



Effectiveness and sustainability of a diagonal investment approach to strengthen the primary health-care system in Ethiopia

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Weakness of primary health-care (PHC) systems has represented a challenge to the achievement of the targets of disease control programmes (DCPs) despite the availability of substantial development assistance for health, in resource-poor settings. Since 2005, Ethiopia has embraced a diagonal investment approach to strengthen its PHC systems and concurrently scale up DCPs. This approach has led to a substantial improvement in PHC-system capacity that has contributed to increased coverage of DCPs and improved health status, although gaps in equity and quality in health services remain to be addressed. Since 2013, Ethiopia has had a decline in development assistance for health. Nevertheless, the Ethiopian Government has been able to compensate for this decline by increasing domestic resources. We argue that the diagonal investment approach can effectively strengthen PHC systems, achieve DCP targets, and sustain the gains. These goals can be achieved if a visionary and committed leadership coordinates its development partners and mobilises the local community, to ensure financial support to health services and improve population health. The lessons learnt from Ethiopia's efforts to improve its health services indicate that global-health initiatives should have a proactive and balanced investment approach to concurrently strengthen PHC systems, achieve programme targets, and sustain the gains, in resource-poor settings.

Introduction

The 1978 Declaration of Alma-Ata¹ advocated primary health care (PHC) as the main strategy to achieve the goal of health for all.² The principles underlying PHC systems continue to be recognised as essential to the achievement of universal health coverage (UHC).^{3,4} However, the debate between advocates of comprehensive PHC approaches and those of more targeted strategies represents an ongoing challenge.^{5,6} Some have argued that comprehensive PHC is too idealistic and expensive, and that UHC should be pursued with a more selective model that focuses on diseases with cost-effective interventions.^{7,8}

As a result, during the past two decades, there has been an increase in the number of disease control programmes (DCPs) and disease-specific global-health initiatives (GHIs) that leverage additional resources for targeted health interventions.⁹ Estimates suggest that The Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund), the President's Emergency Plan for AIDS Relief (PEPFAR), and the World Bank have contributed more than two-thirds of all development assistance for health (DAH) to prevent and control HIV/AIDS, tuberculosis, and malaria in resource-poor settings.^{10,11}

Since 2005, GHIs have provided Ethiopia with substantial resources to support DCPs. However, the implementation of these DCPs was soon found to be compromised by underlying weaknesses in the Ethiopian health system, and the strategy of targeted funding was found to undermine efforts to strengthen the health system.¹² Criticisms have also been raised by the global health community that weak health systems hinder progress towards DCP targets and that GHIs overburden already fragile health systems.¹³ Acknowledging these issues, key GHIs—ie, PEPFAR, The Global Fund, and

Gavi, the Vaccine Alliance (Gavi)—have collaborated with other donors to increase their financial support towards health-systems strengthening,¹³ in what has been called the diagonal investment approach.^{14,15}

A diagonal investment approach is a proactive and balanced approach that concurrently strengthens PHC systems and scales up DCPs. The diagonal investment approach addresses the requirements of specific priorities while providing opportunities for strengthening health systems.^{16–18} The approach has been employed in Mexico, where specific intervention priorities (such as

Search strategy and selection criteria

We reviewed the medical literature within the framework of the objectives of this Review, which were to understand what contributed to strengthen the primary health-care systems in Ethiopia and how this process happened. We searched the PubMed, Embase, and Google Scholar databases. We extracted data on health expenditure and related statistics from databases or webpages of WHO; the World Bank; The Global Fund to Fight AIDS, Tuberculosis, and Malaria; and Gavi, the Vaccine Alliance. We used the search terms “primary health care”, “health financing”, “health systems strengthening”, “human resources for health”, “supply chain management”, “laboratory”, “disease control programs”, “vertical programs”, “horizontal integration”, “global health initiatives”, “development assistance”, “health outcomes”, “diagonal”, “effectiveness”, “sustainability”, and “Ethiopia”. We included peer-reviewed papers and official reports from the government and global health initiatives to analyse the trend in health-care financing and health outcomes over time. Only articles published in English between 1980 and 2018 were included.

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Key messages

- Weak primary health-care (PHC) systems have hindered progress in meeting the targets of programmes in resource-poor settings
- Ethiopia has embraced a diagonal investment approach to strengthen its PHC systems and scale up disease control programmes (DCPs); this approach has led to increased PHC-system capacity and has improved programme coverage and health status
- Despite the decrease in development assistance for health, Ethiopia has sustained its financial support for health and has promoted PHC systems' capacity with increased domestic resources (such as public, private, and out-of-pocket funds)
- The lessons from Ethiopia have implications for future investments on DCPs so that effective, sustainable, and resilient PHC systems can be built to progressively realise universal health coverage in resource-poor settings

See Online for appendix

Panel: Primary health-care units of Ethiopia

Primary health-care (PHC) units comprise five satellite health posts, a referral health centre, and a primary hospital. A primary hospital provides inpatient and ambulatory services to an average population of 100 000. The primary hospital is also a referral centre for close health centres and a practical training centre for nurses and other paramedical professionals.^{20,21} A health centre provides both preventive and curative services to approximately 25 000 people,^{22,23} accepts referrals from the five health posts, and offers training for health-extension workers.^{24,25}

The Health Extension Programme (HEP) is an innovative community-based programme to deliver preventive and promotive services and selected high-impact curative interventions at the community and household levels. This programme was introduced in 2003 to enhance PHC services, especially for the rural population.²⁶ The HEP includes 17 packages under four main categories: hygiene and environmental sanitation, disease prevention and control, family health services, and health education and communication.²⁷ These are delivered at health posts at the village (locally called Kebele) level to an average 5000 people.²⁸ The health-extension workers, who manage the health posts, report to health centres and village administrations. The HEP has substantially improved the knowledge, attitudes, and practices of rural people on hygiene, environmental sanitation, disease prevention, and family health.²⁹

For more on the HEP see <http://www.uhep.jsi.com/>

immunisation services) were used to drive improvements to the health system.^{14,15} Other resource-poor countries, such as Rwanda and Malawi, have also benefited from this approach as HIV/AIDS investments have been channelled to strengthen health systems.^{13,19}

With this Review, we aim to present the experience of Ethiopia as a case study of how diagonal investments from key GHIs can be used to broaden funding effectiveness (ie, the degree to which the objectives of targeted and complementary health systems are achieved) and sustainability (ie, the ability to maintain achievements at the desired standard after the intervention is completed). Our manuscript combines a narrative review of both published and grey literature and a quantitative analysis of national programmes and health-account data from government offices and financial-disbursement data from GHIs.

