# Learning from the health scale up under the Millennium Development Goals (MDGs)

How global health moved towards the MDGs

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## Abstract

The health sector has mounted the most coordinated, sophisticated, and ultimately successful campaigns and partnerships to pursue the Millennium Development Goals (MDGs). As part of a global partnership without central coordination, global and national organizations collaborated in pursuit of the goals. This paper identifies five components of this global partnership: (i) shared goals and metrics, (ii) back-castings and policy standards, (iii) international funding mechanisms and national implementation, (iv) evidence-based advocacy, and (v) a strong evidence base, monitoring & evaluation, and technology development. Other priorities under the Sustainable Development Goals (SDGs), such as education, smallholder farming, and access to basic infrastructure lack similar partnerships and organization. The paper proposes how, drawing on the experiences of the health sector, these sectors can strengthen their organization in pursuit of the SDGs. Just as happened in global health in the early 2000s, private philanthropy and development funders can help close implementation gaps that inhibit faster progress towards the SDGs.

## About the SDSN

The UN Sustainable Development Solutions Network (SDSN) mobilizes scientific and technical expertise from academia, civil society, and the private sector to support practical problem solving for sustainable development at local, national, and global scales. The SDSN has been operating since 2012 under the auspices of the UN Secretary-General. The SDSN is building national and regional networks of knowledge institutions, solution-focused thematic networks, and the SDG Academy, an online university for sustainable development.

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The health sector has mounted the most coordinated, sophisticated, and ultimately successful campaigns and partnerships to pursue the Millennium Development Goals (MDGs). The fight against child mortality, maternal mortality, and the three major infectious diseases (HIV/AIDS, malaria, and tuberculosis) has experienced the fastest acceleration of progress following the adoption of the goals in 2001, particularly in some of the poorest countries. Even if the numerical MDG targets for MDG 4 (child mortality) and MDG 5 (maternal mortality) were not fully achieved (UN, 2015), the gains were remarkable. At least 8.8 million additional child deaths were averted compared with a business-as-usual scenario (McArthur and Rasmussen, 2018).

Yet around 2000 it seemed unlikely that public health outcomes would improve as dramatically as they have. Incidence and mortality from malaria, tuberculosis, and HIV/AIDS were rising rapidly, particularly in Africa. Even though advanced treatment and control methods were available in industrialized countries, it was widely thought they could not be deployed in poor countries, for reasons of cost, efficacy, corruption, or even the incapacity of Africans to adhere to drug regimens. This applied particularly to HIV/AIDS. For example, a major review of the disease in Africa published in the journal *Science* did not mention the word 'treatment' (Binswanger, 2000), and the head of USAID famously declared that treatment was impossible in Africa (The Boston Globe, 2001). Standard treatments for malaria and tuberculosis were losing their efficacy, and the tools that proved critical in reversing the spread of major diseases were unavailable or largely unknown. Examples included Directly-Observed Treatment Short-course (DOTS) for tuberculosis, low-cost artemisinin combination therapy (ACT) to treat malaria, long-lasting insecticidal bed nets (LINs) to control the transmission of malaria, rapid diagnostic tests for malaria, and many more.

Of course, isolated successes had been achieved in health by 2000, including the widespread immunization of children (Shann and Steinhoff, 1999) and substantial progress against polio, river blindness, and other neglected diseases (WHO, 2000). Yet, rapid progress towards achieving the Millennium Development Goals, particularly MDG 6 on infectious diseases, seemed improbable in 2000. This pessimistic view was proven wrong by bold leaders and innovators that created the global partnership for health.

The bold leaders included Secretary-General Kofi Annan, who spearheaded the scale-up under the umbrella of the Millennium Development Goals; WHO Director-General Gro Harlem Brundtland, who mobilized the WHO into action; President Olusegun Obasanjo, who called two Africa-wide summits on malaria (2000) and HIV//AIDS (2001) to mobilize political action; the AIDS activist community, who kept on relentless pressure for action; Bono, who used his celebrity to mobilize public support; President George W. Bush, Jr., who committed US funding to the fight against AIDS, TB, and malaria; AIDS doctors, including Paul Farmer and Bruce Walker, who were early champions of treatment coverage for the poor; and Jeffrey D. Sachs, who chaired the WHO Commission on Macroeconomics and Health and the UN Millennium Project, and who made the analytical case for scaling up public-health financing and multi-donor funding through a global fund.  Countless others made important contributions, of course including the scientists who brought forth the new medicines, diagnostics, and expert systems that made effective action possible.

Without high-level leaders working closely together, none of the rest of the actions discussed below could have worked. The leaders made decisive contributions to changing public minds, public policies, and public financing. In turn, those efforts enabled the public health community to organize a highly professional, accountable, transparent, and successful response. Alas, even with the successes to date, the ongoing funding for public health and the Sustainable Development Goals generally, remains inadequate, as described below.

