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CHILD SURVIVAL AND HEALTH GRANTS PROGRAM

TECHNICAL REFERENCE MATERIALS

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IMMUNIZATION



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ABBREVIATIONS AND ACRONYMS

AEFI	Adverse Event Following Immunization
AFP	Acute Flaccid Paralysis
AIDS	Acquired Immunodeficiency Syndrome
BCG	Bacille Calmette-Guérin
CDC	Centers for Disease Control and Prevention
cMYP	Comprehensive Multiyear Plan
CORE	Child Survival Collaborations and Resources Group
CSHGP	Child Survival and Health Grant Program
CRS	Congenital Rubella Syndrome
CSO	Civil Society Organization
DHS	Demographic and Health Survey
DTP	Diphtheria-Tetanus-Pertussis vaccine
EPI	Expanded Program on Immunization
GAVI	Global Alliance for Vaccines and Immunization
GVAP	Global Vaccine Action Plan
HHS	Health System Strengthening
Hib	<i>Haemophilus influenzae</i> type b
ICC	Interagency Coordinating Committee
IMCI	Integrated Management of Childhood Illnesses
KPC	Knowledge, Practice, and Coverage Survey
M&E	Monitoring and Evaluation
MCHIP	Maternal and Child Health Integrated Program
MDVP	Multidose Vial Policy
MNT	Maternal and Neonatal Tetanus
MOH	Ministry of Health
NGO	Nongovernmental Organization
NID	National Immunization Day
OPV	Oral Polio Vaccine
PCV	Pneumococcal Conjugate Vaccine
PVO	Private Voluntary Organization
RED	Reaching Every District
SIAs	Supplementary Immunization Activities
SNID	Sub-national Immunization Day
TRM	Technical Reference Materials
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VPD	Vaccine-preventable Disease
VVM	Vaccine Vial Monitor
WHO	World Health Organization

INTRODUCTION TO THE TECHNICAL REFERENCE MATERIALS

The Technical Reference Materials (TRMs), products of the United States Agency for International Development, Bureau for Global Health, Office of Health, Infectious Diseases, and Nutrition (USAID/GH/HIDN), are a series of guides to help program planners and implementers consider the many elements in a particular technical area of the Child Survival and Health Grants Program (CSHGP). These guides are not an official policy for practice; rather, they are basic everyday summaries to be used as field reference documents. They also may be accessed in the form of electronic toolkits on the [Knowledge for Health](#) website.

The TRMs are organized in modules that correspond to the primary interventions and key strategies that are central to CSHGP. Each module covers the essential elements that need to be considered during implementation, resources for nongovernmental organizations (NGOs) and others implementing community-oriented programs to consult when planning interventions, and examples of tools most commonly used among CSHGP grantees to collect baseline population-level data.

The TRM modules cover the following topics:

Technical Interventions

- Family Planning and Reproductive Health
- Immunization
- Malaria
- Maternal and Newborn Care
- Nutrition
- Pneumonia Case Management and Control of Diarrheal Disease

Cross-cutting Strategies

- Social and Behavior Change
- Health System Strengthening
- Monitoring and Evaluation
- Quality Improvement

Technical specialists in the USAID Collaborating Agency community, CORE Group Working Groups, USAID technical staff, and community-oriented practitioners all contribute to updating the TRMs on an ongoing basis. The revision date for each TRM module is at the bottom of each page. The modules are living documents, and we depend on readers to tell us of the usefulness of the information, the need for additions or amendments, and general comments. This feedback will help us keep the modules alive and responsive to readers' needs. Please share comments with the Maternal and Child Health Integrated Program (MCHIP) at info@mchipngo.net.

MCHIP is grateful for the many contributions and reviews by staff of the different Offices of the Bureau of Global Health, and many of their Collaborating Agencies, CORE Group Working Groups, and most of all to our private voluntary organization (PVO) and NGO partners that continue to use these guides and provide valuable insight on how to improve them. Contributors to this update from USAID include LaToya Armstrong, Endale Beyene, Meredith Crews, Katherine Farnsworth and Angela Shen. Other contributors include Claire Boswell, Independent; Rebecca Fields, MCHIP; Lee Losey, CORE Group Polio Project; Meghan Lynch, CORE Group Polio Project and Catholic Relief Services; Melanie Morrow, MCHIP; Debra Prosnitz, ICF; and Jennifer Yourkavitch, MCHIP.

OVERVIEW

Immunization is one of the most cost-effective public health interventions for reducing morbidity and mortality in children and, increasingly, adults. Generally, the goal of immunization is to reduce the incidence of vaccine-preventable diseases by means of high coverage with potent vaccines administered at the appropriate age. Specific disease control initiatives to eradicate polio, eliminate measles, and prevent maternal and neonatal tetanus are important aspects of many immunization programs. As a matter of policy, USAID prioritizes immunization program activities that are aligned with its efforts to end preventable child deaths. Although tremendous progress has been made in achieving high immunization coverage for key vaccines, such as measles and diphtheria-tetanus-pertussis (DTP), maintaining high coverage is essential and requires continued attention. It is of vital importance that children receive all necessary doses of all vaccines before their first birthday. A balanced child health and child survival portfolio will include engagement in efforts to strengthen routine immunization programs, which is the preferred method for achieving sustainable coverage with childhood antigens in the long term.

Since 2008, new vaccines have been introduced and rolled-out in many low- and middle-income countries that will help reduce deaths from two of the biggest killers of children, pneumonia and diarrhea. These new vaccines, pneumococcal conjugate vaccine and rotavirus vaccine, are important complements to integrated community case management (iCCM efforts).

STATUS OF GLOBAL IMMUNIZATION

Tremendous progress has been made to protect the world's children from vaccine preventable diseases (VPDs). In 1974, the World Health Organization (WHO) launched the Expanded Programme on Immunization (EPI) to build on the success of the global smallpox eradication program and ensure that all children in all countries benefited from life-saving vaccines. At that time, coverage for basic vaccines was an estimated 5% in developing countries. Over the next several years, immunization systems were established in most countries, but vaccination coverage was slow to increase. In the mid-1980s, UNICEF declared the goal of achieving universal childhood immunization (UCI) by 1990 to stimulate rapid increases in vaccination coverage across all countries and in 1991, it was announced that the UCI goal of achieving 80% coverage globally had been met. But during the 1990s, coverage rates stagnated or dropped in many low-resource countries while attention turned to other health priorities. Immunization coverage rates have fluctuated over the years, depending in large measure on the level of funding and program priority placed on EPI by both governments and development partners.

Routine immunization gives each child five contacts with the health system before the age of one year – a tremendous opportunity that is often underutilized.

New funding and coordination mechanisms have since been established, most notably the GAVI Alliance in 2000, described later. In 2010, the Decade of Vaccines was declared (2011–2020) with a vision that all people should enjoy lives free from vaccine-preventable diseases. Subsequently, the Global Vaccine Action Plan (GVAP) was developed as the means for operationalizing the Decade of Vaccines vision.

The GVAP seeks to accomplish the following goals by 2020:

- Achieve a world free of polio, with certification of poliomyelitis eradication to be achieved by 2018.
- Meet global and regional disease elimination targets (for measles, neonatal tetanus, rubella, and congenital rubella syndrome (CRS)).
- Meet these vaccination coverage targets: reach 90% national coverage and 80% in every district or equivalent administrative unit for all vaccines. Specifically, coverage with a third dose of vaccine containing DTP3 is the standard indicator used by the global immunization community to measure routine immunization performance.
- Develop and introduce new and improved vaccines and technologies.
- Exceed the Millennium Development Goal 4 target for reduction in child mortality.

Achievement of the GVAP objectives is to be guided by six principles: (1) country ownership, (2) shared responsibility and partnership, (3) equity, (4) integration, (5) sustainability and (6) innovation.

Key Resources on Global Immunization

- WHO, [Policy](#)
- WHO, [Global Vaccine Action Plan](#)
- WHO, [Immunization](#)
- [Global Alliance Vaccine Initiative](#)
- MCHIP, [Immunization](#)
- John Snow International, [IMMUNIZATION Basics](#)
- PATH [Vaccine Resource Library](#)
- Global [Polio Eradication Initiative](#)
- CORE Group [Polio Project](#):
- [Measles Rubella Initiative](#)
- WHO, [current and historical data on immunization](#), by country

PROGRESS WITH ROUTINE IMMUNIZATION COVERAGE

WHO and United Nations Children’s Fund (UNICEF) estimate that coverage for a third dose of DTP3 vaccine increased from 76% in 1990 to 83% in 2012.¹ The past decade also has been marked by the widespread introduction of new vaccines (described later) and by massive efforts to eradicate polio and reduce morbidity and mortality from measles. WHO reports that the number of deaths caused by traditional vaccine-preventable diseases (diphtheria, measles, neonatal tetanus, pertussis, and poliomyelitis) fell from an estimated 900,000 in 2000 to 400,000 in 2010.