Advocacy for strengthening primary health-care systems in Ethiopia

Ethiopia's health-service delivery is structured in a three-tier system: primary, secondary, and tertiary levels. The primary level is the most accessible service-delivery point, where basic health care is provided and managed (panel, figure 1, and appendix).^{24,30}

Since 2005, the Ministry of Health (MOH) of Ethiopia has embraced the vision, committed to, and sustained the technical requirements for the establishment of strong PHC systems. To reconcile the divergence between DCPs and health systems, and to make DAH effective and sustainable, Ethiopia implemented a diagonal approach. Dr Tedros Adhanom Ghebreyesus, former minister of health of Ethiopia (2005–12), now director general of WHO, actively promoted PHC as the preferable way to extend health-service coverage. Dr Tedros argued that the weakness of health systems was one of the greatest challenges that would be addressed through strategic strengthening of PHC systems and a community-based Health Extension Programme (HEP).³¹ This advocacy led to a series of discussions with development partners, including The Global Fund, PEPFAR, Gavi, and others, which acknowledged that the country could not expand services from DCPs without strengthening the PHC system.

As a result, these GHIs have used a diagonal investment approach in Ethiopia.¹⁷ Gavi introduced a health-systems support programme in 2007 to help countries expand immunisation services by addressing critical health-system constraints such as infrastructure, supply chain, human resources, and information systems.³² The Global Fund's 2008 institutional strategy reaffirmed its commitment to support country-led health-system strengthening initiatives.³³

The commitment of GHIs and successive MOH administrations to strengthen the PHC system has been maintained. Subsequently, the MOH and its partners developed a policy document to coordinate GHIs for the implementation of the health-sector development plan. This document provides details about the one-plan, one-budget, and one-report model to successfully implement the plan. The creation of the Millennium

Development Goals (MDGs, currently replaced by the Sustainable Development Goals [SDGs])³⁴ performance pool fund, based on the International Health Partnership Compact framework, formalised structures to enable direct contributions from donors into a pooled fund for health-systems strengthening. This fund has provided flexible resources for critical services with funding gaps at the PHC-unit level. The major contributors were the Department for International Development (43.9%), Gavi (20.1%), and the Netherlands Embassy (15.4%). The Global Fund and PEPFAR did not contribute to the pool.³⁵

Health-care financing in Ethiopia

Ethiopia's health sector is financed by multiple sources including the government treasury, bilateral and multi-lateral donors, household out-of-pocket expenditures, non-governmental organisations, and private and para-statal employers.^{36,37} Substantial resources have been mobilised from different GHIs, such as The Global Fund, Gavi, the US Government, and other sources. This increase in resources has resulted in a marked growth in total health expenditure,^{35,38} which has increased from US\$357 million in 2000, to more than \$2.4 billion in 2015 (ie, about seven times its initial value).³⁹ The per-capita spending on health—which includes both domestic and external sources—increased from \$4.1 in 1995–96, to \$28.7 in 2013–14 (ie, about seven times its initial value), at an average annual growth rate of about 12% (figure 2).⁴⁰ Most of the spending occurs at the PHC units, consistently with the effort to strengthen PHC systems.⁴¹ In 2013–14, the PHC units received 54% of the total government recurrent expenditure, with 43% of the recurrent government health expenditure spent on health centres and health posts, and 26% of the recurrent government health expenditure spent on hospitals.⁴²

DAH is estimated to make up 73% of government expenditure on PHC.⁴³ The contributions from GHIs increased from 16% of the total health expenditure in 1995, to 50% of the total health expenditure in 2010. PEPFAR, The Global Fund, and Gavi have been the major contributors to the health sector. PEPFAR donated \$2.75 billion between 2007 and 2017, The Global Fund donated \$2 billion between 2003 and 2018 (which represents an average of 13.5% of the total health expenditure per annum and peaked at 20% of the total health expenditure in 2010),⁴⁴ and Gavi donated \$940 million between 2000 and 2018.⁴⁵

These GHIs focus on reducing the burden of HIV, malaria, and tuberculosis, ensuring the availability of essential PHC services, and achieving key MDGs. The largest donors to Ethiopia's HIV response are PEPFAR (51%) and The Global Fund (26%). The Global Fund is the largest contributor to the malaria programme (41%), and the US President's Malaria Initiative contributes 27%. Close to 24% of the tuberculosis programme

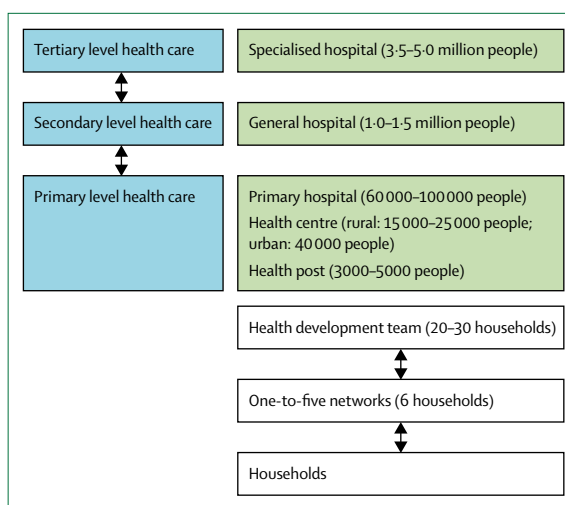


Figure 1: Ethiopian health-care delivery tiers

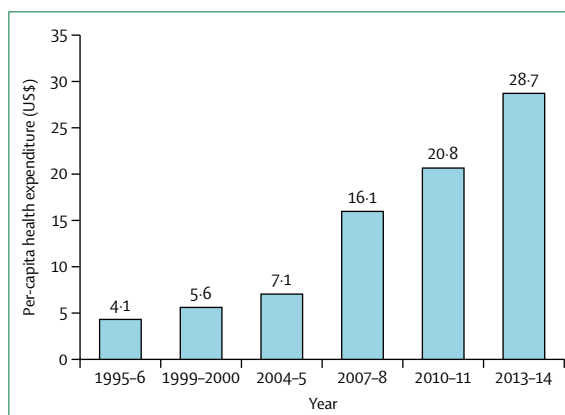


Figure 2: Trend in per-capita health expenditure in Ethiopia, from 1995–96 to 2013–14

is financed by The Global Fund and 18% by the US Government.⁴⁶

Strengthening the primary health-care systems in Ethiopia

Ethiopia has been designing and implementing several reforms, such as the business-process re-engineering (ie, analysis and renewed design of workflows and structures).⁴⁷ These reforms have resulted in the development of system-wide strategies: the Pharmaceutical Logistic Master Plan, the Laboratory Master Plan, the Health-Management Information Reform Scale-Up, the Health-Sector Financing Reform and Health Insurance, the Human Resource For Health (HRH) strategy, and second-generation HEP.^{48,49} These reforms and initiatives have also been accompanied by strategic investments to strengthen the PHC system and expand access to health services.