Drawing on earlier studies (Schmidt-Traub and Sachs, 2015), this paper reviews the ecosystem of organizations that together transformed global health and outlines implications for other investment priorities under the Sustainable Development Goals (SDGs). Section 1 describes five components of the global partnership for health and how they interacted to achieve time-bound goals. Section 2 illustrates how lessons from global health might be applied to other sectors. The final section concludes with implications for philanthropy and development funders.

## 1. The five components of the global partnership for health

The global partnership for health comprised five components (

Figure 1) that were developed or strengthened during the early 2000s. All interacted with and depended on one another:

1. **Shared Goals and Metrics:** The MDGs became the most ambitious and comprehensive, time-bound health goals that were supported by all major health actors. The goals raised the level of ambition and results focus across the health sector. They were complemented with input and outcome metrics to monitor progress towards achieving them.

2. **Back-castings and Policy Standards:** International organizations and research institutions worked back from the time-bound goals to analyze how they could be achieved. Starting in the early 2000s such 'back-castings' included financing and other requirements to meet the goals, which in turn inspired countries to raise their level of ambition. Back-castings also established global treatment and policy standards that guided national action and accelerated convergence in control, treatment, and health outcomes.

3. **Adequate Funding and National Implementation:** Large health funding mechanisms launched after the adoption of the Millennium Declaration (Global Fund, Gavi, and PEPFAR) and their technical partners generated high-quality proposals ('quality demand') for increased investments in national programs to achieve ambitious national targets in line with the MDGs. Using domestic and international financing, large-scale programs were implemented in all developing countries, including fragile countries, which led to rapid improvements in health outcomes.

4. **Evidence-based Advocacy**: Advocacy from civil society and international organizations expanded significantly during the early 2000s to become a critical enabler of the goals, international back-castings, greater financing, and scaled-up national programs. Advocacy organizations built a strong moral case for urgent action at national and global levels using the latest scientific

evidence; successfully advocated for greater international and domestic resources for health; and watched over transparent and effective implementation of programs.

5. **Applied Research, Monitoring & Evaluation and Technology Development:** The health community expanded applied research into achieving the MDGs and assembled a robust evidence base for the effectiveness of interventions under different country circumstances. This in turn supported evidence-based advocacy. The back-castings motivated targeted investments to develop or improve technologies. National programs and changes in health outcomes underwent rigorous monitoring and evaluation, including implementation research, to ensure efficient use of resources and to improve the understanding of how national-scale programs could be implemented in diverse national contexts.

*Figure 1 ¦ The five components of a goal-based partnership*
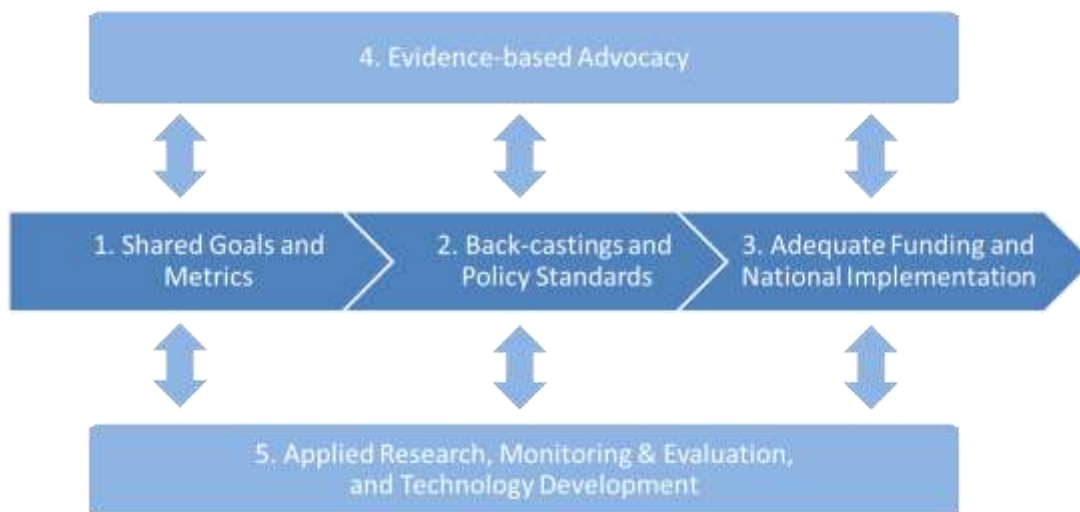


These five components operated without formal central coordination – similar to how different types of organisms form a natural ecosystem – even though WHO and some philanthropists, notably the Gates Foundation, played important coordinating roles. As discussed below, these philanthropists made critical contributions by supporting metrics, evidence-based advocacy, building out the evidence base, and technology development. Where gaps were identified, the foundations provided flexible funding at substantial scale to fill them quickly.

The remainder of this section reviews each component in greater detail with a focus on the organizations that provided critical leadership. The paper seeks to illustrate how the principal components of the global partnership for health worked and interacted. It does not provide a history of the health partnership or discuss all important organizations and individuals who made success possible.

