strong leadership, adjusted strategies, increased and strategic investment, and more research and innovation at all levels of the health system. New ways to address challenges that are rooted in human rights, guided by scientific evidence, and span health and several non-health sectors are needed. A comprehensive approach and system-wide changes are required—a fragmented health agenda will deliver some results but will not succeed in strengthening health service delivery and public health systems, and will not address the determinants of health. Broad partnerships beyond the medical and health community are essential to move the health agenda forward. Without a serious shift in mindsets across all levels of society, all sectors of government, and all institutions, it will be difficult to have meaningful and sustainable change. Africa's young people will be key to bringing about the transformative changes needed to rapidly accelerate efforts to improve health and health equity.

We summarise the actions in sections 3–10 into the following key messages and recommendations.

A framework shift is needed to deliver better health outcomes through people-centred health systems and UHC

Frameworks that rely on hospitals and individual care are unlikely to lead to the achievement of greatly improved health for all Africans. A rapid expansion of new, African-bred approaches to people-centred health systems focused on prevention, primary care, and public health supported by clinical referral systems and quality tertiary care is required to move to the next stage of better health. UHC should be designed with local values, sustainability, and equity in mind from the onset. Recommended actions include:

- 1 Involvement of communities and civil society in the design and implementation of people-centred health systems, and paying as much attention to keeping people healthy as to treating them when they are sick.
- 2 Use of health outcomes to guide policies, management, and funding, and inclusion of health outcomes in the evaluation frameworks of policies, services, and providers.

- 3 Ring fencing of funding for public health as part of UHC, reinvigoration of public health training, and strengthening of laboratory infrastructure and information systems.
- 4 Acceleration of training of all cadres of health professionals with competencies that correspond to the needs of people, pursuit of alternative modes of delivering health services, and better support for the existing health workforce, especially in rural and underserved areas.
- 5 Taking an integrative approach towards commodity security, starting with revision of legislation in a way that allows rapid efficiency gains in commodity procurement while working on medium- and long-term measures, such as strengthening regulatory capacity and development of domestic manufacturing capability.

Historic, not to be missed opportunities exist to improve health within the next decade

Given the African region's economic growth and societal changes, and building on the momentum from the beginning of the SDG era, most sub-Saharan countries have an opportunity to bring some traditional health challenges under control and to prevent others from taking hold and having the same devastating impact seen in other regions of the world. Some landmark achievements are within reach. Recommended actions include:

- 1 Elimination of polio and guinea worm.
- 2 Finishing the work of achievement of the health-related MDGs, an opportunity to make great strides in reduction of preventable morbidity and mortality.
- 3 Fully meeting demand for family planning and modern contraceptives, an opportunity to slow population growth.
- 4 Full implementation of the Framework Convention on Tobacco Control, a one-off chance to prevent an epidemic of tobacco-related diseases in Africa.
- 5 Completion of the unfinished agendas for control of HIV, malaria, tuberculosis, and diarrhoeal and respiratory diseases.
- 6 Prevention of an escalation in the burden of cardiovascular diseases, cancers, chronic respiratory diseases, diabetes, and mental disorders through a combination of public health and medical interventions, legislation, policy changes, and public education.

Achieving good health for all citizens should be a political priority for every sub-Saharan African country

In addition to a better life for people, investing more in health will contribute to economic growth and sustainable development. Good health for all citizens is a central responsibility of the state and its elected bodies, requiring considerable investment of public funds, a legislative framework, and a whole-of-society response. In 21st century Africa there is no place for extreme poverty, huge health inequities, female genital mutilation,

child marriage, criminalisation of homosexuality, and other human rights abuses. Accountability requires mechanisms to hold duty-bearers to account, and people need to have the capacity to demand their rights.

