

CENTER FOR GLOBAL DEVELOPMENT
MILLIONS SAVED
NEW CASES OF PROVEN SUCCESS
IN GLOBAL HEALTH

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Foreword

The world is healthier than ever. For the first time in human history, Africa recorded no polio cases at all in 2015. Deaths from malaria, AIDS, tuberculosis, pneumococcal disease, and meningitis are down significantly. And child mortality has been cut in half in the last 25 years.

What's enabled these global health successes? At the highest level, a combination of scientific advances, innovative financial interventions designed to address market failures, and effective collaboration among developing countries, the private sector, and government and philanthropic funders.

In each instance, there are valuable insights to be learned from what has worked well—and not so well—in global health. That's what this book is about. *Millions Saved* shows, through 22 rigorously evaluated case studies, exactly what worked and why.

It is a refreshing reminder of our ability to take on some of the biggest global challenges. And it underscores the incredible impact development aid can have—and why it's so important that we continue to support poor countries in lifting themselves out of poverty.

From the virtual elimination of meningitis A in 15 endemic countries in Africa, to providing universal health care in Thailand, to extending antiretroviral treatment to thousands in Botswana, *Millions Saved* shows how—with the right tools and support—even the poorest countries are able to respond to difficult challenges. In an engaging and readable way, this book chronicles important global health initiatives and illuminates valuable lessons that can be applied elsewhere.

While every case study is unique, *Millions Saved* identifies some common attributes. Successful programs started with ambitious but achievable goals. They targeted efforts to the people who would gain the most. They drew on the best evidence available, measured results, and used that information to do better. The outcome was large gains in public health at stunningly low cost.

Importantly, *Millions Saved* also looks at what didn't work. In Gujarat in western India, for example, a program to pay private doctors to offer hospital child-births to poor women failed to increase the number of hospital deliveries or

reduce birth-related complications—because it never reached the poorest mothers. What this case showed is that good intentions need effective, targeted delivery systems to make a real difference. There is as much to learn from a health program that did not reach its goals as one that did.

That's why our foundation helped fund the research, writing, and publication of *Millions Saved*—because the more information we can gather and share, the better decisions we can make and the more impact we can have. This is crucial because nearly 6 million children under the age of five are still dying every year—mostly from causes that we can prevent or treat.

The Center for Global Development has done a great job—and provided a great service—with this book. There are few organizations that apply economic research to global health and development policy with such forensic scrutiny.

I encourage global health experts, policymakers, funders, and anyone else interested in helping create a better world to read *Millions Saved*. I am confident you will come away with a clearer sense of what the world has learned about fighting some of our biggest health challenges—and how we can use that knowledge to save even more lives.

Bill Gates

Co-chair, Bill & Melinda Gates Foundation

INTRODUCTION

Global Health Revolution

Since the turn of the 21st century, people in low- and middle-income countries have experienced a health revolution, one that has created new opportunities and brought new challenges. It is a revolution that keeps mothers and babies alive, helps children grow, and enables adults to thrive through and beyond their working lives.

Yet that same health revolution has left many people behind, particularly those who are disadvantaged by the circumstances of their births. The urgent task ahead is to sustain and deepen health improvements in all regions of the world while finding creative ways to support better health among people who still suffer from exclusion and deprivation.

Economic conditions have sparked the health revolution. Low- and middle-income countries' economies have grown faster than those of their wealthier counterparts, and even the worst-off families have seen their living standards rise as national incomes have grown. Aid has also played a role. Foreign aid for health from public and private sources expanded fivefold between 1990 and 2013.¹ Furthermore, the arrival of new global health funders has fostered innovation and enabled delivery of health technologies even in the most impoverished and conflict-prone places in the world.

This edition of *Millions Saved* chronicles the global health revolution from the ground up, showcasing 22 of the local, regional, and national health programs that have been part of this global change. The first edition of *Millions Saved*, published by the Center for Global Devel-

opment in 2004, described 17 large-scale global health successes, and in the second edition this number was expanded to 20.² This new edition, however, profiles both major achievements and a few crushing disappointments. Each case demonstrates how much effort—and sometimes luck—is required to fight illness and sustain good health in challenging settings. Sometimes technology can be the game changer, but far more often success emerges from wise strategic choices, quality analysis, and sound leadership. Together, the cases offer lessons about what it takes to bring good health to all.

