

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 countries face a double burden of traditional, persisting health challenges such as infectious diseases, malnutrition, and child and maternal mortality, as well as emerging challenges from a rising prevalence of chronic conditions, mental health disorders, injuries, and health problems related to climate change and environmental degradation. Though there has been real progress on many health indicators, life expectancy and most population health indicators remain behind most low- and middle-income countries in other parts of the world.

Our Commission was prompted by the region's potential to improve health on its own terms, and largely with its own resources. The spirit of this report is one of evidence-based optimism, with a caution. We recognise that major health inequities exist and that health outcomes are worst in fragile countries, in rural areas, urban slums, and conflict zones, and among the poor, disabled, and marginalised. In addition sub-Saharan Africa is facing the challenges and opportunities of the largest cohort of young people in history, with the youth population under 25 nearly 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. Continuing 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. This is why we are advocating an approach based on people-centred health systems and inspired by recent 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 all other development agendas summarised in the Sustainable Development Goals.

Leadership on Africa's health, scientific, and development challenges must come from Africans in close collaboration with the global community, including non-traditional development partners. In addition to aligning with the host country's priorities, harmonising the different global and domestic health mechanisms is key to reduce transaction costs of service delivery and reporting.

A comprehensive approach and system-wide changes are required. A fragmented health agenda will deliver some results but it will not succeed in strengthening health service delivery and public health systems, and it 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 across sub-Saharan Africa.

We highlight 12 strategic options that all sub-Saharan countries should consider in their policies and plans. They are connected to the health-related Sustainable Development Goals (SDGs) and integrate commitments made by regional African bodies. They are as much about promoting health and preventing disease as they are about expanding 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, the social determinants of health, and health outcomes
- leadership, stewardship, civil society engagement, and accountability at all levels
- financing for health
- commodity security (i.e. medicines, technologies, essential equipment, tools, supplies, etc)
- 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 the report. 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 report concludes with an agenda for action based on the following key messages.

A paradigm shift is needed to deliver better health outcomes through people-centred health systems and universal health coverage.

Current paradigms rely on hospitals and individual care and 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. Universal health coverage 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 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. Examples include eliminating polio and guinea worm, meeting demand for modern contraceptives, reducing maternal mortality and water borne diseases, greatly reducing the mortality and incidence of HIV infection, making significant progress on sanitation, and preventing an epidemic of tobacco-related diseases, among others.

Achieving good health for all citizens should be a political and investment priority for every sub-Saharan 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. 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, building 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 pre-paid 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 GDP, 15% of government expenditure, and US\$ 86 per capita. Improving access and outcomes for the poor must remain a priority and requires more effort in identifying and reaching these groups. Improving public financial management is the foundation of better health spending and must be complemented with taking a systemic approach to implementing 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.

The poor in Africa still have disproportionately less access to health services and are more exposed to impoverishing expenditure compared to the non-poor. All efforts to improve health must explicitly address the crying inequities within countries. Health inequities are greatest among the very poor, rural populations, those who are marginalised or excluded from society, and those who live in humanitarian settings and conflict zones. A key priority is reducing 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 the countries such payments make up more than 40% of total health expenditure, and in only five countries (Botswana, Mozambique, Namibia, Seychelles, and South Africa) they represent less than 10%. Further progress is needed in removing user fees and ensuring the poor benefit the most from health insurance schemes.

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

Higher education is vital for developing 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.

Generating and using 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. There is huge scope for innovative, low-cost vaccines, diagnostics, therapies, and IT applications for prevention and care. Also urgently needed are innovations in health professional education, health service delivery, and governance, particularly those using information and communication technologies.

Stronger regional cooperation will add value to national health efforts.

Pooling resources among sub-Saharan countries and collaborating 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 countries and the 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.

A SOBERING LEGACY, A PROMISING FUTURE

Sub-Saharan Africa (SSA) 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 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 50 years since independence for most nations, and a turbulent recent history in several countries.

The early twentieth century, a time of ecological and economic disruption due to European colonisation,¹ saw epidemics of trypanosomiasis (from which one-third of the population around Lake Victoria died between 1901 and 1905),² and the 1918-19 H1N1 pandemic which caused 2 million deaths across SSA.³ Malaria exerted a heavy toll; even in Nairobi at 1800m, over 14 000 cases were recorded in 1913.⁴ Tuberculosis was unknown in areas like Tanzania until colonisation,⁵ and miners were disproportionately affected. There were significant outbreaks of syphilis across SSA, gonorrhoea in the Central African region,¹ and meningococcal meningitis in the Sahel and sub-Sahel; a 1921 meningitis epidemic in Nigeria caused 45 000 deaths in Sokoto Province (population 1.36 million) alone.⁶ SSA had a high incidence of smallpox relative to other regions; even by 1962, the estimated incidence rate in Republic of Congo was 144/100 000, compared to India's 10/100 000.⁷

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 a variety of 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 SSA 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 five centuries of European colonisation relates to official working languages, health worker education, and nurses' uniforms. This historic impact is also reflected in the organisation of the health system. Francophone countries inherited a mixed system of heavily centralised disease control programmes ("la lutte contre les grandes endémies" often managed by military physicians in colonial times) and primary care services, whereas anglophone countries traditionally embraced more a decentralised health system with multiple layers. Christian missions and non-government organisations (NGOs) have been playing a major role in former Belgian and Portuguese colonies. In general, public health systems aimed to ensure a workforce for whatever the agricultural, mining, or industrial needs were of the coloniser.

Human resources for health were woefully inadequate at independence in almost every sub-Saharan country, but Belgian and Portuguese colonies were the least prepared for managing their health systems. This is partly because colonial governments focused on training low level cadres of health workers like nursing aides and auxiliaries or clinical assistants. It was only much later in the 1930s to 1950s when higher level training (e.g. medical education for doctors) was established, and trainees had to be registered in Europe. By 1960 only six medical schools existed in SSA outside of 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 countries still have a major shortage of

health-care workers, the 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 have not enough positions in the public sector, while they have enough qualified medical staff, others have vacant positions and yet cannot absorb them. Health services have also expanded significantly since independence to reach rural areas although quality and equity remain huge issues. The legacy of apartheid in South Africa with continuing inequalities 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 the World Health Organization (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 reflecting history. Such continuing European influence is probably most extreme in a number of francophone countries: they 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 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 impact on health and health systems. For example, health systems in several sub-Saharan countries have yet to recover from the impact of the structural adjustments and other economic reforms imposed by the International Monetary Fund (IMF), the World Bank, and other international agencies in the wake of the economic downturn in the 1970s. Many countries have a health system under the Ministry of Health and other parallel health systems managed by funders and NGOs.

Another significant 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, while genocides such as in Rwanda and Darfur are extreme examples, large parts of the continent 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. The 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.

SSA's health challenges are numerous, wide ranging, and well documented. Though nowhere near the scale of other infectious diseases such as HIV, tuberculosis, malaria, respiratory infections, and diarrhoeal diseases, the Ebola epidemic in 2014–2015 was a stark reminder that the public health infrastructure in many countries is not fit for purpose. Climate change will likely affect Africa very profoundly. Less widely reported are achievements and the possibilities to greatly improve health outcomes within a generation. Failure to date is more likely to be inadequate and poor implementation of the most important current ideas, inadequate health workforce, and lack of investment in health systems rather than a paucity of novel ideas. Importantly, the solutions to many of SSA'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 region's potential to improve health on its own terms, and largely with its own resources. The spirit of this report is one of evidence-based optimism, with a caution. We recognise that major health inequities exist and that health outcomes are worst in fragile countries, in rural areas, urban slums, and conflict zones, and among the poor, disabled, and marginalised. The future of health in Africa is bright, but only if no one is left behind.

Our report could not come at a more opportune time. It is the dawn of the United Nation's "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 SSA. Our report builds on numerous recent publications, including several African declarations and reports (panel 1 and table 3), and some Lancet Commissions.¹⁰⁻¹⁵

The 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/reports and scientific publications were reviewed. Additional analyses were conducted 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 (section 5). A core writing group assembled the information and drafted the report, which was then circulated to Commissioners for comments and revised accordingly.

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

SECTION 1. HEALTH IN SUB-SAHARAN AFRICA: CURRENT SITUATION AND PROJECTIONS TO 2030

Life expectancy, mortality, and outcomes

Life expectancy in SSA, though 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 started to become more widely available, whereas Ethiopia has had three 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 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.

Figure 1: Life expectancy at birth, selected sub-Saharan countries and regions, 1980–2014

Progress aside, the need remains great. Table 1 shows key health-related data for all 49 sub-Saharan countries, and some significant differences between countries. For example, in 2015 the estimated

antiretroviral therapy (ART) coverage among adults living 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.

Table 1: Key health indicators, 49 sub-Saharan countries (latest year available)

Most African countries now face a double burden of 1) traditional persisting health challenges such as infectious diseases, malnutrition, and child and maternal mortality; and 2) 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 SSA both fell by 49% between 1990 and 2013.¹⁶ Projections by the Institute for Health Metrics and Evaluation for this Commission to 2030 suggest that the rates of the projected decline will vary across and within the four sub-Saharan regions (figures 2 and 3). Sharper declines in child mortality from 2013 are projected for Central Africa and Southern Africa than the other two sub-regions while the projection for Southern Africa is expected to almost meet the SDG target of 25 per 1000 live births. The maternal mortality ratios are projected to decline in all sub-regions except Southern Africa where the projection plateaued at the lowest level of 200 per 100 000 live births among the four sub-regions. Although the maternal mortality ratios Central Africa are projected to fall as well, they remain at very high levels of around 400 per 100 000 live births.

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

Figure 3: Maternal mortality ratios (per 100 000 live births) in four sub-Saharan regions, 1990–2015, with projection to 2030

The biggest challenge for Africa in terms of child mortality is neonatal mortality, which has distinct causes and needs specific programmatic solutions, as well as stillbirths. During the Millennium Development Goal (MDG) era the number of neonatal deaths in Africa actually increased due to slow progress in reducing 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.¹⁷

These projected trajectories suggest efforts above and beyond the levels seen in the MDG era will be required by many sub-Saharan countries in order to meet the SDG targets to reduce the maternal mortality ratio to less than 70 per 100 000 live births and to end preventable deaths of newborns and under-5 children by 2030. The 24 fragile states in SSA (classified as on “alert” or worse in the Fragile States Index 2015) are least likely to achieve these targets: by 2030, according to the World Bank, 11 will not have met the less ambitious MDG 4 target for child mortality and only 5 will have met the MDG 5 target for maternal mortality.¹⁸

Although there have been substantial reductions in low birth weight, 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.¹⁹ Half of the children aged under 5 years in SSA are iron deficient and one-quarter are deficient in vitamin A.²⁰ The prevalence of low birth weight ranges from 7% to 35%, and emaciation or wasting due to acute undernutrition ranges from 1% to 23%.²¹ Stunting in under-5 children due to chronic undernutrition, which has a long-term impact on personal and cognitive

development, ranges from 8% in the Seychelles to 58% in Burundi; underweight in under 5 children ranges from 4% in the Seychelles to 39% in Eritrea (table 1).

Infectious diseases

Infectious diseases remain the leading causes of morbidity and mortality in SSA with HIV/AIDS, lower respiratory infections, malaria, diarrhoeal diseases, and tuberculosis ranking 1–4 and 6 in age-standardised 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.²² Vaccines are also responsible for dramatic falls in measles, mumps, and rubella. New vaccines being introduced on the continent include a pentavalent vaccine, meningococcal and pneumococcal conjugate vaccines, and rotavirus vaccines, and a malaria vaccine is being introduced in piloted 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 recent epidemic of yellow fever in Angola and the DR Congo.