DTP3 coverage is often used as a proxy to measure the ability of the health system to reach children multiple times with immunization services.

Global estimates of immunization coverage mask important disparities across regions and countries, and even within countries. For example, in 2000, WHO and UNICEF estimated DTP3

coverage at 97% in the Americas, compared to only 52% in Africa. As of 2012, the gap has narrowed, but the disparities continue with DTP3 coverage in the Americas estimated at 93% when compared with 75% for Southeast Asia and 72% for Africa.²

Clearly, it is a challenge not only to achieve but also to maintain high immunization coverage. The lessons of the 1980s and 1990s demonstrate that the job of immunizing children does not end when coverage targets are met. As the world's population grows, it becomes increasingly difficult to reach every child with a full series of vaccinations. In 2011, nearly 135 million children were born, all needing immunization, and in each successive year, that number increases. To reach these children requires continual intensive and sustained efforts. When those efforts are reduced, coverage declines, and the result is resurgences of vaccine-preventable diseases. Furthermore, efforts to achieve national targets can lead to widening gaps in equity, with neglect of poor or underserved populations. These gaps heighten the need for equity-focused approaches and concentrated efforts to reach the final fifth of children—the 22 million children who are un-vaccinated or under-vaccinated each year.

The GAVI Alliance

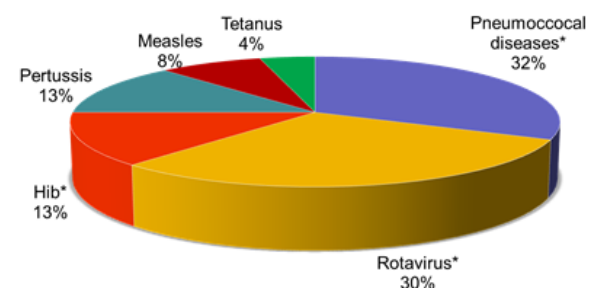
The GAVI Alliance, formerly called the Global Alliance for Vaccines and Immunization, is a public-private health partnership that has the stated mission to save children's lives and protect people's health by increasing access to immunization in poor countries. As of 2014, 53 countries are eligible for GAVI support based on a per capita gross national income below or equal to \$1,570 (U.S. dollars). GAVI's most substantial contributions are through donations of new and underutilized vaccines that recipient countries are required to co-finance. GAVI also provides cash support for health system strengthening (HSS) that must be linked to improved immunization outcomes. Not all countries qualify for new vaccine and HSS funding: GAVI sets [conditions for each type of support](#). Through its HSS account, GAVI encourages countries to involve civil society organizations (CSOs, including PVOs and NGOs) to be active partners in immunization activities. GAVI's CSO constituency provides input on GAVI policy and programs.

With the advent of new vaccines against such common childhood killers as pneumonia and diarrheal disease, it is estimated that 17% (1.5 million) of the 8 million deaths that occur in children under the age of five are vaccine preventable, as shown in Figure 1. GAVI provides co-financing to support the introduction of these vaccines.

Equity

Reaching the unreached, or a focus on equitable access to immunization services and coverage, is an issue of increasing importance. As described in the GVAP, in some

The cause of 1.5 million deaths globally among children that are preventable by routine vaccination, 2008



Source: Black RE, et al. Global, regional, and national causes of child mortality in 2008: a systematic analysis. Lancet. 2010 Jun 5;375(9730):1169-87. Epub 2010 May 11.
* WHO/IVB estimates

Figure 1. Vaccine-preventable causes of death

Key GAVI Resources

- [GAVI Alliance website](#)
- [GAVI CSO Constituency](#)

countries, coverage of measles-containing vaccine in rural areas is 33% lower than in urban areas; however, important disparities that are difficult to monitor exist even within urban areas, with coverage lower among underserved and impoverished slum-dwellers.

DHS data on immunization have shown that vaccination coverage, as reflected by DTP3, is consistently higher in higher wealth quintiles (wealthier populations) than in lower, poorer ones. Other factors that directly or indirectly contribute to low immunization rates include difficult geographic access, ethnicity, gender, maternal education, and high birth order. These characteristics also contribute to marginalizing populations and must be considered in developing approaches for immunizing all children. It is important that the hardest to reach should be at the center of strategies to increase immunization coverage.

Key Equity Resources

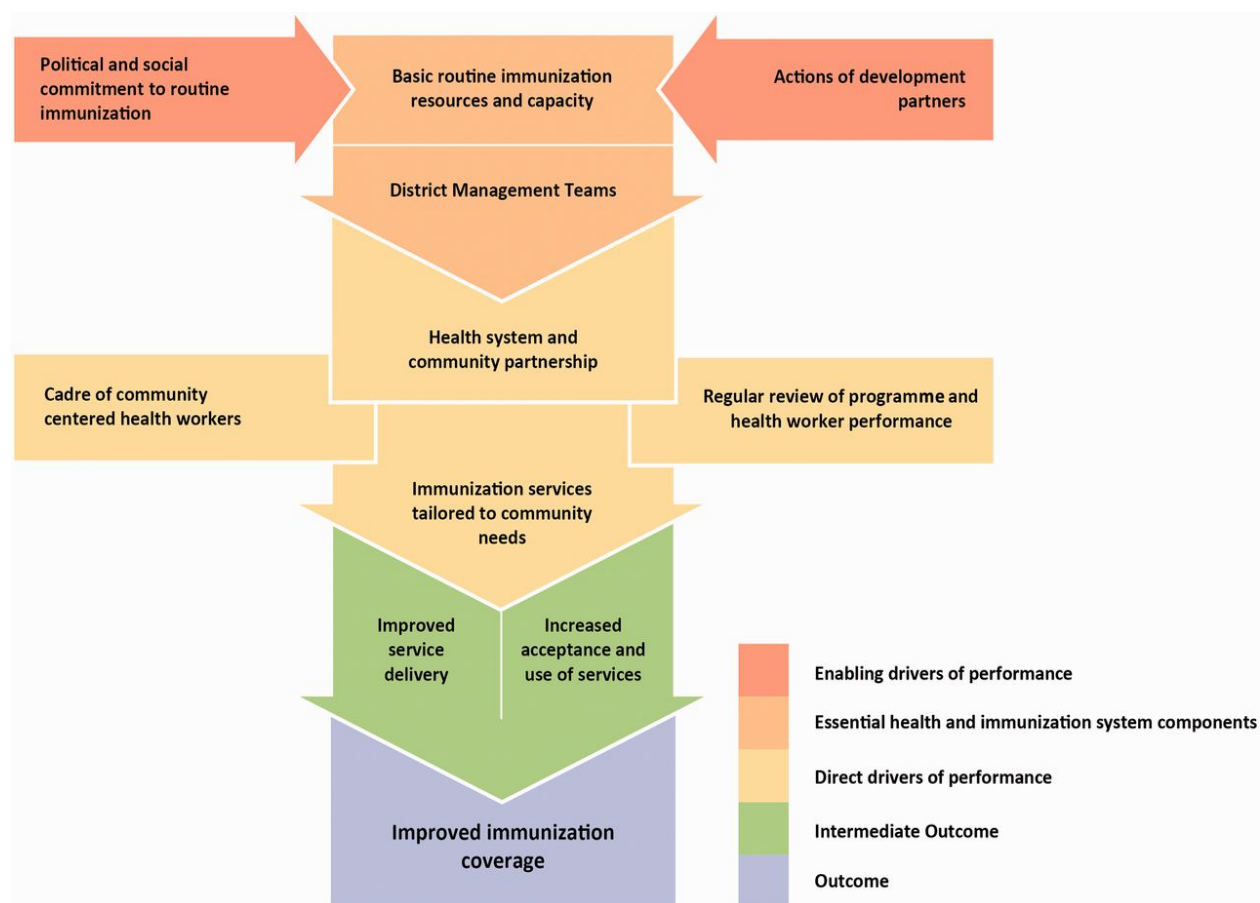
- Save the Children, U.K., 2012. [Finding the Final Fifth: Inequalities in immunization](#)
- Anthony Lake, UNICEF Executive Director, 2011. [“Reaching the Fifth Child: Immunization and Equity”](#)

PVO AND NGO INVOLVEMENT IN IMMUNIZATION

Sustainable, effective partnerships between health ministries, service providers, and the community have the potential to improve access to immunization services and their utilization.