The Global Fund, PEPFAR, and Gavi have contributed substantially to the development of the PHC systems.

	2000	2005	2010	2015
MDG 4				
Proportion of children who received all basic vaccinations (%)	17.0%	20.0%	24.0%	39.0%
Under-5 mortality per 1000 livebirths	166	123	88	67
MDG 5				
Contraceptive prevalence (any method, %)	8.0%	15.0%	29.0%	36.0%
Proportion of women who received antenatal care (at least one visit, %)	27.0%	28.0%	34.0%	62.0%
Proportion of births at a facility (%)	5.0%	5.0%	10.0%	26.0%
Proportion of women who received skilled birth attendance (%)	6.0%	6.0%	10.0%	28.0%
Maternal mortality ratio per 100 000 livebirths	871	673	676	412
MDG 6: HIV				
HIV prevalence among pregnant women aged 15–24 years (%)	12.4%	5.6%	2.6%	1.7%
Proportion of people living with HIV/AIDS receiving ART (%)	<1.0%	<1.0%	29.0%	54.3%
MDG 6: tuberculosis				
Tuberculosis incidence per 100 000 people	370	364	349	192
Proportion of tuberculosis cases detected (%)	36.0%	30.0%	42.0%	67.3%
Number of deaths associated with tuberculosis per 100 000 people	56	54	45	25
MDG 6: malaria				
Malaria incidence per 100 000 people per year	3854	2452	2320	1540
Proportion of children younger than 5 years sleeping under insecticide-treated bednets (%)	1.0%	60.2%	64.5%	70.0%
Number of deaths associated with malaria per 100 000 people	32	18	16	10
MDG=Millennium Development Goal. ART=antiretroviral treatment.				
Table: Improvements in selected health indicators (defined under Millennium Development Goals 4, 5, and 6) in Ethiopia, from 2000 to 2015⁷¹				

For instance, Gavi has invested \$254 million (27% of its total support to Ethiopia) on non-vaccine activities (such as cold-chain equipment, injection safety, and health systems) between 2002 and 2018. This donation included \$173 million (18.4% of the total Gavi support to Ethiopia) spent on health-systems strengthening between 2007 and 2018, which was largely focused on the construction of PHC facilities, strengthening of the supply chain and laboratory management, and training PHC staff.⁴⁵ One-third of The Global Fund investments has also been calculated to have been used to support health systems in the period leading up to 2018.^{50,51} In 2015, the Government of Ethiopia and The Global Fund signed a 3-year grant of \$551 million, to strengthen health systems, including supply-chain management, data systems, and training of PHC workers.⁵²

As a result, Ethiopia has made substantial improvements to its health infrastructure, which include the construction and renovation of more than 250 hospitals, 3000 health centres, and 12 000 health posts between 2003 and 2016. Subsequently, the total number of health centres increased from 519 in 2004, to 3727 in 2016, and the total number of health posts increased from 2899 in 2004 to 16 480 in 2016. The total number of hospitals also increased from 146 in 2004 to 394 (more than 60% of them are primary hospitals) in 2016.^{24,35} Ethiopia also used the support from PEPFAR to develop its laboratory system (for example, a national reference laboratory and six regional reference laboratories were

constructed).^{53,54} Some of these regional laboratories have now evolved into fully operational regional public-health institutes.^{35,51,55}

Staffing the increased PHC infrastructure has been a challenge in Ethiopia.^{56,57} The World Health Report 2006⁵⁸ estimated that Ethiopia had a collective density of doctors, nurses, and midwives of 0.25 per 1000 citizens. The country has been implementing a flooding strategy to address its HRH gaps since 2008, which consists in increasing exponentially the number of training facilities and setting ambitious targets for health graduates to ensure an excess of HRH that will not be offset by attrition.^{59,60} In the past decade, the government has allocated up to 4.6% of its GDP on education, which has caused a marked increase in training and education.³⁵ The number of graduates from higher education institutions has increased from 1041 in 2000, to 16 017 (16 times the initial number) in 2013.³⁵ PEPFAR, through its Medical Education Partnership Initiative, has contributed to these developments.⁶¹ The Global Fund and PEPFAR have supported the training of health extension workers and the implementation of the HEP.^{44,52} As a result, the HRH density has increased from 0.25 per 1000 people in 2006, to 1.3 per 1000 people in 2013.³⁵

Logistics and supply chain were recognised as bottlenecks for scaling up PHC services. Therefore, the MOH developed a Pharmaceutical Logistics Master Plan, which led to the establishment of the Pharmaceuticals

Fund and Supply Agency in 2008. This agency became the sole purchaser and distributor of health commodities.⁵⁵ The Global Fund supports the construction of warehouses, the purchase and maintenance of trucks, and the procurement of laboratory and diagnostic equipment that can benefit the entire health system.⁴⁴

The agency's annual distribution capacity increased to six times its initial value between 2010 and 2015. The completion of 17 modern warehouses increased the national storage capacity from 46 260 m³ to 531 000 m³, and the cold-chain storage capacity from 50 m³ to 800 m³. A 2014 national survey indicated that the availability of essential tracer medicines at health facilities increased from 65% in 2006, to 89% in 2014.^{24,62,63}

Ethiopia has upgraded its Health Management Information System, which has been used by the government as a major source of information for decision making since 2008. One of the achievements of this initiative is the introduction of family folders, which provides a great opportunity to strengthen evidence-based planning and service delivery, and establishes the base for vital events registration in the country.⁶⁴ Institutes financed by PEPFAR, such as Tulane University and John Snow, Inc, have supported this national endeavour.⁶⁵

