

GLOBAL
IMMUNIZATION
STRATEGIC FRAMEWORK
2006-2010



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VISION STATEMENT

A world without vaccine preventable disease, disability, and death.

MISSION STATEMENT

To protect the health of Americans and global citizens by preventing disease, disability, and death through immunization.

BACKGROUND AND INTRODUCTION

Childhood immunization is one of the most cost-effective of all health interventions. In the past two decades, immunization has prevented an estimated 20 million deaths globally from vaccine-preventable diseases.

The United States has greatly reduced its burden of vaccine-preventable diseases (VPDs) through childhood immunization. However, U.S. children and adults remain at risk for VPDs largely due to their widespread occurrence in other countries. Globally, more than 2 million childhood deaths from VPDs are prevented each year (2004 estimate), and an additional 600,000 hepatitis B-related deaths from liver cirrhosis and hepatoma that may otherwise have occurred in adulthood are prevented.

Each year, more than 130 million children are born worldwide who need immunization services. While 78% of the world's infants receive diphtheria-tetanus-pertussis vaccine (DTP3) – the benchmark indicator of annual routine immunization coverage – an estimated 27 million infants remain unvaccinated. One in six children is not vaccinated against tuberculosis; 1 in 4 is not vaccinated against measles, only half of the world's infants are fully immunized against hepatitis B, and 3 in 4 are not vaccinated against Hib disease.

The negative impact of these gaps in immunization is enormous. An estimated 1.4 million children under age five died from the six major VPDs in 2004, with a further 1.1 million deaths from pneumococcal disease and rotavirus (vaccines that are available in the United States but rarely used in developing countries).

Since 1991, CDC has provided substantial financial and technical support for polio eradication and measles elimination. CDC's yearly investment in global immunization has grown from \$3.1 million to \$140 million in 2006. In addition, CDC currently has more than 30 staff seconded to international health organizations, such as WHO, UNICEF, Pan American Health Organization, World Bank, and the American Red Cross, providing full-time technical and operational support to priority countries and regions.

In keeping with this growth, CDC has a much broader role and greater influence in the field of global immunization than it did even five years ago. In addition to being a key partner in both the global polio eradication initiative and the Measles Initiative, CDC has played a critical role in developing the Global Immunization Vision and Strategy for 2006-2015 (GIVS); has a representative on the Global Alliance for Vaccines and Immunization (GAVI) working group; is an implementing partner in the Hib Initiative, charged by the GAVI Alliance to assist countries to make evidence-based decisions regarding the introduction of Hib vaccine into national programs; and is supporting pilot projects in three countries to strengthen the delivery of routine immunization.

In addition, since CDC's last five-year strategic plan for global immunization, much has changed. There has been a renewed commitment from global partners for preventing VPDs among the world's children. This includes \$4 billion from the International Finance Facility for Immunization (IFFIm) over the next 10 years and a \$750 million investment from the Bill and Melinda Gates Foundation for 2006-2015. Both of these investments will support the GAVI Fund for several initiatives including supporting measles SIAs, strengthening immunization and health systems, eliminating maternal and neonatal tetanus, establishing the polio vaccine stockpile, improving access to underused vaccines, and speeding the development and introduction of new vaccines in GAVI-eligible countries. Investment cases for introduction of rotavirus vaccine and pneumococcal conjugate vaccine are under development.

The GAVI Fund will finance two major strategic approaches to reducing the number of deaths among children under five in more than 70 of the world's poorest countries. These funds will be used to invest in the introduction of new and underused vaccines including combination vaccines for diphtheria, tetanus, pertussis, hepatitis B and Haemophilus influenzae type B (Hib). It is expected that additional vaccines (pneumococcal conjugate, rotavirus, meningococcal conjugate, Japanese encephalitis and human papillomavirus) could be supported within the next five years. Money will also be targeted towards strengthening of immunization delivery systems, including support for increasing routine immunization coverage in the poorest countries and for conducting mass immunization campaigns to rapidly reduce mortality from measles and tetanus. It is estimated that this investment will save the lives of five million children under five by 2015, and a further five million adult lives after 2015.