## 1.1. Shared goals and metrics

As described in Sachs (2013), John F. Kennedy famously explained the power of clear goals: "By defining our goal more clearly - by making it seem more manageable and less remote - we can help all peoples to see it, to draw hope from it, and to move irresistibly toward it" (Kennedy, 1963). The health MDGs provided a clear vision for the health community. To guide action and to help the health community move towards the MDGs, the broad goals were translated into operational targets. Of these the '3 by 5' target to provide anti-retroviral therapy for 3 million HIV/AIDS patients by 2005 was likely the most influential. It initiated a system of ART coverage every 6 months, which was new to the health sector and instigated the 'delivery revolution' sought by Jim Kim and JW Lee at the WHO.

The TB community adopted the 'Reach 3 million' target, and similar targets were adopted for malaria, immunization, preventable child deaths, polio, neglected tropical diseases, and other health conditions. Most health targets were conceived and promoted by United Nations organizations and international partnerships, such as Roll-Back Malaria and the Stop TB Partnership. They shifted the focus towards scaling up treatment, collection of data, and regular reporting on progress – all to make the health goals seem more manageable. As the fight against the diseases advanced and the capacity to scale up disease control improved, the operational targets were revised to become more ambitious.

Of course, international goals were nothing new to the health sector. Under James Grant, UNICEF pioneered successful immunization campaigns in the 1980s that were based around ambitious goals. As head of the WHO in the late 1990s Gro Harlem Brundtland promoted several goals, some of which were consolidated into the MDGs. The MDGs themselves have learnt and taken inspiration from the health sector, which may explain why three out of eight MDGs focused on health.

These health targets derived from the MDGs came with clear performance metrics. They mobilized the community to develop clear strategies for implementation, develop the technologies needed to implement them, and raise financing. The goals galvanized advocacy organizations to call for a greater level of ambition and urgency in implementation. They also encouraged health actors to improve coordination.

Health data available in 2000 was inadequate to guide and monitor a global response to implement the MDGs. Metrics did not have adequate consistency, coverage, or comparability. The world lacked some of the most basic data, such as consistent estimates of the principal causes of mortality in developing countries (Smith, 2015). These gaps were filled by improved WHO metrics, particularly following the 2000 World Health Report (WHO, 2000) and the newly created Institute for Health Metrics and Evaluation at Washington State University. Under the leadership of Chris Murray and with generous financing from the Gates Foundation, this institute has developed the Global Burden of Disease (Wang et al., 2016), which provides detailed data on health inputs and outcomes. Improved data from IHME and from official organizations has allowed health ministers to devise better health strategies, track results, and elevate the profile of health within and outside governments.

## 1.2. Back-castings and policy standards

Health goals spurred international 'back-castings' that worked backwards from the goals to analyze the policies, technologies, and investments needed to achieve quantitative, time-bound targets. Back-castings for health targets demonstrated how ambitious treatment and mortality targets could be achieved through targeted investments over sustained periods of time. They gradually established a consensus around delivery mechanisms and the need for scaled-up national health budgets.

Under the leadership of Jeffrey D. Sachs, the Commission on Macroeconomics and Health (2001, 2003) and then the UN Millennium Project (2005) developed the macroeconomic case for investing in health, showed how long-term goals could be achieved, and underscored the need to invest billions in the health sector in a major departure from business as usual (Sachs, 2002). Its 2001 report became a precursor to the MDG conversation and opened the door towards discussions on the scaling up of public investments in health, including through increased aid, which led to the creation of Gavi, the Global Fund, and PEPFAR among others – first recommended by Sachs (2000). The CMH report also supported or encouraged action plans focusing on specific diseases or health conditions, such as the Global Plan to Stop TB (Stop TB Partnership, 2000), the Roll-Back Malaria strategy (Roll Back Malaria Partnership, 2008), and the WHO strategy to achieve the 3 by 5 targets (WHO, 2003). Family Planning 2020 and the Partnership for Maternal, Newborn, and Child Health (PMNCH) promoted back-castings for sexual and reproductive health, as well as newborn and child health (e.g. Harmonization for Health in Africa, 2011). The Millennium Project (2005) identified broad frameworks for implementation that were broadly discussed at the special United Nations MDG Summit in New York in 2005 (McArthur, 2013).

These examples show that the term 'back-casting' is not to be confused with rigid central planning. It allows for bottom-up innovation and must be adaptive, as strategies and pathways will have to be continually revised and updated based on new scientific insights, technological innovation, and lessons learnt from implementation.

The health sector applied long-term back-castings where major implementation gaps had to be closed, particularly through large-scale investments in human resources, management systems, infrastructure, and technologies. It takes three years to train a nurse and far longer to build out training facilities for nurses. Many other investments to scale up treatment and prevention of complex diseases have similarly long lead times. As a result, long-term investments could not be identified or programmed through standard incremental budgeting that focused on the marginal expansion of services and infrastructure over short time horizons (CMH, 2003; UN Millennium Project, 2005).