This edition provides new stories of global health impact over the past decade; however, the gains profiled in the first *Millions Saved* endure. Three examples illustrate the durability of those gains against specific diseases: guinea worm, smallpox, and iodine deficiency. The global health community has brought guinea worm to the verge of eradication without the aid of a vaccine or medicine; according to the Carter Center, only 22 cases were reported in four countries in 2015.³ Smallpox remains safely eradicated—the last wild case occurred in Somalia in 1997—although the threat of bioterrorism demands sustained vigilance. Iodine deficiency, whose symptom is goiter, was most prevalent worldwide in China. Now, since over 90 percent of the country enjoys access to iodized salt, goiters have become rare in China, and remaining efforts now stretch to provide iodized salt to nomads and rural dwellers in the country's remote mountainous regions.⁴

Global health priorities have also shifted since the original case studies were compiled, most obviously in

the transition from the Millennium Development Goals to the Global Goals for Sustainable Development.⁵ First, noncommunicable diseases have risen in prominence on the global health agenda, surpassing other types of disease and causes of death in all but the very poorest countries. Second, the global health community has rallied behind the promise of universal health coverage as a strategy to improve population health and prevent families from falling into poverty as a result of sky-high medical expenses. Third, results-based funding has proliferated around the globe, and evidence is growing that—designed well—this approach can help improve health outcomes and increase access, quality, and efficiency. And fourth, health experts now give serious attention to the importance of social determinants—especially gender inequality—in shaping health outcomes. The cases selected for this new edition reflect these major shifts.

About This Volume

This new edition of *Millions Saved* contains 22 case studies and a chapter on methods. Each case profiles an at-scale program that aimed to improve health. There are four main categories of programs: those that involve (1) rolling out medicines and technologies, (2) expanding access to health services, (3) targeting cash transfers to improve health, and (4) promoting population-wide behavior change to decrease risk. The book is divided into four parts, one for each category.

Together, the 22 cases (see Box 1) showcase a diversity of strategies to improve health in low- and middle-income countries.

The cases show that health success is possible anywhere, given the right strategies. Most of the world's regions are represented: seven from sub-Saharan Africa, six from Latin America and the Caribbean, five from East and Southeast Asia, and four from South Asia. The cases also come from an economically diverse range of countries, including some of the poorest countries and regions in the world.

As in the first edition of *Millions Saved*, programs were selected based on four key criteria developed by the original What Works Working Group and updated for this edition. The key criteria included the following:

1. **Importance.** The intervention was designed to solve a problem of public health significance. Mortality, morbidity, or another standardized measure such as disability-adjusted life years (DALYs) was used to indicate importance; other indicators, such as equity or demand on health system resources, were also considered.
2. **Impact.** Interventions or programs demonstrated a significant and attributable impact on one or more population health outcomes based on currently available evidence. Evidence of impact was judged along a continuum from most to least convincing, based on study designs that used experimental or quasi-experimental methods.
3. **Scale.** Interventions were implemented on a significant scale—primarily national, but regional was also considered. Programs were characterized as national if they had strong national-level commitment even if targeting a limited area or subgroup.
4. **Duration.** Interventions functioned at scale for at least five years.

The updated selection criteria gave preference to programs that could show cost-effectiveness in implementation, global relevance, or improvements in equity or financial protection.

The “impact” criterion proved especially tricky to apply (see the discussion in “Methods Used in Selecting and Analyzing *Millions Saved* Cases,” the book’s final chapter). All but 4 of the 22 programs had significant impact on one or several health outcomes; this is our core definition of success. The four disappointments represent valuable opportunities to learn; the programs were large and rigorously evaluated but failed to demonstrate significant health benefits.