The Africa Routine Immunization System Essentials ([ARISE](#)) project found that in several health districts in Africa where essential immunization inputs (vaccines and related supplies, capable health personnel, and technical standards) were in place, an important driver of improved performance for routine immunization was a strong, dynamic partnership between health systems and communities. These partnerships connect public health planners, vaccination service providers, public administrators, community organizations, and informed community members to work toward improving the health of people and the communities where they live. By establishing strong relationships between communities and health systems, community stakeholders can coordinate to address gaps in services, carry out health education activities to promote the use of immunization services, and facilitate other community-based public health programs. Figure 2 illustrates this process.

Figure 2. Pathway to improving routine immunization coverage at the district level in Africa ³
(ARISE project)



Because of their close relationships and distinct role in communities, PVOs and NGOs can make important contributions to immunization, particularly routine immunization, by carrying out any of a wide range of activities, such as these examples:

- Directly immunize children and women.
- Support district-level Ministry of Health (MOH) staff, with training and capacity building.
- Advocate for resources so that immunization services are sufficiently supported.
- Work with communities and health services to plan, monitor, and support vaccination activities in the following ways:
 - Arrange a clean outreach site (school or community meeting room, for example).
 - Transport vaccines and health workers, particularly for outreach sessions.
 - Inform community members when a health worker or team arrives at the outreach site.
 - Provide a meal to health workers when they are on outreach visits.
 - Register patients, control crowds, and make waiting areas more comfortable on the day of an outreach session.
 - Motivate and mobilize community members to use immunization and other primary health care services.
 - Deliver appropriate messages and dispel false rumors about immunization, if needed.

- Assist with newborn and defaulter tracking; use birth registers and vaccination registers to identify people who have been missed by vaccination services (left-outs) and people who started but did not complete the vaccination schedule (drop-outs).
- Arrange home visits when children are behind schedule in their immunizations to explain the benefits and motivate caregivers.
- Provide equipment and financial support.

PVOs and NGOs have much information to teach partners about how to work with communities to increase the demand for vaccination and with peripheral health services to deliver services more effectively to meet that demand. Most countries have established a national-level Interagency Coordinating Committee (ICC) or equivalent collaboration mechanism. By participating in the ICC, PVOs and NGOs that are active in immunization efforts can play an important role in extending the reach of services into communities, encouraging their uptake, and complementing MOH immunization activities. Table 3 has more suggestions for community involvement.

VACCINES AND VACCINATION SCHEDULES USED IN IMMUNIZATION PROGRAMS

Vaccines are the core input to any immunization program. For many years, these were the standard EPI vaccines:

- Bacillus Calmette-Guerin (BCG) against tuberculosis
- Oral polio vaccine (OPV)
- DTP
- measles

The past several years have seen widespread efforts, largely supported by GAVI, to introduce new vaccines in dozens of countries. Decisions about which vaccines to introduce are made by governments, often with WHO input, which issues official position papers on each vaccine and National Immunization Technical Advisory Groups in countries that have established them. The criteria for deciding to adopt a new vaccine usually include disease burden, cost, the ability of the country to obtain supplies of the vaccine, and the health system's capacity to deliver the vaccine safely and effectively. GAVI plays a key role in donating new vaccines in low-income countries, contingent on a co-payment by the countries themselves.

All vaccines must be given according to the national vaccination schedule. The schedule is generally a compromise that takes into account the immunological, epidemiological, organizational, and financial characteristics of the country and its population. The traditional child vaccination schedule recommended by WHO and used in many countries is shown in Table 1.

Table 1. WHO vaccination schedule

Birth	BCG, OPV-0 in some countries
6 weeks	DTP1, OPV1, PCV1*
10 weeks	DTP2, OPV2, PCV2*
14 weeks	DTP3, OPV3, PCV3*
9 months	Measles

* *In countries where pneumococcal conjugate vaccine (PCV) has been introduced*

With the widespread introduction of new vaccines, most countries have updated their schedules to substitute pentavalent vaccine (which protects against diphtheria, pertussis, tetanus, Hepatitis B, and *Haemophilus influenza* type b [Hib]) for DTP. Many countries also are introducing pneumococcal conjugate vaccine (PCV), with doses given at the same time as DTP1, 2, and 3. Rotavirus vaccine is being introduced in many countries as well, with doses to be given during existing vaccination contacts; however, the number and timing of doses may vary by vaccine manufacturer and country schedule. Most countries are introducing a second dose of measles vaccine and one dose of inactivated polio vaccine to their schedules. Some countries include regionally appropriate vaccines, such as yellow fever, meningococcal type A, or Japanese encephalitis.

The general schedule shown earlier is used in many countries, but vaccination schedules vary widely and are subject to change. For example, the schedules in most Latin American and European countries call for immunization to be given at slightly older ages. WHO maintains a database of national vaccination schedules. *PVOs and NGOs must always follow the vaccination schedule for the country where they work.*ⁱ

When USAID is providing support for immunization programs, PVOs and NGOs must prioritize vaccines in the national schedule that support USAID’s goal to end preventable child deaths. Those vaccines typically will be indicated for children 1 year of age and under. For more guidance on USAID immunization priorities policy, please refer to the [Global Health Programs Account Guidance](#).

The vaccination of women with tetanus toxoid (TT) to protect against maternal and neonatal tetanus is a standard component of national immunization programs. All women should receive at least two doses of TT before the birth of their first child, up to a total of five doses for protection throughout childbearing years. Considering the complexity of the TT schedule, it is essential that each TT dose be recorded on maternal cards (records) that are retained and screened at each contact a woman has with the health system. The WHO-recommended TT schedule used by most countries is shown in Table 2.

Table 2. WHO-recommended TT schedule

1	At first contact or as early as possible in pregnancy	None
2	At least 4 weeks after TT 1	1–3 years
3	At least 6 months after TT 2 or during subsequent pregnancy	At least 5 years
4	At least 1 year after TT 3 or during subsequent pregnancy	At least 10 years
5	At least 1 year after TT 4 or during subsequent pregnancy	For all childbearing years, possibly longer

Some countries with high enrollment of girls in early grades of primary school may choose to offer annual booster doses to girls and boys at school in the early primary grades, while enrollment rates are high. This approach takes advantage of the long-lasting duration of immunity provided by TT and is an effective long-term approach to sustain population immunity and reduce future tetanus.

Key Resource on Vaccines and Schedules

- WHO, [database](#) of national vaccination schedules

ⁱⁱ **Policy Note:** PVOs should align their efforts to support countries’ national vaccine schedule recognizing that USAID priorities are aligned with efforts to end preventable child deaths. For example, MCH funds should prioritize vaccination efforts for those under age 5 as opposed to support for vaccines indicated for individuals over age 5 (e.g. HPV, influenza).

NEW AND UNDERUTILIZED VACCINES

***Haemophilus Influenzae* Type B**

Haemophilus influenzae type b (Hib) vaccine has now been introduced on a wide scale, usually as a component of pentavalent vaccine, which is given at 6, 10, and 14 weeks of age. By 2012, 91% of U.N. member states had included it in their child vaccination schedule. Before the introduction of this vaccine, it was estimated that Hib accounted for more than 400,000 deaths, primarily due to pneumonia in children under age 5 years.

Pneumococcal Conjugate Vaccine

Pneumococcal disease caused by *Streptococcus pneumoniae* is the leading vaccine-preventable cause of death for children under age 5 years, and it is responsible for some common forms of pneumonia and meningitis. In 2008, WHO estimated that 476,000 children died each year from pneumococcal infection. WHO recommends that inclusion of PCV be given priority in all immunization programs, especially in countries with high mortality rates among children ages 5 years and under. As of early 2012, 37% of U.N. member states had introduced PCV; however, this number is changing rapidly because the global supply of PCV and GAVI support for its introduction have increased. Two types of PCV vaccine are available: PCV10 and PCV13, which protect against 10 and 13 strains of *S. pneumoniae*, respectively.