To protect children in the United States and reduce the global burden of VPDs, the Centers for Disease Control and Prevention (CDC) supports a broad range of programmatic and research efforts. CDC's experience working with domestic immunization partners provides valuable lessons and linkage with our international efforts and priorities. Tremendous progress has been achieved through these efforts:

Polio: The number of global polio cases has been reduced by more than 99.8% since 1988, including the prevention of five million cases of paralysis and more than 250,000 deaths. In 2006, only four countries remain endemic for polio, the fewest ever.

Measles and Rubella: Endemic measles has been eliminated from the Western Hemisphere and no importations from Latin America have occurred in the United States since 2000 (in 1990, more than 90% of measles importations into the U.S. were from Latin America); building on this achievement, CDC is working to control measles in those parts of the world responsible for importations into the United States.

CDC is a founding member of the Measles Initiative, which, together with host governments, has helped cut measles deaths by 60% in Africa from 1999-2004. Global measles deaths have dropped by 48%, falling from 871,000 deaths in 1999 to 454,000 in 2004. CDC is also a major partner in regional initiatives in PAHO and the European Region of WHO to eliminate rubella and congenital rubella syndrome (CRS) by 2010. In addition, CDC provides technical support to other regions and countries in the context of the increasing use of rubella-containing vaccine from 65 countries in 1996 to 116 countries in 2004.

Other VPDs: With technical support from WHO, UNICEF, CDC and other partners, global immunization coverage for DTP3 has increased from 20% in 1980 to 78% in 2003. Hepatitis B vaccine is now given routinely in 153 countries. However, approximately 40,000 immigrants with chronic hepatitis B are admitted each year to the United States. Increasing the number of countries offering the vaccine routinely will reduce the burden of HBV infections in this country. CDC support has greatly increased for enhancing global influenza surveillance and promoting wider use of seasonal influenza vaccine both to reduce the burden of influenza disease and to build capacity for pandemic influenza preparedness and response. Hib vaccine is provided routinely in 92 countries (WHO, as of end of 2004). An opportunity now exists to expand support for the introduction of rotavirus, HPV, and pneumococcal vaccine to further reduce illness and death in other countries and protect the health of children and adults in the United States.

Linkages with non-vaccine child survival interventions: Immunization campaigns are increasingly used as a platform for delivering additional child survival interventions. Through 2005, nearly 18 million doses of de-worming medicine and 3.5 million insecticide-treated bed nets have been provided during immunization campaigns in Africa. The bed nets already have prevented tens of thousands of childhood deaths from malaria. In addition, an estimated 1.25 million childhood deaths have been averted by administration of Vitamin A during polio immunization campaigns since 1998.

CDC also actively supports the evaluation and introduction of new vaccines to prevent pneumonia, meningitis, and diarrheal illness in children, and research to develop new vaccines to protect against the greatest killers in developing countries: HIV, tuberculosis, and malaria. In addition, CDC provides support to strengthen routine immunization programs and to increase the safety of vaccines and injections.

This is a critical moment for CDC to remain deeply engaged in global immunization. To fully realize the benefits of the increased interest and support for global immunization, there is an urgent need to provide expertise in immunization program implementation, epidemiologic and laboratory surveillance of VPDs, technical and operational support to strengthen immunization programs, and technical support for development, introduction and evaluation of new vaccines. Moreover, CDC can leverage its technical and programmatic support and funding to positively influence the support of other global health partners for global immunization. CDC shares the established goals of protecting U.S. citizens from VPDs and reducing the burden of VPDs in all countries, and it has substantial technical expertise to support all aspects of global immunization.

Support for global immunization requires close partnership with other international agencies and donors engaged in global immunization, including WHO, UNICEF, World Bank, Rotary International, American Red Cross, International Federation of Red Cross and Red Crescent Societies, the UN Foundation, the Bill and Melinda Gates Foundation, and the GAVI Alliance. CDC will continue to support and expand these partnerships to assure the greatest impact of CDC's technical and scientific resources on reducing the burden of VPDs.

