A hard look at global health measures

Researchers seek convincing evidence that large-scale projects save lives

By Jon Cohen

Since 2002, rich countries have poured more than $10 billion into malaria control. The money has helped pay for planeloads of bed nets treated with insecticides, hundreds of millions of doses of a powerful combination therapy, widespread indoor spraying of homes, and prophylactic treatment of pregnant women, an especially vulnerable group. The generous, large-scale programs have saved the lives of hundreds of thousands of people, most of them African children.

Or have they? It may sound strange, but some analysts say we don’t really know. Yes, the World Health Organization estimates that between 2000 and 2012, malaria cases have dropped by 25% worldwide and deaths have been cut by 42%. But in April, researchers at the widely respected Center for Global Development (CGD) in Washington, D.C., triggered a fierce debate among malaria experts when they wrote in a blog post that they couldn’t find a single study with convincing data that showed how a large-scale intervention directly led to lower numbers of cases or deaths. (CGD and the Disease Control Priorities Network wanted an example for the third edition of Millions Saved, a book that documents proven successes in global health.)

The CGD researchers don’t doubt that malaria interventions can work. Controlled clinical trials among several thousands of people have shown with statistical...
Hats off to Vietnam’s helmet law

By Martin Enserink

A decade ago, it wasn’t unusual to see a Vietnamese family of five cheerfully braving the frenzied traffic of Hanoi on a single motorcycle—with nobody wearing a helmet. No longer. A stringent law passed in 2007 has made helmets compulsory—and has proven that such laws, which require political will more than money, can have a huge impact on public health. Research suggests that the law’s passage saved more than 1500 lives the first year and reduced serious head injuries by almost 2500.

Traffic injuries aren’t the first thing most people think about upon hearing “global health,” but road accidents kill an estimated 1.24 million people worldwide annually, about the same number as tuberculosis and twice as many as malaria. That’s why the World Health Organization (WHO) has made road safety a priority. In developing nations in particular, there are huge opportunities to drive down the death toll.

In Vietnam, the economic boom of the 1990s led tens of millions to trade in their bicycles for motorcycles, causing injuries to soar. (Cars are still relatively rare.) In 2010, Vietnam had 24.7 traffic deaths per 100,000 people, compared with 11.4 in the United States and 3.0 in Sweden. The country has had helmet laws on the books since 1995, but at first helmets were compulsory only on major roads, and enforcement was weak. Many Vietnamese resisted what they called rice cookers, saying they were uncomfortable in the tropical heat—or an assault on their hairdos.

In 2007, a new law required riders to wear helmets on all roads at all times. Fines were set at $6 to $12, a whopping 30% of the average monthly income. Foreign governments and nongovernmental organizations pitched in with money for education campaigns and free helmets. When the law took effect on 15 December 2007, helmet use jumped from less than 40% to almost 100% literally overnight.

It wasn’t the end of all problems. Many riders initially didn’t strap their helmets, which was then made an offense as well. Many of the helmets on the market are flimsy, and the government is still struggling to enforce quality standards. But a study published in 2010 by researchers at WHO’s country office in Hanoi found 16% and 18% reductions in the risk of serious head injuries and deaths, respectively, in 2008.

Researchers at the Center for Global Development (CGD) plan to include the Vietnam law in the next edition of Millions Saved, a book on proven successes in global health—but strictly speaking, the evidence doesn’t meet CGD’s standards. The center prefers to see a randomized study or at least a “quasi-experimental” study design (see main story). That didn’t happen in Vietnam. CGD decided to include the case anyway because it’s difficult to see what else—besides the law—could have caused the drop. CGD’s Miriam Temin hopes Vietnam’s success will inspire other countries.


significance that each can reduce cases and deaths. But efficacy in a carefully managed, tightly monitored study does not equal effectiveness in the messiness of the real world. Confusing matters further still, weather patterns, an economic upswing, or improved housing can also have a big impact on disease.

