Meeting the Sustainable Development Goal Zero Targets: What Could We Do?

Charles Kenny and Mallika Snyder

Abstract

The Sustainable Development Goals are an ambitious set of targets for global development progress by 2030 that were agreed by the United Nations in 2015. Amongst the 169 targets are a number that call for universal access, universal coverage, or universal eradication. These include ending extreme poverty and malnutrition alongside preventable under-5 deaths, ending a number of epidemics, providing universal access to sexual and reproductive health services, primary and secondary education, a range of infrastructure services, and legal identification. These have often been labeled "zero targets." A review of the literature on meeting these zero targets suggests very high costs compared to available resources, but also that in many cases there remains a considerable gap between financing known technical solutions and achieving the outcomes called for in the SDGs. In some cases, we (even) lack the technical solutions required to achieve the zero targets, suggesting the need for research and development of new approaches.

Keywords: Sustainable Development Goals, global health, infrastructure, education

Center for Global Development
www.cgdev.org

Working Paper 472
December 2017

Meeting the Sustainable Development Goal Zero Targets: What Could We Do?

Charles Kenny
Center for Global Development

Mallika Snyder
Center for Global Development

The Center for Global Development is grateful for contributions from the Bill & Melinda Gates Foundation in support of this work.

Charles Kenny and Mallika Snyder. 2017. "Meeting the Sustainable Development Goal Zero Targets: What Could We Do?" CGD Working Paper 472. Washington, DC: Center for Global Development. https://www.cgdev.org/publication/meeting-sustainable-development-goal-zero-targets-what-could-we-do

Center for Global Development
2055 L Street NW
Washington, DC 20036

202.416.4000
(f) 202.416.4050

www.cgdev.org

Contents

Introduction

The Sustainable Development Goals are an ambitious set of targets for global development progress by 2030 that were agreed by the United Nations in 2015. Amongst the 169 targets are a number that call for universal access, universal coverage, or universal eradication. These include ending extreme poverty and malnutrition alongside preventable under-5 deaths, ending a number of epidemics, providing universal access to sexual and reproductive health services, primary and secondary education, a range of infrastructure services, and legal identification. These have often been labeled "zero targets."

Achieving the zero targets would require historically unprecedented progress across a range of sectors in a number of countries, alongside outcomes previously unachieved in any low-income country. Assume rapid economic growth in the poorest countries, movement of all countries to the "policy frontier" of best performance at a given income and continued global technological progress of the type we have seen over the past 15 years. Ignore any potential negative interactions between goals. Even under this optimistic scenario, 44 countries with populations of more than one million people will fail to meet the SDG target on secondary education, 12 will fail to meet the electricity access goal, and 14 the sanitation goal—although all countries would meet the mortality goals (Kenny and Patel 2017).

But in many cases we do at least understand the technical solutions that could deliver (close to) zero goals. This paper looks at each zero target in turn and reviews the literature with regard to what technical interventions could help meet (or come close to) the target, and how much that intervention would cost. Note these assumptions often use different baselines (current versus forecast business as usual, for example) and make different assumptions about what will happen in terms of economic growth or with complementary inputs. Some rely on costs and efficacy from trials of various interventions and assume they can be rolled out at scale without raising costs or reducing effectiveness so that they may not be strictly comparable. They cover different country groups. And the costings we report do not always include all of the technical interventions to "get to zero," instead to achieve progress that brings us close to that goal—akin to the World Bank declaring the zero poverty goal should be interpreted as less than 3 percent of the world living on less than $1.25 a day in 2030. For all of these reasons, we shy away from aggregating the costings or comparing across them in a sense beyond suggesting comparative orders of magnitude.

In some cases, we are unable to provide a costing or an analysis of non-financial barriers because a literature search did not uncover source material. That in and of itself might be taken as a measure of the plausibility of such targets being met (this applies to the targets for full and productive employment and decent work for all women and men; universal access to transport systems and green and public spaces; and provision of safe and affordable housing).

Note also the question of complimentarities—what more than the money to finance technical solutions is required—is a vital part of the story that is often under-emphasized in

"costing studies" of development targets (Clemens, Kenny and Moss 2007). It is widely accepted that a "production function" approach is over-simple when, for example, child health depends on considerably more than the financing of health services (including the quality of those services, demand for the services, infrastructure including clean water and sanitation, nutrition, bed net use, adequate income and education). Given these concerns, the below sections also look at what else beyond the costed technical interventions would be necessary to make rapid progress.

Matching Kenny and Patel's (2017) finding that the secondary education goal appears to be the most ambitious goal in terms of technical and policy progress required followed by infrastructure goals, followed in turn by health goals, the analysis below suggests that in a rough orders of magnitude sense the education zero goals would be the most expensive to meet, followed by the infrastructure goals followed by the poverty and health goals. Note also that in all cases progress will require considerable and challenging complementary inputs. All of this suggest the need for caution in taking SDG targets too literally in planning or budgeting exercises at the national or international level.

Extreme Poverty

Target: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day

What could we do? The primary tool for poverty reduction is (equitable) economic growth. There is a secondary role for transfers. The economic growth rates required in poor countries to "eradicate" (or at least come close) poverty are high: United Nations Conference on Trade and Development (2014a) estimates it at 8.3 percent per annum. Chandy et. al. (2013), Yoshida et al. (2014) and Sumner (2013) use a range of growth projections to suggest that growth alone will leave as many as 8.6 percent (Yoshida et al., 2014) or in the best case 1.4 percent (Chandy et. al., 2013) of developing country populations in poverty. Financial transfers could close the gap. Fiszbein et al. (2014) suggest that current transfer mechanisms (employment guarantees, cash transfers, etc) are already keeping 150 million people out of poverty. These programs could be expanded.

What would that cost (and how much would need to come from outside resources?) Sumner (2013) suggested the current global poverty gap—the amount it would cost to bring all those living on less than $1.25 a day up to $1.25 a day—is 0.2 percent of global GDP, or $150 billion (PPP 2005). A more recent estimate by Kharas and Rogerson (2017) is that the gap has reached $75 billion. Some of these resources could be provided by national governments, although Fiszbein et al. (2014) suggest only 50 percent of low-income countries could cut extreme poverty by half through domestically-financed transfers, even with the best targeting currently available. Schmidt-Taub (2015) estimated the poverty gap could be filled in LICs and LMICs at 57 percent efficiency for $82 billion a year.

What else is necessary? Large enough financial transfers correctly targeted could end global extreme income poverty. But the financial and institutional challenge is considerably greater than suggested by poverty gap estimates. Poverty estimates are based on extremely

limited sample survey data. Frequently repeated complete census survey data would be required in order to target payments at anywhere near perfect accuracy. Even with such data it is implausible to imagine a transfer mechanism that provides exactly the right amount of resources to increase incomes to $1.26 a day. Fiszbein et al. (2014) look at the percentage of transfers that go to reduce the poverty gap, measured as the 20th percentile income, across a range of social protection programs worldwide. They find that more effectively targeted programs (including cash transfers) can reach above 40 percent efficiency, but benefit-cost ratios for reducing the $1.25 poverty gap for developing countries see a *maximum* value of 40 percent worldwide and a mean of just 8 percent. Fiszbein et al. note the extent to which tighter targeting is feasible is open to question because the political economy of the country may not generate adequate budget for social protection if the interests of the middle income groups are separated from those of the poor. All of this suggests that beyond the considerable institutional challenges of creating large social safety net programs, the cost to eliminate $1.25/day poverty might be better estimated at five or tenfold the poverty gap—although that gap would decline over time.