The global back-castings to achieve time-bound goals spurred discussions on how to tackle challenges relating to policy coherence and implementation. Examples are the WHO-hosted High-Level Forum on the Health MDGs, which advanced the agenda on fiscal space for domestic investments in health, and the Global Health Workforce Alliance to address human resource bottlenecks (Vujicic et al., 2012). Through these and other initiatives, the health sector gradually addressed key implementation challenges and moved towards a consensus on how to scale up health interventions to achieve the MDGs.

The WHO and the World Health Assembly reviewed evidence from programs to achieve the health goals and issued global standards, including treatment guidelines, for preventing and treating major diseases. As one example, malaria treatment guidelines (WHO, 2007a, 2010) documented the inefficacy and high cost associated with social marketing of LINs and established the free or highly subsidized distribution as a global standard in 2007. Similarly, guidelines for ART (WHO, 2016) evolved significantly in line of clinical experience and changes in the cost of the drugs.

No other MDG sector used global back-castings and standards as comprehensively and successfully as the health sector, as is evidenced by a far less robust understanding of public and private investment needs to achieve other SDG priorities (UN Millennium Project, 2005; Schmidt-Traub, 2015; Sachs et al., 2018). Back-castings and global standards guided and often empowered national programs to be more ambitious and rigorous, as evidenced by the rapid adoption of ART (Adams et al., 2001; Schwartländer et al., 2006; WHO, 2016) and replacing quinine with ACT following back-castings from WHO and others (Roll Back Malaria Partnership, 2008; WHO, 2010). They quantified financing needs to support resource mobilization for the sector and identified gaps in technologies or knowledge that had to be filled.

### 1.3. Adequate funding and national implementation

The success in the health sector would not have been possible without strong private sector engagement and innovation. Drugs, diagnostic devices, and other commodities were largely developed and provided by the private sector. For-profit companies also played important roles in managing the logistics of national health programs, data collection, monitoring and evaluation. In some cases, businesses also delivered health services, particularly in middle-income countries. Yet, the incremental funding needed for public health scale-up in poor countries had to be grant funding, overwhelmingly in the form of official development assistance. ODA for health soared after the year 2000, in line with the recommendations of the Commission on Macroeconomics and Health and the UN Millennium Project (IHME, 2015).

By 2001 the Global Fund and Gavi had been established as the first mechanisms to make large-scale grant funding available to national programs for the control and treatment of major diseases. Both institutions share unique design parameters (Sachs and Schmidt-Traub, 2017) that set them apart from other institutions, such as the World Bank and the bilateral PEPFAR program (Shakow, 2006). For ease of exposition we focus below on the experience of the larger Global Fund, including its close interplay with PEPFAR. Similar lessons apply to Gavi.

Funding from the Global Funds was provided competitively on the basis of countries' proposals that had to undergo an independent technical review to ensure adherence to best medical and operational practice but without regard to the funding volumes sought. The Global Fund provides only financing, so technical support for preparing proposals was supplied by a range of international organizations (e.g. WHO, UNAIDS, and UNICEF), bilateral agencies (e.g. AFD and GIZ), academia (e.g. Columbia and Harvard University), as well as civil society organizations, such as MSF. In turn, the Global Fund's technical review process was designed to ensure technical integrity and to avoid interference with political considerations relating to countries (Schmidt-Traub, 2018). Throughout its history, the board of the Global Fund has approved the recommendations of the independent Technical Review Panel. Every program supported by the Global Fund was independently audited by third parties. Moreover, the

independent office of the inspector general can launch investigations into any aspect of the Global Fund's work.

Particularly in the early years, the Global Fund and PEPFAR worked effectively together to scale up funding for HIV/AIDS treatment. Under Mark Dybul's leadership PEPFAR was quick to disburse large volumes of funding. The Global Fund's country-led funding model enabled it to fill gaps in PEPFAR programs, including the strengthening of national systems and partnership with civil society (Shakow, 2006). Together both financing mechanisms helped generate early successes, which inspired greater volumes of funding for the Global Fund and ambitious HIV/AIDS programs outside PEPFAR-eligible countries.

The Global Fund model enabled robust national strategies to meet the health goals in three major ways. First, during the Rounds-Based Funding Mechanism (2002-2010), the Global Fund allocated needs-based funding competitively to countries through an independent technical review. All successful country programs were fully funded in annual funding rounds. This empowered health ministers and other partners to develop large-scale national programs. In many countries, finance ministers started to work closely with their health ministers in designing and implementing national-scale investment programs for health, which in turn removed major organizational and governance bottlenecks in the health sector. The multi-stakeholder Country Coordination Mechanisms (CCM) of the Global Fund promoted engagement with civil society and other stakeholders. Multi-stakeholder processes proved particularly important for tackling infectious diseases, such as HIV/AIDS, which are associated with social stigma and require behavior change from large segments of a population. In several countries, the Global Fund is the only outside provider that enjoys the trust and support from governments and civil society to co-finance programs tackling stigmatized infectious diseases. It is also the only provider able and willing to disburse funds directly to any type of organization (government departments, civil society organizations, international organizations, or businesses), which promotes innovation and takes advantage of complementarities between different operational partners. For example, in many countries CSOs run prevention and treatment programs for vulnerable or marginalized populations.