In the push to get the biggest health bang out of every health buck, information on the costs and effects of programs is an essential resource for donors and governments. In 11 of the 22 cases, we include a measure of the cost-effectiveness of the programs, mostly the result of our own calculations.⁶ Some cases include a cost-effectiveness estimate while others do not. This is because some approaches, such as medicines and technologies, lend themselves more easily to this type of analysis than others. Efforts to increase access to care generate multiple benefits—protection from impoverishing out-of-pocket spending on health, greater access to needed care, or simply peace of mind—and quantifying this impact would require cost-benefit analysis along many more dimensions than health.

There are costs to employing such rigorous selection criteria. For example, two of the most influential small-scale programs on the impact of early nutrition inter-

Box 1. Cases in Millions Saved

Rolling Out Medicine and Technology

- Beginning of the End: Eliminating Meningitis A across Africa's Meningitis Belt
- Making the Impossible Possible: Botswana's Mass Antiretroviral Therapy Program
- Reducing Cancer Risk in China: Equalizing Hepatitis B Vaccine Coverage
- One Mosquito at a Time: Zambia's National Malaria Control Program
- A Solid Foundation for Child Health: Mexico's Piso Firme Program
- A Fresh Start for a Bright Future: Kenya's School-Based Deworming Program
- An Outbreak Halted in Its Tracks: Eliminating Polio in Haiti
- Learning from Disappointment: The Integrated Management of Childhood Illness in Bangladesh

Expanding Access to Health Services

- Health Access for All: Thailand's Universal Coverage Scheme
- Paying for Provincial Performance in Health: Argentina's Plan Nacer
- Tackling Disease at its Roots: Brazil's Programa Saúde da Família
- Motivating Health Workers, Motivating Better Health: Rwanda's Pay-for-Performance Scheme for Health Services
- Learning from Disappointment: Reducing the Cost of Institutional Delivery in Gujarat, India

Using Targeted Cash Transfers to Improve Health

- Giving Vulnerable Children a Fair Shot: Kenya's Social Cash Transfer Program
- A Step Up for the Children Apartheid Left Behind: South Africa's Child Support Grant
- Protecting Childhood: Punjab's Female School Stipend Program
- Learning from Disappointment: Honduras's Programa de Asignación Familiar

Changing Behavior Population-wide to Reduce Risk

- Cracking Down on Lighting Up: Thailand's Campaign for Tobacco Control
- Improving Road Safety: Vietnam's Comprehensive Helmet Law
- A Persuasive Plea to Become "Open Defecation Free": Indonesia's Total Sanitation and Sanitation Marketing Program
- Empowering Communities to Tackle HIV: India's Avahan Program
- Learning from Disappointment: Peru's Handwashing Initiative

ventions, in Guatemala and Jamaica, are excluded by the scale and duration criteria, despite their considerable importance in shaping understanding of the long-run impact of early childhood intervention.⁷ Also notable is that no study is included on the role of information technology in improving health, despite an explosion of studies on this topic, in this case because of scale and duration.

The new cases selected for this edition of *Millions Saved* were rigorously evaluated and documented. Yet there is no such thing as perfect knowledge; evidence on many programs is evolving thanks to longer periods of implementation, replication studies, new survey methods, and maybe even a "data revolution." What we do know is that this collection of case studies represents the best evidence available at the time of writing, and shows

that all but four of these experiences fall close to the "success" end of the evidence continuum.

In truth, some of the cases are not without controversy—three, in particular: Kenya's school-based deworming program, India's Avahan HIV control program, and Indonesia's program to reduce open defecation. Doubts regarding each program's impact arise from different factors. In the case of school-based deworming, a global systematic review and a replication study found that although worm loads dropped as a result of deworming, anti-anemia and education effects have not been comparable to those published in the original Kenya study, resulting in a debate that some have termed "worm wars."⁸ In Avahan, the impact estimates are modeled on and vary widely depending on how the counterfactual is defined.⁹ And Indonesia's program to reduce open defecation,

based on an approach first implemented in Bangladesh, yielded a significant health benefit but used tactics that many considered problematic.¹⁰ These cases were included because the disagreements about the programs have important lessons for global health policymakers and underscore the importance of rigorous impact evaluation, local context, and systematic reviews of the range of evidence available.