Hunger

Target: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons[1]

What could we do? This target involves several sub-goals, some of which are much more likely to be achieved than others. Global progress on reducing numbers of children stunted seems promising; indeed, both the International Food Policy Research Institute (IFPRI) (2016) and Horton and Hoddinott (2014) agree that the world seems likely to be on track to achieving 2025 World Health Organization (WHO) goals of a 40 percent reduction in the number of children under-5 who are stunted and reducing and maintaining childhood wasting to less than 5 percent, though Horton and Hoddinott qualify that this would still require considerable additional effort. IFPRI further identifies the 2025 WHO targets on wasting and overweight among children under age 5 and exclusive breastfeeding as likely to be achieved, although successfully meeting the targets on anemia in women and adult overweight, diabetes, and obesity seems less promising. These assessments rely on projections based on lists of key direct nutritional interventions, with IFPRI using a list of 13 that are suitable for scaling up and Horton and Hoddinott's based on the interventions identified by Bhutta et al. (2013). IFPRI suggests a 2030 goal to end undernutrition is "plausible," but its detailed analysis is limited to interventions to achieve the 2025 40 percent target. For overweight, obesity, and nutrition-related noncommunicable diseases (NCDs),

[1] The 2025 WHO targets that form a part of this SDG are: 40 percent reduction in the number of children under-5 who are stunted, 50 percent reduction of anemia in women of reproductive age, 30 percent reduction in low birth weight, no increase in childhood overweight, increase the rate of exclusive breastfeeding in the first 6 months to at least 50 percent, and reduce and maintain childhood wasting to less than 5 percent. These can be found here.

IFPRI suggests a more plausible target is that "a rising tide can be stopped"—suggesting we do not have the technical solutions available to end all forms of malnutrition (p.4).

What would that cost? IFPRI (2016) identifies a current 10-year funding gap of US $70 billion to achieve the 2025 WHO targets for stunting, severe acute malnutrition, breastfeeding, and anemia. We could not find an estimate of meeting the 2030 "end all forms of malnutrition" target.

What else is necessary? While economic growth can help finance nutrition programs, growth alone has a very small or no association with early childhood undernutrition in the medium term, as noted in Vollmer et al. (2014). Direct nutritional interventions, thus, are critical to achieving these goals. However, implementation of these programs, as noted in IFPRI (2016), has been highly variable: fortification and supplementation programs have been better implemented and scaled up than dietary diversity promotion and breastfeeding. Breastfeeding suffers from a lack of legislation related to maternity protection policies and declines in implementation of other policies such as the International Code of Marketing of Breast-Milk Substitutes. Poor progress at the country level on implementing WHO recommendations on healthy diets (related to marketing to children, reducing salt, and reducing trans and saturated fats) has hindered dietary diversity promotion; as noted in IFPRI, two-thirds of countries have not made any progress any of these three categories.

In short, it is clear that financing is not enough to meet the WHO targets without considerable institutional improvement, and that we do not necessarily have the policy tools to ensure additional financing is turned into improved outcomes effectively.

Under-5 Mortality

Target: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births

What could we do? Achieving the under-5 mortality goal is possible in a best-case scenario for lower-middle income countries and middle income countries, according to the projections of Boyle et al. (2015), which suggest that the under-5 mortality rate could fall to 27 per 1000 live births in low-income countries, 13 in lower-middle income countries, and 18 in low and middle income countries; in a constant health intervention coverage scenario, the under-5 mortality rate could would likely rise from the 2011 baseline of 76 to 83 in low and middle income countries. This best case scenario would entail enhanced investment and research and development (R&D), as well as a list of interventions associated with child health developed by the UN Interagency OneHealth tool (a list including supplements, oral rehydration, breast feeding, vaccination, malaria prohylaxis and treatment and neonatal health care) alongside health system strengthening support to increase the absorptive capacity of local systems to deliver interventions at scale (WHO 2017a). In low and middle income countries, this amounts to 8.2 million averted under-5 deaths if the best case scenario is achieved as compared to constant coverage.

What would that cost? Boyle et al. (2015)'s best case scenario involves R&D expenditure, which is estimated by the authors to cost $3 billion annually for all disease in low-income countries. In addition, the annual incremental cost of investment in low and middle income countries for treatment of child illness is estimated to be $4.43 billion in 2020 and $7.05 billion in 2030. Boyle et al. suggest that even without increases in assistance, increased domestic spending on health to 3-4 percent of GDP in low income countries and lower-middle income countries could, given projected GDP growth, fund the cost of this convergence domestically.

What else is necessary? National and global health systems have converted past funding into improved child health. Some of those systems have already reached very widespread coverage—vaccination for diphtheria, tetanus and pertussis reached 86 percent of infants worldwide in 2016, for example, as noted by the WHO (2017b). But while Boyle et al. (2015) account for institutional factors such as workforce expansion that are needed to deliver interventions, it is still unsure whether health systems can help deliver such rapid progress, even with financial investments and R&D. A number of interventions rely on behavior change as well as health systems networks strengthening that involve cultural and institutional development to have impact—change that cannot be guaranteed because there is a considerable gap between financing and rollout of health services and health outcomes.

For example, between 2005 and 2011, the number of children in India born in a health facility more than doubled in nine different states, motivated in part by a government cash incentive scheme encouraging institutional births, the Janani Suraksha Yojana (JSY). The sad news is that the massive increase in institutional births had no impact on infant mortality (Das and Hammer 2014). A major factor behind that could be the low level and quality of care available at health facilities. Surveys of clinical practice in developing countries often find adherence to clinical guidelines is the exception rather than the rule and that management of maternal and newborn complications is particularly poor (World Bank, 2017c; Irimu et al., 2012). Kruk et al. (2016) use the JSY case as an example of a greater challenge to the emphasis on increasing utilization of health care that worked well in the case of MDG coverage-based goals but which, without an emphasis on quality of care, has failed to "reduce excess deaths from MDG conditions that require more complex clinical care" (p. e594). The other major challenge going forward, note Kruk et al., is that the new conditions of interest, such as non-communicable disease, mental health, and addiction, also rely on "accurate and rapid diagnosis and treatment, care integration for multimorbidity, and longitudinal care" (p. e594), which emphasizes the importance of quality of care in achieving the SDG targets.

More broadly, across countries, there is no relationship between overall levels of health expenditures and health outcomes at a given income per head, nor a link between health inputs like doctors and nurses per capita and health outcomes once GDP per capita has been accounted for (Casabonne and Kenny, 2011—see also Nakamura et. al., 2016; French, 2016; and Jamison, 2016 for a more positive view). And a World Bank review of extending universal coverage to health services in developing countries found that only five out of eighteen studies of coverage rollout found a positive impact on health indicators (Giedion, Andrés Alfonso and Díaz 2013). Beyond low service quality, many of the most important

determinants of health outcomes are not delivered by health systems (for example nutrition, clean water, sanitation, low levels of local pollution, quality housing infrastructure). Lim et al (2016) find that there is a very high correlation between a measure based on average income per person, educational attainment, and total fertility rate and a composite index of the health-related SDG indicators. Under the circumstances finance *of health systems alone* is almost certainly not enough to meet mortality goals, however generous it is.

To conclude, there are technical solutions available to meet the under-5 mortality target. Financing would likely help their rollout as well as the development of cheaper, simpler tools to achieve mortality reductions. Institutional and cultural barriers remain, however, that may blunt the rollout or impact of technical solutions in health systems, and health systems are only one part of the solution to high under-5 mortality.

Infectious Disease

Target: End the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases

Sub-Target: HIV/AIDS

What could we do? It is first worth considering what it means to end an epidemic, and which more specific goals might aid in doing this successfully. Over (2011) defines an "AIDS transition" as preserving "AIDS mortality reductions while lowering the number of new infections even further so that the total number of people living with HIV/AIDS diminishes"(p. 1). Similarly, PEPFAR (2017) defines epidemic control as occurring "when the total number of new HIV infections falls below the total number of deaths from all causes among HIV-infected individuals" (p. 2).