The most immediate global immunization challenges include:

- Controlling, eliminating, and/or eradicating VPDs. This challenge includes the goals of certifying global polio eradication by 2010 and reducing annual measles deaths by 90% by 2010 (compared with 2000 figures). Progress in global immunization will contribute substantially to achievement of Millennium Development Goal #4: “Reducing child mortality by two-thirds between 1990 and 2015.”
- Improving global surveillance for VPDs and immunization program monitoring.
- Strengthening and sustaining effective immunization services and linking immunization delivery with other priority health interventions.
- Developing and supporting the introduction of new vaccines to prevent diseases of global health importance, including vaccines targeting pneumococcal and epidemic meningococcal disease, rotavirus, Japanese encephalitis, influenza and avian flu, malaria, HIV, HPV, and TB.
- Building and sustaining partnerships and collaborations to support and promote the availability and use of vaccines needed in developing countries.

At the same time, these challenges must be addressed in the context of broader health systems challenges, which include:

- the need to support immunization in the face of multiple competing health priorities at the national level;
- the need to determine and document the impact of immunization on MDGs and the primary causes of mortality and morbidity;
- overall deficiencies in health systems, particularly health management;
- the financial sustainability of immunization programs, especially for new vaccines; and
- the introduction of new vaccines while maintaining and increasing coverage for current routine EPI.

The purpose of this strategic plan is to articulate the goals, objectives, and strategies of CDC and its global partners for effectively meeting these global immunization challenges from 2006-2010. Achievement of these goals will require that CDC work closely and effectively with global partners. This document is intended to build on and complement CDC's previous five-year plan, Global Immunization 2002-2006: An Over-Arching Strategy for CDC.

SUMMARY OF GOALS

Working with global partners, CDC will pursue the following major global immunization goals:

- GOAL 1:** Control, eliminate, and/or eradicate vaccine-preventable disease, disability, and death globally.
- GOAL 2:** Improve global surveillance for VPDs (integrated epidemiologic and laboratory surveillance) and health information systems for immunization program monitoring, and consolidate these structures and functions into a Global Framework for Immunization Monitoring and Vaccine Preventable Disease Surveillance that can support the immunization delivery system.
- GOAL 3:** Build and sustain safe and effective immunization services as a component of health delivery systems, and promote opportunities for linking immunization delivery with other priority health interventions.
- GOAL 4:** Support introduction of new vaccines to prevent diseases of global public health importance, by assisting in vaccine development, evaluating vaccine safety and efficacy, and assisting countries both in making evidence-based decisions and in implementation issues.
- GOAL 5:** Build and strengthen multilateral and bilateral partnerships and other collaborative efforts to support availability, equitable access, sustainable financing, and use of vaccines for all children and adults globally, especially in developing countries

GOALS, OBJECTIVES AND STRATEGIES

GOAL 1

Control, eliminate, and/or eradicate vaccine preventable disease, disability, and death globally.

OBJECTIVES:

1. End global transmission of polio by 2007, certify global polio eradication by 2010, and initiate global action plan for poliovirus containment and OPV cessation (Global Action Plan for Laboratory Containment of Polioviruses, 3rd edition [GAP III]). (GIVS)
2. By 2010, reduce by 90% the annual global measles-related mortality compared with the 2000 estimates (2000 baseline: 734,000 deaths). (GIVS)
 2. a. Eliminate measles in EURO by 2010, EMRO by 2010, and WPRO by 2012. Sustain measles elimination in PAHO (target achieved in 2002). (WHO Regional Goals)
 2. b. By 2010, at least 75% of countries (144 of 192) will have achieved >90% first dose measles coverage. (WHO Strategic Plan 2006-9)
 2. c. By 2010, 100% of countries will have implemented a second opportunity for measles immunization within the preceding 5 years through routine or supplemental immunization activities. (WHO Strategic Plan 2006-9)
3. Eliminate rubella and congenital rubella syndrome (CRS) in the American and European Regions of WHO by 2010 and support the control and prevention of rubella and CRS worldwide.
4. By 2010, all countries will have introduced hepatitis B vaccine in infant immunization schedules. (WHO Strategic Plan 2006-9)
 4. a. EMRO target: reduce seroprevalence of HBsAg to less than 1% in age cohorts born since introduction of routine vaccination.
 4. b. WPRO target: By 2012, reduce the seroprevalence of HBsAg to less than 2% in 5-year-old children born since introduction of routine vaccination (and achieve 80% coverage with birth dose within 24 hours of birth).
5. Eliminate neonatal tetanus (NNT) (< 1 case per 1000 live births) in all districts of all countries by 2010.

