A Booster Shot for Children's Vaccines

A new vaccine project aims to coax industry to produce more—and better—vaccines for developing countries

IN 1990, THE WORLD HEALTH ORGANIZATION (WHO) reported that 80% of all the world's children had been inoculated for tuberculosis, diphtheria, tetanus, polio, whooping cough, and measles. If that sounds like an overwhelming success, in fact it is only half of the story. It turns out these vaccines are not reaching more than 2 million uninoculated children who die every year. And another 3 million to 5 million children could be saved if vaccines for a few other conditions—including pneumonia and certain diarrheas—could be coaxed out of the drug industry.

Saving more children's lives won't be easy, however. Developing countries, where the vaccines are needed most, often lack refrigeration to prevent spoilage, infrastructure to get multiple doses of a vaccine to a child at a reasonable cost, and educational campaigns to convince mothers that their children need the immunizations. As for the prospect of entirely new vaccines, the big multinational drug companies that have the wherewithal to develop them aren't by and large in the mood to do it, because the potential return on their investment is low.

If it sounds like time for a shot in the arm of the international community, that's exactly the intent of the Children's Vaccine Initiative (CVI): "You've got to see the CVI as an international conspiracy to leverage more vaccine development out of whatever source we can get it," says Anthony Robbins, a professor at the Boston University School of Public Health. Robbins is a key player in the development of CVI, a newly formed coalition of international donor agencies, a score of individual scientists, and industry and government health ministers.* Their hope is to use political clout and purchasing power to catalyze the development of a new generation of vaccines that can make a dent in the Third World.

Last month, the initiative's newly formed steering committee—called the Task Force on Priorities and Strategic Plans—met for the first time, behind closed doors at the Rockefeller Foundation in New York, to list priorities for vaccine development and distribution. Coming out on top were new vaccines for respiratory infections, meningitis, and certain diarrheal diseases. Equally vital, the committee agreed, was a new heat-stable polio vaccine that will remain "potent in the pocket" even when carried around by doctors or nurses for a week without refrigeration.

Just a notch lower on the committee's wish list were: a measles vaccine that can be given to an infant before it is 9 months old, oral vaccines generally, a single-dose tetanus vaccine that can be given to mothers who can pass on their immunity to infants (neonatal tetanus kills an estimated 536,000 infants every year), an improved pertussis vaccine, and an affordable hepatitis B vaccine that can be combined with other vaccines and delivered in one dose. And finally, the priorities list calls for development of a super vaccine—as task force chairman Dr. Suryanarayan Ramanchandran of India's department of biotechnology calls it, a "multicomponent cocktail"—which would counter the high dropout rate of as high as 25% every time a child must return for another dose of a vaccine as well as dramatically cut the costs of getting vaccines to children.The ultimate vaccine would be given to children soon after birth in a single dose and would protect them against all of childhood's major infections. While such an ideal vaccine is decades away, the technology for combining some vaccines is available.

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Big shot. *An Indian baby—one of the lucky ones—is vaccinated; millions of other Third World children go uninoculated against common diseases.*

But coming up with the wish list was the easy part. After the meeting, researchers who were present acknowledged to *Science* the true challenge—as Johns Hopkins University professor of international health Philip K. Russell, a special adviser to the CVI, puts it: "To convince the industry that it is worth their while, and that there will be a stable market for their vaccines." Indeed, the magnitude of the challenge was immmediately apparent: A drug company representative who was at a National Academy of Sciences (NAS) meeting on the CVI last week—Pharmaceutical Manufacturers' Association vice president Tom Copmann—summed up industry's reaction by saying: "We would love to get involved, but we have to take care of the market concerns first."

The CVI people think they have some tricks up their sleeve to address these concerns. They have hired economists to help them find key "leverage points" where a brilliantly placed injection of funds or an induced change in government regulations or new patent protections might convince a drug or biotechnology company to take on a project. They are also working with epidemiologists to make sure the vaccines they want will be used in developing nations—and talking with foreign health minister to ensure that their orders for vaccines will be firm. They also have invited the National Institutes of Health to join the CVI, and it has already spent $5 million on new vaccine development and established a half-dozen vaccine evaluation centers where it conducts clinical trials of vaccines.

It remains to be seen whether CVI's idealism can overcome the forbidding obstacles that lie in the way of better vaccine coverage in developing countries, but the task force wants to see the quick development of one vaccine prototype, such as the heat-stable polio virus, that could give a psychological boost to the rest of the initiative. And another boost could be delivered by the NAS, whose Institute of Medicine launched a study last week on how federal agencies can best invest in CVI. Even if the CVI accomplishes only a fraction of its goals, however, it will be a significant achievement. "If we could just have vaccines against pneumonia and diarrhea, it would be beautiful," says Henrik Zoffman, an epidemiologist who is deputy of the WHO's Expanded Programme on Immunization and an adviser to CVI. ■ ANN GIBBONS

*CVI's founding agencies are the WHO, UNICEF, the United Nations Development Project, and the Rockefeller Foundation.