Figure 4: Leading causes of age-standardised disability-adjusted life years (DALYs) in sub-Saharan Africa, 1990 and 2015

Great strides have been made in controlling malaria and HIV/AIDS. Malaria mortality in the WHO African Region was reduced by 48% from 2000–2015; among the under-5 age group mortality fell by 58% over the same period.²³ Malaria elimination is now becoming a realistic goal in several African countries, though not yet in those in malaria's heartland where outbreaks, such as recently in Rwanda, continue to emerge, illustrating that disease control and clinical strategies must adapt on the road to elimination. AIDS-related deaths in SSA decreased by 36% between 2000 and 2015 to 800 000 and the number of new HIV infections decreased by 43% to 1.4 million.²⁴ However, this still represents over 65% of all new HIV infections globally,²⁵ and since 2005 the decrease has been negligible (an annualised rate of change in incidence of -0.03 from 2005 to 2015) with most of the decline due to preventing 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. Rising prices of treatments for co-morbidities and opportunistic infections, such as ultra-resistant TB in South Africa, are also a concern. Ending HIV will require a vaccine.¹²

While 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 for example with malaria in the 1960s, and with HIV in several communities on the continent.^{26,27} 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 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

SSA is facing a growing burden from chronic disease with ischemic 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).²⁸ SSA has among the highest incidence rates of cervical and liver cancer as a result of high rates of human papillomavirus and hepatitis B infection, while breast cancer in women is low but increasing as well.²⁹ There is however evidence that age-standardised death rates from cardiovascular disease may not be increasing in SSA, and are actually falling in countries such as the Seychelles and South Africa.³⁰ These mortality trends indicate that the epidemic of cardiovascular disease may be prevented in SSA if appropriate public health action is taken.³¹

A combination of changing food habits due to urbanisation, increased income and affluence, an ageing population, more sedentary lifestyles, and a lack of preventive and treatment programmes mean 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 2000.³² Recent reviews showed hypertension was prevalent in nearly all studies conducted in SSA (figure 5).³³ 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).

Figure 5: Prevalence of hypertension across sub-Saharan Africa by rural, urban, or mixed setting

Figure 6: Age-standardised mean body mass index of females globally, 2014

A major question for the continent 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 preventing a major tobacco epidemic—SSA's greatest historic public health opportunity—this perverse convergence can be averted, but countries will need to take decisive action now in order to reap the long-term health benefits.^{34,35} With the exception of some anti-smoking 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”.³⁶ 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.

Limited 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 at times gross violations of human rights. This treatment gap could be as wide as 90% or more even for schizophrenia, psychoses, and other severe and disabling mental disorders, due in part to chronic underinvestment.³⁷ 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.³⁸ Researchers have proposed novel training initiatives to tackle the substantial shortfall in service provision and workforce in this area,³⁹ and a formal role for traditional practitioners remains largely unexploited.

Injuries are also increasing. Between 1990 and 2015 the number of deaths in SSA due to injuries rose by 20% to over 614 000 (15% rise in DALYs).^{28,40} The three leading causes were road injuries (33% increase), self-harm (87%), and interpersonal violence (58% increase). The levels of burden differed by cause, gender, and age. For example, four-fifths of road injury deaths amongst adults aged 15 to

49 were male while half of the fall deaths amongst women were aged 70 or over.⁴⁰ 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 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.⁴¹ To address the complex causes of different injuries, intersectoral and targeted prevention strategies must be identified and implemented.

Sub-national health inequities

National data often hide significant and inequitable sub-national differences in health outcomes. For example, the 2008 Ghana Demographic and Health Survey showed a range in under 5 mortality from 50 per 1000 live births in the Greater Accra and Volta regions to 142 per 1000 live births in the Upper West Region;⁴² and the Ghana Maternal Health Survey of 2007 showed pregnancy related mortality ratios varying from 308 in the Ashanti region to 594 per 100 000 live births in the Eastern region.⁴³

Poverty, ethnicity, living in rural areas, and lack of education contribute to health inequities within countries. For example, in Cameroon 49% of children under 5 in the lowest wealth quintile are stunted vs 12% in the highest; in Nigeria the under 5 mortality rate is 188 per 1000 live births among those in the lowest wealth quintile and 72 for those in the highest; in Ethiopia the percentage of births attended by skilled health personnel is 5% in rural areas and 52% in urban areas (table 2). 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 reflect the historic racial disparities under apartheid.^{44,45} In Kenya, 52% of women with secondary or higher education reported using modern contraceptive methods compared with only 12% among those who never went to school; in Madagascar, the diphtheria, pertussis, and tetanus (DPT) immunisation coverage is 89% among the 1-year-olds whose mothers completed secondary or higher education and 50% for mothers who had no education (table 2). Additional years of education beyond primary school have a significant impact on demand for health services as women with more education are better informed and empowered to participate in decision making.⁴⁶

A full understanding of health outcomes and disparities within and between sub-Saharan countries is difficult at present. 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, current 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.

Table 2: Health inequities in sub-Saharan Africa, selected indicators and countries

The broader context: opportunities and challenges

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

Economic growth: Gross domestic product (GDP) in SSA grew by 4.5% in 2014 and 3.0% in 2015.⁴⁷ GDP growth for 2016 and 2017, though still projected to be faster than in most other regions of the world, has been downwardly revised due to low commodity prices, tightening global financial conditions, and drought in parts of the region. SSA's collective annual GDP—US\$1.573 trillion in 2015²¹—is expected to rise to \$3.5 trillion by 2025, according to one estimate.⁴⁸ Gross national income (GNI) per capita has increased from \$505 in 2000 to \$803 in 2005 to \$1628 in 2015.²¹ However, economic growth and per capita GNI vary greatly among and within countries and large portions of the population continue to live in poverty. In order 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- and middle-income settings, has most recently been made in *The Lancet* Commission on Investing in Health¹⁰ and the report of the High-Level Commission on Health Employment and Economic Growth.⁴⁹ Overall, this economic growth makes an increase in domestic resources for health very realistic.

Demographic transition: SSA's population is expected to rise from 962 million people in 2015 to 1.40 billion by 2030. Half of the world's population growth from 2015 to 2050 will be concentrated in nine countries and five of these are in SSA: DR Congo, Ethiopia, Nigeria, Tanzania, and Uganda.⁵⁰ The demographic transition in SSA has been much delayed, primarily due to its high fertility rates (5.1 children per woman). However, population growth rates are projected to decline (figure 7). Some countries are closer to completing the transition than others.⁵¹ All five countries in SSA with current fertility rates below 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 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 other two sub-regions (52% for Central and 42% for Western Africa).⁵² By 2035, more than 30 sub-Saharan countries will have fertility levels below 4.0 and 11 countries lower than 3.0.

Figure 7: Demographic transition in sub-Saharan Africa, estimates (1950–2015) and projections (2015–2050)

Demography is now more aligned than it has ever been to support health investments as a means to increase not only individual, but also social welfare.⁵³ SSA has the largest cohort of young people in history—405 million people aged 0 to 14 in 2014; by 2040, its labour force will be bigger than that of India and China.⁵⁰ Accelerating 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 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.⁵⁴ In addition, more attention to adolescent health will be necessary to give them maximal opportunities in life and to ensure healthy adulthoods. However, ensuring relevant good quality education, jobs and meaningful democratic participation will be essential securing Africa's peaceful future and development, and may represent one of the continent's greatest challenges.

Urbanisation: People are increasingly concentrated in urban areas: the number of megacities in SSA rose from 10 in 1990 to 28 in 2014.⁵⁵ 37% of the population in SSA lived in urban areas in 2014; a figure that is projected to rise to 45% by 2030, and continue to rise thereafter. Since many of the

region'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 SSA's urban population live in slums⁵⁶), 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 there will be major negative repercussions for health.⁵⁷ New solutions are needed: cities are growing so quickly that plans developed even a decade ago are now obsolete. Better convergence between urban planners' policies and the health sector is imperative and will require visionary leadership and effective governance, in addition to the development of a stronger evidence base.

Environmental degradation and climate change: There is a real risk that the combination of rapid economic growth, urbanisation, and a growing population that is increasingly dependent on natural resources will lead to an increase in diseases and illnesses related to environmental degradation. In addition, climate change has several direct and indirect impacts on health in SSA. Directly, higher temperatures can increase mortality. For example, studies from the INDEPTH network in Burkina Faso have demonstrated associations between higher temperature and the daily mortality rate, with a particularly strong effect on under-5 mortality.⁵⁸ Indirectly, especially in fragile or conflict affected states, extreme weather can gravely affect health by exacerbating food and water insecurity. For example, drought in the Horn of Africa region in the 2010-2012 famine is estimated to have caused 258 000 deaths in Somalia, over half of whom were children under five.⁵⁹ Research on the links between weather patterns and malnutrition also suggests that in Central, Southern and Eastern Africa, the effects of climate change may offset expected reductions in child stunting linked to socioeconomic development.⁶⁰

Climate change is also likely to exacerbate existing vulnerabilities to various infectious and chronic diseases, including outbreaks of cholera and cardiovascular disease.⁶¹ Modelling suggests that highland areas above 2000m, especially in East Africa, are likely to become malarial zones.⁶² 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/mitigation measures for both the environment and public health (such as clean cooking fuels, which reduce climate altering pollutants and disease from air pollution).

Information and communications technologies (ICTs) and social media have been and will continue to be significant enablers of Africa's transformation. 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 SSA with variations across regions (figure 8).²¹ Mobile phone based money transfer services such as M-pesa (launched in Kenya in 2007) and others are revolutionising business and power relations. ICTs can transform the work environment, introducing flexibilities that encourage positive lifestyles, and mobile phones and wearable devices can help people to exercise and make other healthy behaviour choices and thus impact the burden of chronic conditions. But ICTs can also lead to sedentary behaviour in young children, adolescents, and adults and thus precipitate exactly the opposite outcome. The potential of ICT innovations for "leapfrogging" opportunities in Africa to address health workforce constraints and improve people's access to quality health services is discussed in section 10.

Figure 8: Mobile telephones, internet users, and urban population in four sub-Saharan regions, 2000–2015

Civil society, peace, and security: Alongside countries' deepening democracy, citizens in several countries are finding their voices and exercising their power (e.g. the ousting of Blaise Compaoré in Burkina Faso, peaceful democratic elections and hand over to the opposition in Nigeria, peaceful democratic transitions in Senegal and Botswana since independence, 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-standardized DALYs per 100 000 due to war and illegal interventions fell dramatically from a ranking of 19 in 1990 to 60 in 2015 (figure 4). However, some countries have been chronically politically unstable and in a fragile situation for decades, terrorism is on the rise in some parts of SSA, 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 may represent another risk for civil unrest.

In summary, sub-Saharan countries are experiencing 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 and healthy lives that new technologies, well functioning health systems, and good governance offer people living on other continents. Table 3 presents 12 strategic options that all African countries should consider in their policies and plans. They are connected to the SDGs and integrate commitments made by regional African bodies. They represent a combination of the unfinished agenda of infectious diseases, maternal and child health, and malnutrition, and new health challenges. As is evident from the table, the strategic options are as much about promoting health and preventing disease as they are about expanding access to treatment. They are a mixture of health outcomes and ways of achieving health. Moreover, while some are health-sector led and primarily Ministry of Health responsibility, more than 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 may 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.