Second, by providing funding at scale with medium-term to long-term visibility, the Global Fund became an effective partner for business, which helped drive innovation in the development and delivery of tools for prevention, treatment, control, and diagnosis of major diseases. The harmonized funding of national health strategies made it possible for President Clinton working with UNITAR to secure an agreement with the pharmaceutical industry on differential licensing arrangements, which then led to major reductions in the cost of ART (Stover et al., 2011). Similar innovation and cost reductions were achieved for commodities to control and treat malaria (Zelman et al., 2014) thanks to the long-term demand projections by the Global Fund.

Third, the Global Fund helped generate and propagate the knowledge on how to design and implement national-scale programs against the diseases. Whereas in the early 2000s the medical interventions to tackle the three diseases were largely known, there was little understanding of how they could be delivered at scale, particularly in poor countries with weak health systems. This applied especially to behavior change and social outreach programs for marginalized populations affected by the diseases.

The Global Fund's Technical Review Panel facilitated the operational learning and propagation of knowledge across countries. By reviewing and comparing large numbers of funding proposals in each disease category, the cross-disciplinary experts on the Panel could determine best practice, identify knowledge gaps, and highlight innovations in one country that could be applied elsewhere. Following each funding round the Panel discussed lessons learnt with the Global Fund's technical partners, such as Roll-Back Malaria, UNAIDS or WHO, who then supported countries in tackling weaknesses in their programs. Countries whose proposals were rejected by the Technical Review Panel could study successful proposals and incorporate lessons. In this way the knowledge of how to design and implement national-scale programs was generated in a few years and propagated across the world. Even countries that score poorly on standard measures for government effectiveness now have effective Global Fund-supported programs to tackle the diseases (Schmidt-Traub, 2018). Though weaknesses remain in many health strategies, the experience in the health sector stands in sharp contrast to other MDG priorities where no such learning process has taken place, and countries' strategies lack the ambition, rigor, and operational details required for successful implementation.

In 2013, the Global Fund adopted its New Funding Model, which moved away from rounds-based financing towards pre-determined country allocations with modest incentive funding allocated on a competitive basis. While there are reasons for this shift (HLIRP, 2011; GFATM, 2013), it weakens the 'demand discovery' approach, which has been a hallmark of Global Fund success, and may undermine innovation.

Over time, governments significantly increased domestic resources for the health sector (WHO, 2018), and many middle-income countries have graduated from the Global Fund. Even in countries where the Global Fund has provided a modest share of overall healthcare spending, it has supported rapid innovation in service delivery and a shift to medical best practice, as demonstrated by China's experience in fighting HIV/AIDS and malaria (Wang et al., 2014; Minghui et al., 2015). When funds were misused or programs proved ineffective, the Global Fund cut funding and now requests countries to pay back misused funds (Brown and Griekspoor, 2013; Usher, 2016), though its performance-based funding has been criticized (Fan et al., 2013; Glassman et al., 2013).

Thanks to the unique design principles of the Global Fund, increased funding for the three diseases went hand-in-hand with the generation of high-quality demand in the form of ambitious and rigorous country programs. In this way the health sector managed to strike a balance between country ownership on one side and adherence to medical best practice as well as operational transparency and effectiveness on the other. This experience stands in contrast to other sectors, like education, that did not manage to generate large volumes of quality demand. By the end of the MDG period country strategies outside the health sector still tended to lack outcome targets, operational details, and accountability frameworks.

## 1.4. Evidence-based advocacy

Persistent, evidence-based advocacy and independent watchdogs proved critical in transforming global health. It took long battles to win the case for anti-retroviral treatment of poor people in poor countries, for the free distribution of LINs and other anti-malaria control measures, for attention to multi-drug resistant TB, and for action against neglected tropical diseases. No victory was assured at the start, and progress came despite cynicism and open doubts in the early 2000s.

Activists played three key roles (Figure 1): First, they raised awareness of the pandemics and turned the fight against them into a global moral issue. In particular HIV/AIDS activists, such as ACT UP, the International HIV/AIDS Alliance, or the Treatment Action Campaign in South Africa, worked with solidarity across rich and poor countries to raise awareness of the disease and advocate for increased domestic and international resources. Some organizations engaged in aggressive campaigning, including for example the heckling of Al Gore for his lack of attention to HIV/AIDS during the 2000 US presidential election (Behrman, 2008) or campaigning against drug companies that strongly resisted differential drug pricing at first (Oxfam, 2011). Others engaged in behind-the-scenes lobbying, such as Bono who convinced Senator Jesse Helms and ultimately President George W. Bush to support large US investments in preventing and treating HIV/AIDS in developing countries. CSOs around the world forced governments to pay attention to the diseases, and they helped tackle the stigma associated with them, which in turn enabled rapid progress in expanding prevention and treatment often with support from the Global Fund, as in China (Minghui et al., 2015; Wang et al., 2014), the former Soviet Union (Harmer et al., 2012), or South Africa (Poku and Whiteside, 2017).

