

Reaching Every Child

Kent Hill



USAID Photo

A health worker examines a child in Faizabad, Afghanistan, at a clinic supplied by the U.S. Agency for International Development. USAID programs have helped to support routine childhood immunization programs, medical personnel training, and clinic and hospital facilities.

The U.S. Agency for International Development (USAID) has been involved in worldwide efforts to immunize children in developing countries for more than three decades. The agency is also a member of the GAVI Alliance, a public-private global health partnership dedicated to expanding access to vaccines in the world's poorest countries.

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For more than half a century, medical science has recognized that widespread, routine immunization against infectious diseases can prevent the deaths of young children, sparing parents an agony that has spanned millennia. When children escape disease, they can thrive to become healthy adults, contributing to the development of more vibrant and productive societies.

Knowledge is one thing. The delivery of vaccine to children everywhere is a vastly greater challenge.

Since the 1970s, the U.S. Agency for International Development (USAID) has worked with partners across the globe to confront that challenge and help immunize children in remote and underdeveloped parts of the world.

Over the decades tens of millions of infants and children have survived the momentary discomfort and dismay of immunization to gain protection from disease.

USAID was a partner in the 1970s campaign to rid the world of smallpox. USAID provided support in the 1980s to the World Health Organization's (WHO) Expanded Immunization Programme (EPI), a campaign to expand access to immunization against childhood tuberculosis, polio, diphtheria, pertussis, tetanus, and measles. By 1990 coverage for those six diseases reached 70 percent globally, and the occurrence of those preventable but often fatal illnesses fell dramatically. Even though the news was fairly good at the global level, most of Africa and Asia remained far below the global mark of 70 percent—clearly a problem that needed attention.

We have learned that the challenge never ends and the task is never done.

In the 1990s the levels of vaccination among populations leveled off and even declined in some nations. The momentum of the EPI slowed for a variety of reasons, not the least of which was a sense that the job was done. In economically struggling nations, other priorities demanded attention. Major donors turned their attentions to other desperate problems.

By 1999 recognition of this reversal of progress led to a new initiative—the formation of the Global

Alliance for Vaccines and Immunization (GAVI) [<http://www.gavialliance.org>]. It is an alliance devoted to saving children's lives and protecting people's health through the widespread use of vaccines. A powerful alliance of governments, international organizations, vaccine manufacturers, nongovernmental organizations, and public health institutions is devoted to creating a new model for the delivery of international development aid. In pursuit of that goal, GAVI funds programs that strengthen health and immunization systems and accelerate access to new vaccines and new vaccine technologies.

Since inception, donors have committed more than \$3 billion to the GAVI Fund, and more than \$1 billion has already been distributed to nations implementing immunization programs. The GAVI Fund has provided multiyear grants to 73 of the world's poorest countries in order to help them build a permanent and sustainable system for delivery of immunizations to children.

The United States continues to be one of the largest donors to GAVI, having committed more than \$350 million since the institution was created.

In GAVI's first five years, almost 100 million additional children received new vaccines, with 2006 efforts reaching another 38 million youngsters. WHO estimates that the premature deaths of 2.3 million children have been prevented through the efforts of the GAVI Alliance. By

The World Knows How

The world knows how to immunize its children, and the GAVI Alliance strives to provide the leadership and resources to make sure that vaccines are delivered to all the world's children, no matter how remote their homes or how poor their families.

Partners in the GAVI Alliance include national governments, from both donor nations and developing countries. Donors currently represented on the GAVI board are France, the Netherlands, Norway, the United Kingdom, and the United States. Developing nation representatives from Armenia, Cambodia, Ethiopia, and Ghana also serve on the board in 2007.

The United Nations Children's Fund, the World Health Organization, and the World Bank are also part of the alliance, along with nongovernmental organizations, such as the Bill & Melinda Gates Foundation and the International Pediatric Association.

Pharmaceutical companies from both the developed and the developing world are partners in the GAVI Alliance today, with Merck and Co., Inc., now serving on the board. The vaccine manufacturers participating in this effort produce the greatest share of the world's supply. ■

Source: <http://www.gavialliance.org/index.php>

reaching so many children in such a short time, GAVI is amplifying its global impact and paving the way for the introduction of future vaccines.

The GAVI Alliance now enters a new phase in which we will work toward broader goals to increase global development assistance for health, harmonize the work of the partners with strategies devised by recipient countries, and advance new, better, and more affordable technologies for the delivery of immunizations and health care.

NEW TECHNOLOGIES AND METHODS

Considerable success has already been achieved in improving the number of children reached with vaccines. In fact, effective and easy-to-use technologies have been important in the scale-up of developing world vaccination rates in GAVI's first few years. For example, a vaccine against hepatitis B had been available and used for more than 15 years in the developed world before GAVI came into existence. As an alliance with financial backing from its partners, GAVI moved swiftly to make hepatitis

B vaccine available for use in developing countries.