Involvement and empowerment of communities has been the major driver of PHC improvement in Ethiopia. Community engagement has increased considerably since 2003, when the HEP was launched, and has been further enhanced by the initiatives of the Health Development Army.⁶⁶ The Global Fund, PEPFAR, and Gavi have been supporting these initiatives,^{44,45,52} which have played a pivotal role in improving accesses to essential health services.³⁰ This support has also enabled the health sector to mobilise resources from communities, both in kind and in cash, for the construction of health posts, improvement of environmental health, and other activities.^{67,68}

Improved health status in Ethiopia

Enhanced PHC-system capacity through increased and strategic investment, which have accompanied the health-reform initiatives, has substantially improved service coverage and health status in Ethiopia.^{24,30} Given that the MDGs were effective proxies for essential PHC services, Ethiopia achieved most of the health-related MDGs, with a 67% reduction in mortality of children younger than 5 years, a 71% decline in maternal mortality ratio, and a greater than 50% decrease in mortality due to malaria, tuberculosis, and HIV from its 1990 baseline.^{69,70}

Coverage of PHC services and health outcomes have consistently improved between 2000 and 2015, but underwent the most pronounced change since 2010, as improvements in health-systems capacity reached critical mass (table).^{35,69,72,73} Even though it might not be possible to establish a causal link between PHC-system

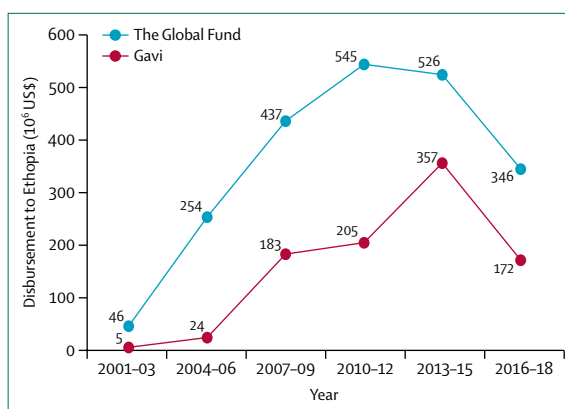


Figure 3: Disbursements from The Global Fund to Fight AIDS, Tuberculosis and Malaria and Gavi, the Vaccine Alliance (Gavi) to Ethiopia, 2002–18

strengthening and health-status improvements, there is evidence of temporal association between the two: access to services and their use have progressively increased in the country since its PHC-service capacity started to improve.^{74–80} Moreover, progress accelerated after 2005, when the annual rate of reduction in mortality of children younger than 5 years increased from 3·3% in 1990–2005, to 7·8% in 2005–13.⁷² However, it is important to note that the improved PHC-service capacity has benefited only strong vertical programmes, but not weaker ones, such as the non-communicable diseases programmes.⁸¹ Furthermore, we acknowledge that the improvements in health status are also partly due to progress in the socioeconomic status in the country.⁷⁰

Despite these successes, Ethiopia still faces challenges to achieve equity and offer quality services in health, which need to be addressed within the SDGs framework. Towards this objective, the country has developed a health transformation plan that aims to sustain the gains achieved through the MDGs and address the equity and quality gaps. The leadership, once again, has recognised that further transformation of the PHC system is fundamental to sustain the gains and achieve UHC.²⁴

Decreasing development assistance for health in Ethiopia

Ethiopia is now experiencing a decline in DAH (figure 3). The share of DAH for the total health expenditure has also decreased from 50% in 2010–11, to 36% in 2013–14.⁴² This decline is substantial, since the cuts in funding from The Global Fund (which contributes 59% of the total DAH) and PEPFAR (which contributes 30% of the total DAH) have resulted in a combined decrease of total funding of almost 50%.^{82,83} The national health accounts⁴² indicate that the resources for HIV/AIDS decreased from 20% of the total health expenditure in 2007–08, to 10% of the total health expenditure in 2013–14, because of the decline in the DAH contributions

(particularly from PEPFAR and The Global Fund), which decreased from 86% of HIV/AIDS funding in 2007–08, to 20% in 2013–14. The funding from PEPFAR declined from \$894 million in 2007–09, to \$710 million in 2013–15.^{82,84} The support from Gavi has also started to decline since 2015 (figure 3).^{45,51}

The rapidly decreasing assistance from PEPFAR and The Global Fund has mainly affected the supply-chain and laboratory system, the functioning of the AIDS resource centre, the HIV/AIDS advanced clinical monitoring systems, and mentorship activities, and has caused qualified staff, both internal and external, to leave the country.⁸⁵ These effects could have implications for quality of care. For example, commodities for the laboratory programme have declined to the point that some services (such as clinical chemistry) have become unavailable to people living with HIV/AIDS and the public. Activities such as laboratory quality assurance and specimen referral are downsizing. Quality assurance for HIV rapid testing can only be implemented in 54% of HIV testing points. The specimen-transportation service has decreased by more than 45%.⁸⁶

MOH personnel and external analysts have become seriously concerned that the decline in DAH and technical support will affect the continuity of service delivery and compromise the gains already achieved.⁸² Others, such as PEPFAR, contend that Ethiopia can substantially support further development of its PHC services, regardless of reduced external support.⁴³ In light of these critiques, we analyse any available evidence of sustainability of the investments made thus far and we identify the most vulnerable areas of progress, as the country is facing a decrease in support from its major global-health partners.

Sustaining the gains from investments by GHIs in Ethiopia

Ethiopia has visibly stronger health systems now than a decade ago. The remarkable progress that has been made can be identified, in particular, in the increased number of PHC facilities and HRH, the improvements to the supply-chain management, and the decentralisation of services.^{24,35} Furthermore, programme activities have been transferred from PEPFAR to local authorities smoothly, so that continuity of care will not be compromised.^{87,88} This successful transition was possible because of the increased number and capacity of health workers in the PHC system.³⁵

Other factors have also contributed to sustain the PHC systems. The per-capita health expenditure and the total health expenditure have continued to increase even after the drop in DAH since 2010–11 (figure 1).³⁹ The share of the total health expenditure coming from domestic sources (which include public, private, and out-of-pocket funds) has increased substantially, from about 50% of the total health expenditure in 2010–11, to almost 64% in 2013–14. Government spending on health increased

substantially (to 257% its initial value), as did its contribution to the total health expenditure, which increased from 16% to 30% between 2010–11 and 2013–14. Health spending increased from 4.5% of general government expenditure in 2007–08, to 6.7% in 2013–14.⁴²