Ghys and Izazola (2015) argue that it could be possible for the annual number of HIV infections and AIDS-related deaths to fall by 90 percent in 2030 from 2010 levels, using existing tools, which would "effectively end the AIDS epidemic as a public health threat" (p.1). This would depend on the achievement of several service targets related to areas such as condom promotion, programs targeted to key populations, and treatment and support. Stover et al. (2016), in an update of Ghys and Izazola, model the UNAIDS Fast-Track approach, predicated on a rapid scale-up of focused, effective prevention and treatment services over the next 5 years and then maintaining a high level of programme implementation until 2030, including the rapid scale-up initiative for antiretroviral treatment known as 90-90-90. Boyle et al. (2015)'s projections, using a list of reproductive, maternal, newborn, and child health (RMNCH) interventions suggested by the OneHealth Tool, scaled up to the broader adult population, and adapted to include additional strategies, also suggest that there could be a marked decrease in HIV deaths. They suggest that new infections could fall to 135 thousand in low-income countries, 100 thousand in lower-middle income countries, and 235 thousand in low and middle income countries; in a constant coverage scenario, new infections would likely rise from the 2011 baseline of 1,581 thousand in low and middle income countries to 2,425 thousand. This best case scenario with enhanced investment and R&D would, according to the authors, result in 1.61 million deaths

averted in low and middle income countries in 2030 compared to the constant coverage scenario.

Taking a more target-centered approach, Geldsetzer et al. (2014) suggest that the achievement of two key interventions to address HIV/AIDS in hyper-endemic countries would be possible: achieving antiretroviral therapy (ART) coverage of at least 90 percent of HIV-infected adults with very low CD4 cell counts and then expanding the scale-up to people with higher CD4 counts, and attaining male medical circumcision (MMC) coverage of at least 90 percent in adult HIV-negative adult men. To increase ART coverage, the authors recommend extensive HIV testing programs and scaling up measures to improve retention. To increase MMC, the authors recommend increases in international donor contributions to MMC programs and demand creation, while national MMCs focus on attaining greater service efficiency.

What would it cost? Given the differences in estimation strategies and interventions emphasized, cost estimates vary. Ghys and Izazola (2015) predict that total resource needs will reach $35.6 billion by 2020, with a decline through 2030. Stover et al. (2016)'s update suggests total 2020 costs of US$26.1billion by 2020 in developing countries. Boyle et al. (2015) predict lower but increasing costs for their package of interventions; after accounting for the US $3 billion R&D expenditure required in low income economies for all disease, the interventions to combat HIV/AIDS among the adult population would involve annual incremental costs of $4.2 billion in 2020 and $8.4 billion in 2030 for low and middle income countries. Geldsetzer et al. (2014) estimate that achieving the ART and MMC targets that they identify would involve additional costs, compared to a constant coverage scenario, of around $500 million for MMC and $16.5-$19.3 billion for ART. They note that ART scale-up would require around 100 percent in additional investment, while MMC would require only 3 percent in additional investment, due to ART being a long-term continuous service and MMC being a one-time procedure. In the paper summary, these additional costs are annualized to $1080 million for ART and $30 million for MMC.

What else is necessary? Aid-financed interventions including PEPFAR have demonstrated that it is possible to roll out large scale, wide-coverage antiretroviral treatment packages across a range of countries facing high HIV burdens. But like many health and development challenges, HIV/AIDS cannot simply be solved with large amounts of money. Ghys and Izazola (2015) note that their approach requires improvements in cost-effectiveness that would in turn would likely necessitate price negotiations, community based service delivery, and economies of scale. Implementing these interventions could also involve addressing barriers to treatment and prevention, as mentioned by Geldsetzer et al. (2014), who note that efforts to ensure universal HIV testing have not yet achieved their goals, and not all ART-eligible individuals start or continue treatment, so enhancing testing and treatment coverage remains a difficult task. In their modeling, Stover et. al. (2016) assume that the "primary prevention" tools like condom distribution, all work at the 75th percentile of the effectiveness distributions revealed in the literature—which is optimistic. Friedman (2015) finds that countries perceived as corrupt have less efficacy in converting donated antiretroviral drugs into declining AIDS deaths.

Over and Oroxom (2017) note that in thirteen PEPFAR priority countries, while AIDS-related deaths have fallen dramatically, new HIV infections have not fallen nearly so fast so that the number of people living with AIDS continues to climb. Over and Glassman (2015) recommend financial incentives to recipient countries to encourage the adoption of more aggressive measures to reduce new infections. At the country-level, MMC demand is still low, and alternative methods of enhancing demand, such as financial incentives, may prove necessary. While Westercamp and Bailey (2007) found that MMC is moderately socially acceptable in Sub-Saharan Africa, with the median number of uncircumcised men willing to be circumcised at 65 percent, this also implies that there are many individuals to whom such a preventative measure might be unacceptable.

Sub-Target: Tuberculosis (TB)

What could we do? Vassall (2014) suggests that it could be possible to reduce TB deaths by 95 percent and TB incidence by 90 percent by 2030. This would depend on the development of new diagnostic tools and treatment technologies, investment in improved physical infrastructure, improvements in ensuring adherence to medication, and general health system strengthening. Boyle et al. (2015) provide a best case scenario of enhanced investment of R&D, based on predicted rates of decline in TB incidence and costs provided by the WHO Global TB Programme. They suggest that new cases could fall to 675 thousand in low-income countries, 1.3 million in lower-middle income countries, and 1.95 million in low and middle income countries; in a constant coverage scenario, new infections would likely fall from the 2011 baseline of 6.3 million in low and middle income countries to 5.9 million. This best case scenario with enhanced investment and R&D would, according to the authors, result in 930 thousand deaths averted in low and middle income countries in 2030 compared to the constant coverage scenario.

What would it cost? Costs, once again, vary based on the assumptions and approach. Vassall (2014) estimates that it would cost 8.09 billion for the first year (alone) of attempting to achieve the targets set. Boyle et al. (2015) suggest that the cost to meet their less ambitious target would be lower: after accounting for the US $3 billion of R&D expenditure required, the annual incremental cost of the best case scenario would be 2.33 billion in 2020 for low and middle income countries and 2.25 billion dollars in 2030.

What else is necessary? As observed in the case of HIV/AIDS, the social and cultural factors surrounding tuberculosis diagnosis and treatment can hamper success even if all the required funds were available (Wang and Osih, 2014, Munro et al., 2008, and Storla et al. ,2008). Wang and Osih, who argue for a dissemination of best practices guidelines about treatment as well as the further development of an evidence base on new drugs, focus particularly on issues in MDR-TB care, and observe that the extreme side effects from associated with some MDR-TB drugs can prove a significant barrier to treatment. Munro et al., focusing on qualitative literature, find that while social context can matter greatly for treatment adherence, few interventions incorporate social and family support mechanisms. Storla et al. identify several reasons for delays and lapses in diagnosis and treatment, noting particularly selection of a traditional practitioner in the first instance of seeking care, poverty, difficulties reaching health care facilities, and fear of loss of income, as contributors to delays

in diagnosis. The emphasis that DOTS (Directly Observed Treatment, Short-Course) places on daily visits can also prove a burden on patients and is seen as humiliating in that the patient must be directly observed. Further, the non-specific nature of initial symptoms may lead to misdiagnosis. Self-treatment, linked to stigma, can further delay the diagnosis. This body of research suggests that while funding is certainly important, other social and cultural factors may play a vital role in determining a program's success.