Table 3: Strategic options to reach the health-related SDGs by 2030

In order to realise in an equitable and accelerated way the health outcomes and the SDGs listed in table 3, there is a need for a paradigm shift in health systems. A renewed and multi-pronged approach with people at the centre and focusing on outcomes is necessary to achieve better health and wellbeing. Continuing to build health systems at the current pace of progress, and 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.

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 critical areas of:

- people-centred health systems, universal health coverage, the social determinants of health, and health outcomes
- leadership, stewardship, civil society engagement, and accountability at all levels
- financing for health
- commodity security (i.e. medicines, technologies, essential equipment, tools, supplies, etc)
- 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 different areas where changes are needed and make recommendations for the way forward, recognising the great diversity within SSA. This Commission strongly emphasises that health systems require country-born solutions that relate to specific contextual factors. At the same time we strongly endorse the high premium both the AU's Agenda 2063 and the UN's 2030 Agenda for Sustainable Development have given to strengthening regional action and cooperation, and it is a recurring theme in several sections below.

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 (DTP3 immunization) approaching the recommended coverage level of 80%.⁶³ Less than half the children under 5 with acute respiratory infection, diarrhoea, or fever receive appropriate care.²¹ Financing and service delivery for chronic diseases⁶⁴ and palliative care⁶⁵ have received little attention comparative to infectious diseases, leaving a gap which patients suffering from complex co-morbidities (e.g. patients living with HIV and mental health disorders⁶⁶) feel the most.

Inequity is a major concern as the little available resources tend to be concentrated so as to favour the wealthier groups. Poor governance affects health systems' performance⁶⁷ and their ability to cope with shocks. As such, not only do insufficient and sub-optimally allocated resources attend the health needs of populations with some of the more complex health challenges in the world, but people's trust in health systems is shaken by frequent stock-outs of essential medicines⁶⁸⁻⁷⁰ and overstretched health personnel, particularly in low-level health facilities and poor areas.^{71,72} People's access to health services is in many cases is further obstructed by long distances, high travel costs, high out-of-pocket (OOP) payments, cultural beliefs, and queues. Barriers to access have been primarily researched for rural settings, but are equally relevant for those hard to reach in urban settings.⁷³

Lack of financial protection is a significant financial 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 may be further pushed into poverty by OOP payments on health services.¹⁶ 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 has attained near universal coverage (80% or more).

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

Universal health coverage 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 the WHO in 2005,⁷⁴ its prominence in the WHO World Health Report 2010,⁷⁵ and its endorsement by the UN General Assembly in 2012.⁷⁶ Many sub-Saharan countries now have a UHC agenda or are thinking about UHC and have some kind of policy documents/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, while 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. This is unfortunately usually not the case in terms of policies and practice. It is important that for a healthy future in SSA the 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.⁷⁷ While South Africa is currently 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 it will be shaped by its political history, the considerably big size of its private sector, and the predominance of a decentralised approach.⁷⁸ Therefore, in order to ensure that UHC is a key instrument to advance population health and equity in the region for decades to come, it must be complemented with strategies that address its current 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.⁷⁹ The current conceptualisation of UHC has come under criticism⁸⁰ for imposing an overly medicalised model of care to the detriment of prevention and health promotion. Furthermore, some service coverage expansion interventions may 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 focussing on its delivery may completely lose out of focus 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.⁸¹ It is the pragmatic “how” of implementing UHC reforms, particularly financing, service delivery, and governance arrangements, which 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,⁸² but experiences in SSA show that only a full understanding of the barriers to benefitting from UHC reforms, which go beyond financial access and are faced particularly by the disadvantaged, can hope to fully deliver the UHC promise.⁸³

Overall, there is wide consensus that pursuing UHC makes economic sense⁸⁴ and the commitment to pursuing UHC in SSA is firm.⁸⁵ There is also agreement on UHC as a social as well as 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, and with a coalition of social, technical, and political forces that have driven the process and continue to drive it.⁸⁶

Whilst 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 (e.g. South Korea, Sri-Lanka, Taiwan, and Thailand) show that public financing and public regulation of the 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. Service provision, on the other hand, could be public or private or a mix and equity objectives could still be attained with the right choice of regulatory mechanisms and strategic purchasing approaches.

Why people centred health systems are the way forward

At the heart of health systems are people in varying and interdependent roles, their interactions and relationships. Essentially *“health systems are also human systems”*.^{87,88} The Commission proposes the 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, as well as advocating for nationally bred solutions that are embedded in the realities of each country and each community.

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

Recently WHO has been working on an integrated, people-centred health services framework, which was adopted by the Sixty-ninth World Health Assembly.⁸⁹ The framework starts from the premise that the 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).

Figure 9: WHO's integrated people-centred health services framework

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

That decision makers and implementers need to change the angle from which they think about and address health systems in SSA is well illustrated by several of the lessons from the Ebola epidemic in West Africa. Beyond the virus itself, and beyond any medical interventions to contain the epidemic, historical, contextual, socio-economic and socio-cultural factors, trust, power and politics at the global, national and sub-national levels all influenced the processes and outcomes.⁹⁰ 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, frontline 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 and frontline as well as the 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. Also important will be designing supportive services with clear pathways, continuity of care, integrated service delivery, and strong community based health programmes. Critical to this will be a dismantling of the current fragmented project approaches, and an integration of such programmes into national policy agendas and action.

Private sector engagement and accountability

Although the role of the private sector in health systems in SSA, and particularly in achieving UHC, is highly controversial among health system experts, 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.⁹¹

A recent Lancet series discussing 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- and middle-income countries and that the private and public sectors do not have to be mutually exclusive.⁹² One key concern raised across all papers is that the evidence available on the merits and shortcomings of the private sector is weak or absent and therefore it 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 SSA.⁹³ 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 being deteriorated and relying 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.⁹³ The two types that are absent 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 series argues that when the private sector dominates the health system, the poor struggle to access fee-for-service care.⁹³ 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. All 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.⁹⁴

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 (i.e. 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.⁹⁵

Public and private sectors should be considered as part of a national health system, with the government having a key role in assuring 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 system's perspective and explore all the 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 the 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 impact on health (e.g. 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 impact 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 role in family planning, condom, and bed net promotion, and access to safe drinking water.⁹⁶ Soap manufacturers are embedding handwashing with soap habit building in marketing strategies, and working through health and education systems.⁹⁷ Two examples are participating 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 the social determinants of health

Ensuring better health and wellbeing depends on more than just the health system. That is why the values and the 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 through their life-cycle can influence their health outcomes. For example, for some groups and particularly for those living in poverty, the risks of adverse health outcomes are higher than for those who are more advantaged economically,⁹⁸ but influencing these risk determinants may 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 the 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 review on the social determinants of health concluded that not acting on health inequities can be, in the long turn, detrimental in economic terms as they result in lost productivity and government revenue and represent a cost for health services.⁹⁸ Examples of introducing specific societal approaches to address social determinants of health and their related health inequities include promoting school enrolment for girls through cash transfers, ensuring schools and homes have adequate toilet facilities, particularly for girls and women, providing social protection to older people and their families (e.g. Lesotho, Malawi, South Africa), and promoting anti-discrimination 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: i) address the health and social needs of an individual and communities by dedicated teams coordinating and proposing joint care and prevention; ii) 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; iii) develop and promote multisectoral interventions to address the social determinants of health, health promotion, and health in all policies, including introducing 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 above, wide-ranging concepts such as UHC and "health system

building blocks" focus on implementing and evaluating key processes at the risk of losing focus on the health outcomes themselves. The reality is that core health indicators (e.g. life expectancy, mortality rates) in SSA are indeed better than they were 20 years ago, but have evolved in line with global trends at best. Closing the gap separating sub-Saharan countries from other low- 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 it can induce a cultural change, in terms of patient care, prevention activities, and management, which all are often driven by process outcomes. Equally important is including health outcomes measurement at all health system levels and incorporating health outcome measures in staff training and evaluation. However, it is also important to note that health outcomes are experienced a long time after the service is provided which makes it difficult therefore 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 must be brought to the heart of designing and evaluating health policies by incorporating them in existing accountability frameworks for public health providers. This approach involves explicitly coupling health outcomes with financing, management, and service delivery. Three directions can particularly be considered. First, we advocate for a move towards explicitly including health outcomes in the evaluation frameworks of all types of providers in a way commensurate with their capacity and responsibilities. Second, invest in coupling demand- and supply-side interventions to achieve the targeted health outcomes and avoid formulating such policies in isolation. However, on the whole there have been too many partial successes (or downright failures) caused by a failure to address root problems jointly. Third, invest in outcome monitoring and surveillance systems, and provide feedback to both providers and people in the community.

Above all, countries must decide on the right mix between the different policy interventions and actions. While some countries lack health policies, in many countries the fundamental problem is the lack 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 (www.healthdatacollaborative.org), the Global Partnership on Sustainable Development Data (www.data4sdgs.org), the Service Delivery Indicator (www.sdindicators.org), and the Afrobarometer project (afrobarometer.org) are examples of initiatives supporting country efforts to improve data collection, reporting, and use.

SECTION 4. STEWARDSHIP IN SHAPING 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 SSA and the attainment of the SDGs and the AU's Agenda 2063. This section briefly discusses these inter-related concepts including fostering interministerial 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.⁹⁹ 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.¹⁰⁰ One 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 impact of an exodus of doctors and a severe staff shortage by training surgical technicians to care for pregnant women and war casualties.¹⁰¹

Absorptive capacity requires willingness to tolerate and learn from failures. One 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 which can sustain them.¹⁰²

A qualitative study 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”.¹⁰³ The study identified a gap in the use of data to monitor and improve performance. Health leadership capacity strengthening has generally focussed more on boosting technical competencies rather than on “softer” leadership skills such as relationship management.¹⁰⁴ This area needs to be prioritised in future.

Using data from a 360 degree 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.¹⁰⁵ In a baseline assessment in Ghana, South Africa, and Uganda of the needs and competencies for strategic health sector leadership development, respondents were overwhelming in support of the need for a structured long-term capacity building effort that employed a mix of formal and informal mechanisms including coaching, mentoring, and peer-to-peer as well as peer-to-facilitator learning.¹⁰⁶ 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,¹⁰⁷ and this needs to change.