Household out-of-pocket spending is also a major source of financing for health. It has almost doubled in absolute terms, but its contribution to the total health expenditure has remained essentially the same, decreasing only slightly from 34.0% in 2010–11, to 33.0% in 2013–14.⁴² The substantial increase in domestic financing and its share of overall spending on health is encouraging; however, the excessive out-of-pocket spending on health is a real concern because it precludes the country from gradual progression towards UHC. The introduction of community-based health insurance and social health insurance is designed to address the challenge of high out-of-pocket spending during use of health services.^{37,89} To achieve UHC, the country needs to accelerate the implementation of initiatives for health insurance, while also advocating for increased allocation of funds from public-sector budgets and development partners to the PHC system.⁹⁰

A projection model that was used to estimate Ethiopia's ability to finance its PHC system indicated that the country can substantially support further development of PHC services even if external support is decreasing.⁴³ The projection shows that the increasing out-of-pocket payments represent a challenge of concern. The possibility of addressing this concern will largely depend on substantial economic growth, increased mobilisation of government funding for PHC, and efficient use of resources.⁴³

Finally, we would like to underline that health-development initiatives in Ethiopia have benefited from socioeconomic development, peace, and stability in the country. However, we currently observe that there are instabilities that might compromise the gains achieved thus far. The political turmoil in the country, which has been ongoing since 2015, might challenge the financial support to the health system, the ability to retain the health workforce, the distribution of supplies to health facilities, and the overall possibility of providing health services. Hence, the country's pursuit of UHC and SDG 3 (ie, "ensure healthy lives and promote wellbeing for all at all ages")⁹¹ is at risk again.⁹² To face this risk, all concerned bodies need to fundamentally rethink every action and weigh their benefits and drawbacks toward democratisation, social justice, and economic equity.

Conclusions

A diagonal investment approach has enabled Ethiopia to attain both short-term goals (ie, MDGs 4, 5, and 6) and long-term goals (ie, strengthened PHC system).⁷⁰ It is commendable that the government is responding to a decrease in DAH with additional domestic resources, which are essential to sustain the gains that have been

achieved in health development. However, achieving UHC necessitates greater and more consistent political awareness and commitment than has been displayed thus far, increased government expenditure, and reduced out-of-pocket payments. The reduction of out-of-pocket expense, moreover, requires overall socioeconomic development, which includes the achievement of social justice and peace in the country. The lessons learnt from Ethiopia's efforts to improve the country's health services can affect future investments on DCPs that already exist, are emerging, or are re-emerging, and thus help countries to build effective, sustainable, and resilient PHC systems towards a progressive achievement of UHC.^{50,93}

Contributors

YA and PSH conceived the Review. YA collected and analysed the data and drafted the Review. DT assisted in data collection and provided comments during revision. WVD provided comments during revision. PSH supervised the entire writing process and provided comments during revision. All authors approved the final version of the Review for submission.

Declaration of interests

We declare no competing interests.

References

- WHO. Declaration of Alma-Ata. Sept 12, 1978. http://www.euro.who.int/__data/assets/pdf_file/0009/113877/E93944.pdf (accessed March 25, 2018).
- WHO. The world health report 2008: primary health care (now more than ever). Geneva: World Health Organisation, 2008. <http://www.who.int/whr/2008/en/> (accessed March 25, 2018).
- The Lancet. The NHS at 70 and Alma-Ata at 40. *Lancet* 2018; **391**: 1.
- Hall J, Taylor R. Health for all beyond 2000: the demise of the Alma-Ata Declaration and primary health care in developing countries. *Med J Aust* 2003; **178**: 17.
- Navarro V. A critique of the ideological and political position of the Brandt Report and the Alma Ata Declaration. *Int J Health Serv* 1984; **14**: 159–72.
- Cueto M. The origins of primary health care and selective primary health care. *Am J Public Health* 2004; **94**: 1864–74.
- Magnussen L, Ehiri J, Jolly P. Comprehensive versus selective primary health care: lessons for global health policy. *Health Aff (Millwood)* 2004; **23**: 167–76.
- Walsh JA, Warren KS. Selective primary health care: an interim strategy for disease control in developing countries. *Soc Sci Med C* 1980; **14**: 145–63.
- Dieleman JL, Haakenstad A, Micah A, et al. Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995–2015. *Lancet* 2018; **391**: 1799–829.