Sub-Target: Malaria

What could we do? Raykar and Laxminarayan (2014) focus on two key goals: delaying artemisinin resistance greater than 1 percent until 2025 and reducing malaria incidence by 50 percent by 2025. Boyle et al. (2015) do not report the effect of their proposed malaria interventions, which are adapted from a set of OneHealth Tool recommendations and extended to the full population at risk. The End Malaria Campaign, which is supporting the development of new tools focused on vector control, monitoring, drugs and malaria vaccines, suggests eradication might be achievable by 2040 with new technologies (Gates and Chambers, 2015).

What would it cost? Raykar and Laxminarayan (2014) estimate the cost of delaying artemisinin resistance and reducing malaria incidence in Sub-Saharan Africa is US $570 million annually, and $145 million annually for delaying artemisinin resistance alone. Boyle et al. (2015) estimate that the annual incremental cost of their proposed interventions in low and middle income countries would be US $7.28 billion in 2020 and $10.55 billion in 2030 with the current tools. Gates and Chambers (2015), writing for the End Malaria Campaign, estimate the costs of eradicating malaria could be $90–$120 billion between 2015 and 2040.

What else is necessary? There has been dramatic recent progress against malaria -- since 2000, the rate of global malaria deaths has fallen 60 percent. Financing would support further progress. But technical difficulties in diagnosis and treatment, as well as problems in ensuring adherence, can prevent countries from successfully implementing malaria control programs. Raykar and Laxminarayan (2014) discuss how achieving high ACT coverage is important if the cost is to match the benefits in terms of avoided resistance, but this can be expensive. Mistargeting of ACTs due to challenges with diagnostic tools could also impede malaria control efforts. Use of insecticide treated bednets, another important tool in malaria prevention, can also be difficult to promote and ensure: Alaii et al. (2003) find that levels of ITN adherence still only approached 70 percent after education campaigns.

Sub-Target: Neglected tropical diseases (NTDs)

What could we do? Like malaria, there are only limited estimates of what we could achieve in the fight against NTDs. Seddoh et al. (2013) argue that five NTDs that contribute to 90 percent of the NTD burden in Africa can be treated with preventative chemotherapy and could be eradicated by 2040 through mass drug administration. This estimate suggests that they would be at least partially eliminated by 2030, achieving the SDG sub-target in question. As noted in Johnston et al. (2015), integrating water, sanitation, and health(WASH)

programs with NTD elimination efforts may prove helpful, but there is need for additional evidence on this front.

What would it cost? Seddoh et al. (2013) estimate a cost around $300 to $400 million per annum up to 2020, with costs decreasing as transmission is interrupted and the burden begins to fall to address the 5 chemotherapy-treatable NTDs alone. This would also likely require free donated drugs to support the mass drug administration.

What else is necessary? Despite considerable global will to eradicate certain NTDs such as guinea worm, this has not yet been completely achieved. In the case of guinea worm, unexpected modes of transmission in Chad have recently imperiled eradication work (Molyneux, 2017). In addition to ecological factors, socio-political issues can also play a role, as noted by WHO (2012), which identifies political instability among the challenges to NTD elimination. Nonetheless, finance is a concern and additional financing will help; as noted by Inobaya et al. (2014), the costs of mass drug administration are very difficult to sustain, and if not all individuals are covered, this can lead to resurgences of infection.

Regarding all disease targets covering HIV, tuberculosis and malaria as well as NTDs, even optimistic forecasts do not suggest eradication by 2030. But past progress and future technological advance do both suggest the possibility of considerably reduced morbidity and mortality by that year with eradication possible perhaps as soon as a decade after.

Sexual and Reproductive Health

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

What could we do? On family planning, the goal would be to reach 100 percent of demand for family planning met with modern contraceptive methods (Fabic et al., 2015). Improved access to family planning services alone might reduce the burden of maternal mortality by one third, according to the United Nations Population Fund (UNFPA) (2014). Additional technical solutions to reduce maternal mortality, included by Boyle et. al. (2015) in their analysis of potential health improvement to 2030, include safe abortion and post-abortion case management, management of pre-eclampsia and diabetes in pregnancy, and labour and delivery management and active management of the third stage of labor.

What would it cost? Boyle et al. (2015) estimate that the incremental cost of scaling up family planning services is estimated for low and middle income countries to be US $1.05 billion in 2020 and $2.35 billion in 2030. Maternal and newborn health interventions add $4 billion in 2020 and $8.3 billion in 2030. Note this scale up is not (necessarily) to universal provision, but projects coverage trends by country for each intervention based on the fastest rate of positive change achieved historically since the year 2000 in other countries with comparable starting coverage levels.

What else is necessary? Strong family planning programs do significantly increase access to modern contraception, working on both the supply and demand side (Ross, 2015; Belaid,

2015). But sexual and reproductive health issues are particularly associated with social and cultural factors that may hinder the implementation of programs designed to address them. As noted by UNFPA (2016), women in developing countries with lower levels of education, living in rural areas, or residing in poorer households have the highest unmet need for contraception; there are particularly strong challenges present for adolescents who seek to acquire contraceptives, due to restrictive laws, social stigma, and power balances in family and marital structures. This will be one reason why even in some comparatively wealthy regions including Europe, access to modern contraception as a percentage of demand is below 80 percent. Fabic et al. (2015) suggest that a more realistic goal may be that, by 2035, levels of met demand for family planning in developing countries will equal 75 percent of demand, thought they note that at currently projected rates of growth, only 8 of the 49 least developed countries would meet this level by 2035.

For all the reproductive health care tools needed to significantly reduce maternal mortality are already available, Alkema et al. (2016) label the related SDG maternal mortality target of a 75 percent reduction "ambitious," noting it would require annual rates of mortality reduction of 7.5 percent compared to regional progress since 1990 of a low of 1.8 percent in the Caribbean to a high of 5 percent in East Asia. In part that will be because seeking to reduce the maternal mortality ratio (MMR) through policy changes may also prove difficult for all of the reasons presented above in relation to child health linked to the quality of health systems. A Government of India scheme to promote institutional births, the Janani Suraksha Yojana, which is discussed in a previous section, may have had no effect on MMR, as noted in Randive (2013), or may have led to an increase in the absolute number of maternal deaths (Gupta, 2012). Strictly, then, financing may be enough to provide access to services, but may fall significantly short of providing the quality of those services.

Education

Target: Ensure that all girls and boys complete free, equitable and quality primary and secondary education, eliminate gender disparities in education and ensure equal access to all levels of education, ensure that all youth achieve literacy and numeracy

What could we do? The technical solution to the supply of schooling is relatively simple: build schools and hire teachers. Managing the demand side is more complex, although well designed conditional cash transfers have increased enrollment rates (Baird et al., 2014). With regard to guaranteeing outcomes including literacy and numeracy, a number of interventions have improved learning in schools, including monitoring and teacher incentives (Murnane and Ganimian, 2014).

How much would it cost? Pscharopoulos (2014) estimates that in order to enroll the 57 million children currently out of primary school, it could take an additional US $17 billion per year to reach the zero target by 2030, based on estimate of the cost per primary student in Sub-Saharan Africa being $300. Schmidt-Taub (2015) suggests an incremental expenditure of $194 billion for LICs and LMICs to meet universal enrollment goals. The International Commission on Financing Global Education Opportunity (Brown Commission) (2016), including secondary education and taking a broader view of the changes needed (which

include restructuring education systems for results, innovation, and an emphasis on inclusion), estimate a need for total spending on education to go from $1.2 trillion per year to $3 trillion in 2030 in constant prices, necessitating an increase of $1.8 trillion.[2]

What else is necessary? Even if students have schools located near them, which might presumably be easier to access, distance to school only has a small association with enrollment, finds Filmer (2007). More broadly, Clemens (2008) finds a strong pattern of uniformity of experience in the rates of enrollment increases across countries, and that many countries which out-perform on enrollment see subsequent declines in quality. Cultural factors may prevent students, particularly girls, from accessing education, notes Pscharopoulos (2014). He argues that it is unlikely that the SDG targets will be achieved under the circumstances.