For health to improve, leadership needs to be strengthened at team, operational, and strategic levels and to work in synergy. Tensions between and within these different levels of leadership can limit performance. For example in The Gambia, research demonstrates a “complicated power tussle” between leaders at the national government and sub-national level, particularly around how centralised budgetary control limits the latter’s managerial capacity and decision-making capabilities.¹⁰⁸

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 where provision is made for intersectoral collaboration and governance. Collaboration with the Ministry of Finance is particularly crucial. There are numerous and long-standing examples of intersectoral HIV prevention programmes in Africa—Kenya’s comprehensive HIV prevention roadmap is a strong and effective model.¹⁰⁹

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 products¹¹⁰ as part of a strategic plan to reduce the burden of chronic conditions.¹¹¹ 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 their food will become more popular, even if today only 5-10% of the food that people eat in a country like 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 study in South Africa reinforced the need to engage religious leaders in overweight and obesity prevention.¹¹² The systematic engagement of community leaders in northern Nigeria proved pivotal in the success of 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”.¹⁰⁴

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

Addressing corruption, strengthening accountability

Corruption is the “*abuse of entrusted power for private gain. It can be classified as grand, petty, or political, depending on the amounts of money lost and the sector where it occurs*”.¹¹³ By diverting resources from desired public policy goals and creating perverse incentives for behaviour and related outcomes, corruption works against effective processes, outputs, and outcomes in all sectors including health and health-related sectors. While corruption is not unique to SSA or to any particular time, age, or civilisation, corruption is considered rife in the health sector in many African countries.¹¹⁴

In the socio-economic and political realm, corruption is an adaptable moving target requiring constant vigilance to thwart rather than any one single unchanging measure. The published empirical literature on health leadership, governance, and corruption in Africa remains limited. However, there is enough to show that it 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.¹¹⁵⁻¹¹⁷ 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, and thus increasing the chance of adverse events for which frontline health workers will be held responsible.¹¹⁶ In Chad, a study shows less than 1% of the non-wage funds allocated by the Ministry of Health to the regions reached local health facilities due to high level of leakage at regional level.¹¹⁸ A review of gaps in health systems research identifies corruption as an area where there has been remarkably little research relative to its impact on sub-Saharan health systems.¹¹⁹

Corruption is an important area to address in any recommendations for the future of health in Africa.^{120,121} Tackling corruption in the health sector requires a stronger stance from sub-Saharan 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.¹²² For example, the Global Fund to Fight AIDS, Tuberculosis and Malaria has taken a proactive stance in investigating and documenting large-scale corruption¹²³ and disseminating case studies of the deleterious impacts corruption can exert on health. At level of service delivery, lower-scale corruption such as what is known as quiet corruption whereby “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.¹¹⁴

Corruption is often not driven by a single cause, but rather by a constellation of factors, and any effort to reduce it requires a multi-faceted approach.¹²⁴ 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.¹²⁴ These tools are all an important part of ensuring people-centred health systems and provide a pathway to reducing 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 impacts 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.¹²⁵ 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.¹²⁶ 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, inside the parliamentary system and in the media and civil society. This should benefit greater accountability in health. Particularly where political commitment is lacking and/or service delivery is absent or of poor quality, civil society and communities must 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. Much can be learned from the remarkable achievements of people affected by HIV and concerned communities, which included a shift to the paradigm of human rights in health service delivery, affordable antiretroviral drugs, and the scale up of treatment in Africa.¹² The report of the UNAIDS–*Lancet* Commission on HIV/AIDS explicitly recommended financial support to activist groups as a public good in health.¹² 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.¹²

Governments and non-state actors can be more effective working together than in isolation.¹²⁷ 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 implementing 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.¹²⁸ 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 in the driving seat. There is 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—though it can be critical in particular issues, such as HIV treatment or women’s and children’s health (see section 5). SSA remains by far the major beneficiary of health-related official development assistance from the UK, US, EU and Japan, which through TICAD (Tokyo International Conference on African Development) related initiatives is trying to match China’s growing influence in Africa. The Global Fund and Gavi, the Vaccine Alliance are innovative forms of multilateral co-operation. The ultimate scope of China’s, India’s and Brazil’s involvement in health in Africa may take a while to clarify as a new model of bilateral co-operation (panel 3).

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

The New Partnership for Africa’s Development (NEPAD) was ratified by the AU 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 Cooperation shifted the narrative from aid to development co-operation 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 move towards using country systems. However, many of these envisaged changes have yet to materialise, and in several sub-Saharan countries there is still quite 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 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.¹²⁹

- 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, though sometimes direct external support to NGOs may be justified in countries in fragile situations or to reach marginalised populations that the government may 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. One major difficulty has been getting donors to agree to country led evaluation frameworks, 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 to reorient 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.¹⁰ However, particularly countries in crisis or in fragile situations will require more classic development assistance for the foreseeable future. The future of health in Africa also depends on redefining development co-operation to be broader than just traditional aid (i.e. grants, loans, and projects) in order to also include non-traditional actors. Examples include: investment vehicles such as private equity¹³⁰ 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, as well as to ensuring substantive government budgets for health.

SECTION 5. TOWARDS SUSTAINABLE FINANCING FOR HEALTH

What are the funding needs?

Enacting the vision outlined in this report will require not only political commitment, inspired leadership, and unprecedented depth of cooperation, but also financial and human resources. Despite ongoing political commitment towards allocating 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 significant for most sub-Saharan countries. The 15% of government spending for health target in the Abuja Declaration was implemented incompletely and achieved little gains.¹³¹⁻¹³³ In 2014, half the countries in the region reported health allocations below the 10% mark.

While the central role of public spending for progress towards UHC is undisputed, there is no single benchmark to determine funding needs.¹³⁴ The Africa Scorecard for Domestic Financing, launched by the AU in September 2016,¹³⁵ aims to drive domestic investment in health, improve accountability, and show how realistic it is to meet the domestic funding targets. It tracks national health spending against multiple targets: the Abuja Declaration 15% target, the per capita target proposed by the Commission on Macroeconomics and Health (2001),¹³⁶ 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 study for Chatham House (US\$ 86 public spending per capita and 5% of GDP for health). The scorecard shows that most sub-Saharan countries still require a major effort to achieve the targets, while there are also countries that are on track to achieving several or more of the financial targets (e.g. Namibia, Republic of Congo, and Swaziland).

It is worth noting that the targets suggested by McIntyre and Meheus¹³⁷ refer to achieving a package of services that includes primary level care for chronic conditions and mental health, reproductive, maternal, newborn and child health (RMNCH), and communicable diseases (see web appendix for methodology). This package does not include, however, hospital care and public health activities, therefore the \$86 public spending per capita is by any account an underestimate of providing 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 half the countries even reaching such a spending level would leave them substantially below the minimum \$86 per capita spending level. This gap remains in any case 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 report¹⁰ used One Health Tool¹³⁸ to estimate the absolute costs of scaling up selected health interventions to reduce mortality rates from infections and RMNCH disorders in low- 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 limited number of infectious disease and MCH interventions alone range from less than 10% of the current total health expenditure (THE) 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 must be acknowledged that this figure does not account for a range of other areas like adult malnutrition, injuries, and surgery – therefore it is in any case 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, while 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,¹³⁹ and DAH, which will remain important to some countries. Channelling contributions from philanthropists may also play a role,¹⁴⁰ but is unlikely to ever be a substitute for government or individual contributions. Harnessing this potential will nevertheless require sustained stewardship efforts from governments to engage in coordinating and maintaining dialogue with such actors and other partners in order to ensure alignment with national priorities.¹⁴¹

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

Financing national health

Health financing arrangements across SSA are as diverse as their health financing needs. The health financing directions to maintain progress towards UHC are known from the WHO work on public financing for health in Africa: 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.¹³⁹ Making fiscal policy choices that improve the efficiency and compliance of tax collection without compromising equity will be essential going forward.^{142,143}

Two issues are prominent and relevant to all from a sustainability perspective: the reliance on out-of-pocket (OOP) payments and the substantive contribution of external funding. OOP payments remain a major contributor to financing health services: despite overall progress during the past decade, some countries have had little reduction in OOP as a share of THE. In more than a third of the countries such payments make up more than 40% of THE.¹⁴⁴ In only five countries (Botswana, Mozambique, Namibia, Seychelles, and South Africa) OOP contributions represent less than 10% of THE.

On the other hand, the volume of external resources for health as a percentage of THE has grown four-fold in the entire African region over the past two decades and remains comfortably higher than in any other region.¹⁴⁵ Some countries have had relatively constant external assistance relative to THE since 2000 (e.g. Cameroon and Malawi), others have seen marked increases (e.g. DR Congo, Kenya, and Mali), while others have relied less and less on external funding (e.g. Chad). HIV, malaria, and RMNCH have received the most attention—with some countries highly dependent on foreign funding for their HIV treatment programme—while DAH for non-communicable diseases has been minimal (figure 11).

Globally, however, the outlook of health aid is uncertain and this lack 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.¹⁴⁶ In the short-term, plateaus or even drops are projected for the African region.¹⁴⁷ Long-term projections point to overall increases, albeit with substantial uncertainty around estimates.¹⁴⁸ As countries in Africa become classified as middle income, the requirement to transition or graduate to financing from domestic sources may 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 "principle basis for classifying countries and determining eligibility for external financial support".¹⁴⁹ It proposes a new policy framework to guide health financing decision making that is based on a broader set of economic and health indicators. Renewed and accelerated DAH commitments for SSA in order 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.¹⁵⁰ Furthermore, it is necessary to couple the transition agenda with the efficiency improvement agenda in order 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. While a generous range of proven, facility-level efficiency-improving strategies are available,¹⁵¹ 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 for rigorous research and careful planning before assuming that such gains are within reach.¹⁵²

Figure 11: Total development assistance for health by disease area in sub-Saharan Africa

Progress towards UHC depends to a large extent on sustaining health financing. Improving the consistency of funding is a key direction for African countries.¹³⁹ Furthermore, sustainability goes beyond ensuring necessary funding (e.g. increasing the share of domestic funding in THE 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 2009-2014 WHO Global Health Expenditure Database data on three indicators – share of OOP payments from THE, share of external resource from THE, and share of government health expenditure from general government expenditure – and calculated an average measure of the trend in each indicator over the 2009-2014 interval, namely the average of year-on-year percentage change. Further, we classified average percentage change in three categories, as per table 4. The 5% cut-off was informed by the median progress/regress of countries in the sample for the three indicators.

The results of this typology are shown in table 5. Most countries have been able to sustain progress in at least one of the indicators. For example, 16 countries have constantly 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 (e.g. Namibia 8% average annual decrease as a share of THE, and South Africa 7%). At the other extreme, Senegal and Swaziland have increasingly used external resources, thus increasing donor dependency, by an annual average of 11% and 21%, respectively. Stability is arguably more important than progress in either direction in order to ensure funding predictability. Most countries have had stable progress in the proportion of OOP payments, which is in line with the slow decreasing trends at a regional level referred to above. Several countries, however, stand out. Chad and Republic of Congo have had continuous reductions in OOP levels, while Botswana, Mozambique, and Tanzania have had significant increases.

Table 4: Classification of health financing efforts

Table 5: Outlook of sustainability of health financing efforts

The results of this classification are to be read in conjunction with absolute values of key indicators, such as those in the Africa Scorecard and country financing profiles. It attempts to quantify and present in context the extent to which progress in health financing reforms towards UHC has been sustained over time. It is designed to be an aid for national-level decision makers, helping them identify the health financing objectives that require either stability in order to ensure predictability or sustained action in order to turn around a negative trend. Needless to say, it must 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 dimensions also need to be read in conjunction, not in isolation, for a given country: for example, a relative decrease in the proportion of OOP levels may be linked to a comparable increase in external support. Furthermore, cross-checking the data against National Health Accounts (NHA) data would provide additional reassurance towards their validity and interpretation, however few countries have recently completed NHA. If any, its merit is that it puts

the evolution of key health financing indicators in a dual perspective, over time and across selected key indicators.

Progress in improving financial risk protection

Ensuring financial risk protection for service users against catastrophic health spending 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 lacking – in the First Global Monitoring Report of UHC such data were available only for 37 countries (2002-2012), of which only nine in SSA.⁶³ More broadly, many African governments have embarked on reforms towards reducing reliance on out-of-pocket expenditure and increasing the share of pre-paid contributions under public pooled insurance.