Recommended actions include:

- 1 Making health a basic right of citizens and improved health outcomes a specific objective of programmes related to poverty alleviation, nutrition, water supply, sanitation, transport, urban planning, climate change, fiscal policies, and the environment.
- 2 Strengthening legal frameworks to enable equitable access to quality health services (including health promotion and disease prevention), and supporting civil society organisations as health advocates and implementers.
- 3 Strengthening management and technical capacity of the Ministry of Health with accountability frameworks for departments and individuals.
- 4 Harnessing private sector resources and capabilities in a manner that contributes substantially to equitable and sustainable health systems, and better health outcomes.

Each country needs to chart its own path to improve health outcomes

Each country needs home-bred solutions to build the required systems based on its own culture, while making maximal use of regional and international experiences and evidence, strengthened stewardship of health, and commitment to accountability. All domestic and external resources for health should be aligned to a country's national health strategy, with actions evaluated by specific health outcomes. Recommended actions include:

- 1 Development and implementation of a national, multisector strategy to achieve better health outcomes, informed by detailed country-specific financial needs assessment.
- 2 Reviewing existing delivery services, policies, and training to strengthen the path to people-centred health systems.
- 3 Investment in information and communication technologies to provide up-to-date, accurate, and disaggregated data required to inform national and local health policy and planning, and day-to-day management.
- 4 Reshaping the relationship with international funders around national priorities and making medium-term and long-term plans to gradually reduce dependency on external sources, with increased access to domestic resources, global finance and economy to achieve grand convergence in health
- 5 Dedication of resources to strengthen capacity in leadership and governance in health sector institutions, and supporting empirical research to understand contextual issues such as accountability and corruption.

- 6 Preservation of health services and essential prevention programmes such as vaccination should be a top priority for those in political and military control in countries in conflict or in fragile situations, and for humanitarian and other international actors.

All governments can and should invest more in health and do more to address inefficiencies

As the role of domestic financing for health is set to become increasingly prominent, governments need to focus on identifying new funding sources, but should focus equally on maintenance of steady progress over time towards increasing the share of pre-paid contributions in total health expenditure and towards prioritisation of health in domestic budgets. Improvement of access and outcomes for poor people should remain a priority and requires more effort in identifying (eg, improvement of the performance of targeting mechanisms) and reaching these groups (eg, engagement and partnering with service providers beyond the public sector). Improvement of public financial management is the foundation of better health spending and should be complemented by a systemic approach to implementation of reforms towards reduction of fragmentation across health system functions, public sector portfolios, and stakeholders' efforts. Recommended actions include:

- 1 Sustaining and increasing government health expenditure, using international targets (eg 5% GDP, 15% of government expenditure, and US\$86 per capita) as an indication of spending requirements (exact spending levels need to be determined on a country-by-country basis), including the use of dedicated taxes with proven health benefits and revenue generation effects (eg, tobacco tax).
- 2 Expansion of publicly pooled pre-paid financing arrangements, ensuring that efficient pooling and coverage for the poor and disadvantaged are present from the outset.
- 3 Substantial improvement of both health spending performance and health sector efficiencies, including through strategic purchasing practices and service integration wherever possible.
- 4 With an increasing number of countries graduating to middle-income status, any eligibility policies to external financing should be informed by health needs relative to a country's income and capacity, so as to mitigate any risk of losing health gains when external finance decreases.
- 5 Strengthening accountability mechanisms and use of an explicit legal and operational framework to improve processes that minimise corruption.

Closing health equity gaps should be a core concern for policy and action

All efforts to improve health should explicitly address the crying inequities within countries. Health inequities are greatest among the very poor, people in slums and rural areas, those who are marginalised, and those who

live in humanitarian settings and conflict zones. Recommended actions include:

- 1 Measurement of the success of health policies and programmes in terms of how much they improve health outcomes in geographical areas and population groups with the worst health outcomes.
- 2 Protection of all citizens from catastrophic health expenditures, and explicitly accounting for the equity implications of UHC and any new mechanisms to increase domestic health financing before their implementation.
- 3 Donors and agencies should provide specific support to states in fragile situations to protect population health, targeting the most vulnerable communities, and ensuring that humanitarian action includes a proactive health component.