While there has been considerable progress in gender equality of schooling—and, indeed, there are more girls than boys in tertiary education worldwide—equal access along gender, economic, ethnic, and geographic dimensions is likely to remain an unmet goal at the secondary level given that universal enrolment is unlikely to occur. In turn, access to tertiary education is likely to remain considerably skewed towards the advantaged worldwide—in Bangladesh, for example, rich young men are approximately 10 times more likely to attend higher education than poor young women, according to Ilie and Rose (2016).

Further, even if students attend school, that may not enhance learning: across around 50 developing countries, the calculations of Sandefur and Pritchett (2017) suggest that "40 percent of women would be illiterate even if all women completed at least grade six"(p. 3). Merely ensuring completion of grades of schooling may not actually result in steep declines in illiteracy, suggesting that more emphasis on education system strengthening may be needed for these goals to be achieved. In that regard, numerous evaluations find a very weak link between schooling expenditure and learning outcomes (Murnane and Ganimian, 2014; Pritchett, 2013) suggesting the need for both considerable institutional reform of school systems as well as changes in factors that determine learning outcomes beyond the school gates.

Infrastructure

Sub-Targets: Access to safe and affordable drinking water, adequate and equitable sanitation, an end open defecation; access to affordable, reliable and modern energy services; access to safe, affordable, accessible and sustainable transport systems; access for all to adequate, safe and affordable housing; access to safe, inclusive and accessible, green and public spaces

[2] The United Nations Conference on Trade and Development(UNCTAD) (2014) estimates a need for an additional $250 billion annually in infrastructural investment to move towards sustainable development in the education sector.

(We were not able to find analysis of the technical solutions or cost estimates of providing access to all for safe, affordable, accessible, and sustainable transport systems or access for all to adequate, safe and affordable housing or access to safe, inclusive and accessible, green, and public spaces.)

Sub-Target: Safe and affordable drinking water, adequate and equitable sanitation, an end open defecation

What could we do? The infrastructure solutions to provide safe water and sanitation are well known (primarily piped services or wells and pit latrines). Ending open defecation involves both improved infrastructure provision and behavioral change.

How much would that cost? As in the case of previous goals, estimates vary based on the assumptions and approach involved. Hutton and Varughese (2016) focus on safe water, basic sanitation, safe fecal waste management, hygiene, and an estimated 50 percent of households first having basic water and simple pit latrines before investing in higher-quality services. They estimate that the total capital cost involved would be $114 billion annually. It would cost $28.4 billion per year to extend basic drinking water, sanitation, and hygiene services to the unserved; they use a list of lower-cost technology options for basic WASH, such as community wells for water supply, improved latrines for sanitation, and a basin with soap and water for hand washing, as well as higher-cost options such as piped water and sewerage. These estimates are, they observe, likely to be lower than the probable expenditure to meet basic standards of service, as technologies chosen will vary based on the context and utility coverage areas. UNCTAD (2014), taking a more general approach, suggests that there is an investment gap of $260 billion annually to achieve provision of water and sanitation to industry and households in developing countries. Note that new technologies, including high-quality non-networked fecal management solutions (waterless toilets) might significantly reduce this cost.

What else is necessary? Success in implementing these changes will certainly require more than finance alone; as WHO and United Nations Children's Fund (UNICEF) (2014) note, even after ensuring access, quality can remain a concern, as is sustainability and safe management of services. For example, daily duration of supply for those connected to water pipes is below four hours in India and low across much of the developing world. As well as reducing access, intermittent supply allows pollutants to leak into damaged pipes, rendering water unsafe (Shaheed et al., 2014). For example, Bhalotra et al. (2017) find chlorinating water may have its associated reductions in diarrheal disease mortality attenuated by the effect of poor infrastructure in the case of age-degraded water pipes and lack of complementary sanitation infrastructure. While networked water and sanitation is frequently delivered at a price below the cost of delivery (making it "affordable"), this denies resources to both infrastructure rollout as well as maintenance. Furthermore, interventions including hand washing and ending open-field defecation require cultural change, and practices are frequently embedded (Neal et al., 2016).

Sub-Target: Energy access

What could we do? The technical solutions to energy access are expanding: both traditional networked electricity and gas as well as off-grid approaches including mini or micro grids alongside solar home solutions, bottled liquid gas and improved cook-stoves.

How much would that cost? Galiana and Sopinka (2014) break down the costs by target: $14-$134 billion annually for universal electrification; $60.6 billion annually for universal access to modern cooking fuels, based on Pauchuri et al. (2013); and adding up the previous figures, $74.6-194.6 billion annually for universal energy access. Bhattacharya (2014) identifies as a mid-range estimate the $50-60 billion per year as the investment required for universal energy access. Schmidt-Taub suggests a range of $321-$347 billion for LICs and LMICs including operating expenses. Focusing on the power sector in developing countries for the investment in generation, transmission, and distribution of energy, UNCTAD (2014) estimates total need for annual additional investment of $370-$690 billion at constant prices.

What else is necessary? Finance can roll out access to networked services and provide equipment for clean cooking or solar systems. However, there is a significant issue with the sustainability and quality of networked service provision. Across the world as a whole, the World Bank reports an average of 6.5 power outages a month, while in South Asia the same number is 25 outages (World Bank, 2017b). As with water, while networked power is frequently delivered at a price below the cost of delivery (making it "affordable"), this denies resources to both infrastructure rollout as well as maintenance. Regarding clean cook-stoves, there has been significant resistance to adoption of many models as well as use alongside traditional approaches that blunt health impacts, suggesting the potential gap between access to and use of "modern energy services" (Hollada et al., 2017).

Identity

Target: Legal identity for all, including birth registration

What could we do? Currently, 71 percent of the world's births, and 45 percent of births in least developed countries, are registered (Dunning et al., 2014). The World Bank and WHO (2014) note that if the universal registration target were to be achieved, that would likely require an extensive scale-up of existing birth registration efforts. This would involve strengthening of national civil registration and vital statistics (CRVS) systems as well as extensive international support. Providing universal legal identity first involve determining what exactly is meant by legal identity, as well as providing proof of identity to the those who lack it, which is around 1.1 billion people, according to Identification for Development (2017). Programs including India's UID program do suggest that rapid and approaching-universal identification programs can be rolled out in developing countries, however.

How much would it cost? The World Bank and WHO (2014) suggest that, excluding domestic funding, there is an estimated US $1.99 billion financing gap over the ten-year period for the global scale-up plan for the 73 COIA (Commission on Information and Accountability for Maternal and Child Health) countries for birth registration. The total cost

of scaling up and maintaining CRVS systems in the 73 countries is around US $3.82 billion. Atick (2014) estimates that the cost of providing a national ID is around $3-$6 per person, though with the achievement of economies of scale, this could be lower. Using the ID4D data, this would bring the total cost to, at the upper end, $6.6 billion.