The impact of user fee removal on service utilisation has generally been positive, despite it having been implemented with insufficient preparation in most African countries,¹⁵³ but the evidence is mixed at best for improved equity, quality, and financial risk protection. In Zambia, for example, there are indications that removing user fees in primary care facilities starting from 2006 benefitted the rich much more than the poor.¹⁵⁴ The risk of catastrophic health payments remains concentrated among the poorest of the poor, and transport cost is the main determinant of limited protective effect.¹⁵⁵ It is important to acknowledge that financial barriers are only one of many considerations for inadequate access to care; others include different price elasticities across health services, the opportunity cost of time for the poor, high non-medical direct costs (e.g. transport) or medical costs borne outside facilities (e.g. drugs), and perceptions of poor quality of care.¹⁵⁶

Removing financial barriers to access is important, but it must be complemented with broader measures that address the relevant causes. Findings from the evaluation of Sierra Leone's user fee removal initiative, Free Health Care Initiative (FHCI), point to important lessons: despite a comparably hasty implementation, FHCI took a systemic approach and used FHCI as a platform to trigger sector-wide reforms (e.g. human resources for health, introducing performance-based financing to replace resources foregone in facilities).¹⁵⁷ Maintaining quality of care is another key consideration to keep in mind when introducing such policies. In Niger, user fee removal and improvements in utilisation came at the cost of deteriorating quality of service, particularly in areas where health facilities were not supported by NGOs. These shortcomings may seem unintended consequences, but were in place long before the implementation of fee exemption policies, which only made them more visible. More broadly, one must safeguard against the risks of creating a two-tier system: free and low quality services for the poor on the one hand, and paid for and better quality for the non-poor, on the other.¹⁵⁸

The uptake of various health insurance models has increased in SSA since 2000. Community-based health insurance (CBHI) has proved more popular, with adopters including Burkina Faso, Ethiopia, Rwanda, and Senegal, while social health insurance (SHI) has been rolled out in countries such as Ghana (panel 4). The evidence on the impact of health insurance in African countries has been generally mixed.¹⁵⁹ While both CBHI and SHI are associated with improved financial protection and service utilisation for enrolees, there is no guarantee that introducing health insurance increases service quality, ameliorates inequity or, in the case of CBHI, empowers communities. Given the exceptionally high cost of introducing or scaling up national health insurance schemes, governments need to have clarity on the exact purposes of insurance schemes and approach the issue from the perspective of assessing the opportunity costs relative to reforming existing systems. For example, strengthening financial management and contracting capacity in Ministries of Health may prove to

bring, depending on the context, more substantial equity gains than rolling out a full blown insurance scheme.

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

Two broad categories of challenges remain particularly relevant: ensuring that individuals who would benefit the most from having insurance do enrol; and ensuring that people can access the benefits that are relevant to them once enrolled.¹⁶⁰ When national health insurance plans start by enrolling the 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.¹⁶¹ The National Health Insurance Scheme (NHIS) 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 the poor are substantial irrespective of the approach and there is no substitute for full commitment towards this goal. Despite the insurance enrolment camps, heavy subsidisation, and exemptions from contributions, the poor are still at least twice less likely to be enrolled in Ghana's NHIS than the rich.¹⁶² This is partially due to policy incoherence e.g. one of the stipulated criteria to identify the core poor is not having a fixed place of residence, which is only rarely the case and in effect disqualifies many of the poor. Low awareness among the poor of exemptions they are entitled to is another contributing factor.¹⁶³ Further, poverty identification strategies must combine statistical information, relevance, and community acceptability in order to be viable.¹⁶⁴ As such, translating pro-poor policies in practice is often a matter of implementation. Without close consideration of all relevant aspects, the impact of pro-poor policies may well depend on the initiatives of district health managers/administrators and frontline workers.¹⁶⁵

Enforcing the mandatory character of insurance comes with political and operational challenges, hence pooling remains fragmented in many African countries. This raises issues of adverse selection, inequity, and financial viability, particularly for voluntary schemes addressing the informal sector. Reducing fragmentation by merging the different insurance pools is essential to promote equity in the utilisation of health services, create opportunities for cross-subsidisation, and ensure the financial sustainability of the schemes. This, however, 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 enrolling the formal sector and the difficulties of enforcing nationwide enrolment. Tanzania started making steps towards bringing together its two major health insurance schemes, the National Health Insurance Fund (NHIF), the compulsory formal sector scheme, and the Community Health Funds (CHF), the voluntary scheme for those in the informal sector, in a move to increase insurance coverage. In 2009, NHIF took over the management of CHF and an early evaluation suggested an increase in insurance coverage, particularly in the informal sector, however harmonising legal frameworks is an essential pre-condition and administrative costs did not decrease.¹⁶⁶

Progress to date in improving financial risk protection needs to be sustained further. The poor in Africa 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 the insurance schemes can be further improved. For example, group enrolment (rather than individual or household) and incorporating lead-in time following enrolment have been found to be effective against adverse selection. Third, taking a systemic view of reforms aimed at improving coverage and financial risk protection, which includes combined action on demand side, e.g. improved targeting, and supply side determinants e.g. partnering with faith-based and private sector providers in areas

with poor coverage of government facilities and using performance-based financing to stimulate enrolment and improve health service.

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 achieving UHC and, ultimately, better health: efficiency, understood as achieving better health outcomes with the same resources, is crucial.⁷⁵ The consequences of inefficiency are anything but trivial: it has been estimated for OECD countries that improving efficiency to the standard of best performing countries would bring, on average, an increase of 2 years in life expectancy, compared with 4 months brought by a 10% increase in public health expenditure per capita.¹⁶⁷ Investing in efficiency and demonstrating value can strengthen the dialogue between African Ministries of Health and Ministries of Finance¹⁶⁸ and help convince Ministers of Finance of the returns associated with allocating much needed resources for health.

Evidence suggests that the African region has the least efficient health spending in the developing world.¹⁶⁹ Africa reports higher per capita health spending and worse health outcomes than South Asia, the most comparable region in terms of health expenditure.¹⁷⁰ This categorisation again masks important between-country imbalances: Namibia and Togo are among the most efficient spenders, while 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 emerges that improving efficiency would bring at least comparable gains to mere increased spending (figure 12). In countries like 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 levels, but with improved efficiency.

Figure 12: Potential gains in health adjusted life expectancy (years) from reaching the regional average in public health expenditure per capita and health spending efficiency, respectively, in selected sub-Saharan countries

Where does inefficiency lie? Low budget execution (an estimated \$10 to \$100 million in unused fiscal space for health across African countries),¹³⁹ 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.⁷⁵ Emerging evidence suggests that African countries with higher corruption levels also experience lower health outcomes.^{171,172} One 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 2007¹⁷³ 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.¹⁷⁴ However, research on the extent to which it 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 only building up.¹⁷⁵ Experiences from countries like Nigeria,¹⁷⁶ Kenya,¹⁷⁷ and South Africa¹⁷⁸ suggest that while 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.¹⁷⁹

Several priorities emerge for improving efficiency. First, improving the financial management of health resources is key.¹³⁹ Second, a systemic approach to reform must be taken.¹⁸⁰ This entails linking, among others, health financing with service delivery, domestic funding with donor funding, financial resources with human resources, and so on. 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 2011-2015 there were close to 100 drug distribution channels and 85% of health sector partners used their own channel. There was significant duplication and wastage, and the Government had little control over drug distribution. By aligning donors with the national procurement and supply system, injecting domestic resources into the national procurement and supply system, and pooling resources for the transport of supplies, drug transport costs decreased leading to \$3.5 million estimated annual savings.¹⁸¹ 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 better 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.¹⁸²

SECTION 6. ACCESS TO ESSENTIAL HEALTH COMMODITIES

Achieving 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 or without prescriptions, and also prescribed inappropriately, is clearly one of Africa's major problems. It 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 TB (MDRTB and XDRTB). It also relates to inefficiencies in the health system.

Sub-optimal access to such health commodities has long been a serious issue in SSA, an unwanted nexus of high commodity costs relative to the local purchasing power, inefficient procurement practices (e.g. multiple tendering processes each year), counterfeit medicines, and stock imbalances.^{183,184} In general, the availability of essential medicines has been problematic in SSA, more so than in any other region.¹⁸⁵ The average availability of essential medicines in SSA is around 40% in the public sector and 60% in the private sector, drastically below the WHO target of 80% medicines availability in all sectors.¹⁸⁶ The target is nearly met in countries like Sudan¹⁸⁷ and Burkina Faso,¹⁸⁸ but not in others such as Malawi,¹⁸⁹ and data gaps remain significant for many countries (table 6).¹⁹⁰ Moreover, the availability of essential medicines is often superior in the private sector compared to the public sector, for essential medicines compared to non-essential medicines, and in urban compared to rural settings.^{191,192}

Medicine procurement also appears to bear a strong link with historical disease burden trends: medicines for chronic conditions have on average nearly 40% less availability (absolute terms) in the public sector compared to medicines for acute conditions,¹⁹¹ a reflection of health priorities to date. In terms of affordability, buying medicines in SSA can have devastating impoverishing effects for households.¹⁹³ There is evidence that large-scale multi-stakeholder initiatives like Affordable Medicines for Malaria can lower prices and improve access through manufacturer negotiations, subsidies, and communication campaigns, but they cannot be reproduced to cover the entire spectrum of health needs.¹⁹⁴ The rise of chronic conditions will add to the growing need for affordable quality medicines, though most of the drugs needed to treat common chronic conditions are available as generics.

Table 6: Median availability (%) of selected generic medicines in public and private facilities, selected countries, 2007–2013

While the principles of ensuring health commodity security are well known,¹⁹⁵ the practical realities of SSA call for enduring political commitment and targeted financial investment to enact these principles. A recent report by the Lancet Commission on Essential Medicines for universal health coverage estimated that between \$13 and \$25 per capita is required to finance a basic package of essential medicines in all LMICs, whereas most low-income countries were spending less than \$13 a person.¹⁹⁶ Several directions have strategic value to improving commodity availability and affordability: stimulating local commodity production, harmonising legislation, and investing in regulatory capacity. These directions are amenable to direct government intervention, while others depend more on joint action from governments and private sector partners. An example of the latter is overcoming the dysfunctionalities of pharmaceutical supply chains in SSA. High levels of fragmentation in the distribution chain prevent agents to achieve the scale required to obtain optimal efficiency. Some of these are a result of conditionalities imposed by external donors. Furthermore, low multiplicity (usually one distributor covers a given geographical area) hinders competition and innovation.¹⁹⁷ Both factors directly affect affordability and availability through high mark-ups and frequent stock outs, respectively. The stewardship role of governments is essential in recognising the particular supply chain model that applies to their given countries and formulating policy that stimulates the 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.¹⁹⁸ The substantial foreign aid received by African countries during the past decades to support TB, HIV, and malaria medicines has led to large scale generic drug imports, primarily from Indian companies.^{199,200} Whereas the availability of bona fide generic antiretrovirals from India have made it possible to treat over 10 million people living with HIV in SSA, a recent pilot study found that antibiotics and TB drugs of Indian origin are more likely to be of substandard quality in Africa compared to other markets.²⁰¹ More broadly, the issue of counterfeit medicines has global proportions but is even more stringent in SSA than in other regions,^{202,203} with a median of 20% of the population reporting to have been a victim of counterfeit drugs.²⁰⁴ In theory, relying more 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 SSA and must be advanced with due caution.²⁰⁵