Rotavirus

Rotavirus is a leading cause of severe diarrheal disease and dehydration in children under age 5 years. WHO estimates that over 450,000 children under age 5 years die from rotavirus infection annually, with more than 95% of deaths occurring in low-income countries in Africa and Asia. WHO recommends that rotavirus be included in national immunization programs, and it has emphasized the importance of providing rotavirus vaccination in the context of a comprehensive diarrheal disease control strategy, as mentioned earlier. As of early 2012, 16% of U.N. member states had introduced rotavirus vaccine; with support from GAVI, the number of countries that are incorporating the vaccine into their immunization programs is rapidly increasing.

Hepatitis B Vaccine

As of early 2012, 93% of U.N. member states had added Hepatitis B to their childhood vaccination schedule, usually as a component of pentavalent vaccine given at 6, 10, and 14 weeks of age. For many years, WHO recommended that the first dose of Hepatitis B vaccine be given within 48 hours of birth only in countries where mother to child transmission of Hepatitis B during delivery was a major cause of infection. In 2009 WHO revised its position to state that all infants should receive the first dose of Hepatitis B vaccine as soon as possible after birth, preferably within 24 hours. (The second and third doses can be given together with DTP1 and DTP3, possibly as pentavalent vaccine.) Implementing this recommendation requires the availability of monovalent Hepatitis B vaccine for the birth dose and presents substantial challenges in settings where it is common for women to deliver outside of health facilities.

Human Papillomavirus Vaccine

An estimated 266,000 women die from cervical cancer each year, with more than 85% of those deaths occurring among women in low-income countries.⁴ Nearly all cervical cancer is caused by

human papillomavirus (HPV), a sexually transmitted disease. HPV vaccines can prevent up to 70% of cervical cancer cases. WHO, United Nations Population Fund (UNFPA), the Cervical Cancer Action coalition, and the Alliance for Cervical Cancer Prevention call for a joint approach to cervical cancer prevention that includes vaccination of young girls and screening and treatment of women. In 2013 over 50 countries had included HPV in their national immunization programs, and others are beginning demonstration programs with GAVI support. Because the target group for HPV vaccine (girls 9–13 years of age) differs from others in most national programs, the delivery system is a challenge. School-based approaches are garnering much attention.

Yellow Fever

For the 45 countries considered to be at risk for yellow fever, WHO recommends that yellow fever vaccine be administered routinely at the time of the visit for measles vaccine (at 9–12 months of age), thus avoiding the need for an additional visit. As of 2012, 32 of the 43 at-risk countries had implemented the recommendation.

Key Resources for New and Underutilized Vaccines

- [Official WHO position papers](#) describing the burden and epidemiology of all VPDs, the vaccines themselves, and WHO's recommendations for their use.
- [Global Action Plan for Pneumonia and Diarrhoea](#) (WHO/UNICEF 2013). In light of the increased availability of effective vaccines against pneumonia and diarrheal disease, this document describes how immunization has become a core component of comprehensive, integrated approaches.
- [School-Based Immunization](#) page of the Immunization Service Delivery page of the WHO website, a resource for school-based HPV immunization.
- GAVI [New and underused vaccines support](#) provides additional information on new and underutilized vaccines.

PLANNING AND PROVIDING EFFECTIVE IMMUNIZATION SERVICES

POLICIES AND GUIDELINES

Health workers need clear policies, guidelines, skills, supplies and logistics support, and regular supervision, as well as appropriate resources to enable them to perform their tasks. WHO and GAVI strongly encourage countries to prepare and update their immunization comprehensive multiyear plan (cMYP) that facilitates planning, budgeting, and resource mobilization. WHO maintains a database of national cMYPs, and PVOs and NGOs should consult the cMYP in countries where they work to learn of the immunization program's objectives, policies, strategies, and plans.

Key Resource for Policies and Guidelines

- WHO [database for national cMYPs](#)

TOOLS AND TRAINING FOR PROGRAM STAFF

Many training materials on immunization are available for health care providers and mid-level managers. When possible, PVOs and NGOs should refer to the training materials available from the national immunization program in their country of work.

WHO has produced two key training resources: the Mid-Level Managers course and Immunization in Practice for frontline health workers. PVOs and NGOs may be particularly interested in the module on partnering with communities in the Mid-Level Managers course and the module on building community support for immunization in the Immunization in Practice

Key Resources for Training Program Staff

- WHO, 2008. [WHO Training for Mid-Level Managers](#)
- WHO, 2004. [Immunization in Practice](#) is a training reference intended for district and facility level health personnel

course.

REACHING EVERY DISTRICT APPROACH

Flexibility and creativity are needed to develop service delivery strategies that are appropriate for the needs of different communities. The Reaching Every District (RED) approach has been used widely for several years to strengthen routine immunization services. To help close the equity gap, the RED approach is being recast as the Reaching Every Community, placing greater emphasis on communities that often are missed by the health system.

RED comprises five main components:

1. **Planning and managing resources.** At district and facility levels, planning should identify the resources needed to reach all target populations in a way that can be managed well and thus maintained. Good planning involves (a) understanding the district or health facility catchment areas; (b) prioritizing problems and designing microplans that address key gaps; (c) being part of microplanning and developing a budget that realistically reflects the human, material, and financial resources available; and (d) regularly revising, updating, and costing microplans to address changing needs.
2. **Reaching target populations.** This component is a process to improve access and use of immunization and other health services in a cost-effective manner through a mix of service delivery strategies that meet the needs of target populations.
3. **Linking services with communities.** PVOs and NGOs may be able to make a particularly strong contribution in this area. This component of RED encourages health staff to partner with communities in managing and implementing immunization and other health services. Through regular meetings, district health teams and health facility staff engage with communities to make sure that immunization and other services are meeting their needs.
4. **Providing supportive supervision.** This component focuses on promoting quality services by periodically assessing and strengthening service providers' skills, attitudes,

and working conditions. It includes regular on-site teaching, feedback, and follow-up with health staff.

5. **Monitoring and using data for action.** District health teams and health facility staff need a continuous flow of information telling them whether health services are of high quality and accessible, who is and is not being reached, whether resources are being used efficiently, and whether strategies are meeting objectives. Discussed in more depth in the Measuring Progress section of this document, this entails tracking progress toward program objectives as close to the point of data collection as possible, as well as using data as a basis for taking appropriate action. Common measures include tracking coverage and drop-out rates, and mapping the populations served by each health facility.

Examples of concrete actions that PVOs and NGOs can take to support the RED approach to immunization are shown in Table 3.

Table 3. Possible areas for community involvement in immunization

Type of Community Involvement	When Most Needed or Appropriate	When Most Feasible
Jointly assess health problems	Community involvement is low	When sufficient trained government or PVO or NGO staff are available to orient the community about the process
Jointly assess and monitor preventive practices (e.g., immunization status)	Coverage is low, infant mortality rate is high	When sufficient trained government or PVO or NGO staff are available to orient the community about the process
Identify newborns	Timely DTPI or BCG or OPV0 is low; postpartum seclusion common	When community health workers or other groups are willing to be trained and do this
Ensure effective planning for immunization sessions (place, time, and location). Collaborate on convenient schedules for sessions (routine, outreach, mobile)	Where coverage is <90%	Getting community input should be feasible almost everywhere, but responding to it may require flexibility by the health system and personnel
Provide food or shelter, or both, to outreach teams	Where such teams visit	Should be feasible anywhere except in most impoverished communities
Assist health workers during immunization sessions with crowd control, registration, education	Where sessions are understaffed, waits are long, health workers lack time for good counselling	Should be feasible anywhere if community members are well oriented and appreciated
Publicize immunization sessions and announce arrival of the outreach team	Where coverage is <60% or parents of defaulters don't know when and where to go for immunizations	Should be feasible anywhere, using local organization and channels
Identify, visit, and motivate dropouts and left-outs (community promoters, scouts, health committee, pupils)	Where coverage is <80%, and DTPI-DTP3 dropout is >10%	Should be feasible where an appropriate group can be identified, oriented, and motivated
Make home visits to help caretakers understand when the next immunization is due	Where DTPI-DTP3 dropout is >10%	Should be feasible where an appropriate group can be identified, oriented, and motivated
Plan and implement community recognition of children who have been fully immunized by 1 year of age	Where coverage is <90%	Should be feasible in any community that has at least quarterly meetings, festivals, or a central meeting place (market, community center)
Participate in learning about immunization	Where there are common misperceptions, rumors	Should be feasible anywhere through home visits or group discussions, drama, and other venues
Participate in learning about health services and health workers	Where large cultural or educational gaps exist between health workers and caregivers	Should be feasible where a facilitator is part of the process (e.g., NGO staff)
Advocate for more accessible and convenient immunization and other services	Where coverage is <60% or 20 percentage points less than average for the district or country	Should be feasible anywhere, but likelihood of success greater in more democratic, wealthier settings

Key Resources for Reaching Every District

- WHO Africa Regional Office, 2008. [Implementing the Reaching Every District \(RED\) Approach: A Guide for District Health Teams](#)
- BASICS, 2003. [My Village is My Home: Community Tool for Immunization Self-Monitoring and Health Education](#)

ASSURING QUALITY AND SAFETY OF IMMUNIZATION SERVICES

Vaccines, Supplies, and Logistics

Only vaccines of known quality, supplied by a vaccine manufacturer that has been pre-qualified by WHO, should be used. Vaccines provided by the Ministry of Health meet this requirement. Locally available refrigerators or freezers designed for household use are not appropriate for storing vaccines.