What else is necessary? Even if it were possible to perfectly scale up birth registration services with increased financing, doing this without a larger framework of identity would likely be ineffective, observe Dunning et al.; this would also involve finding a way to issue identity to stateless people, which would be a complex effort. Further, as Oppenheim and Powell (2015) note, birth registration may not fully address inequities in accessing legal documentation or improve quality of life in situations where it is not directly linked to citizenship. It is also worth noting that the under-5 target does not address the many other individuals older than that age whose births were never registered, and who thus face continuing difficulties with establishing their identity. Regarding ID, questions of whether it is possible to "opt out" of such a system, and what privacy means in a national identification system, remain salient—there may be legitimate political opposition to universal ID schemes in both poor and rich countries, and Aadhar in India, for example, has generated considerable discussion and controversy (Mukherjee, 2017; Abraham et al., 2017).

Conclusion

We have chosen not to present a summary table of costs presented in this paper. Very few of the costs we report are expressly meant to estimate the cost of achieving the full SDG target language globally; they use different methods for discounting and are subject to a wide range of uncertainty. Money alone will not be sufficient to meet the zero targets. But the figures and analysis presented above do suggest some orders of magnitude and likelihood of success, financing or not.

Using the language of costing studies of the Millennium Development Goals, were we to have come close to achieving the SDG zero targets by 2030, we would likely have spent trillions to do so. While the health goals appear comparatively affordable (and many of them more technically plausible), rapidly speeding progress on child and maternal mortality, under-nutrition, HIV, TB, malaria, NTDs, and sexual health might cost $40 billion a year (for comparison, Schmidt-Traub (2015) suggests a total cost for SDG health goals in LICs and LMICs of $69-89 billion). Even with very rapid growth in countries home to the world's extreme poor, expenditures to end $1.25/day poverty at reasonable targeting accuracy would cost in the many tens of billions of dollars annually. Meeting the low-bar universal energy targets and a parsimonious definition of the water and sanitation infrastructure targets would require perhaps $300-$500 billion in additional annual expenditure. The Brown Commission estimates $1.8 trillion additionally to meet the education goals alone, although Schmidt-Traub (2015) suggests $194 billion per year in incremental spending for LICs and LMICs alone. For comparison current total net financial flows to developing countries from DAC countries were $315 billion USD in 2015 and global GDP was 112 trillion (OECD, 2017, World Bank, 2017).

But as the MDGs helped demonstrate, additional financing is far from sufficient (Kenny and Sumner, 2011). Across many SDGs there is a significant gap between building the infrastructure or offering the service and universal use of that infrastructure or service. Some of that gap is accounted for by the low quality of infrastructure and services provided, some by norms and practices. That suggests even in an environment of near-unlimited financing for development, institutional and cultural change would be required to convert financing into development outcomes.

We have seen dramatic development progress over the past twenty years across most of the domains covered by the SDG zero targets. There is no reason to believe that the next fifteen years cannot see faster progress, and increased financing would surely help speed that progress. At the same time, a number of the zero targets call for progress that is historically unprecedented.

In many cases there remains a considerable gap between financing known technical solutions and achieving the outcomes called for in the SDGs. In some cases, we (even) lack the technical solutions required to achieve the zero targets, suggesting the need for research and development of new approaches. Given the experience of the MDG period, it is quite possible the SDGs will help foster development progress and unlock some additional development finance. But it appears extremely unlikely they will foster the rate of progress required to meet the zero targets that they set.

This might suggest the need to avoid taking SDG targets too literally in planning or budgeting exercises at the national or international level. If, in fact, achieving the SDGs would take incredible amounts of money and/or as of yet un-invented technologies and/or politically impossible policy choices and/or tradeoffs that make one goal even more remote at the cost of making another closer, such exercises that assume plausibility at the outset may avoid these hard tradeoff choices, and ignore issues of where to invest limited resources with the highest return. The Goals are certainly a useful tool to illustrate a range of elements of sustainable development in which we want to make progress, but some targets may be unhelpfully ambitious.

References

Abraham, Ronald, Elizabeth S. Bennett, Noopur Sen, and Neil Buddy Shah. 2017. *State of Aadhar Report 2016-17.* Report, IDinsight.

Alaii, Jane A., Van Den Borne, H. W., S. Patrick Kachur, Karen Shelley, Halima Mwenesi, John M. Vulule, William A. Hawley, Bernard L. Nahlen, and Penelope A. Phillips-Howard. 2003. "Community Reactions to the Introduction of Permethrin-Treated Bed Nets for Malaria Control During a Randomized Controlled Trial in Western Kenya." *American Journal of Tropical and Medical Hygiene* 68 (Suppl 4): 128-36.

Alkema, Leontine, Doris Chou, Daniel Hogan, Sanqian Zhang, Ann-Beth Moller, Alison Gemmill, Doris Ma Fat, et al. 2016. "Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group." *Lancet* 387: 462-74. doi:10.1016/S0140-6736(15)00838-7.

Atick, Joseph J. n.d. *Digital Identity: The Essential Guide.* ID4Africa.

Baird, Sarah, Francisco H. G. Ferreira, Berk Özler, and Michael Woolcock. 2014. "Conditional, unconditional and everything in between: a systematic review of the effects of cash transfer programmes on schooling outcomes." *Journal of Development Effectiveness* 6 (1). doi:10.1080/19439342.2014.890362.

Belaid, Loubna, Alexandre Dumont, Nils Chaillet, Vincent De Brouwere, Amel Zertal, Sennen Hounton, and Valéry Ridde. 2015. "Protocol for a systematic review on the effect of demand generation interventions on uptake and use of modern contraceptives in LMIC." *Systematic Reviews* 4 (124): 1-8. doi:10.1186/s13643-015-0102-7.

Bhalotra, Sonia R., Alberto Díaz-Cayeros, Grant Miller, Alfonso Miranda, and Atheendar S. Venkataramani. 2017. *Urban Water Disinfection and Mortality Decline in Developing Countries.* Working Paper No. 467, Washington, DC: Center for Global Development.

Bhattacharyya, Subhes. 2013. "Financing energy access and off-grid electrification: A review of status, options, and challenges." *Renewable and Sustainable Energy Reviews.*

Bhutta, Zulfiqar A., Jai K. Das, Arjumand Rizvi, Michelle F. Gaffey, Neff Walker, Susan Horton, Patrick Webb, Anna Lartey, and Robert E. for Lancet Maternal and Child Nutrition & Interventions Review Groups Black. 2013. "Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?" *Lancet* 382 (9890): 452-77. doi:http://dx.doi.org/10.1016/S0140-6736(13)60996-4.

Boyle, Colin F, Carol Levin, Arian Hatefi, Solange Madriz, and Nicole Santos. 2015. "Achieving a "Grand Convergence" in Global Health: Modeling the Technical Inputs, Costs, and Impacts from 2016 to 2030." *PLoS ONE* 10(10).

Casabonne, Ursula, and Charles Kenny. 2011. *The Best Things in Life are (Nearly) Free: Technology, Knowledge, and Global Health.* Working Paper 252, Washington, DC: Center for Global Development.

Chandy, Laurence, Natasha Ledlie, and Veronika Penciakova. 2013. *The Final Countdown: Prospects for Ending Extreme Poverty by 2030.* Policy Paper, Washington, DC: Brookings Institution.

Clemens, Michael A, Charles J Kenny, and Todd J Moss. 2007. "The Trouble with the MDGs: Confronting Expectations of Aid and Development Success." *World Development* (Elsevier Ltd) 35 (5): 735-751. doi:10.1016/j.worlddev.2006.08.003.

Clemens, Michael A. 2008. "The Long Walk to School: International Education Goals in Historical Perspective." Center for Global Development Working Paper No. 37. doi:10.2139/ssrn.1112670.

Das, Jishnu, and Jeffrey Hammer. 2014. "Are Institutional Births Institutionalizing Deaths?" *World Bank Blogs: Future Development.* November 20. Accessed September 27, 2017. http://blogs.worldbank.org/futuredevelopment/are-institutional-births-institutionalizing-deaths.