Millions Saved “Wows”: Four Common Features, Seven Key Lessons

Although each case is unique and context-specific, all the cases have four features in common. First, wise choices were made about the interventions or tactics to be deployed, based on the best available scientific evidence. Second, partnerships and coalitions were formed to mobilize needed technical, financial, and political resources, domestically and internationally. Third, political leaders, not one but many, sometimes across political cycles, sustained efforts over time. And fourth, the programs used data, results, and evaluation in their particular settings and countries and parlayed this information to improve health. In this they were distinct from many other health programs.

Seven key lessons emerge from this experience.

1. Millions Saved shows that global health works.

Global polling finds that 64 percent of adults believe that when today’s children grow up, they will be worse off than their parents.¹¹ High-profile disease outbreaks, natural disasters, corruption, and economic woes sometimes seem to conspire to create an atmosphere of pessimism. But the global health revolution writ large, and the *Millions Saved* cases in particular, show that this pessimism has little place when it comes to global health. With the right tactics—reaching the right people at the right time—health can improve rapidly, even in the poorest countries and among the poorest people. Just a few of the programs featured in *Millions Saved* cases together saved more than 18 million years of life that would otherwise have been lost to preventable causes of death and disability.¹² Furthermore, these huge gains have come at a remarkably low cost; life-sustaining antiretroviral treatment, a service provided in Botswana’s Masa (“New Dawn”) program, comes at an estimated average cost of US\$480 per patient annually. Likewise, the cost of one routine pediatrician visit in a wealthy country, about US\$53,

buys enough bed nets to save 10 Zambian children from dying from malaria in a year.

2. Focusing on the worst-off yields the biggest health gains.

Many of the new group of *Millions Saved* programs focused on people who live in poverty or belong to high-risk groups. Programs that were better able to reach the groups most in need achieved larger health impact. This makes intuitive sense: more health progress is possible where baseline conditions are worse. But good targeting comes in many forms. Brazil’s Programa Saúde da Família allocated more funding to poorer municipalities, adjusting the budget envelope according to the poverty level in each community. Kenya’s cash transfer program used both geographic and community-based targeting, asking village leaders to identify families in need that met the program’s eligibility criteria. And India’s AIDS programs made a difference by focusing on key population groups that were most affected by AIDS: female sex workers, men who had sex with men, transgender people, people who used drugs, and groups that worked along major trucking routes.

Other interventions were universal in scope—and “universal” means everyone. For example, the enforcement of Vietnam’s helmet legislation affects the poor and wealthy alike. Even within universal approaches, however, dedicated efforts are often needed to reach people in the most excluded communities, via targeted outreach, subsidies, and community monitoring.

3. Governments can do the job; aid helps.

In nearly all the cases, governments in low- and middle-income countries have led the hard work of reaching populations in need, making policies, and forming strategies. Brazil’s Programa Saúde da Família expressed the government’s commitment to equity when it brought primary healthcare to people living in poverty. In South Africa, the post-apartheid government used the Child Support Grant as a central spoke in its strategy to undo the legacy of the past. And in Thailand, advocates convinced the government to take on Big Tobacco with far-reaching legislation and a new health promotion fund financed by tobacco taxes. Even in countries that some label “failed states,” health authorities have managed to work effectively. Three cases—elimination of polio in Haiti, cash transfers in Pakistan, and vaccination in Africa’s meningitis belt—

show that weak governance in general does not preclude effective government-led health-service delivery when the right external support is available.

Indeed, the partnerships described in the cases show that success results from shared responsibility; all do their part and no one partner foots the bill alone. Most cases feature external co-financing or technical cooperation (see Table 1). Many programs were critically aided by the contributions of global partnerships, bilateral and multilateral aid agencies, and foundations. The private sector can also play a role: pharmaceutical companies donated medicines in Botswana, copper companies delivered malaria control programs in Zambia, and a plastics company dreamed up handwashing stations in Peru.