Providing potent vaccines through an effective cold chain is a critical aspect of any immunization program. Administering ineffective vaccine is worse than providing no vaccine at all because it can damage community confidence in the vaccination program. For example, a typical remark could be “My child got the vaccine but still got measles.” Contaminated or frozen vaccines also can cause abscesses and other serious adverse events.

To help assure vaccine potency, health workers must be trained in handling vaccines, maintaining proper temperatures for vaccine storage and transport, and using vaccine vial monitors (VVMs). These small labels, attached to vials of all vaccines supplied by UNICEF, change color irreversibly to indicate exposure to heat.

While heat damages some vaccines, exposure to freezing can damage and inactivate others, including DTP, TT, Hib, Hepatitis B, PCV, and rotavirus. All vaccines should be maintained continuously in the temperature range of 2 to 8 degrees Centigrade. If cold-sensitive vaccines are exposed accidentally to freezing temperatures for any period of time, they must be discarded.

Health workers should reconstitute lyophilized (freeze-dried) vaccines using *only* the diluent provided by the same manufacturer for that vaccine.

Key Resource for Supplies and Logistics

- WHO, 2014. [Immunization Supply Chain and Logistics](#)

Reducing Vaccine Wastage

Vaccine wastage reduces the cost effectiveness of programs. Use of VVMs and the multidose vial policy (MDVP) described later can help reduce wastage, but a heavy focus on reducing vaccine wastage may come at the expense of providing complete immunization of children as soon as they are eligible. Health workers must respect national guidelines on vaccine use, but they should avoid turning away mothers who have brought their children to a vaccination session because not enough children have come to justify opening a multidose vial.

Before the introduction of the MDVP, all opened vials of vaccine had to be discarded at the end of the immunization session, regardless of the doses remaining. Under the MDVP, vials of some

vaccines, including OPV, DTP, pentavalent vaccine, and TT, may be used for up to 28 days after being opened, provided that *all* of the following conditions are met:

- The expiry date has not passed
- The vaccines are stored under appropriate cold chain conditions
- The vaccine vial septum has not been submerged in water
- Aseptic technique has been used to withdraw all doses
- The VVM, if attached, has not reached its discard point

For safety, the MDVP *does not* apply to vaccines that do not contain preservatives, including BCG, measles, PCV-10, or yellow fever. These vaccines *must be discarded* within 4–6 hours of reconstitution, according to national policy. In general, the MDVP does not apply to any lyophilized (freeze-dried) vaccine that has to be reconstituted.

Key Resource for Reducing Vaccine Wastage

- WHO, 2000. [Multi-dose vials](#)

Injection Safety

Injections for vaccination represent approximately 5 to 10% of all injections given in the developing world. In 2003, WHO estimated that unsafe medical injections given for any purpose accounted for 39% of all new Hepatitis B infections, 40% of all new Hepatitis C infections, and 5% of all new HIV infections. Unsafe injections can lead to abscesses and septicemia, traumas resulting in paralysis, and rare hemorrhagic fevers; therefore, vaccinations must be given in ways that do not pose risks to patients, health workers, or communities.

WHO policy states that for immunization injections, only auto-disable needles and syringes that automatically lock after a single use should be used. They should be placed immediately in safety boxes after use without recapping. Filled safety boxes should be destroyed according to national guidelines. Patients should never be expected to purchase and provide their own injection supplies for immunization because the practice can encourage the reuse of contaminated injection equipment or the use of inappropriate equipment.

Key Resources for Injection Safety

- PATH, 2001. [Giving Safe Injections: Using Auto-Disposable Syringes for Immunization](#)
- PATH, 2006. [Proper Handling and Disposal of Auto-Disposable Syringes and Safety Boxes](#)
- WHO, [Safe Injection Global Network](#)

Adverse Events Following Immunization

An adverse event following immunization (AEFI) is a medical event or incident that takes place after an immunization, but is not necessarily caused by immunization. There are several categories of AEFI: those due to program errors (for example, incorrectly reconstituting a lyophilized vaccine); coincidences that are unrelated to the vaccine; events caused by the

injection rather than the vaccine itself; and events caused or precipitated by inherent properties of the vaccine when given correctly. All immunization programs have systems for detecting, reporting, investigating, and managing AEFI.

Key Resource for AEFI

- [WHO webpages on AEFI](#)

Quality of Services and Client Satisfaction

Vaccination services must be of high technical quality and available where and when clients can reach them easily. They also must be offered in a welcoming way that encourages clients to return and complete the vaccination schedule. To reduce the likelihood that caregivers will start but not complete the vaccination schedule, health workers need to treat them with respect and provide reliable, high-quality services. One way to draw attention to drop-out rates and, therefore, work to reduce them is by monitoring DTP1–DTP3 drop-out rates.

Exit interviews with mothers as they leave immunization services can help in assessing provider counseling skills, but this method tends to underestimate caretakers' true level of dissatisfaction with their treatment. Focus group discussions conducted by an independent party, such as a PVO or NGO (as opposed to local Ministry of Health personnel), produce more open and useful opinions of services. Supervisory-based methods and facility surveys have been used to monitor and evaluate health worker practices and to target activities to improve practices.

Avoiding Missed Opportunities

“Missed opportunities” refers to contact between a health care provider and a child or woman eligible for vaccination, but the child or woman does not receive the vaccinations for which they are eligible. It is safe and usually effective to vaccinate children with common illnesses. Several studies have shown that if health workers are confident and comfortable about providing vaccinations to a child with a mild or common illness, parents do not object. HIV/AIDS infection presents only minor barriers to immunization. WHO recommends that all vaccines can be given to an HIV-infected child, with the exceptions that BCG should not be given to HIV-positive infants and yellow fever vaccine should not be given to a child with severe immunodeficiency.

Demand for Immunization

Immunization is generally a widely accepted service that is valued by parents, particularly in places where VPDs such as measles are still familiar and where few other health services are available.

In recent years, much attention has been given to the concept of vaccine hesitancy, the resistance or ambivalence of caregivers or community leaders to accept and use vaccination services. This is a serious issue in places where immunization coverage has been very high for years and people no longer fear the diseases that vaccines prevent. In some low-resource settings, vaccine hesitancy is also due to misinformation, myths or rumors—sometimes politically motivated—about the safety and purpose of vaccines or the belief that vaccination is against religious principles. High drop-out rates also are often attributable to previous unpleasant experience with immunization services. Communication with communities by trusted leaders or health personnel

can raise acceptance and demand for immunization and create better acceptance and immunization services utilization.

If people have physical access to immunization services but are not using them or drop-out rates are high (over 10%), the following strategies should be considered:

- Increase community understanding of the value of knowledge about immunization.
- Change the hours of immunization sessions so that they are more convenient for parents.
- Involve community members in organizing immunization services and solving transport problems.
- Engage trusted community or religious leaders to promote the benefits of immunization and provide information on when and where it is available.

Health workers should screen all children for their immunization status and vaccinate them if they are eligible, even if they have come for curative care. It is particularly important that health workers inform caretakers as to when and where to return for vaccination. In fact, this is more important than increasing parent's knowledge of the names of the vaccines.