Investing to harmonise production with international industry standards will be a necessary and also lofty first hurdle. The AU's Pharmaceutical Manufacturing Plan for Africa aims to support the local industry to reach international standards of production through an array of initiatives that include a Good Manufacturing Practice roadmap, specialist human resource development policies in African universities, and lobbying to extend the TRIPS Agreement flexibilities beyond 2016.²⁰⁶ Complying with international production standards and producing at competitive costs is achievable for African pharmaceutical producers, though by no means easy,²⁰⁷ and it 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.²⁰⁸ However, the time to strengthen local production capacity is now. More than 30 sub-Saharan countries are currently 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 TRIPS Agreement.²⁰⁹

Second, regulatory capacity building requires substantial investment. Most national regulatory agencies in sub-Saharan countries lack 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.²¹⁰ To give just one example, only five countries (Kenya, South Africa, Tanzania, Uganda, and Zimbabwe) have WHO prequalified laboratories for drug quality testing.¹⁹⁷ Staff shortages, insufficient and fluctuating funding, and precarious information management systems directly impact medicines availability and patients' health. It can take up to 5 years or longer for medicines to become available to African patients than in other parts of the world.²¹¹ 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,²¹² but efforts must be thoroughly supported and accelerated by national governments. The example of countries in the East African Community, the first sub-regional entity to set up a harmonised medicines registration system, demonstrates that regulatory strengthening is possible through coordinated regional initiatives, although legislative and capacity challenges remain prominent.²¹³

Furthermore, substandard and counterfeit medicines continue to pose severe threats to human health in Africa.^{214,215} More than 100 000 deaths in children under five in SSA were estimated to be associated with poor quality antimalarials in 2013 alone.¹⁹⁰ While the scope of the problem is enormous, it remains difficult to quantify with precision. For example, a 2014 review of the Worldwide Antimalarial Resistance Network's antimalarial quality database found no information for 17 of the 44 malaria-endemic sub-Saharan countries.²¹⁶ NGO initiatives such as the Ghanaian-born mPedigree Network (panel 8) empower patients and health professionals to identify falsified drugs and are an excellent example of health-care innovation in practice. They cannot substitute the functions of central regulators, rather they are an additional tool to enhance regulatory effectiveness.²¹⁷

Reforming Central Medical Stores (CMS) towards granting them more autonomy in order to improve their performance has yielded encouraging results.²¹⁸ Still, CMS in many countries continue to face challenges in infrastructure, human resources, management, and operational capacity. Furthermore, there is no guarantee that improving CMS overall performance automatically leads to improvements in perceived availability of drugs (or at least of all drugs) by frontline staff.²¹⁹ Aligning the incentives of the many stakeholders in the supply chain is essential and the introduction of performance-based financing in supply chains is an alternative worth considering,²²⁰ as illustrated by recent encouraging results from Mozambique.²²¹

Finally, national legislation requires alignment with efficient purchasing objectives. The UN Commission on International Trade Law Model Law on Procurement of Goods and Services²²² 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 and less so for medical devices as they also tend to limit competition and are, thus, suitable for 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, while in others such as Mozambique legislative barriers still prevent their enactment.²²³ Even where procurement itself is effective, post-procurement management of commodities is critical, as the experience of Ghana's CMS illustrates.

The Commission advocates for an integrative approach towards achieving commodity security and access to essential medicines in SSA, an approach that considers the commodity pathway in its entirety, from manufacturing/importation, market registration, procurement, and purchasing. The Commission also supports the main recommendations of the Lancet Commission on Essential Medicines for UHC, 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, developing missing essential medicines.¹⁹⁶ It is obvious that achieving sustainable in-flows of good quality, affordable medical products cannot happen overnight, but, as demonstrated by recent examples of successful initiatives mentioned above, 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 more to inform policies and practice as one approach to improving efficiency in service delivery to improve outcomes.

SECTION 7. STRENGTHENING PUBLIC HEALTH SYSTEMS AND CONTAINING EPIDEMIC THREATS

With their focus on preventing disease and promoting health among the population as a whole, public health systems are an essential part of health systems. Among other things, they 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.²²⁴ Multidisciplinary and multisectoral in nature, public health systems should work closely with treatment and caring for the sick, 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 may 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 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 agenda²²⁵ has driven public health systems development in response to concerns relating to emerging infections with pandemic potential and to bioterrorism.

Lessons from Ebola

The importance of public health systems is most dramatically illustrated by the Ebola epidemic in West Africa, a part of Africa which had not previously experienced outbreaks of the virus. It caused over 11 000 deaths (as compared with over 300 for the largest outbreak in Central Africa), involved almost the entirety of three nations (Guinea, Liberia, and Sierra Leone), including their capitals, and lasted over 2 years.²²⁶ It illustrated that a “perfect storm”²²⁷—which may not be repeated as such—can turn a limited outbreak into a humanitarian crisis. In any case, it 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.²²⁸ In addition, a legacy of civil war and corrupt dictatorship in the three countries affected made them 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 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),²²⁹ had a punitive impact on the affected countries and could be seen as a major disincentive for openness about future epidemics. Countries must 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 a lack of resources increased the risk of health-care worker infection and death (over 500 health-care workers were killed by Ebola in West Africa)²²⁶ further depleting the already scarce workforce.²³⁰ Health facilities became a source of transmission for the virus.²³¹ Consequently, uptake of routine services declined due to fear of contagion,²³² 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.^{233,234} Such community action and “people science” played a major role in several areas to control the epidemic.²³⁵

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.²³⁶ To address the need to provide incentives for the development of vaccines where there is market failure, a public-private partnership called the Coalition for Epidemic Preparedness Innovations was launched to finance research on vaccines against diseases with epidemic potential.²³⁷ Although the conduct of research during this epidemic set an important precedent for incorporating more pro-active 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,²³⁸ demonstrate the importance and utility of regional collaboration in mobilising resources and technical expertise, and in supporting public health systems. Countries such as the 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.²³⁹ Similarly, it will be important to learn from attempts to control a recent yellow fever outbreak in Central Africa²⁴⁰ and from responses to the re-emergence of wild poliovirus in northern Nigeria.²⁴¹

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, as well as the availability of a sufficient number of trained public health staff experienced in its operation, enabled rapid containment and elimination of the Ebola virus.²²⁵

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 one year, affected almost 23 000 people across 12 of the country’s 13 districts, and was declared a humanitarian emergency by the President.^{242,243} 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.²⁴³ Yet 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,^{244,245} it is highly likely that such epidemics will occur again in Africa, in addition to pandemics such as influenza.

Current public health capacity in sub-Saharan Africa

According to WHO, many African countries lack adequate, functioning, and resilient public health systems. Like health systems in general, they are often fragmented and under-resourced, and often

have a disease-specific focus, with multiple systems running in parallel.²⁴⁶ Many countries lack the 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, 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.²⁴⁷

The 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 47 countries in the WHO African region, only 17 have designated national institutes of public health,²⁴⁸ and fewer than 400 laboratories are accredited to international standards, of which 90% are in South Africa.²⁴⁹ Almost half of all countries lack 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.²⁵⁰

Health promotion to address risk behaviours for ill-health is an important but under-resourced component of public health systems in the region. In the past 10 years, WHO AFRO has assisted 28 countries in developing national health promotion policies and strategic plans.²⁵¹ Challenges to the implementation of effective health promotion include: inadequate leadership; disengagement of community groups, civil society, academia, and regulatory and legislative organisations; a lack of skilled practitioners at the community level; a lack of financing; and a lack of evaluation of interventions.²⁵¹

Many sub-Saharan countries lack 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.²⁵² 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 the health and demographic surveillance systems (HDSS).

Routine disease surveillance is largely implemented through the integrated disease surveillance and response (IDSR) system (currently in 43 sub-Saharan countries).^{224,246} Unfortunately, implementation has been limited by a number of systemic challenges.²⁴⁶ For instance, systems suffer from a lack of core funding for basic resources such as laboratories, communication systems, and transport, and for their day-to-day operation.²⁴⁶ There are severe shortages of basic equipment,²⁵³ trained surveillance staff, epidemiologists, and laboratory staff.^{224,249} 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.²⁴⁶ Community-based surveillance is lacking, and surveillance systems are primarily passive.²⁴⁶ Laboratory data are under-utilised to inform surveillance,²⁴⁶ the quality of testing performed is frequently unacceptable, and data on antimicrobial resistance is scarce.²⁵³

Coordination across different elements of the system is generally poor and there is rarely any evaluation of the system, nor are data collected to facilitate such an evaluation.²⁴⁶ Furthermore information technology is underutilised for the collection, analysis, and interpretation of data.²⁴⁶

Systems mostly focus on human diseases, despite the large burden of emerging infections caused by zoonotic and vector-borne pathogens.^{246,254} Current surveillance systems generally exclude chronic conditions, maternal and child health, and environmental risks,^{224,246} 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.²⁵⁵ To achieve the Commission's vision and the health-related SDG targets listed in table 3, sub-Saharan countries will have to invest significantly more in developing effective public health systems, including developing the requisite IHR core capacities, which is a matter of priority.

Effective models for public health system development in SSA, such as the IDSR, do exist. An assessment of existing public health systems capacity should be undertaken by each 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.^{224,256}

Disease specific programmes may 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 PEPFAR was used for multi-disease laboratory system strengthening.²²⁴ 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.²⁵⁷ 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.²⁵⁸

Given the weakness of public health systems, the lack 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 as well as regional and international technical expertise. Pooling resources among countries and adopting common regional standards and approaches for training, disease surveillance, emergency response, governance and regulatory procedures, and research and development would benefit countries and the region as a whole.

Numerous initiatives are underway to strengthen capacity across the region (table 7). 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.²⁵⁹ Political and economic regional alliances such as the AU and Economic Community of West African States can greatly help in removing political and economic barriers to resource mobilisation and in fostering cooperation between member states, and were active in the Ebola response in West Africa.²⁵⁸

Most important for Africa's epidemic preparedness is the recent launch of the Africa Centres for Disease Control and Prevention by the AU under the leadership of John Nkengasong with subregional hubs, and of centres of surveillance and disease control by the West African Health Organisation, as is the establishment of WHO's African Public Health Emergency Fund²⁶⁰ to

support national efforts to respond to public health emergencies. Engagement of global partners, such as philanthropic organisations, NGOs, and technical organisations, is also critical for system development and mobilising technical experts in public health emergencies as exemplified by the work of the WHO Global Outbreak Alert and Response Network.²⁵⁹ Some countries like Nigeria, Senegal, and the three countries most affected by Ebola are consolidating or building national centres for epidemic preparedness and response. As these are all in their infancy, much will depend on the support and commitment from the AU and WHO and its member states.