Dunning, Casey, Alan Gelb, and Sneha Raghavan. 2014. *Birth Registration, Legal Identity, and the Post-2015 Agenda.* Policy Paper 046, Washington, DC: Center for Global Development.

Fabic, Madeleine S, Yoonjoung Choi, John Bongaarts, Jacqueline E Darroch, John A Ross, John Stover, Amy O Tsui, Jagdish Upadhyay, and Ellen Starbird. 2015. "Meeting demand for family planning within a generation: the post-2015 agenda." *Lancet* 385 (9981): 1928-31. doi:10.1016/S0140-6736(14)61055-2.

Filmer, Deon. 2007. "If You Build It, Will They Come? School Availability and School Enrolment in 21 Poor Countries." *Journal of Development Studies* 43 (5): 901-28.

Fiszbein, Ariel, Ravi Kanbur, and Ruslan Yemtsov. 2014. "Social Protection and Poverty Reduction: Global Patterns and Some Targets." *World Development* Vol. 61, p. 167-77.

French, Declan. 2016. "Did the Millennium Development Goals Change Trends in Child Mortality?" *Health Economics* 25 (10): 1312-25. doi:10.1002/hec.3218.

Galiana, Isabel, and Amy Sopinka. 2014. *Benefits and Costs of the Energy Targets for the Post-2015 Development Agenda.* Energy Assessment Paper, Copenhagen Consensus Center.

Gates, Bill, and Ray Chambers. 2015. *From Aspiration to Action: What Will It Take to End Malaria?* End Malaria 2040.

Geldsetzer, Pascal, David Bloom, Salal Humair, and Till Bärnighausen. 2015. *Benefits and Costs of the HIV/AIDS Targets for the Post-2015 Development Agenda.* Health: HIV/AIDS Perspective Paper, Copenhagen Consensus Center.

Ghys, Peter, and José-Antonio Izazola-Licea. 2015. *Benefits and Costs of the HIV/AIDS Targets for the Post-2015 Development Agenda.* HIV/AIDS Viewpoint Paper, Copenhagen Consensus Center.

Giedion, Ursula, Eduardo Andrés Alfonso, and Yadira Díaz. 2013. *The Impact of Universal Coverage Schemes in the Developing World: A Review of the Existing Evidence.* UNICO Studies Series 25, Washington, DC: World Bank.

Gupta, Sanjeev K., Dinesh K. Pal, Rajesh Tiwari, Rajesh Garg, Ashish K. Shrivastava, Radha Sarawgi, Rajkumar Patil, Lokesh Agarwal, Prashant Gupta, and Chandrakant Lahariya. 2012. "Impact of Janani Suraksha Yojana on Institutional Delivery Rate and Maternal Morbidity and Mortality: An Observational Study in India." *Journal of Health, Population, and Nutrition* 30 (4): 464-71.

Hollada, Jacqueline, Kendra N. Williams, Catherine H. Miele, David Danz, Steven A. Harvey, and William Checkley. 2017. "Perceptions of Improved Biomass and Liquefied Petroleum Gas Stoves in Puno, Peru: Implications for Promoting Sustained and Exclusive Adoption of Clean Cooking Technologies." *International Journal of Environmental Research and Public Health* 14 (2): 182. doi:10.3390/ijerph14020182.

Horton, Susan, and John Hoddinott. 2014. *Benefits and Costs of the Food Security and Nutrition Targets for the Post-2015 Development Agenda.* Food Security and Nutrition Perspective Paper, Copenhagen Consensus Center.

Hutton, Guy, and Mili Varughese. 2016. *The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene.* Water and Sanitation Program: Technical Paper, World Bank.

Identification for Development. 2017. "Global ID4D Dataset." World Bank. Accessed June 27, 2017.

Ilie, Sonia, and Pauline Rose. 2016. "Is equal access to higher education in South Asia and sub-Saharan Africa achievable by 2030?" *Higher Education* 72 (4): 435-455. doi:10.1007/s10734-016-0039-3.

Inobaya, Marianette T., Remigio M. Olveda, Thao N.P. Chau, David U. Olveda, and Allen G.P. Ross. 2014. "Prevention and control of schistosomiasis: a current perspective." *Research and Reports in Tropical Medicine* 2014 (4): 65-75. doi:10.2147/RRTM.S44274.

International Food Policy Research Institute. 2016. *Global Nutrition Report: From Promise to Impact: Ending Malnutrition by 2030.* Washington, DC: IFPRI.

Irimu, Grace W, David Gathara, Dejan Zurovac, Harrison Kihara, Christopher Maina, Julius Mwangi, Dorothy Mbori-Ngacha, Jim Todd, and Alexandral English, Mike Greene. 2012. "Performance of Health Workers in the Management of Seriously Sick Children at a Kenyan Tertiary Hospital: Before and after a Training Intervention." *PLoS ONE* 7 (7): e39964. doi:10.1371/journal.pone.0039964.

Jamison, Dean T., Shane M. Murphy, and Martin E. Sandbu. 2016. "Why has under-5 mortality decreased at such different rates in different countries?" *Journal of Health Economics* (48): 16-25.

Johnston, E. Anna, Jordan Teague, and Jay Graham. 2015. "Challenges and opportunities associated with neglected tropical disease and water, sanitation and hygiene intersectoral integration programs." *BMC Public Health* 15:547.

Kenny, Charles, and Andy Sumner. 2011. *More Money or More Development: What Have the MDGs Achieved?* Working Paper 278, Washington, DC: Center for Global Development.

Kenny, Charles, and Dev Patel. 2017. "Estimating the SDGs's Demand for Innovation."

Kharas, Homi, and Andrew Rogerson. 2017. *Global development trends and challenges: Horizon 2025 revisited.* Report, London: Overseas Development Institute.

Kruk, Margaret E., Elysia Larson, and Nana A. Y. Twum-Danso. 2016. *Time for a quality revolution in global health.* Comment, Lancet, 4: e594-6.

Lim, Stephen S., Kate Allen, Zulfiqar A. Bhutta, Lalit Dandona, Mohammad H. Forouzanfar, Nancy Fullman, Peter W. Gething, et al. 2016. "Measuring the health-related Sustainable Development Goals in 188 countries: a baseline analysis from the Global Burden of Disease Study 2015." *Lancet* (388): 1813-50. doi:http://dx.doi.org/10.1016/S0140-6736(16)31467-2.

Molyneux, David, and Dieudonné P. Sankara. 2017. "Guinea worm eradication: Progress and challenges–should we beware of the dog?" *PLoS Neglected Tropical Diseases* 11 (4): e0005495. doi:10.1371/journal.pntd.0005495.

Mukherjee, Anit. 2017. "India's Supreme Court Ruling on Privacy and What It Means for Aadhaar." *Center for Global Development Blogs: Views from the Center.* August 24. Accessed September 27, 2017. https://www.cgdev.org/blog/indias-supreme-court-ruling-privacy-and-aadhaar.

Munro, Salla A., Simon A. Lewin, Helen J. Smith, Mark E. Engel, Atle Fretheim, and Jimmy Volmink. 2007. "Patient Adherence to Tuberculosis Treatment: A Systematic Review of Qualitative Research." *PLoS Medicine* 4 (7): e238. doi:doi:10.1371/journal.pmed.

Murnane, Richard J, and Alejandro J Ganimian. 2014. *Improving educational outcomes in developing countries: Lessons from rigorous evaluations.* Cambridge, MA: National Bureau of Economic Research.

Nakamura, Ryota, James Lomas, Karl Claxton, Farasat Bokhari, Rodrigo Moreno Serra, and Marc Suhrcke. 2016. *Assessing the Impact of Health Care Expenditures on Mortality Using Cross-Country Data.* CHE Research Paper 128, York, UK: Centre for Health Economics, University of York.