Key Resource for Increasing Demand

- UNICEF, 2004. [Building Trust in Immunization: Partnering with religious leaders](#)

LINKING IMMUNIZATION WITH OTHER HEALTH SERVICES AND INTERVENTIONS

To provide services that meet a range of caregiver needs and reduce missed opportunities, routine immunization should be a part of other maternal and child health services and interventions. For example, vaccination contacts can be used as an opportunity to provide referral messages to clients on using [family planning services](#) that are available the same day at the same facility. Here are some other linkages:

- Antenatal care: Include tetanus toxoid vaccination of mothers and counsel mothers on the importance of vaccination of their infants.
- Child outpatient services and integrated management of childhood illnesses (IMCI): All eligible children coming for any reason to the outpatient clinic, including those receiving IMCI, should be screened for immunization status and vaccinated accordingly.
- Adult outpatient services: All pregnant women and eligible children present at the outpatient clinic (even when children are only accompanying their mother or guardian because no one is home to care for them) should be screened and vaccinated for any missed or due vaccine. This procedure requires that patient flow in a facility favors this practice and that the child's vaccination card is brought every time the child comes to the health facility, no matter the reason for the visit.
- Vitamin A supplementation for eligible children.
- Growth monitoring and promotion, including nutrition counseling.

Vitamin A supplementation

Vitamin A supplementation can be provided during certain vaccination contacts, even if a project is not otherwise involved in nutrition interventions. Child immunization contacts may be a good, if limited, opportunity to provide vitamin A supplements to mothers and infants. For infants, the measles vaccination contact at 9 months is usually the only routine immunization contact used to provide vitamin A because measles is the only vaccination scheduled between 6 and 12 months of age, the optimal time for infants to receive their first dose of vitamin A. In some countries, vaccine booster doses and occasional mass vaccination campaigns against measles, polio, or other VPDs provide additional opportunities for vitamin A supplementation. For post-partum women, the first immunization contact for her infant (BCG or DTP1) provides an opportunity for her to receive a post-partum dose of vitamin A (usually 8 weeks after delivery for breastfeeding mothers and 6 weeks for non-breastfeeding mothers, depending on MOH policy).

Key Resource for Immunization and Vitamin A:

- WHO/MOST/HKI, 2000. Integrating Vitamin A with Immunization: An Information and Training Package. CD-ROM can be ordered from: World Health Organization, Dept of Vaccines and Biologicals' CH-1211 Geneva 27, Switzerland, Fax: (41-22- 791-4193 or 4192, Vaccines@who.int.

MONITORING AND EVALUATION

KEY INDICATORS

Table 4 is a list of the most frequently used indicators for monitoring immunization, easily available and tracked at all levels of the health system (note: most countries now use pentavalent vaccine instead of DTP vaccine):

- DTP1 or Penta 1: First dose of pentavalent or DTP vaccine, which is an indicator of access to immunization services and initial use of the service
- DTP3 or Penta 3: Third dose of pentavalent or DTP vaccine, which is a proxy for completion of the vaccination series and the ability of the health system to reach children multiple times with an essential service
- DTP1–DTP3 or Penta 1–Penta 3 drop-out rate, which is an indicator of perceived satisfaction and operational problems. A drop-out rate of 10% or more suggests a problem with the immunization services. Drop-out rate is calculated as shown in the text box.

Drop-out rate = $\frac{\text{\# of Penta 1 doses given} - \text{\# of Penta 3 doses given}}{\text{\# of Penta 1 doses given}} \times 100$

Table 4. [Knowledge, practice, and coverage \(KPC\) surveys](#) on immunization collect the core data shown

INDICATOR	DEFINITION
1. Availability of vaccination card at time of survey	Percentage of youngest children, ages 12–23 months, who have a vaccination card at the time of the survey
2. Access to immunization services (Penta 1)	Percentage of youngest children, ages 12–23 months, who received Penta 1 according to the vaccination card or mother's recall at the time of the survey
3. Health systems performance in immunization services (Penta 3)	Percentage of youngest children, ages 12–23 months, who received a Penta 3 vaccine according to the vaccination card or mother's recall at the time of the survey
4. Measles vaccination coverage	Percentage of youngest children, ages 12–23 months, who received measles vaccine according to the vaccination card or mother's recall at the time of the survey
5. Drop-out rate (Penta 1 to Penta 3)	Percentage of youngest children, ages 12–23 months, who received a Penta 1 vaccine but did not receive a Penta 3 vaccine according to mother's recall or vaccination card verified at the time of the survey
6. Fully immunized children by age 12 months (valid coverage)	Percentage of youngest children, ages 12–23 months, who received all doses of all vaccines according to the vaccination schedule by 12 months of age
7. Fully immunized children ages 12–23 months	Percentage of youngest children, ages 12–23 months, who received age-appropriate vaccination at time of survey
8. Non-immunized children	Percentage of youngest children, ages 12–23 months, who had not received any dose of any vaccines in the national immunization schedule by the time of the survey
9. Ever possessed a vaccination card	Percentage of youngest children, ages 12–23 months, who were ever given a vaccination card or a health book where their vaccinations are recorded

Sources of Data

Coverage can be estimated based on facility records from tally sheets and ledgers or population-based surveys from vaccination or child health cards. PVOs and NGOs can provide valuable assistance by helping with the regular collection, analysis, and use and feedback to communities of vaccination data at every level.

Unfortunately, problems with the quality of routine immunization data are widespread and can lead to overestimates or underestimates of coverage. A few common issues include inaccurate data on denominators (target populations) because of incorrect projections from old census data or population movement, incomplete recording of doses or writing down the wrong figures, giving doses to children of older age groups but recording them as given to younger age groups, and caregivers obtaining different doses of vaccines at different facilities.

Population-based surveys generally yield more accurate information on immunization coverage but are carried out infrequently. Occasional population-based surveys, such as Demographic and Health Surveys (DHS), UNICEF multi-indicator cluster surveys (MICS), KPC surveys, and WHO 30-cluster surveys, provide valuable data for comparison with facility-reported coverage.

Other methods used to evaluate and monitor program performance include immunization program reviews (conducted every 5–6 years), reviews of effective vaccine management practices, and post-introduction evaluations for new vaccines. Most of these studies are organized by Ministries of Health together with WHO.

Establishing Baselines and Setting Targets

PVOs and NGOs usually determine immunization coverage at the beginning of their intervention through a baseline KPC survey or other population-based survey. Targets are set and at the end of the program, a final assessment or KPC survey documents outcomes. In general, immunization targets should be modest, realistic, and on the order of no more than a 5–10% increase in coverage per year. Although PVOs and NGOs can be very successful at achieving results, it is important to remember that targets set by PVOs and NGOs support those of the MOH or district-level authorities for immunization.

Using Data for Management and Action

Immunization data that are regularly available at health facilities and districts can be used to estimate coverage, identify problems, and plan locally appropriate strategies to overcome them. An important principle is to distinguish whether the major obstacle to full immunization is lack of access or drop-out, or a combination of the two. Figure 3 is a schematic framework from the WHO document, “Increasing Immunization Coverage at the Health Facility Level,” and it helps guide thinking about broad approaches.

Progress toward targets in a geographic area can be monitored by plotting routine administrative data against targets on a cumulative monitoring chart. Small sample surveys can be conducted to estimate whether immunization coverage is reaching targets (e.g., using lot quality assurance sampling). Community and household mapping to identify children and their vaccination status (population-based methods) can help guide where improvements in services are needed, as well as high performing areas.

Coverage and population data at district and facility levels should be used for vaccine forecasting, to reduce wastage, schedule outreach services, and improve logistics management. Immunization personnel should monitor refrigerator temperatures (twice daily), storage facility adequacy, and vaccine stockouts. Supportive supervision should observe and review counseling, vaccine safety, and availability of essential vaccines, equipment, and supplies to detect problems, note achievements, and problem-solve for solutions. Many supervision guides are available for this purpose.