Table 7: Selected initiatives for public health capacity building in Africa

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 significantly more in developing robust and resilient public health systems, not only for preparedness, but also for preventing chronic diseases, improving health in general, and decreasing the burden on expensive health-care services and hospitals. Above all, current efforts to ensure UHC in Africa must 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 SSA are in extremely short supply, particularly in rural areas. Of the 57 countries with a health workforce shortage in 2006, 36 were in SSA.²⁶¹ Since then, several African and global reports and declarations have documented the extent and impact of the shortages and proposed solutions, including scaling up and transforming the education and training of health workers.^{131,262-265} Many African countries are implementing national human resources for health plans, and there has been progress. However, as figure 13 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, chaired by the Presidents of France and South Africa, and the global strategy on human resources for health^{49,266} adopted by the World Health Assembly in 2016, will catalyse action. We also support the refreshing perspective of Mandeville et al stating 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”.²⁶⁷

Figure 13: Health workforce to population ratios, by WHO region

Health workforce shortages vary widely among and within African countries. For example, the number of physicians per 10 000 population ranges from as low as 0.1 in Liberia, and 0.8 in Cameroon and Mali, to 4.1 in Nigeria, 7.8 in South Africa, and 10.7 in the Seychelles (table 1). The disparities are similar for nursing and midwifery personnel: with the exception of Gabon and South Africa, countries have less than 50 nurses per 10 000 population²⁶⁸ with ratios ranging from 1.4 in Niger, to 8.6 in Kenya, to 33.5 in Botswana.²⁶⁹ In addition, urban/rural and public/private maldistribution of health workers is a huge problem across SSA. According to an International Labour

Organisation (ILO) report, an estimated 77% of the rural population in Africa went without access to health-care services in 2015 due to health worker shortages (compared with 50% of people in urban areas).²⁷⁰ This shortage is compounded by a high level of absenteeism of health workers from public facilities in SSA, for example, Uganda (52%) and Kenya (29%), with the highest absence rate in larger urban health centres for the latter.^{114,271,272}

Two examples highlight the multiple reasons behind the maldistribution of physicians within countries. A study in Togo²⁷³ 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.²⁷³ Figure 14 from the Sub-Saharan Medical School Study²⁷⁴ shows where doctors were 5 years after graduation.

Figure 14: Where are doctors 5 years after graduating from a medical school in sub-Saharan Africa

Business-as-usual projections are dire. Using ILO's proposed threshold of 3.45 health professionals per 1000 population, one analysis²⁷⁵ put the health worker deficit in SSA at 2 103 770 in 2012, rising to 3 757 522 in 2030. This means a 10.21% average annual growth rate is required to meet the need for physicians, nurses, and midwives by 2030.²⁷⁵ Few African countries are currently on this growth trajectory. A study 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 threshold by 2035: 2100% in Ethiopia; 386% in Ghana; 528% in Kenya; 1864% in Mozambique; 1307% in Senegal; and 383% in Sudan.²⁷⁶ The authors concluded that the feasibility of achieving these thresholds was "least likely".

These and other estimates show that even with massive investment—and time—many African countries will struggle to produce, employ, and retain the health workers needed to achieve UHC and the other health-related SDG targets.^{71,277} In some 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.^{49,267} It is clear that the health outcomes promoted by this Commission cannot be achieved without improving the working environment of health-care workers in rural areas and developing new approaches to health service delivery that are not centred exclusively around physicians and nurses.²⁶⁷ For example, the more the private sector integrates the SDGs in their business models, the more they may bring workforces that can be useful, especially for health promotion. 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 recommendations included shifting education models "away from narrow specialisations to focus on lifelong building of locally relevant competencies", relaxing unnecessary barriers to entry, and attracting young people to careers in the health sector.⁴⁹ At the same time, task shifting, task sharing, and alternative modes of delivering health care that make optimal use of the available workforce, including clinical officers, community health workers (CHWs), pharmacy assistants, chemists, and informal health-care providers, must urgently be pursued. The 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 practice.²⁷⁸

However this approach should not be at the expense of training higher level types of personnel because they 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 the health service providers in SSA, 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 (e.g. hardship allowances) and non-financial incentives (e.g. enhanced scopes of practice) are required to better support health workers and reduce attrition among those employed in remote and rural areas.²⁷⁹

Health workforce education capacity

The number of health workforce training institutions is rapidly increasing in SSA, though quality is highly variable.²⁶⁴ For example, the Sub-Saharan Medical School Study 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).²⁷⁴ However, among sub-Saharan countries with populations of 2 million or more, 1 had no medical school and 14 had only one medical school.²⁷⁴

A study in Kenya found the annual student enrolment in nurse training to have doubled between 1999 and 2010.²⁸⁰ 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,²⁸¹ a South-South collaboration. The Government of Ethiopia pursued a rapid workforce scale-up by mandating increases in class sizes in medical schools while investing in physical infrastructure including a new teaching hospital. First-year enrolment in one medical school rose from 250 in 2009 to 400 in 2013.²⁸² 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- 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.²⁷⁴ These training programmes and the health science institutions that host them demonstrate 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.²⁸³

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 SSA.

Insufficient numbers of qualified teachers, poor infrastructure, and inadequate coordination between ministries of education and health were amongst the most significant deficiencies

identified by the authors of the Sub-Saharan Medical School Study. The authors made ten recommendations to promote and improve medical education and population health in SSA 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.²⁷⁴

To ensure effective approaches to health workforce development, it is important that SSA educational institutions increase their capacity in the disciplines of medical and other health professional education. Examples include the US-funded Medical Education Partnership Initiative (MEPI) and the Foundation for Advancement of International Medical Education and Research (FAIMER), both of which supported capacity development in this direction. The Nursing Education Partnership Initiative (NEPI) has formed partnerships with governments and key stakeholders to address the chronic underinvestment of pre-service nursing and midwifery education.²⁷⁴ But this is only a beginning and much more needs to be done.

There is great value in African medical and other health professional schools collaborating within and across countries on issues such as educational standards, curriculum development, common exams, and capacity building. This approach enhances the quality of their outputs and increases the relevance of their work. For example, MEPI 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.^{284,285} In West Africa, the existence of several colleges including of surgeons, physicians, nurses, and pharmacists have successfully established a standardised curriculum for all these specialities. Recently, with help from the Royal College of Physicians, London, 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 SSA currently 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 “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 recent systematic review 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.²⁸⁶ 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”.²⁸⁶ 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 educating and training 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 SSA. 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 annual compulsory placement in rural communities. In addition, the Master of Public Health is based on the “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.²⁸⁷

Targeted admission policies to increase enrolment of students from rural areas, scholarship schemes aimed at disadvantaged rural students, and locating health professional schools outside of the capital are among the approaches being used to address the urban/rural maldistribution.²⁷⁹

The 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 (see panel 5 for examples). It is vital that these cadres are valued in the health system, and complement traditional health professionals.²⁸⁸ A systematic review showed that with the right approaches, mid-level health workers provide effective care.²⁸⁹ 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 SSA 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.

Panel 5: Accelerated medically trained clinicians in sub-Saharan Africa, selected examples

CHWs may also improve access to and affordability of health services, though there has been little formal evaluation 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 SSA for many years.²⁹⁰ Examples include Mozambique's Agentes Polivalentes Elementares Programme and Uganda's Village Health Teams. Ethiopia's Health Extension Programme (HEP) was introduced to provide a package of quality health services at the community level.²⁹¹ 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 18 years of age or older with at least grade 10 secondary education, and selected by the community in which they live—received one 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 HEP 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 a vital link between communities and health and social services.²⁹² However, the performance of interventions and programmes is greatly influenced by numerous contextual factors, an area that requires further study.²⁹³ 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.²⁹²

In summary, each 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 involves a considerable amount of forecasting (e.g. future population needs, economic growth etc.) 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, 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: KEY DRIVERS OF BETTER HEALTH AND SUSTAINABLE DEVELOPMENT

Higher education is not only at the centre of nation building processes, it is also vital 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 "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 AU, the African Academy of Sciences, and the Planet Earth Institute, an Angola-based international NGO working for scientific independence for Africa. Fifteen universities from eight countries have formed the African Research Universities Alliance, with the aim of strengthening research and post-graduate 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.²⁹⁴ 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 from biomedicine to epidemiology, to physical sciences, to social sciences. Research provides the evidence base for national policies that impact on

health, directly (e.g. clinical research and health systems research) or indirectly (e.g. research on the health impact of climate change, and of agriculture and food policies). Because of the importance of context in promoting 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 the health priorities, service problems, and socio-cultural issues of vulnerable groups.^{109,295}

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 AFRO's 10-year research for health strategy²⁹⁶ and the AU's 10-year Science, Technology and Innovation Strategy for Africa.²⁹⁷ A bibliometric analysis 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 2014.²⁹⁸ This is a relative growth of 251% as 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.²⁹⁹

Part of the problem is Africa's critical shortage of researchers—there are about 80 researchers per million people compared with a global average of 1081—and a lack of reasonably paid career paths. Another challenge is that a large percentage of researchers spend less than 2 years in African institutions.³⁰⁰

Financial support for science in Africa varies widely, with countries contributing between 0.01% of GDP (Lesotho) and 0.89% (South Africa) per annum between 2007 and 2014.²¹ Almost all political commitments to increase investments in research have yet to be honoured by most African governments.³⁰¹⁻³⁰⁴ As a result, gross domestic spending on R&D as a percentage of GDP in sub-Saharan countries is among the lowest in the world. Some are on par with Latin American countries (e.g. 0.38% in Chile, 0.54% in Mexico, and 0.61% in Argentina), but all countries invest far less than Asian countries (e.g. 4.29% in South Korea, 2.19% in Singapore, and 2.05% in China). The world average is 2.12%.²¹

Lessons can perhaps be learnt from southeast Asian countries' experience in increasing spending on R&D, 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 (US\$ 262).²¹ Strong government leadership in expanding all levels of education and building research capacity, particularly in the STEM fields (science, technology, engineering, and mathematics), 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.

One major constraint 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.²⁹⁸ 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 'brain drain' into 'brain

circulation'. For example, initiatives such as the Alumni Diaspora Programme by the University of Witwatersrand has demonstrated the potential of capitalising some of the intellectual capacity lost to migration by fostering international collaborations between medical and health sciences alumni with current faculties in SSA to strengthen local research capacity.³⁰⁵

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, has developed a set of strategic priorities to be implemented by 2020.³⁰⁶ 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 AFRO, 23 out of 47 countries lack a functional health research system and 24 out of 47 have no health research policy; even in countries with a research strategy investments remain very low.

All countries need a 10–20 year strategic plan for national health research, coupled with a financing strategy, as well as advocacy for creating and strengthening ministries or departments of research/science and technology that are responsible for all areas of research. WHO AFRO's research for health strategy 2016–2025²⁹⁶ offers a template for countries to create an enabling environment for research: governance (plans, priorities, legal frameworks, regulations, ethics), building and sustaining research capacities (researchers and institutions), producing high-quality research, translating research findings into policy and practice, financing, coordinating, and tracking investments. The strategy has broad support from members of this Commission.

The need for investment in health research and institutional strengthening

At an AU Summit in Algiers in 2008, African governments agreed to increase R&D 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 to research and research capacity building and to invest more in research aimed at improving health systems".³⁰¹ Governments need to set targets for progressive increases in R&D investment and also to create national research funds (e.g. 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 R&D rose from around US\$ 2 billion in 2001 to \$4.3 billion in 2008 and the number of publications doubled from around 4500 to 9000.²⁹⁹

In relation to strengthening research capacity, institutional arrangements must be in place to bring together a critical mass of skilled individuals across disciplines working together. There are two main models: part of a university and specific research institutions. The latter should be closely linked with higher education as it supports excellence in teaching and will attract young people into research. Those chosen to lead these centres must be selected based on their merit and their competencies (i.e. not political appointments), and be accountable to a board of directors.

Providing 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 where students spend most of the time in an African university with a stay in a non-African

university are beneficial. Expanding post-doctoral programmes on the 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 who can identify and advance local research agendas. Paid post-doctoral positions are necessary stepping stones for researchers' career progression from PhDs to scientists winning international competitive grants, being principal investigators, and doing world-class health research in Africa—for Africa.