- Sherry J, Mookherji S, Ryan L. The five-year evaluation of The Global Fund to Fight AIDS, Tuberculosis, and Malaria: synthesis of study areas 1, 2 and 3. Geneva: The Global Fund to Fight AIDS, Tuberculosis, and Malaria, 2009.
- Oomman N, Bernstein M, Rosenzweig S. Following the funding for HIV/AIDS: a comparative analysis of the funding practices of PEPFAR, The Global Fund and World Bank MAP in Mozambique, Uganda and Zambia. Washington, DC: Center for Global Development, 2007.
- Banteyerga H, Kidanu A, Bennett S, Stillman K. The system-wide effects of The Global Fund in Ethiopia: baseline study report. 2005. https://www.theglobalfund.org/media/1521/library_iepnadf194_report_en.pdf?u=636486807000000000 (accessed March 27, 2018).
- WHO. Maximizing Positive Synergies Collaborative Group. An assessment of interactions between global health initiatives and country health systems. *Lancet* 2009; **373**: 2137–69.
- Sepúlveda J, Bustreo F, Tapia R, et al. Improvement of child survival in Mexico: the diagonal approach. *Lancet* 2006; **368**: 2017–27.
- Frenk J. Bridging the divide: global lessons from evidence-based health policy in Mexico. *Lancet* 2006; **368**: 954–61.
- Frenk J. The global health system: strengthening national health systems as the next step for global progress. *PLoS Med* 2010; **7**: e1000089.
- Ooms G, Van Damme W, Baker BK, Zeitz P, Schrecker T. The 'diagonal' approach to Global Fund financing: a cure for the broader malaise of health systems? *Global Health* 2008; **4**: 6.
- Ooms G, Hill PS, Assefa Y. Will effective health delivery platforms be built in low-income countries? In: Brown GW, Yamey G, Wamala S, eds. The handbook of global health policy. Chichester: John Wiley & Sons, Ltd, 2014: 441–56.
- Price JE, Leslie JA, Welsh M, Binagwaho A. Integrating HIV clinical services into primary health care in Rwanda: a measure of quantitative effects. *AIDS Care* 2009; **21**: 608–14.
- Ethiopian Standard Agency. Primary Hospital—Requirements. Addis Ababa: Ethiopian Standard Agency, 2012.
- Food, Medicine and Healthcare Administration and Control Authority of Ethiopia. Standard Treatment Guidelines for Primary Hospital. Addis Ababa: Food, Medicine and Healthcare Administration and Control Authority of Ethiopia, 2014.
- Ethiopian Standard Agency. Health Center—Requirements. Addis Ababa: Ethiopian Standard Agency, 2012. <http://www.forsslund.org/StandardHealthFacility/Health%20Center.pdf> (accessed April 29, 2018).
- Drug Administration and Control Authority. Standard treatment guideline for health centers. Addis Ababa: Drug Administration and Control Authority, 2010. <http://apps.who.int/medicinedocs/documents/s17821en/s17821en.pdf> (accessed April 29, 2018).
- Ethiopia Federal Ministry of Health. Health sector transformation plan, 2015/16–2019/20. Addis Ababa: Ethiopia Federal Ministry of Health, 2015. https://www.globalfinancingfacility.org/sites/gff_new/files/Ethiopia-health-system-transformation-plan.pdf (accessed March 23, 2018).
- Teklehaimanot HD, Teklehaimanot A. Human resource development for a community-based health extension program: a case study from Ethiopia. *Hum Resour Health* 2013; **11**: 39.
- Bayou NB, Gacho YHM. Utilization of clean and safe delivery service package of health services extension program and associated factors in rural kebeles of Kafa Zone, Southwest Ethiopia. *Ethiop J Health Sci* 2013; **23**: 79–89.
- Mohan P. Ethiopia Health Sector Development Program. Africa Region Findings & Good Practice Infobriefs; No. 141. Washington, DC: World Bank, 2007. <https://openknowledge.worldbank.org/handle/10986/9549> (accessed April 15, 2018).
- Ethiopian Standard Agency. Health Post—Requirements. Addis Ababa: Ethiopian Standard Agency, 2012. <http://www.forsslund.org/StandardHealthFacility/Health%20Post.pdf> (accessed April 29, 2018).
- Banteyerga H. Ethiopia's health extension program: improving health through community involvement. *MEDICC Rev* 2011; **13**: 46–49.
- Workie NW, Ramana GN. The health extension program in Ethiopia. UNICO Studies Series; No. 10. Washington, DC: World Bank, 2013. <https://openknowledge.worldbank.org/handle/10986/13280> (accessed April 10, 2018).
- Ghebreyesus TA. Ethiopia extends health to its people. *Bull World Health Organ* 2009; **87**: 495–96.
- Global Alliance for Vaccines Initiative. Health systems strengthened in Ethiopia. 2007. <https://www.gavi.org/library/audio-visual/galleries/health-systems-strengthened-in-ethiopia/> (accessed March 15, 2018).
- WHO. The Global Fund strategic approach to health systems strengthening; report from WHO to The Global Fund Secretariat. Geneva: World Health Organization, 2007. http://www.who.int/healthsystems/GF_strategic_approach_%20HS.pdf (accessed March 15, 2018).
- Waddington C, Alebachew A, Chabot J. Roadmap for enhancing the implementation of One Plan, One Budget and One Report in Ethiopia. 2012. https://www.uhc2030.org/fileadmin/uploads/ihp/Documents/Results___Evidence/HAE___results___lessons/Ethiopia%20Roadmap%20enhancing%20one%20plan%20one%20budget%20and%20one%20report%20final.pdf (accessed Aug 3, 2018).