4. Incentives matter for health results.

The cases clearly show that incentives matter for health, and that incentives can take many shapes and forms. For providers, incentives can help motivate greater effort and productivity. They might include the amount of money health workers receive for their services, the nuts and bolts of that payment, or steps to promote accountability and to monitor and reward performance, to name a few. Similarly, incentives can help motivate individual beneficiaries of interventions to adopt healthier behavior, seek healthcare services, and adhere to treatment.¹³ Paying households (via cash transfers) and providers in a way that is consistent with desired health outcomes and measuring what matters can make a major difference in health outcomes.

In Rwanda, paying for and tracking health facilities' provision of quality health services improved provider motivation and children's nutrition. In Brazil and Argentina, paying subnational governments for each additional family enrolled in primary care motivated health workers to track down those in need and ensure that they received key services. In Thailand, people living in poverty were issued a gold card that guaranteed them access to health benefits, which incentivized families to seek care more often and improved their health. In Vietnam, stronger police enforcement of motorcycle helmet use increased the costs of going without, creating a strong new incentive for people to protect their heads.

Incentives are powerful, so it is important to ensure that they make sense and do not induce harmful unintended consequences. Honduras's cash transfer program may have unintentionally created an incentive

for women to have children earlier, or more quickly, than they might have done absent an external incentive. Similarly, Indonesia's rural sanitation program was able to achieve an impact on diarrhea by stigmatizing people who defecated in the open. That powerful social incentive led to better health, but at the cost of shaming and penalizing those who could not afford to build or buy latrines.

5. What works: efficacy is not the same as effectiveness.

In everyday English, "efficacy" and "effectiveness" might seem to have similar meanings. In the field of public health, however, there is an important distinction between the two terms. Efficacy is an intervention's proven impact in laboratory or trial settings, whereas effectiveness is how a particular intervention fares in real-world situations. In this book we are most concerned with effectiveness.

In the field of global health, conventional wisdom often suggests that good technologies—those proven to be efficacious, to work in a small-scale trial—are enough to get the job done. Historically, the global health community has focused on buying vaccines and medicines for countries that cannot afford them, assuming that those products will make their way to those who need them most. Indeed, the main *raison d'être* of global partnerships such as Gavi, the Vaccine Alliance; the Stop TB Fund; UNITAID; and others is to purchase health products, on the implicit assumption that the main barrier to health impact is the lack of efficacious and affordable medicines.

This lack is certainly part of the problem, but it takes far more than an efficacious and affordable technology to improve health at scale. Efficient delivery, appropriate use, and adherence to treatment directives are equally important ingredients of effectiveness. The drop in AIDS mortality in Botswana stems not just from donated medicines but also from health providers' ability to identify people living with HIV and to support their adherence to treatment. Similarly, researchers in Bangladesh found that providing efficacious interventions on their own was not enough to improve health, given families' own counterproductive health-related behaviors as well as broader economic changes.

Taken together, the cases also show that despite our knowing "what works" in terms of health technology, we still have a lot to learn about how to scale up delivery and uptake in specific settings. Several pro-