The CGD researchers are part of a growing movement that seeks harder data about the number of lives actually saved by the billions poured into health in poor and middle-income countries. Such evidence is critical, proponents argue. After a decadelong explosion, funding for global health has leveled off (see p. 1258); governments and charities need to know the impact of their dollars to justify their investments and to change programs that don’t work well enough or not at all.

The new field of what is called impact evaluation is rapidly gathering steam. Large global health donors and developing world governments have widely accepted that they need better evidence of what works, and several new institutes are devoted to gathering it. Publications that use impact evaluation methods have skyrocketed. It’s becoming increasingly difficult for the development assistance world to take credit for changes that might have occurred without their interventions—and to ignore the possibility that the money might have spared more people from disease if spent elsewhere.

“ Agencies have come to realize that impact evaluation is the only way you can meaningfully talk about results,” says Howard White, who heads the International Initiative for Impact Evaluation (3ie), a nonprofit launched in 2008. “They want to be able to go back to their funders or boards and say, ‘We’ve lifted 18 million out of poverty.’ ”

But debates are raging about what constitutes convincing evidence of effectiveness. Randomistas, as some derisively call them, will only seriously consider supersized versions of the randomized, controlled studies used to evaluate the efficacy of drugs and vaccines. Others, like the researchers at CGD who select case studies for Millions Saved, considered other evidence as well. (The sidebars about
specific successes and disappointments in Vietnam, Zambia, South Africa, and Peru in this special news section are based on draft case studies in the upcoming book.)

A few prominent critics, meanwhile, say the new focus on evidence is going way too far. They worry that it diverts money and attention from the actual battle against disease. And rigorous attempts to measure impact can cause unease among major donors, the groups they fund to roll out programs, and disease advocates, says Ruth Levine, a development economist at the William and Flora Hewlett Foundation in Menlo Park, California, who edited the first edition of **Millions Saved**. “The support for global health rests on a collective hope that money is turning into lives saved, and anything that punctures that belief is really very threatening,” Levine says.

**UNTIL 2000**, hardly any impact evaluations were done in global health, or for that matter in development aid in general. “If you asked anyone what their impact was—and I don’t care whether it was diabetes, hypertension, HIV—the answer would have been, ‘We’re spending X amount of dollars’,” says Mark Dybul, who heads the Global Fund to Fight AIDS, Tuberculosis and Malaria, which was formed in 2002.

The Global Fund and the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR), which started in 2003 and was later headed by Dybul, together have spent more than $60 billion on HIV/AIDS, and both have received flak for not taking a close enough look at their own impact. For instance, they have long used the number of patients given antiretroviral drugs as a major yardstick of success. But people don’t always take their pills, or they may drop out of treatment. So the precise public health impact, as well as the cost-effectiveness of specific programs, remained unclear.

Even if public health does improve after the rollout of a program, there may be no causal relationship. What’s needed for a thorough evaluation, says epidemiologist Nancy Padian, who has appointments at both the Berkeley and San Francisco campuses of the University of California (UC), is a way to assess what would have happened if the intervention had not occurred. This is known in the lingo of impact evaluations as a counterfactual, and it’s akin to a placebo control in a drug trial. “It’s all about having the most robust counterfactual you can have,” says Padian, who was a lead scientific adviser for PEPFAR.

A landmark demonstration of the value of this approach involved a social welfare program launched in Mexico in 1997, called PROGRESA, in which families received cash

It’s a wash: Hands-on hygiene in Peru

**By Kai Kupferschmidt**

Few public health interventions promise an easier payoff than getting people to wash their hands with soap. It’s easy, and studies suggest it could prevent up to two-fifths of all diarrheal disease and one-fourth of pneumonia, the two biggest childhood killers in poor countries, saving up to 1 million lives every year. With hand-washing, there’s none of the controversy surrounding condoms and birth control. Yet despite decades of effort and millions of dollars, only between 3% and 34% of people in poor countries regularly wash their hands. Simple routines, it turns out, are not always easy to instill.