Acceptance and adoption of the new GAVI-supported hepatitis B vaccine was astounding—reaching more than 90 million infants in five years—and is one of the first great success stories of GAVI. In addition, GAVI was influential in encouraging vaccine manufacturers to combine hepatitis B vaccine with the established vaccine against diphtheria, typhoid, and pertussis (DTP), allowing immediate inclusion of the new product into existing delivery systems. We are now seeing the fruits of those efforts as new suppliers have entered that market, resulting in substantial price reductions for poor countries.

For years, USAID supported the development and promotion of a special type of syringe known as the auto-disable that is quick, convenient, and safe. It can be used only once, thus reducing the danger that immunization could expose patients to HIV or other diseases through syringe reuse. GAVI purchased these devices by the tens of millions to allow a wide introduction of these safe syringes into immunization programs in the world's poorest countries. GAVI provided enough syringes for each

Vaccine Milestones: Louis Pasteur



Louis Pasteur, a chemist and the founder of microbiology, works on an experiment.

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In the last quarter of the 19th century, scientists identified bacteria as the cause of many diseases, including cholera, typhoid fever, anthrax, plague, diphtheria, and tuberculosis. In France microbiologist and chemist Louis Pasteur had noticed that cultures of fowl cholera lost their virulence if they were left inactive for two weeks. When chickens were inoculated with the old cultures, they did not become ill. Furthermore, the birds remained resistant to the disease even when they were inoculated with fresh cultures. He then experimented with anthrax, a disease that was killing many cows, sheep, and goats in the countryside. Pasteur found that by keeping the anthrax bacilli for two weeks at a temperature of 42 to 43 degrees Celsius, he could greatly weaken their virulence.

In 1881 he and his colleagues inoculated 31 farm animals with the weakened anthrax cultures; a matching set of 31 animals served as controls. Several weeks later, they inoculated both sets of animals with fresh, virulent anthrax bacilli. Most of the control animals died, but of the animals given the weakened anthrax cultures, only one sheep died. Pasteur coined the term “vaccine,” after the Latin *vacca*, or cow, in honor of Edward Jenner and his milkmaids.

Following this success, vaccines were developed against tuberculosis, cholera, typhoid, and other diseases. Perhaps the most dramatic development was Pasteur's vaccine against rabies, which attracted worldwide media attention. After testing the vaccine on dogs, in 1885 Pasteur inoculated a nine-year-old boy who had been badly mauled by a rabid dog. The boy's life was saved and Pasteur was hailed as a hero. ■

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country program for three years, and now all countries have taken on the cost of those syringes for routine use in their immunization programs.

GAVI has also had a positive influence on the global business of vaccine production by demonstrating to manufacturers that the developing world can be a profitable market. This activity has thus stimulated additional vaccine supply and reduced prices of some of the GAVI-funded vaccines in a timely manner compared to historical trends.

GAVI wants to be successful in accelerating the delivery of newly formulated vaccines to the developing world. In the past, broad adoption of a new vaccine in poorer nations has lagged as much as 15 to 20 years behind developed nations. In November 2006, the GAVI board approved two such proposals. The decision allows distribution of much newer vaccines, introduced in recent years in the United States and Europe, that will combat diseases that together kill an estimated 1.5 million children annually. One new vaccine targets rotavirus, which causes severe and often fatal diarrhea, and the second prevents pneumococcus, a major cause of pneumonia, meningitis, and sepsis.

The two vaccines will be introduced on a staggered scale in a limited number of countries at first to ensure the completion of additional efficacy studies.

Even as the United States is an enthusiastic member of the GAVI Alliance, USAID has independently supported a number of parallel initiatives. In addition to the development of the auto-disable syringe, USAID has funded clinical trials for vaccines to be used in developing countries and supported disease-burden assessments. To improve immunization technology, USAID has backed research to create vaccine-vial monitors, which allow vaccines to remain safely outside the cold chain for limited

periods of time. This is an important advancement for teams attempting to deliver vaccines to remote villages where refrigeration does not exist or is difficult to maintain in transit.

Current and future research supported by USAID is devoted to development of a vaccine against HIV/AIDS that will be appropriate for use against developing world strains of the disease and under the prevailing conditions of those areas. We are also investing in research to develop a vaccine against malaria, a disease that is rare in the developed world but still takes 1 million lives in the developing world each year, 75 percent of whom are African children. A vaccine against malaria becomes an ever more critical need with the proliferation of malaria strains resistant to most known drug therapies.

THE POTENTIAL

Even as USAID, the GAVI Alliance, and developing world nations muster new resources and ideas on expanding immunization programs to reach every child, we have learned that the rewards of our efforts could be even greater than we dreamed. A 2005 study from the Harvard School of Public Health showed that the benefits of immunization have been significantly underestimated in the past. Not only does immunization protect children from illness and death at an early age, but it also protects the child from the long-term effects of illness on growth and development. Healthier children do better in school and become more productive and higher-earning adults. In fact, the study's authors equate the value of immunization in a child's life with that of primary education.

Ensuring better health for the world's children is a gift our generation must deliver to the future. ■