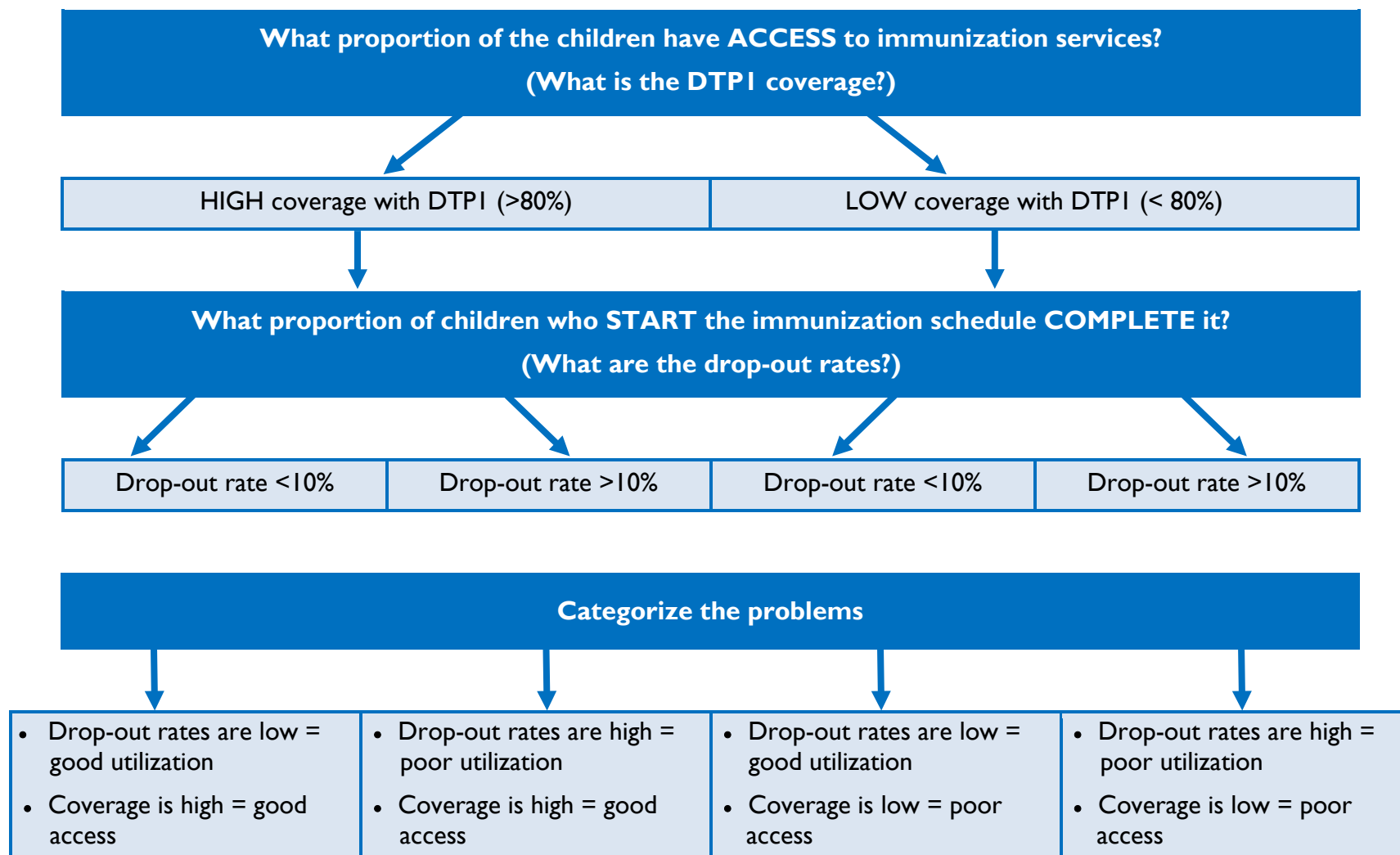
Analyzing Problems of Access and Drop-out in Routine Immunization

By monitoring monthly DTP1 and DTP3 data, health workers and community members can learn whether the major obstacles to vaccination are low access to services, non-completion of the vaccination schedule, or a combination of the two. Causes for low coverage can be related to poor access (e.g., physical, economic, or cultural), low demand, or inadequate service delivery (e.g., inappropriate hours or place, unreliable service schedules, or dissatisfaction with services).

DTP1 can indicate whether all children are being reached or whether some are left out. Drop-out rates can indicate the operational problems with services that need to be corrected.

Many PVOs and NGOs have established community-held registers that list pregnant women or newborns, or both. These registers (lists) can be used to record each child's immunization status and identify those who were not vaccinated at all (left-outs) and those who started but did not complete the vaccination schedule (drop outs). Families can then be targeted for follow-up. The same registers can be used to publicly recognize parents of children who complete immunizations and serve as a basis for discussion with village councils about immunization services and how to improve them. Figure 3 illustrates a framework for this analysis.

Figure 3. Framework for Analyzing Problems of Access and Dropouts



Planning Improvements

Health workers often need stronger skills in community partnerships, communication, organization of fixed and outreach activities, or other skills that may affect the use the services.

Unvaccinated or incompletely vaccinated children tend to cluster in pockets of need that are defined by geography, poverty, ethnicity, or other demographic or cultural factors. Identification of these groups and the barriers they face is an important first step in addressing the constraints and boosting vaccination coverage.

PVOs and NGOs can link communities with health facilities by helping to schedule outreach services to suit community availability, mobilizing communities to attend immunization sessions (fixed or outreach), and publicizing immunization days through town-criers, flags, and announcements during village meetings or religious services.

Key Resource for Planning and Providing Effective Immunization Services

- USAID, 2003. [Immunization Essentials: A Practical Field Guide](#)

Key Resources for Using Immunization Data for Management

- WHO, 2002. [Increasing Immunization Coverage at Health Facility Level](#)
- WHO, 2008. [WHO Mid-Level Managers Training Module 5: Monitoring the immunization system](#)

SPECIAL CONSIDERATIONS

DISEASE SURVEILLANCE

Measuring Impact

Surveillance of vaccine-preventable diseases provides a measure of program impact and early warning of epidemics. Most countries maintain active surveillance for polio (acute flaccid paralysis, or AFP), measles, and neonatal tetanus. Health workers at all levels need to know how to use standard case definitions and report VPDs according to the procedures, including frequency of reporting and stipulated by the MOH.

Where a disease surveillance system already exists in the project area, PVOs and NGOs make use of the data it produces for monitoring and decision making. For example, the percentage of VPD cases that have been vaccinated provides a crude estimate of vaccine efficacy. If it is suspected that vaccine effectiveness is declining and the number of cases is increasing, an investigation of the cold chain, vaccination procedures, or a search for new clusters of unvaccinated people in the population is needed. When cases of VPDs are seen in unvaccinated children—which is usually the case—these high-risk populations should be identified and vaccinated. In situations where an outbreak is suspected, PVOs and NGOs can support the MOH in investigating and managing the outbreak.

In areas without disease surveillance, PVOs and NGOs should consider how they can contribute to MOH efforts to establish a system. PVOs and NGOs must feed any surveillance data they collect directly into the MOH health surveillance system so that it can be used by all levels of the health system.

Community-based Surveillance

Many PVO and NGO projects have included community-based monitoring as one of the components of their monitoring and evaluation activities. Some community health workers contribute surveillance data to this system by using simplified case definitions. Community health workers and community groups can be trained to collect and report community-based data and track progress over time. Community-based surveillance for VPDs should be linked with tracking immunization coverage and the development of approaches for reaching unvaccinated and under-vaccinated children.

Interpreting and Using Surveillance Data

The purpose of surveillance is not to collect data, but rather to use it to take action. It is important to use disease surveillance reaction protocols, which usually include providing feedback to communities and facility staff on surveillance data, both about what the data mean in terms of their own health and about how well they are doing with their reporting.

ACCELERATED DISEASE CONTROL INITIATIVES

Accelerated disease control initiatives, such as polio eradication, measles mortality reduction and elimination, and maternal and neonatal tetanus elimination, are characterized by certain features: (a) they set specific global or regional level targets for impact; (b) they rely on strong routine immunization systems; (c) they organize periodic supplementary immunization activities (SIAs); and (d) they carry out intensive surveillance activities. Accelerated disease control initiatives are highly visible activities that attract attention and support to immunization, especially during campaigns; they are, however, not a substitute for strong routine immunization systems. In fact, they depend on a platform of strong routine immunization for their success.

PVO and NGO Involvement in Accelerated Disease Control Initiatives

PVO and NGO participation can contribute to multiple aspects of disease control initiatives:

- **Strengthen routine immunization.** Approaches for strengthening routine immunization already have been described in this document. For example, PVOs and NGOs can contribute to the Reaching Every District (RED) approach, for example, by assisting with microplanning or helping health workers identify and reach underserved groups.
- **Supplementary immunization activities.**ⁱⁱ SIAs, also known as mass campaigns or national immunization days or NIDs when conducted nationwide, provide additional doses of vaccine beyond those given through routine immunization. SIAs are used when a substantial susceptible (unvaccinated) population experiences a high risk of outbreak of

ⁱⁱ Sometimes small-scale local campaigns are organized at district level or below to boost immunity, as for example, just before or after the rainy season. Care should always be taken to adhere to MOH policies and to correctly record and report the doses administered during the campaign. More information on periodic intensification or routine immunization is available at: http://www.immunizationbasics.jsi.com/Docs/PIRImonograph_Feb09.pdf

a VPD. On the other hand, campaign strategies are expensive, occur at irregular intervals, and may divert staff and resources from routine immunization activities. SIAs can supplement routine immunization, but must not substitute for it. PVOs and NGOs can use the opportunity of the intense visibility and political interest in SIAs to draw attention to the needs of routine immunization to sustain the gains from campaigns.