Table 1. Program Implementers and Funders

PROGRAM	MAIN IMPLEMENTERS	LEAD FUNDERS
African Meningitis Belt's Meningitis A Vaccine Program	Meningitis Vaccine Project (led by PATH and WHO), US Food and Drug Administration's Center for Biologics Evaluation and Research, Serum Institute of India Ltd., Synco Bio Partners, UK's National Institute for Biological Standards and Control	Meningitis Vaccine Project (PATH, WHO), BMGF, USAID, Dell Foundation, Gavi, Ministries of Health (Burkina Faso, Mali, Niger)
Botswana's Mass Antiretroviral Therapy Program	Government of Botswana, BMGF, Merck Foundation (via the African Comprehensive HIV/AIDS Partnership)	Government of Botswana; Merck Foundation; BMGF; PEPFAR; Global Fund to Fight AIDS, Malaria and Tuberculosis
China's Program to Equalize Hepatitis B Vaccine Coverage	Chinese Ministry of Health, Gavi	Government of China, Gavi
Zambia's National Malaria Control Program	Zambian Ministry of Health, UNICEF, US President's Malaria Initiative, Roll Back Malaria	USAID; US President's Malaria Initiative; Global Fund to Fight AIDS, Malaria and Tuberculosis; World Bank, PATH (funded by BMGF)
Mexico's Piso Firme Program	Government of Mexico	Government of Mexico
Kenya's School-Based Deworming Program	Kenyan Ministries of Health and Education, Deworm the World	World Bank, Deworm the World, Children's Investment Fund Foundation, END Fund
Haiti's Polio Elimination Campaign	Government of Haiti, Pan American Health Organization, US Centers for Disease Control and Prevention	Government of Haiti, Pan American Health Organization, WHO, Canadian International Development Agency, USAID, UNICEF, Rotary International, World Bank
Bangladesh's Integrated Management of Childhood Illness	Government of Bangladesh; ICDDR,B; WHO	Government of Bangladesh, UNICEF
Thailand's Universal Coverage Scheme	Government of Thailand	Government of Thailand
Argentina's Plan Nacer	Argentina's federal and provincial Ministries of Health, World Bank	Government of Argentina (federal and provincial), World Bank
Brazil's Programa Saúde da Família	Government of Brazil	Government of Brazil
Rwanda's Pay-for-Performance Scheme for Health Services	Government of Rwanda	Government of Rwanda
Gujarat's Program to Reduce the Cost of Institutional Delivery	Government of Gujarat, India	Government of Gujarat
Kenya's Social Cash Transfer Program	Government of Kenya, UNICEF	Government of Kenya, UNICEF, World Bank, UK Department for International Development
Punjab's Female School Stipend Program	Government of Punjab, Pakistan	Government of Punjab, World Bank, UK Department for International Development, Canadian International Development Agency
South Africa's Child Support Grant	Government of South Africa, Lund Committee on Child and Family Support	Government of South Africa
Honduras's Programa de Asignación Familiar II	Government of Honduras	Government of Honduras, Inter-American Development Bank
Thailand's Campaign for Tobacco Control	Government of Thailand, Thai Anti-Smoking Campaign Project, Thai Health Promotion Foundation	Thai Health Promotion Fund
Vietnam's Comprehensive Helmet Law	Government of Vietnam, WHO, Asia Injury Prevention Foundation	Government of Vietnam, Asia Injury Prevention Foundation
Indonesia's Total Sanitation and Sanitation Marketing Program	Government of Indonesia, World Bank Water and Sanitation Program	Government of Indonesia, World Bank Water and Sanitation Program, BMGF
India's Avahan Program	BMGF, Family Health International, CARE International, WHO	BMGF
Peru's Handwashing Initiative	Government of Peru, World Bank Water and Sanitation Program, Public-Private Partnership for Handwashing	World Bank Water and Sanitation Program

Source: See case chapters.

Note: BMGF = Bill & Melinda Gates Foundation; ICDDR,B = International Centre for Diarrhoeal Disease Research, Bangladesh; PEPFAR = US President's Emergency Plan for AIDS Relief; UNICEF = United Nations Children's Fund; USAID = United States Agency for International Development; WHO = World Health Organization.

grams profiled in this volume—Piso Firme in Mexico, cash transfers in South Africa, pay-for-performance in Rwanda—led to improvements in children’s nutritional status, yet each employed a different technology and delivery strategy to achieve its goals. While taking on board the lessons of these particular cases, we must carefully evaluate alternative technologies and delivery strategies in different country contexts to figure out in each case the best way to graduate an efficacious technology to effectiveness at scale.

6. There’s an evaluation revolution, too.

Many health programs are judged on their intermediate outputs—the number of children vaccinated, the number of vaccine doses purchased, or the number of people treated or trained—without any direct assessment of health impact. At the same time, many low- and middle-income countries are seeing rapid improvement in other drivers of health status, such as girls’ education, urbanization, and economic growth. Why is this important? Because if we had known that health would have improved even without a given health intervention, the money could have been better used elsewhere.