Throughout, activists engaged deeply with the science and operational complexities of fighting the diseases (Brandt, 2013), and leading scientists, such as a group of Harvard University faculty (Adams et al., 2001), called publicly for the scaling-up of antiretroviral treatment in poor countries. The combination of public activism and deft lobbying on the basis of rigorous scientific evidence helped propel policymakers, business, and the general public into action (Behrman, 2008; Brandt, 2013).

Second, activists advocated for greater international and domestic funding. Jeffrey D. Sachs drew attention to the fact that financing the health goals required large increases in aid that represented a small fraction of rich countries' gross national income (Sachs, 2000). DATA and then its successor ONE and other NGOs successfully used the health goals and back-castings to advocate for greater resources for health. Though progress towards the Abuja target to spend 15 percent of the national budget on health has been mixed (ONE, 2016), the call on developing-country governments and international donors to jointly scale up resources helped sustain the long-term increase in health funding (e.g. GFATM, 2015). At the same time additional funding became available through the Jubilee 2000 debt relief campaign and the IMF-World Bank's Highly-Indebted Poor Countries (HIPC) initiative, which helped channel debt relief into increased government spending on health and education (Sachs, 2002; Pettifor, 2006).

Third, activists held governments and international organizations accountable, particularly to ensure that the needs of the most vulnerable would be met. They lobbied for transparency, accountability, and performance-based funding, which proved critical in sustaining the scaling up of international aid for health. When cases of suspected mis-use of Global Fund resources surfaced, civil society organizations supported tough action against the offenders, including the suspension of grants and the requirement to return misused funds to the Global Fund (Bass, 2005; Usher, 2016). This helped establish a consensus for zero tolerance of corruption in the scaling-up of international financing for the fight against the three diseases.

Some NGOs assumed a watchdog role. For example, Aidspan has been monitoring Global Fund activities by keeping a close eye on decisions by the Board, actions by the secretariat, and the performance of country programs. It has helped ensure greater transparency and accountability by the Global Fund, and it has provided information materials that facilitate countries' access to Global Fund resources.

A critical enabler of activism in support of the fight against the three diseases was the Gates Foundation, which took the lead in providing flexible funding to evidence-based activist CSOs. ONE and most advocacy organizations focused on the three diseases would either not exist or have been unable to support powerful advocacy for greater action (Behrman, 2008).

## 1.5. Applied research, monitoring & evaluation, and technology development

In contrast to other MDG sectors, global health has assembled a rigorous evidence base for the effectiveness of clinical and behavior-change interventions, conducted systematic monitoring and evaluation of country programs as well as implementation research, and invested to fill technology gaps for the diagnosis, prevention, and treatment of major diseases. The fields of medicine and public health have a long tradition of rigorous implementation research in developed and developing countries alike, but a number of organizations scaled up these efforts significantly during the MDG period. The strengthened evidence base and a greater range of tools to fight major diseases laid the foundation for ambitious health goals, back-castings, country-level implementation, and the evidence-based advocacy.

Of particular importance for building the evidence base were small-scale demonstration projects that tested new approaches and demonstrated the feasibility of control and treatment programs. For example, Partners in Health demonstrated how complex ARV treatment regimens could be administered in Haiti and other low-income countries, thus paving the way for the large-scale rollout (Farmer et al., 2001). UNICEF and the International Federation of the Red Cross and Red Crescent pioneered campaigns for vaccination and distribution of LINs (e.g. IFRC, 2006). Médecins Sans Frontières showed how TB could be treated in some of the most impoverished and conflict-prone settings (MSF, 2009).

The Cochrane Group Collaboration has established a global network and agreed standards for the review of large numbers of clinical studies using advanced statistical techniques. It has helped build consensus within the public health and medical communities on the effectiveness of interventions as well as knowledge gaps. Top peer-reviewed medical journals like The Lancet, the British Medical Journal (BMJ), or the New England Journal of Medicines offered publication space for papers on the evidence base for achieving the MDGs. As a result, leading research groups were able to commit resources to investigating the MDGs. In contrast other disciplines, such as economics, lack publications in top journals on the evidence base for achieving the MDGs (McArthur and Zhang, 2018).

Evidence on the effectiveness of individual interventions had to be combined with an understanding of how to design and implement national-scale programs to meet time-bound health targets. The latter required integrated problem solving across different disciplines including medicine, public health, economics, logistics, human resource training and management, anthropology, and many more. As editor of The Lancet, Richard Horton published integrated Lancet Series and established cross-disciplinary Lancet Commissions to build the evidence base for how countries could end preventable child deaths (Jones et al., 2003; Liu and Black, 2015), reduce maternal mortality rates in line with the

MDGs (Kassebaum et al., 2014), nutrition (Bhutta et al., 2013), or achieve health convergence by 2035 (Jamison et al., 2013). These commissions played a central role in synthesizing and documenting the evidence base for how complex goals could be achieved in different country settings. Due to the high impact factor of The Lancet, large numbers of leading researchers and professionals trained their sights on tackling the implementation challenges for achieving the MDGs.