- 35 Ethiopia Federal Ministry of Health. Health sector transformation plan-I; annual performance report. Addis Ababa: Ethiopia Federal Ministry of Health, 2016. [https://www.itacaddis.org/docs/2017_11_10_09_46_13_HEALTH%20SECTOR%20TRANSFORMATION%20PLAN-I%20ANNUAL%20PERFORMANCE%20REPORT%20\(ARM_2016\).compressed.pdf](https://www.itacaddis.org/docs/2017_11_10_09_46_13_HEALTH%20SECTOR%20TRANSFORMATION%20PLAN-I%20ANNUAL%20PERFORMANCE%20REPORT%20(ARM_2016).compressed.pdf) (accessed March 20, 2018).
- 36 United States Agency for International Development. Health care financing reform in Ethiopia: a path to sustainable financing while improving quality and equity. Washington, DC: United States Agency for International Development, 2014. https://www.msh.org/sites/msh.org/files/ethiopia_hcfr_brief_final.pdf (accessed March 15, 2018).
- 37 Zelelew H. Health Care Financing Reform in Ethiopia: Improving Quality and Equity. 2012. https://www.hfgproject.org/wp-content/uploads/2015/02/Ethiopia_Health_Care_Reform_Brief1.pdf (accessed March 17, 2018).
- 38 Ethiopia Federal Ministry of Health. Ethiopia's Fifth National Health Accounts, 2010/2011. Addis Ababa: Ethiopia Federal Ministry of Health, 2014. <http://apps.who.int/nha/database/DocumentationCentre/Index/en> (accessed March 25, 2018).
- 39 Knoema. Ethiopia—Current expenditure on health. 2016. <https://knoema.com/atlas/Ethiopia/topics/Health/Health-Expenditure/Expenditure-on-health> (accessed April 23, 2018).
- 40 The National Bank of Ethiopia. The National Bank of Ethiopia's 2013–14 Annual Report. 2014. http://www.nbebank.com/pdf/annualbulletin/Annual%20Report%202013–2014/Annual%20report%202013_14.pdf (accessed March 18, 2018).
- 41 Black RE, Taylor CE, Arole S, et al. Comprehensive review of the evidence regarding the effectiveness of community-based primary health care in improving maternal, neonatal and child health: 8. summary and recommendations of the Expert Panel. *J Glob Health* 2017; 7: 010908.
- 42 Ethiopia Federal Ministry of Health. Ethiopia Health Accounts, 2013/14. Addis Ababa: Ethiopia Federal Ministry of Health, 2017. <https://www.hfgproject.org/ethiopia-health-accounts-201314/> (accessed March 27, 2018).
- 43 Berman P, Mann C, Ricculi M-L. Can Ethiopia finance the continued development of its primary health care system if external resources decline? *Health Syst Reform* 2018; published online June 21, 2018. DOI:10.1080/23288604.2018.1448240 (preprint).
- 44 Japan Center for International Exchange, Friends of The Global Fund. Case Studies on Global Fund Contributions to Universal Health Coverage. 2015. http://jcie.org/researchpdfs/UHCconference_121115/Studies_Ethiopia.pdf (accessed April 6, 2018).
- 45 Gavi, the Vaccine Alliance. Gavi support for Ethiopia. 2018. <https://www.gavi.org/country/ethiopia/> (accessed April 6, 2018).
- 46 Office of the Inspector General of The Global Fund. Audit report: Global Fund grants to the Federal Democratic Republic of Ethiopia. Geneva: Global Fund to Fight AIDS, Tuberculosis, and Malaria, 2017. https://www.theglobalfund.org/media/6981/oig_gf-oig-17-025_report_en.pdf?u=6679306970000000 (accessed March 20, 2018).
- 47 Ethiopia Federal Ministry of Health. Health Sector Development Program IV, 2010/11–2014/15. Addis Ababa, Ethiopia Federal Ministry of Health, 2010. <http://tucghe.org/HSDP%20IV.pdf> (accessed Aug 5, 2018).
- 48 President's Emergency Plan for AIDS Relief. Ethiopia operational plan report; FY 2011. Washington, DC: President's Emergency Plan for AIDS Relief, 2012. <https://www.pepfar.gov/documents/organization/199726.pdf> (accessed March 21, 2018).
- 49 United States Agency for International Development. President's Emergency Plan For AIDS Relief (PEPFAR). 2018. <https://www.usaid.gov/ethiopia/hivaida/> (accessed April 6, 2018).
- 50 The Global Fund to Fight AIDS, Tuberculosis, and Malaria. Results report 2017. Geneva: The Global Fund to Fight AIDS, Tuberculosis, and Malaria, 2017. https://www.theglobalfund.org/media/6773/corporate_2017resultsreport_report_en.pdf (accessed April 6, 2018).
- 51 The Global Fund to Fight AIDS, Tuberculosis, and Malaria. Ethiopia: Overview. 2018. <https://www.theglobalfund.org/en/portfolio/country/?k=5061c5f2-1100-4eed-9cff-83787e240c78&loc=ETH> (accessed April 6, 2018).
- 52 The Global Fund to Fight AIDS, Tuberculosis, and Malaria. Country impact report. Geneva: The Global Fund to Fight AIDS, Tuberculosis, and Malaria, 2016. https://www.theglobalfund.org/media/5916/publication_ethiopiaimpact_report_en.pdf?u=636486807180000000 (accessed March 25, 2018).
- 53 Kebede Y, Fonjongo PN, Tibesso G, et al. Improved specimen-referral system and increased access to quality laboratory services in Ethiopia: the role of the public-private partnership. *J Infect Dis* 2016; 213: S59–64.
- 54 Hiiwotu TM, Ayana G, Mulugeta A, et al. Laboratory system strengthening and quality improvement in Ethiopia. *Afr J Lab Med* 2016; 3: 1–6.
- 55 Tadesse D, Jamieson D, Cochrane L. Strengthening public health supply chains in Ethiopia: PEPFAR-supported expansion of access and availability. *Dev Pract* 2015; 25: 1043–56.
- 56 Girma S, Yohannes A, Kitaw Y, et al. Human resource development for health in Ethiopia: challenges of achieving the Millennium Development Goals. *Ethiop J Health Dev* 2007; 21: 216–31.
- 57 Chen L, Evans T, Anand S, et al. Human resources for health: overcoming the crisis. *Lancet* 2004; 364: 1984–90.
- 58 WHO. The world health report 2006: working together for health. 2006. <http://www.who.int/whr/2006/en/> (accessed March 22, 2018).
- 59 WHO, Global Health Workforce Alliance. Case study: scaling up education and training of human resources for health in Ethiopia. Geneva: World Health Organization, 2010. http://www.who.int/workforcealliance/knowledge/case_studies/ethiopia_case_study_2010.pdf (accessed March 22, 2018).
- 60 WHO, Global Health Workforce Alliance. Country case study: Ethiopia's human resources for health programme. Geneva: World Health Organization, 2008. http://www.who.int/workforcealliance/knowledge/case_studies/Ethiopia.pdf (accessed April 29, 2018).
- 61 Mullan F, Frehywot S, Omaswa F, et al. The Medical Education Partnership Initiative: PEPFAR's effort to boost health worker education to strengthen health systems. *Health Aff (Millwood)* 2012; 31: 1561–72.
- 62 Tesfaye D. The study of Ethiopia public health supply chain management: before and after pharmaceuticals fund and supply agency (PFSA). 2015. <http://repository.smuc.edu.et/bitstream/123456789/1734/1/DESSALEGN%20TESFAYE.pdf> (accessed April 29, 2018).
- 63 Fenta TG, Gulilat B, Teshome D, Sebsibe F, Assefa T. Outcome of auditable pharmaceutical transactions and services implementation: assessment report. Addis Ababa: Ethiopia Federal Ministry of Health, Ethiopian Pharmaceutical Association, and Systems for Improved Access to Pharmaceuticals and Services, October, 2016. <http://siapsprogram.org/publication/altview/outcome-of-auditable-pharmaceutical-transactions-and-services-implementation-assessment-report/english/> (accessed April 30, 2018).
- 64 Belay H, Azim T, Kassahun H. Assessment of Health Management Information System (HMIS) Performance in SNNPR, Ethiopia. 2014. https://pdf.usaid.gov/pdf_docs/pa00k27k.pdf (accessed March 24, 2018).
- 65 Health Management Information System Reform Team. Health Management Information System (HMIS)/Monitoring and Evaluation (M&E): strategic plan for Ethiopian health sector. Addis Ababa: Ethiopia Federal Ministry of Health, 2008. http://phe-ethiopia.org/resadmin/uploads/attachment-58-Health_Management_Information_System_%28HMIS%29.pdf (accessed March 24, 2018).
- 66 Teklehaimanot H, Teklehaimanot A, Tolera B, Getachew M, Abdella M. Health Development Army network, Ethiopia. 2016. <http://www.3ieimpact.org/en/funding/thematic-window/increasing-immunisation-thematic-window/health-development-army-network-ethiopia/> (accessed March 28, 2018).
- 67 Participedia. Community Based Health Insurance in Ethiopia. 2017. <https://participedia.net/en/cases/community-based-health-insurance-ethiopia> (accessed March 28, 2018).
- 68 Wang H, Tesfaye R, Ramana GN, Chekagn CT. Ethiopia health extension program: an institutionalized community approach for universal health coverage. Washington, DC: World Bank Group Publications, 2016.

