nature medicine

The never-ending 'game'

This summer, the new director-general of the World Health Organization (WHO), Jong-Wook Lee, promised that the world would be polio-free by 2005. Sound familiar?

This is not the first time such proclamations have been made. Past director-generals first set 2000, then the end of 2002, as deadlines for a polio-free world, calling its eradication the 'end-game'. Their campaign was successful—almost. So far this year, there have been 304 polio cases in 8 countries, compared with 350,000 in 125 countries when the initiative began in 1988. The Americas and the Western Pacific and European regions have all been certified polio-free, meaning they have not seen polio caused by wild strains of the virus in at least three years.

The renewed goal to eradicate polio is admirable, to be sure. But is it realistic?

The WHO says it is. Lee has appointed a new chief for the initiative: David Heymann, who brings with him the experience of battling smallpox in India, drug-resistant malaria in Malawi, Ebola in the Congo and, most recently, severe acute respiratory syndrome (SARS) worldwide. In an effort to cut costs, the program is adopting such practical strategies as trying to piggyback its surveillance efforts with those already in place for influenza, yellow fever and SARS. Members of the initiative, including Rotary International and the US Centers for Disease Control and Prevention, have enlisted the help of religious and community leaders, film stars and even cricket players to convey their message.

Most important, the initiative plans to pour all its resources into just seven countries where polio is still endemic—rather than the 80-plus countries of previous efforts—and seven more at high risk for resurgence.

The next few months will be critical to the WHO's success. By December, the organization hopes to orchestrate massive immunization campaigns in four of the seven endemic countries—Nigeria, India, Pakistan and Egypt—which together account for 99% of new cases. The goal is to reach more than 175 million children with multiple doses of oral polio vaccine.

Formidable as those numbers sound, the reality is even more daunting. In India, for instance, millions of volunteers have already organized several national immunization days since January. Despite those efforts, a recent study found that only 70% of the children in some areas had been immunized during the past year (see News, page 1231).

To eradicate polio, the WHO will have to reach every child—not just 70%—and eliminate every weak link in the immunization chain. If they fail, they put not only the host country, but also the entire world at risk. In 2002, for instance, lapses in routine immunization in just one Indian state caused the number of cases worldwide to spike to 1,918 cases, up from 483 in 2001.

In the past four years, there have been 12 exportations of the virus to polio-free regions. The mop-up cost the WHO nearly $100 million, a significant chunk of its scarce funds. The WHO now faces a $210 million funding gap, without which the world may not become polio-free in the foreseeable future.

There are a myriad of other challenges. In the endemic countries, malnutrition and diseases such as AIDS, tuberculosis and malaria are much more pressing concerns. Only 1 in 100 people is paralyzed by polio, and nonparalytic symptoms—fever, fatigue, nausea and diarrhea—can easily be confused with those of other diseases. For those reasons, polio surveillance is difficult, and even one detected case is suggestive of a much larger problem. Large birth rates, cultural and geographic factors, mistrust, civil war and the weather can all complicate matters.

Making the world polio-free also means preventing accidental or intentional reintroduction of the virus from existing stocks. Nearly 10,000 laboratories worldwide carry stocks of the virus, but of 147 countries with stocks, only 80 have submitted an inventory and only 9 have destroyed their stocks. At the same time, some laboratories must maintain expertise in polio, both for surveillance purposes and for continuing research into the virus and vaccine. For instance, the genetic basis of the virus' transmission is only poorly understood; more information there would be invaluable to preventing outbreaks.

The widely used oral vaccine is a live, attenuated enterovirus that differs from the wild-type strain by only a few nucleotides. In rare cases, the vaccine mutates in the gut and reverts back to an infectious form, which can spread to others through infected feces. The virus mutates much faster in immunocompromised individuals—such as the considerable numbers of HIV-positive children in endemic countries—who can harbor the virus for several years, potentially spreading it to areas with low vaccination coverage.

Still, the oral vaccine is the WHO's best option. Unlike the injectable killed vaccine, the oral vaccine is cheap, easy to administer and prevents transmission by inducing immunity in the gut.

Setting ambitious aims is important, and the WHO's goal is not impossible to attain. The initiative has succeeded in eliminating the disease from such challenging countries as Angola. Unfortunately, its success thus far has caused both donors and the biomedical research community to become complacent, thinking the battle has been won. Still, the way to revive the world's attention is not by setting unrealistic deadlines. With a more realistic time frame and the support of the global community, the WHO can successfully end this 'game'.