Other partnerships were created to tackle specific implementation challenges. For example, the Stop TB Partnership standardized DOTS treatment protocols for application around the world and enlisted private industry to tackle the challenges of multi-drug-resistant TB (Stop TB Partnership, 2000). UNICEF, UNFPA, and many others have promoted essential child health packages, defined the core interventions for sexual and reproductive health, as well as maternal and newborn health. These global efforts to inventory tools, standardize treatment protocols, and establish global standards enabled an unprecedented diffusion of knowledge and technologies in a short period of time.

Another driver for implementation research was funding from the Global Fund for program evaluation. This enabled researchers to test the efficacy of interventions and programs at national scales. For example, implementation research from a Global Fund-supported program in Kenya helped shape the global consensus for the need to distribute LINs for free or at highly subsidized prices (WHO, 2007b). Similarly, changes in treatment guidelines for HIV/AIDS were informed by implementation research from Global Fund-supported programs in Africa and elsewhere (WHO, 2016).

Finally, the back-castings for health goals and lessons from implementation research revealed a number of technology gaps that the health sector then set out to fill. For example, in response to growing resistance to quinine, ACT was developed in a short period of time to reduce the risk of resistance to artemisinin, which had been developed by China. The fight against malaria also required simpler and faster diagnostic tools. With support from the Gates Foundation, major research and development efforts were launched that led to the introduction and adoption of new rapid diagnostic tests within a few years (Zhao et al., 2012). Industry developed low-cost production techniques for LINs and other medicines drawing on consensus lists of technology gaps (Kaplan et al., 2013). Throughout the Gates Foundation played a central role in identifying key technology gaps and promoting innovation through its generous funding to public-private partnerships for technology development. This includes bets on long-term technological breakthroughs, such as a malaria vaccine.

## 2. Lessons from the health partnership

Starting in the early 2000s, the health sector has strengthened and expanded a global goal-based partnership that comprises many international and national organizations, which collaborate without central coordination or guidance. Without this ecosystem of organizations pursuing a shared global agenda, poor countries would not have experienced the rapid acceleration in improving health outcomes under the MDGs. While national governments bear the ultimate responsibility for achieving development objectives, the health experience suggests that a global partnership can play a critical role in meeting time-bound goals.

The development community needs to consider how lessons from health might be applied to other sectors like education, water and sanitation, agriculture and food security, or energy access. Clearly, no

two sectors face the same challenges, but the five components of the global partnership for health provide a framework for identifying gaps and asking how a sector can accelerate progress towards the SDGs. Here is a list of key questions that other sectors might consider to identify priorities for consideration by governments, civil society, business, philanthropists, development finance institutions, and international organizations.

1. **Shared goals and metrics:**
   - Have broad international goals, such as the SDGs, been translated into transparent, medium-term targets shared by the entire sector? Are the responsible UN organizations, major civil society organizations, and other partners supporting these goals?
   - Are available metrics, such as the official SDG indicators, adequate for tracking progress towards the targets? If such metrics and/or supporting data do not exist, might an organization like the Gates-funded Institute for Health Metrics and Evaluation (IHME) be needed?

2. **Back-castings and Policy Standards:**
   - Does the sector have detailed global back-castings for how the international goals can be achieved, including a full analysis of financing needs?
   - Does the sector have a (formal or informal) mechanism for adopting global policy standards and guidance on implementation like the World Health Assembly?

3. **Adequate Funding and National Implementation:**
   - Does the sector have one or more funding mechanisms that can
     a. provide needs-based national-scale funding based on independent technical review,
     b. provide funding directly to government and other non-government organizations to promote innovation and effectiveness in different country settings, and
     c. promote independent evaluation and implementation research?

4. **Evidence-based Advocacy**:
   - Does the sector have independently funded advocacy organizations and watchdogs?
   - How can academics and other researchers be mobilized to work on how the goals can be achieved?

5. **Applied Research, Monitoring & Evaluation and Technology Development:**
   - Does the sector have a top-rated peer-reviewed journal like The Lancet or BMJ that publishes research on the effectiveness of interventions and cross-disciplinary research on how to achieve complex goals?
   - How can the sector support small-scale demonstration projects to test new interventions or delivery models?
   - How can the sector support the systematic evaluations of evidence on the efficacy of interventions? How can gaps in available technologies be identified and prioritized? Might the Cochrane Collaboration Group provide an organizational model?