In 2008, the Peruvian government, with support from the World Bank and the Bill & Melinda Gates Foundation, launched a media campaign called “clean hands, healthy children” to improve hygiene in 40 randomly selected districts across Peru. Radio spots, brochures, and posters, targeted at millions of mothers and children, stressed the importance of washing hands after going to the toilet or changing a baby and before cooking and eating. In 44 more districts, the media campaign was launched together with further interventions: Primary schools added hand-washing lessons, and teachers and local leaders educated mothers. More than 80,000 simple hand-washing stations designed by the company Duraplast and fashioned out of old plastic bottles—one filled with water and one with soap—were distributed to households. The campaign even introduced a cartoon superhero, Super Jaboncin, who fights germs using water and soap.

But the results were far from superpowered. A 2012 evaluation found that the media campaign alone did not change behavior at all. In communities with the more intensive interventions, hand-washing before food preparation increased from 10% to 17%. But researchers did not find a decrease in either diarrhea or pneumonia. (A campaign in Vietnam had similar results.)
for keeping their kids in school and using preventive health services. PROGRESA’s main architect, Mexican Deputy Finance Minister Santiago Levy, was worried that the next government might shut the initiative down unless hard evidence showed that it worked to improve kids’ health. Levy enlisted an evaluation team led by UC Berkeley health economist Paul Gertler.

Gertler proposed taking advantage of the fact that Mexico could not afford to roll out PROGRESA nationwide all at once. He suggested a lottery to determine which communities could participate in the program first. Other villages would start 2 years later; they became the counterfactual. The comparison showed that the cash transfer led to a significant drop in illness and hospital visits among children, and adults benefited, too. The study was “a phenomenal breakthrough,” Levine says, and PROGRESA survived.

**RANDOMIZED, CONTROLLED STUDIES** create their own counterfactual by randomly assigning participants to intervention or control groups; a mainstay of clinical research, they have rapidly multiplied in global health (see graphic). One leader is the Abdul Latif Jameel Poverty Action Lab (J-PAL), founded in 2003 at the Massachusetts Institute of Technology to do such studies in health and other development projects. J-PAL has since done follow-up evaluations of PROGRESA (renamed Oportunidades) and studied the impacts of hand-washing promotion on diarrhea in Peru, double-fortified salt on anemia in India, and deworming on school attendance in Kenya. 3ie, founded 5 years later, was established to fund evaluations and serve as an online repository of high-quality studies.

While randomized, controlled trials are not always feasible. It’s also widely considered unethical to withhold a proven intervention—some of them life-saving—from one group of people simply to test how well a large-scale rollout works. So scientists have developed several less rigorous methods. Eligibility criteria, for example, have a built-in counterfactual: If an intervention applies to people only under 14, kids who just turned 15 become good comparators. Sophisticated techniques can also “match” the group receiving an intervention to an artificial counterfactual created by statisticians. “There is a suite of methods,” Padian says, some of which aren’t used in standard drug or vaccine trials but are considered convincing to many, including the CGD editors of Millions Saved.

The Global Fund and PEPFAR have embraced the idea of more rigorously measuring impact. “It’s becoming a top priority,” says Deborah Birx, who heads PEPFAR. Today, both programs want to track how many people on HIV treatment have fully suppressed the virus for prolonged periods, which means they’re actually healthier. To accomplish this, PEPFAR is distributing computer tablets to clinics and asking them to record—and report in real time—HIV levels in patients on treatment. Dybul says he’s also “really adamant right now” about finding out how specific clinics are doing, instead of focusing on national data. That’s a great step forward, says Stefano Bertozzi, dean of the School of Public Health at UC Berkeley.

“If you know you have clinics in one country that go from 25% to 90% of patients being virally suppressed, as a manager, you have incredible information to know what’s working and what isn’t,” Bertozzi says.