Going forward it will be important to develop expertise in knowledge translation in order to strengthen links between researchers and policymakers and increase the uptake of research results.³⁰⁷⁻³¹⁰

Whereas 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 SSA as part of their development agenda. There is some encouraging progress on this front. For example, the World Bank's Africa Higher Education Centers of Excellence Project³¹¹ has been supporting universities in Western, Eastern and Southern Africa. The US PEPFAR and NIH's MEPI initiative is strengthening research capacity in African medical schools by twinning them with American universities. The European & Developing Countries Clinical Trials Partnership (EDCTP) supports phase II and III clinical trials of new or improved vaccines, treatments, and diagnostics for HIV/AIDS, tuberculosis, malaria and other prevalent infectious diseases in SSA. The UK's Wellcome Trust supports individuals as part of its long-standing programmes on medical research capacity building. The DELTAS programme, funded by Wellcome Trust and the UK's Department for International Development and managed by the African Academy of Sciences based Alliance for Accelerating Excellence in Science in Africa (AESA), aims to establish world-class research environments at African universities while focusing on creating training opportunities for the next generation of African research leaders.³¹²

Research collaborations and networks

Africa's research transformation will only happen through investment, collaboration, and partnerships. In 2012, 79% of all research in East Africa, 70% in Southern Africa outside South Africa, and 45% in West and Central Africa and South Africa was produced through international collaborations.²⁹⁹ 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.^{313,314}

National Science Academies around the world, especially in high-income countries, are contributing to advancing health in an unbiased manner and could play a similar role in Africa in the coming decades. Already there are 23 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 their greatest merits 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.²⁹⁸

International partnerships should be reshaped around two principles: mutual agenda setting and benefit, and equality in decision making between partners (see panel 6 for what makes a successful collaboration). 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. Improving country capacity should be a primary purpose of any research partnership or collaboration.

Panel 6: What makes a successful research 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 AU, and the four sub-regional political entities all have roles to play in fostering long-term, sustainable collaborations including strengthening regional networks of centres of excellence, coordinating research within the region, actively building research to policy and practice links, and funding research.²⁹⁶

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 and hence central to addressing inequities. Research gives important evidence that should be used to inform health services, policies and practice as one approach to improving health outcomes. Both African governments and international donors must 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, geographic, and financial barriers standing in the way of improving health in SSA.³¹⁵ Innovation is essential to all of our 12 strategic options and to achieving the health-related SDGs, especially since 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 SSA 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 ICT, e-health, and m-health to improve health service delivery makes it difficult to assess their usefulness

and effectiveness.^{315,316} 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.³¹⁶ Second, there are significant barriers to the adoption of such technologies, including a dearth of evidence of their impact on cost and outcomes, and a lack of collaboration between health providers and technologists in product development.³¹⁶ Third, there is a lack of standardisation, regulation, and coordination in the use of innovation within health systems.

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

Improved access

- Extending 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 7), and through mobile phones, the radio, and telemedicine.
- 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.
- Introducing health insurance cards, particularly for the poor, 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.
- Improving diagnosis at various levels of the health system through the use of rapid and simple point-of-care tests (e.g. for malaria and HIV viral load) and portable devices for reading and interpreting diagnostic microscopy.³¹⁷
- Smart phones equipped with special devices (e.g. “PEEK” for eye examination⁶, CardioPad for cardiac monitoring³¹⁸) and miniaturised ultrasound and other imaging.
- Wearables and apps to promote healthy living and behaviour (e.g. Solar Ear, solar-powered digital hearing aid unit³¹⁹).

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.³²⁰
- Improving efficiency of distribution of essential medicines and family planning commodities in lower level health facilities (e.g. 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.
- Mitigating fraud and abuse by verifying medical products (e.g. anti-counterfeiting technology, panel 8) 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 SSA including Ethiopia, Ghana, Malawi, Mozambique, Rwanda, and South Africa (e.g. nurses instead of only physicians for cervical cancer screening; nurses and midwives instead of only specialist physicians for basic emergency obstetric and newborn 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 (e.g. e-learning and Massive Open Online Courses).
- Supervision and support to staff through the use of tablets at health centres (e.g. pilot projects in Ghana and Tanzania), telemedicine networks to reduce isolation of health-care professionals in remote areas (e.g. RAFT³²⁰), and mobile phones for CHWs.

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

Panel 7: Innovative integration of private and public services: use of community health nurses and private drug outlets to control hypertension in Ghana

Panel 8: mPedigree: anti-counterfeiting technological innovation

SECTION 11. SECURING THE FUTURE: AN AGENDA FOR ACTION

Sub-Saharan countries have unprecedented opportunities to dramatically 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 report 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 are needed that are rooted in human rights, guided by scientific evidence, and span health and several non-health sectors. A comprehensive approach and system-wide changes are required—a fragmented health agenda will deliver some results but it will not succeed in strengthening health service delivery and public health systems, and it 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.

1. A paradigm shift is needed to deliver better health outcomes through people-centred health systems and universal health coverage.

Current paradigms rely on hospitals and individual care and 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.

Actions

- i. Involve communities and civil society in the design and implementation of people-centred health systems—pay as much attention to keeping people healthy as to treating them when they are sick.
- ii. Use health outcomes to guide policies, management, and funding, and include health outcomes in the evaluation frameworks of policies, services, and providers.
- iii. Ring fence funding for public health as part of UHC, reinvigorate public health training, and strengthen laboratory infrastructure and information systems.
- iv. Accelerate training of all cadres of health professionals with competencies that correspond to the needs of people, pursue alternative modes of delivering health services, and better support the existing health workforce, especially in rural and underserved areas.
- v. Take an integrative approach towards commodity security—start with revising 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 developing domestic manufacturing capability.

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

Given the 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.

Actions

- i. Eliminate polio and guinea worm.
- ii. Finish the work of achieving the health-related MDGs, an opportunity to make great strides in reducing preventable morbidity and mortality.
- iii. Fully meet demand for family planning and modern contraceptives, an opportunity to slow population growth.
- iv. Fully implement the Framework Convention for Tobacco Control, a one-off chance to prevent an epidemic of tobacco-related diseases in Africa.
- v. Complete the unfinished agendas for controlling HIV, malaria, TB, and diarrhoeal and respiratory diseases.
- vi. Prevent 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.

3. Achieving good health for all citizens should be a political priority for every sub-Saharan 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.

Actions

- i. Make 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.
- ii. Strengthen legal frameworks to enable equitable access to quality health services (including health promotion and disease prevention); and support civil society organisations as health advocates and implementers.
- iii. Strengthen management and technical capacity of the Ministry of Health with accountability frameworks for departments and individuals.
- iv. Harness private sector resources and capabilities in a manner that contributes significantly to equitable and sustainable health systems.

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

Each country needs home-bred solutions, building 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.

Actions

- i. Develop and implement a national, multisector strategy to achieve better health outcomes informed by a detailed country-specific financial needs assessment.
- ii. Review existing delivery services, policies, and training to strengthen the path to people-centred health systems.
- iii. Invest in ICTs to provide the up-to-date, accurate, and disaggregated data required to inform national and local health policy and planning, and day-to-day management.
- iv. Reshape the relationship with international funders around national priorities and make medium- and long-term plans to gradually reduce dependency on external sources with increasing access to domestic resources, global finance and economy to achieve grand convergence in health
- v. Dedicate resources to strengthening capacity in leadership and governance in health sector institutions, and support empirical research to understand contextual issues such as accountability and corruption.
- vi. In countries in conflict or in fragile situations, preserving health services and essential prevention programmes such as vaccination should be a top priority for those in political and military control, and for humanitarian and other international actors.

5. 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 not only on identifying new funding sources, but equally on maintaining steady

progress over time towards increasing the share of pre-paid contributions in total health expenditure and towards prioritising health in domestic budgets. Improving access and outcomes for the poor must remain a priority and requires more effort in identifying (e.g. improve the performance of targeting mechanisms) and reaching these groups (e.g. engage and partner with service providers beyond the public sector). Improving public financial management is the foundation of better health spending and must be complemented with taking a systemic approach to implementing reforms towards reducing fragmentation across health system functions, public sector portfolios, and stakeholders' efforts.

Actions

- i. Sustain and increase government health expenditure, using international targets (e.g. 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 (e.g. tobacco tax).
- ii. Expand publicly pooled pre-paid financing arrangements, ensuring that efficient pooling and coverage for the poor and disadvantaged are present from the outset.
- iii. Improve substantially both health spending performance and health sector efficiencies, including through strategic purchasing practices and service integration wherever possible.
- iv. 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 country's income and capacity so as to mitigate any risk of losing health gains when external finance decreases.
- v. Strengthen accountability mechanisms and use an explicit legal and operational framework to improve processes that minimise corruption.

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

All efforts to improve health must 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.

Actions

- i. Measure the success of health policies and programmes in terms of how much they improve health outcomes in geographic areas and population groups with the worst health outcomes.
- ii. Protect all citizens from catastrophic health expenditures, and explicitly account for the equity implications of UHC and any new mechanisms to increase domestic health financing before their implementation.
- iii. Donors and agencies should provide specific support to states in fragile situations to protect population health, targeting the most vulnerable communities, and ensure that humanitarian action includes a proactive health component.

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

Higher education is vital for developing 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.

Actions

- i. Develop a 10–20 year national health research strategy coupled with a financing strategy that includes allocating 2% of national health expenditure to research and research capacity building, leverage emerging industry expenditure on R&D, and invest more in research aimed at improving health systems.
- ii. Support medical, nursing, and allied health sciences schools through adequate public financing and ensure public and private schools meet international standards for education and research.
- iii. Invest in internationally-competitive centres of scientific excellence, including by selecting leaders based on their competencies, and expand post-doctoral programmes to raise the quality of higher education and research.
- iv. Expand research and education collaborations, particularly within Africa, and reshape international research partnerships around mutual agenda setting and benefit.
- v. Urge 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.

8. Generating and using 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. There is huge scope for innovative, low-cost, new vaccines, diagnostics, therapies, and IT applications for prevention and care. Also urgently needed are innovations in health professional education, health service delivery, and governance, particularly those using ICTs.

Actions

- i. Use innovation to "leapfrog" approaches ahead of the rest of the world, ensuring technological innovations work with existing infrastructure constraints (e.g. irregular power supply); encourage the weaving of big and small technological innovations, e-health, and m-health into the service delivery fabric and into health workforce education and training.
- ii. Foster innovative approaches to address health workforce shortages.
- iii. Enforce 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 ICT applications to create greater efficiencies in health system performance.
- iv. Use innovative technologies to engage communities and civil society in efforts to improve health outcomes, as well as to deepen capacity for accountability and responsiveness of government agencies and institutions.

9. Stronger regional cooperation will add value to national health efforts.

Pooling resources among sub-Saharan countries and collaborating 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 countries and the region as a whole, and would facilitate more proactive sharing of data, innovations, and technical expertise.

Actions

- i. Support reform of the WHO Regional Office for Africa.
- ii. Pursue efficient regional approaches to the supply and regulation of medicines, vaccines, and other health commodities.
- iii. Harmonise standards for health professional education and training and adopt common certification requirements for different cadres of health professionals.
- iv. Catalyse research collaborations between African countries and support African-relevant research through national and regional funding partnerships.
- v. Support 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. This is why we are advocating an approach based on people centred health systems and inspired by recent 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 all 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

The report was constructed in various meetings and through the contributions of all Commissioners. Commissioners contributed to the ideas, structure, and recommendations, wrote parts of the report, and commented on drafts. The writing team included Commissioners IA, PL, BM, NS and PP, as well as AG, HLQ, MO, EN, JE, and JM. AG did the financial analysis. All authors approved the final version of the report.

Declaration of interests

//To be added//

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