# 3. The example of education

A highly preliminary application of these questions to education might reveal the following: As part of the SDGs, the education sector has committed to achieving universal secondary completion, but this goal lacks an operational definition. It is not clear whether the goal refers to upper or lower secondary completion. Equally importantly, the sector lacks clear mid-term goals for learning outcomes by field (e.g. literacy and numeracy) and level (e.g. pre-school, primary, lower and upper secondary). In the absence of such outcome standards, the sector is unable to pursue a goal-based approach.

Closely, related, education also lacks a well-documented production function (Pritchett, 2013) and an evidence base that is as comprehensive and rigorous as in health. Recently, the RISE Program has been aiming to fill this gap (RISE, 2018). Critically, there is currently no equivalent in education for The Lancet or the BMJ that might foster a sustained applied research debate on how to achieve the SDG on education. So the sector is not building out and propagating the implementation knowledge that is required for a 'delivery revolution' along the lines of what the health sector experienced following the adoption of '3 by 5'.

Meanwhile, the education sector has made some progress in improving outcome measures and collecting more data, but it remains far behind the health sector in terms of metrics and data availability. No consensus exists on what constitutes internationally comparable data and learning outcome standards. Perhaps education might benefit from the equivalent of an IHME or the expansion of the OECD's PISA assessments of learning outcomes to broaden the availability of data on outcomes as well as input measures.

The Global Partnership for Education has undergone major reforms and improvements in recent years, but it lacks the scale, independent technical review of proposals, ability to disburse directly to government and non-government partners, and other features that have made the Global Fund successful. The sector also has no equivalent of PEPFAR, so it lacks the large-scale, results-based, international financing that kick-started the progress towards achieving the health MDGs.

Compared with health, the education sector also has far fewer advocacy NGOs that tend to be less well funded and have lower visibility. In spite of the global crisis of education across low-, middle- and some high-income countries, there's no groundswell of evidence-based advocacy akin to the advocacy that transformed global health in the early 2000s.

Other SDG priorities where many countries are off track to meeting the 2030 goals include access to water supply and sanitation, access to modern energy, universal health coverage, gender equality, food security and support for smallholder farmers, decarbonizing energy systems, sustainable management of terrestrial and marine ecosystems, and many more (Sachs et al., 2017). Each sector faces distinct challenges, but they may all benefit from studying the experience of health under the MDGs.

## 4. Outlook

The world managed to turn the tide against the HIV/AIDS pandemic, resurgent malaria, and multi-drug-resistant TB so there is no reason why other SDG challenges cannot be achieved, either. Success will require global partnerships that can draw on the lessons from global health described in this paper. Bold leadership is needed to make such partnerships possible, as happened in public health during the early 2000s.

Financing will of course also be crucial, and most sectors currently lack the resources required to meet the goals. The IMF has recently reviewed the need for large-scale public investments in the SDGs (Gaspar et al., 2019). While some SDG sectors can attract significant private co-financing, many must be financed through public spending (Schmidt-Traub, 2015; Bhattacharya et al., 2016). The poorest countries will need to increase domestic spending on the SDGs substantially, but they also require large increases in international development finance (Gaspar et al., 2019).

The experience of the health sector suggests that well-designed international financing mechanisms can play an important role in mobilizing the financial resources, generating quality demand, and ensuring effective use of resources. Yet even the Global Fund to Fight AIDS, Tuberculosis and Malaria, with its track record of success, is having a difficult time mobilizing the full funding needed to end the three diseases. At the time of writing, the fund appears to be on track to raise the minimum need of $14 billion for its 2020-2022 replenishment, but the true needs are in the order of $31.8 billion over three years (GFATM, 2019), leaving a shortfall of around $18 billion or $6 billion per year. Private wealth, particularly among more than 2200 billionaires in the world, has grown so fast in recent years that it must make a central contribution towards funding SDG financing mechanisms (Sachs et al., 2018) and help close the funding gap for the Global Fund.

Bill and Melinda Gates (later joined by Warren Buffett) have shown how leadership from individual philanthropists can help build and assemble the components of successful partnerships. The Gates Foundation has been a central driver behind the establishment of Gavi, the strengthening of evidence-based advocacy for health, challenges and directed missions to fill key technology gaps, and the collection of improved health data, particularly through the Institute for Health Metrics and Evaluation at the University of Washington. In this way, Bill and Melinda Gates have made a central contribution to develop the knowledge, mobilization, organization, and financing to fight the three diseases. The Giving Pledge established by Gates and Buffett has secured commitments up to $600 billion (Kotecki, 2018). These resources should be focused on implementing the SDGs drawing on the lessons from public health.

Just like the success in health has been driven individual leadership around a shared vision for a global partnership, so other SDG sectors can achieve tremendous progress through bold leadership and increased financing. Billionaires and governments around the world should carefully analyze the gaps and weaknesses of international partnerships to achieve the SDGs using the five components for successful partnership described in this paper. The case of education illustrates that major gaps may exist, which can be filled relatively quickly through targeted investments and bold leadership. Bill Gates has referred to his investments in health as the best investments he has ever made. Now the world needs philanthropists and governments to do the same for other SDG partnerships.

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