But the rising popularity of impact evaluations has triggered plenty of debates, which some have slagged as “wack and warts.” A single impact study often doesn’t mean much because the results may not apply elsewhere, says Harvard University economist Lant Pritchett, a prominent critic of impact evaluations and a nonresident fellow at CGD. The randomness tends to overlook the “key failing” in developing countries, he says: Organizations don’t...
Hard cash boosts child health in South Africa

By Jon Cohen

Money may not buy love or happiness, but if you give a poor family a small sum each month for each of their children, it leads to measurable improvements in their health, education, and well-being. That's the lesson from an ambitious program in South Africa, the Child Support Grant (CSG), which directly reduces poverty with cash transfers.

In South Africa, any family that can demonstrate financial need is entitled to a monthly stipend of about $30 per child, no strings attached. In 1998, when the CSG started, the cutoff was 6 years old; today it is 17, and the program reaches 11 million children. Families can apply to receive monthly payouts for each child, which costs the government more than $3 billion each year.

In 2008, the Cape Town–based Economic Policy Research Institute (EPRI) set out to see how well the program worked, surveying 2500 people in five provinces. Rather than simply comparing families that received help with those that did not, the study took advantage of CSG’s rocky start. At first, many eligible families did not receive the CSG, as a documentary aired on South African TV in 2001 revealed. The exposé spotlighted widespread serious illness in poor, rural children whose caregivers, mainly grandmothers, had not registered for the CSG, often because registration sites were far from their homes or they found the required paperwork overwhelming. In response to the public outcry, the government dispatched vans to the area to sign up eligible families en masse. “That almost created a natural experiment so years later, we could compare the youth in towns where the mobile registration had stopped and signed up people to other youth who were passed over and weren’t getting the grant,” says economist Michael Samson, EPRI’s director of research.

He and his colleagues considered the cash per child the “unit dose” and asked how children fared in households that had received different doses. In May 2012, the South African government and the United Nations Children’s Fund, which funded the EPRI study, published a report detailing the results. Children in families that received higher doses had improved growth, decreases in illness, better grades and attendance at school, and were less likely to take risks with sex, drugs, and alcohol when they reached adolescence. The report asserts that the program is “one of the most comprehensive social protection systems in the developing world.”

Samson says there are “massive scarcities of opportunities” for South Africa’s poor. “A cash transfer effectively allows the household to invest in breaking intergenerational poverty,” he says, noting that unconditional cash transfers have become popular throughout Africa. And in South Africa, he says, the CSG is the main source of income for more than 20% of households.

Samson says many families that are eligible for CSGs still are not receiving them, leading some to urge the government to drop the means test and provide cash transfers to every household with children. “It’s the best way to eliminate the exclusion of the most marginalized,” he says. He points out that two-thirds of South African families are eligible, and says for wealthier families this would be a welcome tax rebate. “Either way, you win.”

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Monthly child support grants, now issued as debit cards, improve the health and education of South African children.

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The drive to use “easily measured indicators” to claim success and impress donors also worries Michel Kazatchkine, Dybul’s predecessor at the Global Fund’s helm. Kazatchkine would like to move beyond quantitative indicators to more qualitative ones, like changes in laws or social policies. “Numbers of lives saved is a very American concept,” he says. “The European audience would wish to know about something a little more conceptual than just a number. Have we changed the system and addressed the roots and the causal determinants and insured that the people, in addition to having their lives saved, live a proper life?”

CGD’s effort to weigh malaria interventions stirred new controversy. Malaria control didn’t make it into the first two editions of Millions Saved, in 2004 and 2007, which documented triumphs from global ones like smallpox eradication to little-known efforts to combat diarrheal disease in Egypt or trachoma in Morocco. Although malaria has plummeted in many countries, the CGD researchers said none of the existing evaluations met their criteria: a study of a large-scale intervention of at least 2 years duration that demonstrated a clear, causal link to a drop in disease or death. They also wanted to see evidence that the intervention had an acceptable cost based on the number of cases averted or lives saved.

“We know from a bunch of small-scale studies that bed nets can protect you from mosquitoes biting you,” says Amanda Glassman, who heads global health policy at CGD. “That’s not what we’re interested in evaluating.” In the real world, nets aren’t always used, for instance because they’re uncomfortable on hot nights or people think there are few mosquitoes around.