The cases in the first edition of *Millions Saved* described evidence that at-scale health impact was largely attributable to specific public health efforts rather than to broader economic and social improvements. Now there is an even better evidence base that illustrates the feasibility and affordability of rigorous evaluation for at-scale health programs. Over the past decade, there has been tremendous growth in the number of such evaluations in low- and middle-income countries, from 10 in 1995 to over 300 in 2014.¹⁴

Of the 22 new cases in this book, 14 used experimental study designs that allowed for the unambiguous attribution of health impact. Some governments stepped forward to involve themselves in commissioning or carrying out evaluations. In Argentina, South Africa, Thailand, and Mexico, government evaluation agencies have been set up to assure rigorous evaluation methods and the translation of results into policy, such as the scale-up of a successful program or the move away from a disappointing one.

In some cases, attributable impact is evident even without rigorous evaluation. Zero smallpox cases is zero smallpox cases, and we only need a high-quality disease surveillance system, not an experiment, to

understand program results. However, an impact evaluation might still be useful, say, to help us learn about effective immunization delivery strategies in rural areas. And in countries where other transformations are taking place, such as changes in the economy or in weather patterns, it is helpful to understand whether trends in disease are most affected by a program or by some other factor.

Despite the real progress that has been made in the world of impact evaluation, many needed types of data are unavailable. For instance, cost-effectiveness is important to many donors and policymakers. They want to know if the health gained is worth the cost of the program, and they need help in prioritizing where scarce public resources should be deployed. Yet few studies report empirical estimates of cost-effectiveness. Only two cases in this book did so; we had to derive the other estimates from modeling and secondary sources.¹⁵ And some categories of intervention—for example, those against noncommunicable diseases—remain woefully under-evaluated, with only a handful of trials and little evaluation at scale.

7. Evidence requires its own advocacy.

Policymakers do not always act on evaluation results, positive or negative. In Gujarat, a program to incentivize births in health facilities continued with an unchanged design despite disappointing results. Inertia, often coupled with political or other considerations, makes it hard to stop something once it starts. Further, policymakers may not even know about failure, thanks to publication bias. Less than half of randomized control trials in healthcare reach publication, and those that do tend to be heavily biased toward statistically significant results—that is, toward results that suggest a drug or program was successful.¹⁶

In an ideal world, policymakers absorb evaluation results, nicely synthesized in a quality systematic review, and adjust their programs to enhance their effectiveness. In reality, it is not enough to evaluate a program; evidence requires its own advocacy. In some settings, such as Mexico and South Africa, public institutions directly commission the evaluation of public programs and promote action to be taken based on the results. There is also a special role for aid; Levine and Savedoff¹⁷ have argued that donors are “uniquely suited” to finance evaluations because of the small relative size of donor monies as domestic finance grows, as well as donors’ ambitions of disproportionate influ-

ence, sensitivity to being used for illicit purposes, ability to bridge several communities, and aspirational role in advancing public-sector accountability.

The Challenges Ahead

Much has changed in global health since the first edition of *Millions Saved*, but much remains the same. In 2004, the original *Millions Saved* declared: “Ancient problems remain unsolved, such as the differentials in health between the rich and the poor. Newer ones—from the AIDS pandemic to the prevalence of tobacco-related diseases to the growing toll of cardiovascular disease—threaten future generations.”¹⁸ Although the intensity of these challenges has lessened, thanks in part to some of the programs described in this book, they do persist, and they continue to require the attention and commitment of the global health community.

In particular, it is disappointing that few noncommunicable disease (NCD) programs made the cut for inclusion in this new edition a full decade later. Although many small-scale trials have shown that NCD interventions are cost-effective, our research turned up few large-scale programs in low- and middle-income countries to reduce or treat NCDs, and even fewer with a proven impact on health status. The list is short: China’s hepatitis B vaccination program to prevent liver cancer, Vietnam’s motorcycle helmet laws to reduce head injuries, Thailand’s tobacco control program, and Brazil’s Programa Saúde da Família, which curbed heart disease. Turning global momentum on NCDs into effective at-scale programming is an imperative that cannot be ignored; the World Health Organization predicts that NCDs will cause more than three-quarters of all deaths by 2030.¹⁹ Even in sub-Saharan Africa, cardiovascular disease is already the number one killer of adults above age 30.