Investments in higher education and research are essential for better health and sustainable development

Higher education is crucial for development of an adequate and skilled health workforce and increasing health research capacity and should receive a higher priority in national and regional agendas. Because of the importance of context in improving health and delivering health services, local research is necessary to identify challenges, set priorities, devise original solutions, and make the best use of limited resources. Recommended actions include:

- 1 Development of a 10–20-year national health research strategy coupled with a financing strategy that includes allocation of 2% of national health expenditure to research and research capacity building, leveraging emerging industry expenditure on research and development, and more investment in research aimed at improving health systems.
- 2 Support of medical, nursing, and allied health sciences schools through adequate public financing and ensuring public and private schools meet international standards for education and research.
- 3 Investment in internationally-competitive centres of scientific excellence, including by selection of leaders based on their competencies, and expansion of post-doctoral programmes to raise the quality of higher education and research.
- 4 Expansion of research and education collaborations, particularly within Africa, and reshaping international research partnerships around mutual agenda setting and benefit.
- 5 Urging academic institutions in sub-Saharan countries to invest in the development of contextually relevant health sector governance and leadership programmes and coherent and integrated national, sub-regional, and regional strategies.

Generation and use of innovation will accelerate better health outcomes and reduce inequities

Capitalising on innovation is key to the future of health in sub-Saharan Africa and can support leapfrogging health

improvements. Huge scope exists for innovative and low-cost new vaccines, diagnostics, therapies, and information technology applications for prevention and care. Innovations in health professional education, health service delivery, and governance are also urgently needed, particularly those using information and communications technology. Recommended actions include:

- 1 Use of innovation to leapfrog approaches ahead of the rest of the world, ensuring technological innovations work with existing infrastructure constraints (eg, irregular power supply); and encouragement of the weaving of big and small technological innovations, e-health, and mobile health into the fabric of service delivery and into health workforce education and training.
- 2 Fostering innovative approaches to address health workforce shortages.
- 3 Enforcement of standards in the private health sector to inspire innovation and tap innovative approaches in the broader corporate sector, such as innovative financing, data driven performance management techniques, and information and communication technology applications to create greater efficiencies in health system performance.
- 4 Use of innovative technologies to engage communities and civil society in efforts to improve health outcomes, and deepen capacity for accountability and responsiveness of government agencies and institutions.

Stronger regional cooperation will add value to national health efforts

Pooling resources among sub-Saharan countries and collaboration on issues related to commodity security, surveillance, emergency response, governance, the health workforce, and research and development would benefit population health and the quality of care in African countries and the African region as a whole, and would facilitate more proactive sharing of data, innovations, and technical expertise. Recommended actions include:

- 1 Supporting reform of WHO Regional Office for Africa.
- 2 Pursuit of efficient regional approaches to the supply and regulation of medicines, vaccines, and other health commodities.
- 3 Harmonisation of standards for health professional education and training and adoption of common certification requirements for different cadres of health professionals.
- 4 Catalysing research collaborations between African countries and support of African-relevant research through national and regional funding partnerships.
- 5 Support of the development of the Africa Centres for Disease Control and Prevention.

Conclusion

Sub-Saharan countries face difficult development agendas in the decades to come, but also immense opportunities to be acted upon today. A key message of

this Commission is that the opportunities ahead cannot be unlocked with more of the same approaches or by keeping to the current pace. Therefore, we advocate an approach based on people-centred health systems and inspired by progress that can be adapted in line with each country's specific needs. Moreover, we believe firmly that better health will not only benefit countries' populations directly, it will also act as a catalyst enabling the successful pursuit of other development agendas. Through sustained commitment towards good governance and health investment, cross-sectoral action, and leadership geared towards innovation, closing the health gap in a generation is well within reach.

Contributors

All authors contributed to this Commission, which was constructed in various meetings. All authors contributed to the ideas, structure, and recommendations, wrote parts of the report, and commented on drafts. The writing team included IAA, PL, BM, NS, PP, AG, HL-Q, MO, EN, JE, and JM. AG did the financial analysis. All authors approved the final version of the Commission.

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