STRATEGIES:

- Provide technical and financial support to countries and partners for surveillance and vaccination campaigns.
- Provide technical and financial support to partners and countries to develop, implement and evaluate disease reduction and elimination strategies.
- Promote the development of case-based surveillance for VPDs, with expansion of laboratory networks for viral and bacterial diseases. (also for Goal 2)
- Ensure that all countries have access to a WHO accredited laboratory that provides accurate virologic and bacteriologic data. (also for Goal 2)
- Complete the research agenda to establish the scientific basis for stopping polio vaccination, modifying vaccination strategies to achieve eradication, and implementing safeguards to minimize risks in the post-eradication period.
- Promote wider use of seasonal influenza vaccine both to reduce the burden of influenza disease and to build capacity for pandemic influenza preparedness and response.

GOAL 2

Improve global surveillance for VPDs (integrated epidemiologic and laboratory surveillance) and health information systems for immunization program monitoring, and consolidate these structures and functions into a Global Framework for Immunization Monitoring and Vaccine Preventable Diseases Surveillance that can support the immunization delivery system.

OBJECTIVES:

1. By end of 2006, in collaboration with WHO, finalize and begin implementing the “Global Framework for Immunization Program Monitoring and Vaccine Preventable Disease Surveillance, 2006-2010”, which outlines a strategic approach for strengthening VPD surveillance, laboratory network capacity, immunization coverage monitoring, and monitoring of other key immunization program performance measures.
2. By 2010, ensure that 100% of countries have access to proficient, accredited laboratories for diagnosis and confirmation of polio, measles/ rubella, influenza, hepatitis B, yellow fever (as epidemiologically appropriate), pertussis, and diphtheria.
3. Expand regional and national surveillance of diseases that can be prevented by new vaccines and strengthen laboratory capacity to monitor the impact of these new vaccines on disease patterns and program operations, to provide baseline data to inform decisions on new vaccine introduction and monitor impact.
4. By 2010, ensure that 90% of national immunization programs will have effective surveillance systems and technical support to monitor immunization safety.
5. By 2007, build and maintain an effective VPD surveillance system with strong linkages to broader networks designed for epidemic preparedness and response such as the Global Disease Detection Network (GDD) and Global Alert and Response Network (GOARN), as well as the global influenza lab network, enabling the appropriate and timely use of vaccines and other control strategies in the context of emerging or threatening epidemics.

STRATEGIES:

- Maintain certification quality surveillance for acute flaccid paralysis (AFP).
- Expand existing surveillance systems (including polio and measles surveillance) to progress towards effective case-based surveillance for VPDs, both for existing vaccines and those recently or about to be introduced. (GIVS)
- Expand existing laboratory networks, including the polio and measles laboratory networks and other regional and local networks such as the Pediatric Bacterial Meningitis Network and sentinel surveillance networks for pneumococcal and rotavirus vaccines, to include other priority diseases such as influenza and avian flu, pertussis, diphtheria, meningococcal disease, Japanese encephalitis, HPV, etc. (GIVS)
- Strengthen laboratory capacity to establish baseline disease burden and monitor the impact of new vaccines on disease patterns (also for Goal 4). (GIVS)
- Strengthen national and regional public health laboratories in developing countries by providing the training, equipment, reagents, and quality control procedures needed to sustain high quality diagnostics for all VPDs and other priority diseases. (GIVS)
- At the global level, develop new diagnostic tests, tools and procedures to improve both field-based and laboratory confirmation of diagnoses (in partnership with WHO). (GIVS)
- Strengthen local capacity for data management and analysis for decision-making and outbreak detection. (GIVS)
- Improve coverage monitoring of vaccines and other linked health interventions and the use of information at district and local levels through strengthening human resource capacity, monitoring of the quality of data, and improved tools for data compilation, feedback and supervision. (GIVS)
- Contribute to the development and introduction of better tools (e.g., computer software) for monitoring coverage of vaccines and linked interventions, vaccine and logistics management, and disease surveillance to better support data entry, analysis, feedback, and utilization, and to improve program performance and management.