Neal, David, Jelena Vujcic, Rachel Burns, Wendy Wood, and Jacqueline Devine. 2016. *Nudging and Habit Change for Open Defecation: New Tactics from Behavioral Science.* Working Paper, World Bank Water and Sanitation Program.

Oppenheim, Ben, and Brenna Marea Powell. 2015. *Legal Identity in the 2030 Agenda for Sustainable Development: Lessons from Kibera, Kenya.* Policy Paper, New York: Open Society Foundations.

Organisation for Economic Co-operation and Development. 2016. "Table 3: Total Net Flows by DAC Country." *Statistics on resource flows to developing countries.* OECD. Accessed October 5, 2017. http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm.

Over, Mead. 2011. *Achieving an AIDS Transition.* Washington, D.C.: Center for Global Development.

Over, Mead, and Roxanne Oroxom. 2017. *Controlling the HIV/AIDS Epidemic by 2020 Will Not End US Responsibilities in Severely Affected Countries.* Global Health Policy Blog, Center for Global Development.

Pritchett, Lant. 2013. *The Rebirth of Education: Schooling Ain't Learning.* Washington, DC: Center for Global Development.

Pscharopoulos, George. 2014. *Benefits and Costs of the Education Targets for the Post-2015 Development Agenda.* Education Assessment Paper, Copenhagen Consensus Center.

Randive, Bharat, Vishal Diwan, and Ayesha De Costa. 2013. "India's Conditional Cash Transfer Programme (the JSY) to Promote Institutional Birth: Is There An Association between Institutional Birth Proportion and Maternal Mortality?" *PLoS One* 8 (6): e67452. doi:10.1371/journal.pone.0067452.

Raykar, Neha, and Ramanan Laxminarayan. 2014. *Benefits and Costs of the Malaria Targets for the Post-2015 Development Agenda.* Health: Malaria Perspective Paper, Copenhagen Consensus Center.

Ross, John. 2015. "Improved Reproductive Health Equity Between the Poor and the Rich: An Analysis of Trends in 46 Low-and Middle-Income Countries." *Global Health: Science and Practice* 3 (3): 419-45.

Sandefur, Justin, and Lant Pritchett. 2017. *Girls' Schooling and Women's Literacy: Schooling Targets Alone Won't Reach Learning Goals.* Policy Paper 104, Washington, DC: Center for Global Development.

Seddoh, Anthony, Adiele Onyeze, John Owusu Gyapong, Jent Holt, and Donald Bundy. 2013. *Towards an Investment Case for Neglected Tropical Diseases: Including new analysis of the cost*

of intervening against preventable NTDs in sub-Saharan Africa. Draft Working Paper, Lancet Commission on Investing in Health .

Shaheed, Ameer, Jennifer Orgill, Maggie A Montgomery, Marc A Jeuland, and Joe Brown. 2014. "Why "improved" water sources are not always safe." *Bulletin of the World Health Organization* 92 (4): 283-9. doi:10.2471/BLT.13.119594.

Storla, Dag Gundersen, Solomon Yimer, and Gunnar Aksel Bjune. 2008. "A systematic review of delay in the diagnosis and treatment of tuberculosis." *BMC Public Health* 8 (15). doi:10.1186/1471-2458-8-15.

Stover, John, Lori Bollinger, Jose Antonio Izazola, Luiz Loures, Paul DeLay, Peter D. Ghys, and Fast Track modeling working group. 2016. "What is Required to End the AIDS Epidemic as a Public Health Threat by 2030? The Cost and Impact of the Fast-Track Approach." *PLOS ONE* 11 (5): e0154893. doi:10.1371/journal.pone.0154893.

Sumner, Andy. 2013. "What will it take to end extreme poverty?" In *Development Co-operation Report 2013: Ending Poverty*, by OECD. OECD Publishing.

The International Commission on Financing Global Education Opportunity. 2016. "The Learning Generation: Investing in education for a changing world."

U.S. President's Emergency Plan for AIDS Relief (PEPFAR). 2017. *Strategy for Accelerating HIV/AIDS Epidemic Control (2017-2020).* Washington, D.C.: U.S. Department of State.

United Nations Children's Fund. 2016. "Birth registration." *Global Databases.* UNICEF. Accessed June 27, 2017.

United Nations Conference on Trade and Development. 2014a. *Growth with structural transformation: a post-2015 development agenda.* The Least Developed Countries Report 2014, UNCTAD.

United Nations Conference on Trade and Development. 2014b. *World Investment Report 2014: Investing in the SDGs-An Action Plan.* UNCTAD.

United Nations Population Fund. 2013. *The global programme to enhance reproductive health commodity security.* Annual Report, New York: UNFPA.

United Nations Population Fund. 2016. *Universal Access to Reproductive Health: Progress and Challenges.* New York: UNFPA.

Vassall, Anna. 2014. *Benefits and Costs of the Tuberculosis Targets for the Post-2015 Development Agenda.* Health: Tuberculosis Perspective Paper, Copenhagen Consensus Center.

Vollmer, Sebastian, Kenneth Harttgen, Malavika Subramanyam, Jocelyn Finlay, Stephan Klasen, and S V Subramanian. 2014. "Association between economic growth and early childhood undernutrition: evidence from 121 Demographic and Health Surveys from 36 low-income and middle-income countries." *Lancet Global Health* 2, p. 225-34.

Wang, Maria, and Regina Osih. 2014. *Benefits and Costs of the Tuberculosis Targets for the Post-2015 Development Agenda.* Health: Tuberculosis Viewpoint Paper, Copenhagen Consensus Center.

Westercamp, N., and R. C. Bailey. 2007. "Acceptability of Male Circumcision for Prevention of HIV/AIDS in Sub-Saharan Africa: A Review." *AIDS and Behavior* 11(3), p. 341-55.

World Bank and World Health Organization. 2014. "Global Civil Registration and Vital Statistics Scaling Up Investment Plan 2015-2024." Publication 88351.

World Bank. 2017a. "GDP, PPP (constant 2011 international $)." World Bank Data. Accessed October 5, 2017. https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD.

—. 2017. "Power outages in firms in a typical month(number)." *World Bank Data*. Accessed September 27, 2017b. https://data.worldbank.org/indicator/IC.ELC.OUTG.

—. 2017c. "Service Delivery Indicators(SDI)." *World Bank Data*. Accessed September 27, 2017. http://datatopics.worldbank.org/sdi/.

World Health Organization. 2012. *Accelerating Work to Overcome the Global Impact of Neglected Tropical Diseases: A Roadmap for Implementation*. WHO.

World Health Organization and United Nations Children's Fund. 2014. *WASH POST 2015: proposed targets and indicators for drinking-water, sanitation, and hygiene*. Recommendations from International Consultations Factsheet, Water Supply and Sanitation Collaborative Council (WSSCC).

World Health Organization. 2017a. "Cost effectiveness and strategic planning (WHO-CHOICE): One Health Tool." *WHO*. October 25. http://www.who.int/choice/onehealthtool/en/.

—. 2017b. "Immunization Coverage: Fact Sheet." *WHO Media Center*. July. Accessed September 27, 2017. http://www.who.int/mediacentre/factsheets/fs378/en/.

Yoshida, Nobuo, Hiroki Uematsu, and Carlos E. Sobrado. 2014. *Is Extreme Poverty Going to End? An Analytical Framework to Evaluate Progress in Ending Extreme Poverty*. Policy Research Working Paper 6740, World Bank.

Schmidt-Taub, Guido. 2015. *Investment Needs to Achieve the Sustainable Development Goals*. SDSN Working Paper No. 2.