

States in the 1940s and 1950s. Measles, on the other hand, was a shrug. “Parents didn’t seem to mind that their kids had measles,” says Orenstein, who led the national immunization program that eliminated measles from the United States.

And polio had a most persuasive advocate and “salesman par excellence,” as Henderson describes him: Albert Sabin, a national hero for inventing the oral polio vaccine (OPV). Sabin’s grand vision was to deliver his easy-to-use polio drops in mass campaigns to reach every child, and voilà, polio would disappear. “Just a few drops on the tongue. How easy it would be,” Henderson recalls.

Rotary International kick-started the polio eradication effort with \$120 million. (It has since contributed \$1.3 billion.) At the Pan American Health Organization, de Quadros began an aggressive campaign to drive polio out of the Americas. The die was cast in 1988, when WHO committed to eradicating polio by 2000—never imagining that the program would still be dragging on 15 years later.

MANY OF THE MEASLES advocates enlisted in the polio wars, among them Cochi, who joined CDC in the 1980s, after 2 years as a pediatrician on a Navajo reservation in New Mexico. At CDC, he quickly found his niche working on vaccine-preventable diseases, logging long hours chasing polio in Nigeria, Pakistan, Bangladesh, and India, to name just a few countries. Soon Cochi was the “go-to” guy for unvarnished advice on polio eradication, says Bruce Aylward, the longtime leader of the polio eradication effort. “Steve has been hugely influential.”

While the polio campaign unfolded during the 1990s, Cochi and others then at CDC, including Peter Strebel and Mark Grabowsky, began laying the groundwork for what they hoped would be the next eradication push—sitting on various acronym-studded expert panels, writing tens of papers, and participating in countless international meetings, including one in 1996 that concluded measles eradication was technically feasible, with a target date within the next 10 or 15 years.

In 2000, the time seemed ripe to go public. Polio seemed to be winding down. Measles had been eliminated in the United States—all cases since then have been “imported” from other countries—and it was on the way out in the entire region of the Americas. The last case in the Americas occurred in 2002, showing the world for the first time the virus could be beaten in poor countries.

At an immunization meeting in Pretoria in December 2000, Cochi pulled aside a small but well-placed group to talk about measles. African governments were desperate for help fighting the outbreaks still exploding there. Could they provide it, he asked? The experts went home and enlisted support from their respective organizations.

Thus was born the Measles Initiative, a loose-knit partnership of five organizations—the American Red Cross, CDC, the United Nations Children’s Fund, the United Nations Foundation, and WHO—with Cochi as its unofficial ringleader. Renamed the Measles & Rubella Initiative in 2012 when it expanded its scope, the initiative did not have an explicit eradication goal, but its intentions were pretty clear when it called for “a world without measles.”

IN SOME WAYS, measles would be easier than polio (see table, p. 960). The measles

mistakenly grabbed the wrong bottle out of the refrigerator and mixed the powder with a powerful muscle relaxant. Within minutes, 15 children under age 2 died, mostly of suffocation. Once reconstituted, the vaccine’s shelf life is only 6 hours, so clinic workers are sometimes reluctant to prepare a batch for just a few kids. They ask mothers to bring them back later, but that often doesn’t happen. Researchers are working on easier-to-use vaccines, but they are still years away.

“In most mass campaigns you are lucky to get 90% coverage, probably 85%,” Henderson says. “That is not going to interrupt measles transmission.”

Toda Kohei, one of the original polio warriors, is now with WHO in Vietnam and has spent much of the past year battling a huge measles outbreak there (see sidebar, p. 962). Kohei desperately wants to see measles disappear. But, he says, “we have to see the virus for what it is. Measles is too

much the virus to fight with. We need to be a little bit humble and modest.”

Still, the first several years of the initiative were a huge success. The partners helped 70 resource-strapped countries launch mass measles vaccination campaigns. The world met the first global target—a 50% reduction in measles deaths from 1999 levels by 2005—

with time to spare. By 2008, mortality had dropped 78% globally and a stunning 92% in Africa. But despite persistent lobbying by the initiative, WHA held off declaring an official eradication goal.

Then, beginning in 2009, “the bottom dropped out,” Cochi says. Hammered by the global recession, the initiative lost close to 75% of its international funding. Mass vaccination campaigns were canceled or scaled back in high-risk countries, routine measles vaccination suffered, and global progress stalled. The following year, measles exploded in southern African countries. By 2011, deaths had climbed back to 200,000, up from 170,000 in 2008.

In some wealthy countries, measles ran headfirst into a strong and increasingly vocal antivaccination movement, mostly among the well-educated, fueled by a long-discredited link between autism and the measles, mumps, and rubella vaccine and by nonchalance about what is seen as a mild disease. The drop in immunization has reversed progress in Europe, which had 37,000 measles cases last year, and left the United States battling repeated importations, like the ongoing one that started in Disneyland in late 2014 and has now spread to 19 states and the District of Columbia.



“If we have to wait to solve the problem of routine immunization [to start measles eradication], we will be waiting for decades.”

Steve Cochi, CDC

vaccine is far better than OPV, providing 99% protection with just two doses. And almost every case of measles is visible, so you know where the enemy is. Not so for polio, which paralyzes just one in about 200 people it infects and so can circulate undetected, sometimes for years, before it strikes again.

But measles poses different challenges, key among them its exquisite contagiousness. Transmitted by respiratory droplets or aerosols, the virus can linger in the air for up to 2 hours after an infected person leaves the room, and kids are often infected in hospitals or doctors’ waiting rooms. The virus’s reproduction number—the number of infections a single case will generate in an unvaccinated population—is a staggering 12 to 18, compared with 5 to 7 for smallpox and 1.5 to 2.5 for Ebola. To stop measles transmission, more than 95% of the population has to be vaccinated, as opposed to about 80% in most places for smallpox and polio.

And the measles vaccine is far harder to deliver than polio drops. It must be injected, so mass campaigns require armies of trained health care workers, not the volunteers who dispense polio drops. It has to be reconstituted in the field, a step that has on rare occasions led to accidents. Last year in northern Syria, for instance, a health worker