The blog posting led to fierce rebuttals from both the U.S. President’s Malaria Initiative (PMI) and the Roll Back Malaria Partnership. Erin Eckert, an epidemiologist at PMI, says impact evaluations are critical. But when it comes to the type of national level programs that CGD is evaluating, she says a “rigorous academic definition of impact evaluation is not always necessary or appropriate.” As Eckert and a colleague wrote in a riposte to CGD’s blog, “The malaria field is full of examples of solid evaluations of interventions and the impact of scaling up those interventions on malaria burden.”
A new vaccine vanquishes meningitis A in Africa

By Kai Kupferschmidt

or more than a century, the Neisseria meningitidis bacterium has swept across large swaths of Africa every few years. Striking during the dry season, it causes meningitis that kills 5% to 10% of those infected and leaves many others deaf or disabled. Although effective—and expensive—vaccines exist against the meningitis strains that plague Europe and the United States, no good one was available to protect Africans against serotype A, the most common strain in Africa. That has changed—and the result, says Brian Greenwood, an epidemiologist at the London School of Hygiene & Tropical Medicine, is “probably the most dramatic success I have ever seen.”

In 2000, the World Health Organization convened global health experts who came up with an idea: Make a safe and effective vaccine specifically for Africa for an African price. And make it fast. With $70 million from the Bill & Melinda Gates Foundation, the Meningitis Vaccine Project, a public-private partnership headed by infectious disease specialist Marc LaForce, got started. The basics were agreed upon quickly: To induce long-lasting immunity, the vaccine would have to be a conjugate, a meningococcus A polysaccharide joined to a tetanus protein to elicit a stronger immune response. And it would have to cost less than 50 cents a dose, a price the Serum Institute of India Ltd. agreed to deliver even before development began.

MenAfriVac is that vaccine. By 2009, trials in Senegal, Mali, and other countries had shown the vaccine to be safe and effective, and in December 2010, Burkina Faso, at the time the hardest hit country in Africa’s meningitis belt, became the first to roll out the vaccine. Within just 10 days, about 70% of the target population—anyone between 1 and 29 years old—had received it. No cases of meningitis A were recorded the next year. In Chad, three regions introduced the vaccine in December 2011 in the midst of an epidemic; during the first half of the following year, those regions recorded just 57 cases of meningitis, none of them caused by N. meningitidis A. Greenwood and his colleagues reported in January in The Lancet. Across the rest of the country, the case number was 18 times higher. 44 per 100,000. “In every single country where the vaccine has been introduced, group A Neisseria meningitis disease has fallen to zero,” LaForce says.

What made it such a success? For one, people in West Africa desperately want the vaccine—almost every family there knows the devastating impact of meningitis firsthand, says Seth Berkley, who heads GAVI, the Vaccine Alliance, which has budgeted $370 million to introduce the vaccine across the continent. Another reason: Unlike earlier vaccines, MenAfriVac also gets rid of the bacterium in asymptomatic people, further increasing herd immunity. By the end of this year, Berkley estimates 200 million people will be vaccinated, with the remaining 100 million slated for 2015.

How long the vaccine’s protection will last is still unclear, however, and scientists worry that other strains of the bacterium could take over the continent. Meanwhile, the Serum Institute of India has already set its sights on the next goal: an affordable vaccine that will protect against meningitis strains C, Y, W, and X as well. LaForce says that vaccine will enter field trials in 2015.

The CGD researchers eventually met with their critics, including Eckert, to sort through the literature, and they agreed that one large-scale intervention in Zambia had enough evidence that it worked, and thus deserved inclusion in the 2015 edition of Millions Saved. The study, by a team that included researchers from Harvard’s School of Public Health and the PATH Malaria Control and Evaluation Partnership in

Miriam Temin, the coordinating editor of the new edition of Millions Saved. It remains difficult for many to accept, she says, that just understanding the effect of a drug, a vaccine, or any other intervention on a human body isn't enough. “We think of the body as something with unknown processes,” Temin says. “Wouldn’t it be interesting if we thought of communities that way?”
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