- Establish surveillance and response systems for adverse events following immunization, both for existing vaccines and for new vaccines as they are introduced into national schedules.
- For seasonal and avian influenza:
 - Provide technical and financial support to countries to establish effective surveillance for influenza to determine burden of disease and to understand the epidemiology of influenza virus circulation in the developing world and the tropics.
 - Provide technical and financial support to countries to establish early warning systems for human and avian influenza outbreaks.
 - Train rapid response teams to respond to surveillance data with timely investigation and containment.
 - Promote community involvement in outbreak reporting.
 - Encourage countries to establish coordination mechanisms between ministries of health and agriculture to improve their ability to detect and respond to human influenza outbreaks associated with zoonotic transmission.
 - Enhance laboratory capacity for rapid diagnosis of influenza.
- Assess and evaluate the usefulness of current systems for monitoring VPDs (e.g., Pediatric Bacterial Meningitis Surveillance, Integrated Disease Surveillance and Response [IDSR] in Africa) and impact of vaccine introduction.
- Develop innovative/alternative approaches to conducting case-based sentinel surveillance
- Improve communication, coordination, and (as needed) sharing of surveillance data at country level between the immunization program and communicable disease group within Ministries of Health.



GOAL 3

Build and sustain safe and effective immunization services as a component of health delivery systems, and promote opportunities for linking immunization delivery with other priority health interventions.

OBJECTIVES:

1. (GIVS) By 2010, countries will reach at least 90% national vaccination coverage and at least 80% vaccination coverage in every district or equivalent administrative unit.
2. By 2010, vaccines are given consistent with safe injection practices in all countries, and at least 65% of developing countries will be using only auto-disable syringes or needle-free devices for immunizations. (WHO Strategic Plan 2006-9)
3. By 2010, at least 5 non-vaccine interventions will be integrated with EPI for which consensus guidelines are available at the regional level for national program management. (WHO Strategic Plan 2006-9) (e.g. vitamin A, other micronutrients, ITN distribution, de-worming treatments, IMCI)
4. By 2010, at least 4 vaccines will have a global recommendation for routine immunization beyond infancy, including new vaccines or new indications for existing vaccines. (WHO Strategic Plan 2006-9)

STRATEGIES:

- Provide support to countries and partners to strengthen key components of VPD program management and delivery, including the formulation and implementation of comprehensive multi-year national plans of action.
- Provide support to countries and partners for monitoring and evaluation of VPD programs.
- Promote regular immunization program monitoring at local, district, and national levels and provide feedback on performance, impediments, and new opportunities to all partners. (GIVS)
- Where appropriate, perform operations research and evaluation of “what works” to improve the delivery of immunization, to make systems more effective, efficient and equitable, and to improve immunization coverage. (GIVS)
- Expand vaccination beyond the traditional infant target age groups (to include older children, adolescents and adults) by defining target populations and age groups for vaccination appropriate to the national situation, and supporting introduction of school immunization laws. (GIVS)
- Use a combination of approaches to reach everybody targeted for immunization, including the Reaching Every District (RED) strategy, and evaluate implementation of the RED strategy.
- Assess health and economic impacts of vaccination programs by applying standard tools to assess the cost-effectiveness of different immunization schedules and strategies in a range of demographic, geographic, and epidemiological settings (GIVS).

- Provide technical support to countries to introduce, sustain, and monitor recommended safe injection practices for all vaccinations, including the use of autodisable syringes or needle-free devices.
- Assist countries in analyzing the economics of their immunization program and securing the necessary funding for sustainable achievement of the program objectives.
- Support programs to incorporate vitamin A, insecticide-treated bed nets, de-worming medicine, health education, and other appropriate health interventions into routine childhood immunization programs.
- With partners, develop standardized methods for monitoring and evaluating the efficiency, effectiveness and impact of combined interventions to improve coverage, and adapt them for use at the district and service delivery level. (GIVS)
- Partner with UNICEF, WHO, and GAVI to address vaccine procurement and supply as a global issue, in keeping with CDC's role as a vaccine funding agency.
- Assist in the interpretation of surveillance, disease burden data, and planning information for policy development at national, regional, and global levels.



GOAL 4

Support introduction of new vaccines to prevent diseases of global public health importance, by assisting in vaccine development, evaluating vaccine safety and efficacy, and assisting countries both in making evidence-based decisions and in implementation issues.