- 69 Assefa Y, Van Damme W, Williams OD, Hill PS. Successes and challenges of the millennium development goals in Ethiopia: lessons for the sustainable development goals. *BMJ Glob Health* 2017; 2: e000318.
- 70 Tadesse M, Defar A, Getachew T, et al. Countdown to 2015: Ethiopia's progress towards reduction in under-five mortality: 2014 country case study. Addis Ababa: Ethiopian Public Health Institute, 2015. <https://www.ephi.gov.et/images/pictures/Ethiopia%20Countdown%20%20Case%20Study%20Final%20Report.pdf> (accessed March 27, 2018).
- 71 The DHS Program, United States Agency for International Development. Demographic and Health Surveys in Ethiopia. 2016. <https://dhsprogram.com/what-we-do/survey/survey-display-478.cfm> (accessed March 27, 2018).
- 72 Ruducha J, Mann C, Singh NS, et al. How Ethiopia achieved Millennium Development Goal 4 through multisectoral interventions: a Countdown to 2015 case study. *Lancet Glob Health* 2017; 5: e1142–51.
- 73 Ethiopian Public Health Institute, Ethiopia Federal Ministry of Health, WHO. Services Availability and Readiness Assessment, 2016. Addis Ababa: Ethiopian Public Health Institute, 2017. <https://www.washinhc.org/documents/Final-SARA-Report-Jan-2017.pdf> (accessed April 29, 2018).
- 74 Yitayal M, Berhane Y, Worku A, Kebede Y. The community-based Health Extension Program significantly improved contraceptive utilization in West Gojjam Zone, Ethiopia. *J Multidiscip Healthc* 2014; 7: 201–08.
- 75 Medhanyie A, Spigt M, Kifle Y, et al. The role of health extension workers in improving utilization of maternal health services in rural areas in Ethiopia: a cross sectional study. *BMC Health Serv Res* 2012; 12: 352.
- 76 Koblinsky M, Tain F, Gaym A, Karim A, Carnell M, Tesfaye S. Responding to the maternal health care challenge: the Ethiopian Health Extension Program. *Ethiop J Health Dev* 2010; 24: 105–09.
- 77 Datiko DG, Lindtjorn B. Health extension workers improve tuberculosis case detection and treatment success in southern Ethiopia: a community randomized trial. *PLoS One* 2009; 4: e5443.
- 78 Karim AM, Admassu K, Schellenberg J, et al. Effect of Ethiopia's health extension program on maternal and newborn health care practices in 101 rural districts: a dose-response study. *PLoS One* 2013; 8: e65160.
- 79 Bilal NK, Herbst CH, Zhao F, Soucat A, Lemiere C. Health extension workers in Ethiopia: improved access and coverage for the rural poor. Chuhan-Pole P, Angwafo M, eds. Yes Africa can: success stories from a dynamic continent. Washington, DC: The International Bank for Reconstruction and Development/The World Bank, 2011: 433–43.
- 80 Hermann K, Van Damme W, Pariyo GW, et al. Community health workers for ART in sub-Saharan Africa: learning from experience—capitalizing on new opportunities. *Hum Resour Health* 2009; 7: 31.
- 81 Getachew T, Bekele A, Amenu K, et al. Service availability and readiness for major non-communicable diseases at health facilities in Ethiopia. *Ethiop J Health Dev* 2017; 31: 384–90.
- 82 Glassman A. Ethiopia's AIDS Spending Cliff. 2012. <https://www.cgdev.org/blog/ethiopia%E2%80%99s-aids-spending-cliff> (accessed March 26, 2018).
- 83 Federal HIV/AIDS Prevention and Control Office. HIV/AIDS strategic plan: 2015–2020 in an investment case approach. Addis Ababa: Ethiopia Federal Ministry of Health, 2014. <http://hivhealthclearinghouse.unesco.org/sites/default/files/resources/22292.pdf> (accessed March 26, 2018).
- 84 Science Speaks. PEPFAR Funding Allocations: FY2011-FY2013. 2012. <http://sciencespeaksblog.org/wp-content/uploads/2012/04/PEPFAR-Country-Allocations-FY11-131.pdf> (accessed March 27, 2018).
- 85 Ethiopian Public Health Institute. The 2nd BSC Based EPHI's Strategic Management Plan (2015/16 to 2019/20). Addis Ababa: Ethiopian Public Health Institute, 2015. https://www.ephi.gov.et/images/pictures/download2009/EPHI_2nd_SPM.pdf (accessed April 30, 2018).
- 86 President's Emergency Plan for AIDS Relief Ethiopia. Ethiopia, Country/Regional Operational Plan (COP/ROP) 2017: Strategic Direction Summary. Washington, DC: President's Emergency Plan for AIDS Relief, 2017. <https://www.pepfar.gov/documents/organization/272012.pdf> (accessed April 27, 2018).
- 87 Palen J, El-Sadr W, Phoya A, et al. PEPFAR, health system strengthening, and promoting sustainability and country ownership. *J Acquir Immune Defic Syndr* 2012; 60: S113–19.
- 88 Kassie GM, Belay T, Sharma A, Feleke G. Promoting local ownership: lessons learned from process of transitioning clinical mentoring of HIV care and treatment in Ethiopia. *Front Public Health* 2018; 6: 14.
- 89 Feleke S, Mitiku W, Zelelew H, Ashagari TD. Ethiopia's community-based health insurance: a step on the road to universal health. 2015. <https://www.hfgproject.org/ethiopia-community-based-health-insurance-step-road-universal-health-coverage/> (accessed March 27, 2018).
- 90 African strategies for health. Health financing profile: Ethiopia. 2016. http://www.africanstrategies4health.org/uploads/1/3/5/3/13538666/country_profile_-_ethiopia_us_letter.pdf (accessed April 23, 2018).
- 91 The World Health Organization. Sustainable Development Goals (SDGs). 2018. <http://www.who.int/sdg/targets/en/> (accessed March 25, 2018).
- 92 British Broadcasting Corporation. Ethiopia declares national state of emergency. 2018. <https://www.bbc.com/news/world-africa-43091248> (accessed April 6, 2018).
- 93 Ooms G, Beiersmann C, Flores W, et al. Synergies and tensions between universal health coverage and global health security: why we need a second 'Maximizing Positive Synergies' initiative. *BMJ Glob Health* 2017; 2: e000217.

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