Nonetheless, the “old” Millennium Development Goals agenda remains unfinished. Preventable maternal, infant, and child mortality; undernutrition; and infectious diseases are still too common, even in countries

where most of the population has completed the epidemiological transition from infectious diseases and reproduction-related risks to NCDs, injuries, and other causes of death. Emerging drug resistance and the threat of malaria resurgence—as well as emerging viruses like Ebola and Zika—oblige us to remain vigilant and sustain efforts, even where specific threats are dormant.

Finally, global health headlines, like the title of this book, focus on lives saved. But many cases in *Millions Saved* are most notable for their impact on alleviating disability, not averting death—a benefit that can extend even into the next generation. Nonfatal diseases can have both immediate and long-term consequences. Among girls, for instance, anemia, human papilloma virus, HIV, and other untreated sexually transmitted infections precede a cascade of health problems for them at older ages as well as for their future children. Treatment of intestinal worms also has both short- and long-term benefits: in Kenya, women who had received deworming pills were, a full 10 years after receiving them, less likely to miscarry than others who had not received the treatment. Reducing disability and increasing the number of healthy years lived is the next generation’s global health challenge, and the result on which we need to measure success going forward.

The health sector is still searching for answers, and finding some. The next edition of *Millions Saved* is likely to be quite different from this one. It will cover a new generation of programs, both within and outside the health sector. It is our hope and expectation that those programs will reflect the sea changes we are already seeing, particularly the growing use of rigorous impact evaluations and cost-effectiveness analysis as tools for health policy. The gains of the previous decade give grounds for optimism that, in the next decade, better health policies will mean many more millions saved.

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ENDNOTES

1. IHME (2014).
2. Levine, What Works Working Group, and Kinder (2004); Levine (2007).
3. Carter Center (2015).
4. American Thyroid Association (2014).
5. The 2015 Millennium Development Goals—targeting poverty, education, gender equality, child mortality, maternal health, disease, environment, and global partnership—have been replaced by the Global Goals for Sustainable Development, a new set of universally acknowledged goals, targets, and indicators that

ENDNOTES, continued

- United Nations member states are expected to use in framing their agendas and political policies until 2030.
6. Mirelman, Glassman, and Temin (2016).
 7. Hoddinott et al. (2008); Grantham-McGregor et al. (1997).
 8. Cochrane Collaboration (2015); Evans (2015).
 9. Ng et al. (2011); Pickles et al. (2013).
 10. Gertler et al. (2015).
 11. Stokes (2015).
 12. The sum of the Botswana antiretroviral therapy, MenAfriVac, hepatitis B, deworming, malaria, Piso Firme, Plan Nacer, helmets, sanitation, tobacco, and Avahan programs comes to 18.1 million disability-adjusted life years averted. See Mirelman, Glassman, and Temin (2016) and chapter 23 of this volume.
 13. Abdul Latif Jameel Poverty Action Lab (2011).
 14. Levine and Savedoff (2015).
 15. Mirelman, Glassman, and Temin (2016).
 16. Dwan et al. (2008).
 17. 2015.
 18. Levine, What Works Working Group, and Kinder (2004, 10).
 19. WHO (2011).

The Structure of This Book

Case studies are grouped into four parts: Part I, “Rolling Out Medicine and Technology”; Part II, “Expanding Access to Health Services”; Part III, “Using Targeted Cash Transfers to Improve Health”; and Part IV, “Changing Behavior Population-wide to Decrease Risk.” Each part has an introductory section listing the cases discussed and the way they fit with the “wows” highlighted in the introduction.

Each case’s story is structured similarly: the facts of the policy or program are set out at a glance; the target health problem is defined and the approach discussed; the health impact and the strength of the evidence are described; the cost of achieving that impact is assessed; the keys to lasting success are summarized; and, finally, the case’s implications for global health more broadly are analyzed.

The book ends with a chapter on the *Millions Saved* process and methods.