OBJECTIVES:

1. Working with WHO, ensure that within 5 years of introduction of a new vaccine into the routine immunization program of each country, coverage reaches the same level as that for other vaccines given at the same age. (GIVS)
2. Working with WHO, complete development by 2010 of the evidence base, including burden of disease, to assess the appropriateness of introduction into immunization programs of 5 new vaccines (human papilloma virus [HPV], Japanese encephalitis, meningococcal A conjugate, pneumococcal conjugate, rotavirus). (WHO Strategic Plan 2006-9)
3. Working with WHO, establish a network by 2010 of at least 10 sentinel countries with a monitoring system for AEFIs and post-marketing surveillance of new vaccines. (WHO Strategic Plan 2006-9)
4. Introduce *Haemophilus influenzae* type b (Hib) vaccine in all countries by 2010, except those in which robust epidemiological evidence exists of low disease burden, lack of benefit or overwhelming impediments to implementation (GAVI, SAGE 2005). [NOTE: the WHO Strategic Plan 2006-9 proposes that by 2010, 125 countries will have introduced Hib vaccine]
5. By 2010, work with WHO to ensure that all nerve tissue-based vaccines for human rabies prevention are replaced by safer, more effective, and equally affordable tissue culture products.

STRATEGIES:

- Collaborate with WHO and other partners on development of new vaccines and advocacy for affordable and equitable introduction.
- Strengthen country capacity to ensure effective and sustainable introduction of new vaccines and technologies based on informed decisions.
- Establish surveillance and response systems for adverse events following immunization for new vaccines as they are introduced into national schedules.
- Strengthen country capacity to assess disease burden and the cost and cost-effectiveness of new or underutilized vaccines and technologies through the use of standard tools. (GIVS)
- Ensure effective and sustainable introduction of new vaccines and technologies. (GIVS)
- Integrate the introduction of each new vaccine into each country's multi-year national plan of action including a financial analysis. (GIVS)
- Generate geographically and epidemiologically representative clinical data on vaccine effectiveness and conduct post-licensure evaluations of the impact of vaccination on disease patterns and child survival. (GIVS)
- Promote research and development of new vaccines against diseases of public health importance. (GIVS)
 - Work with partners to expedite evaluation of the efficacy of new rotavirus vaccines in settings in Asia and Africa where most rotavirus mortality occurs.
- Encourage countries to strengthen influenza surveillance and vaccination policy development to determine the burden of influenza, the cost-effectiveness of introducing influenza vaccine and its impact, and to decide on the optimal vaccination strategy to use.

GOAL 5

Build and strengthen multilateral and bilateral partnerships and other collaborative efforts to support availability, equitable access, sustainable financing, and use of vaccines for all children and adults globally, especially in developing countries.

OBJECTIVES:

1. Engage in new and strengthen existing partnerships to help achieve our mission (e.g., the new measles-malaria partnership), both at the global level as well as regional VPD partnerships tailored to the specific needs and partner composition of regions.
2. Enhance capacity of CDC and domestic and international partners to support global immunization programs.
3. Coordinate CDC's vaccine funding through UNICEF and PAHO Revolving Fund, and with vaccine manufacturers.

STRATEGIES:

- Participate in establishing global immunization priorities, goals and objectives, including engagement with the GAVI Alliance (with partners).
- Collaborate with partners in communicating the value of vaccines, and in the dissemination of accurate information about the benefits and risks of vaccines and immunization.
- Participate in interagency coordinating committees (ICCs) at the regional level and in selected priority countries.
- Work with global partners to secure and maintain the combined resources necessary to address global immunization needs.
- Work with partners to ensure adequate funding for polio eradication, measles mortality reduction and regional elimination, the Hib Initiative, hepatitis B control, and other initiatives.
- With partners, advocate for creation of stockpiles/strategic reserves of vaccines to maintain uninterrupted supply, for emergency response to outbreaks, and for special purposes (e.g., global OPV stockpile).
- Collaborate with partners to advocate for increasing use of vaccines in adults (e.g., vaccination of health care workers, pneumococcal and influenza vaccination, Td and Tdap boosters, HPV).



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