- **Disease surveillance.** The roles of PVOs and NGOs in surveillance are described in detail under the Polio Eradication Initiative heading.

Polio Eradication Initiative

USAID strongly encourages PVOs to become active in polio eradication. The CORE Group Polio Project, which has funded activities in several polio-endemic countries, is unable to take new proposals, but it has many [technical tools and resources](#) to offer to PVOs and NGOs.

PVOs and NGOs can support all aspects of polio eradication. Because the focus on polio eradication can distract efforts to directly improve routine immunization, PVOs and NGOs have an important role in supporting developmental approaches that balance short-term disease control efforts with long-term improvements in primary health care.

Status of Polio Eradication

Initially adopted as a worldwide goal in 1988, the Polio Eradication Initiative has as its ultimate goal to certify the world free of poliomyelitis. The earliest this can happen is three years after the last case, under conditions of high-quality surveillance. A top priority is stopping poliovirus transmission in infected countries and preventing reintroduction of the virus into polio-free countries. Increasing population immunity sufficient to stop transmission through routine immunization and supplemental immunization is critical, especially in marginalized, under-served, migrant, or transient populations. Gaining access to children living in or displaced by civil conflict or humanitarian disasters poses a continuing challenge in several countries. While most countries meet certification-level criteria for surveillance at the national level, gaps at the subnational level exist and need to be improved so that no chains of transmission are overlooked.

As of 2013, only Nigeria, Pakistan, and Afghanistan have never interrupted indigenous poliovirus transmission. Countries with low routine immunization coverage, however, remain at risk of importation and reintroduction. The U.N. maintains current information on the [polio status of all member states](#). A site with [current data on polio cases](#) is updated weekly.

Achieving Polio Eradication

Polio eradication is achieved by maintaining high coverage through routine immunization; conducting high-quality SIAs, such as national and subnational immunization days (NIDS and SNIDS); establishing high-quality surveillance; and conducting focalized mopping up immunization where high-risk areas remain. To interrupt poliovirus transmission, all children under age 5 years must be reached with at least 6 to 10 doses (4 doses by 12 months) of oral polio vaccine provided through a combination of routine immunization and SIAs (as needed). For countries using OPV that are either polio endemic or at high risk for importation and spread, WHO recommends the primary series of 3 OPV doses + a birth dose + a subsequent IPV dose. For countries using OPV but not endemic or high-risk, WHO recommends the primary series of 3 OPV doses + a subsequent IPV dose.⁵

Of course, children under five should also participate in any SIAs that pertain to them. Children under age five in areas without SIAs, however, will not have 6 to 10 doses of OPV. PVOs and NGOs can consider independently monitoring SIA campaigns as an activity in support of polio eradication.

With the Polio Eradication Initiative entering its final phase, the *Polio Eradication and Endgame Strategic Plan 2013–2018* describes the comprehensive, long-term strategy to address what is needed to deliver a polio-free world by 2018. Its four objectives are to: (1) Detect and interrupt all poliovirus transmission, (2) Strengthen immunization systems and withdraw oral polio vaccine (substituting inactivated polio vaccine instead), (3) Contain poliovirus and certify interruption of transmission, and (4) Plan polio's legacy.

National and Subnational Immunization Days for Polio

The objective of NIDs and SNIDs is to reach every child under age 5 years with multiple doses of oral polio vaccine. Even in areas where transmission has been interrupted, NIDs and SNIDs may be needed to protect against re-importation of the virus and, where routine immunization is chronically low, increase population immunity. Participating in the NIDs and mopping up activities builds trust in the community, increases confidence in the immunization program, and helps build a culture of prevention. PVOs and NGOs can do the following activities:

- *Participate on the Interagency Coordinating Committee.* Every country has an ICC for immunization. The ICC, which comprises organizations and interested parties and has in its mandate polio eradication activities, is a forum for planning and coordination, resource mobilization, and problem solving.
- *Participate in micro-planning at the subnational level.* PVOs and NGOs can help map communities; identify households with newborns or infants; provide community guides for vaccinators; assist vaccinators, mobilizers, supervisors, or independent monitors; provide training and information to organizers and implementers; host meetings of civic, religious, traditional, and other local leaders; gain commitment and support; provide logistics support by arranging transportation for vaccine and vaccinators; monitor the cold chain, vaccine quality, and stock-outs; assist with vaccine management; freeze ice packs; and print tally sheets.
- *Assist with house-to-house vaccination visits in communities.* PVOs and NGOs often can hold community dialog with influential local leaders to address community concerns, solve operational challenges, and increase acceptance of immunization in general.
- *Provide vitamin A during NIDs or SNIDs.*
- *Adopt the most difficult and hard to reach areas.* Urban slums, geographically remote areas, high-rise buildings, cross-border areas with migration, refugees, inter-country trade, nomadic or tribal areas, and areas with ethnic or religious minorities.
- *Provide (non-monetary) recognition to vaccinators for a job well done.*

Surveillance for Polio

To be certified polio-free, each WHO region (PAHO, WPRO, EURO, EMRO, SEARO, and AFRO) must meet a rigorous set of criteria. These include weekly reporting of all cases of acute (new) flaccid (floppy) paralysis (AFP, a signal condition for polio) in children under 15 years of age, from every district. Each case should be reported within 14 days of the onset of paralysis

and investigated immediately by a trained surveillance officer who will take two adequate stool samples. These samples are then shipped to a WHO-accredited laboratory to determine if the paralysis is caused by polio or something else that causes AFP. The region must maintain certification standard indicators and a non-polio AFP rate of 2/100,000 in children under 15 years of age for at least three years to be eligible for certification. An independent panel of experts reviews the data and determines if they are of high enough quality to merit certification. Only WHO regions, not countries, can be certified polio-free. Participating in surveillance for AFP and other VPDs will highlight high-risk areas for polio and other diseases.

AFP surveillance is lagging for many reasons: cases may occur in remote areas; poor telecommunications may delay reporting; political instability may be an obstacle to weekly reporting of cases. If caretakers don't take their children to a facility, the case may not be reported. If they take a paralyzed child to a traditional healer first, valuable time is lost in reporting the case and collecting the stool specimens needed for virological confirmation (the viral load in the stools drops off after 14 days). In some countries, doctors are complacent and forget to report AFP promptly if the disease hasn't been seen recently.

Because PVOs and NGOs generally work in some of the most challenging areas for polio eradication, they are well-placed to play an important and complementary role to other organizations like WHO, CDC, and UNICEF. PVOs and NGOs can identify key informants who can enhance the work of the formal surveillance officer. PVOs and NGOs can report any case of AFP to the surveillance officer. PVOs and NGOs may help by transporting a paralyzed child and a caregiver to the surveillance officer for care and stool collection. PVOs and NGOs can provide extra assistance to a family with a paralyzed child (e.g., food, extra visits by a nurse or doctor, and follow up on treatment for AFP, resource mobilization for children in need of surgery, braces, or wheelchairs). PVOs and NGOs can demystify AFP (it is not caused by magic) and discuss prevention.

In non-endemic and recently non-endemic countries, maintaining high quality surveillance is essential. PVOs and NGOs can serve an important role by bringing cases of AFP to the attention of the health system and participating in all NIDs and SNIDs and mopping up activities. PVOs and NGOs can train staff to recognize cases of AFP and report them immediately to the AFP surveillance officer assigned to the geographic area. The local ministry of health will know who is assigned to polio eradication in a given geographic area. The national WHO office can provide information and assistance if needed.

Mopping Up

Mopping up refers to intensive door-to-door immunization that is conducted only when surveillance data show that the poliovirus is in a focalized area. WHO recommends that no less than 2–5 million children be immunized during mopping up. PVOs and NGOs can help plan, implement, monitor, evaluate, and promote high-quality mopping up.

Maximizing the Impact of Polio Eradication Efforts on Routine Immunization

PVOs can play a role along the continuum from routine immunization to SIAs. By working closely with communities on both service delivery and communication, PVOs and NGOs are well-placed to optimize investments in all areas. Here are some examples:

- At the time of polio campaign mobilization, increase the understanding and voice of community leaders to attract and hold the government accountable for predictable routine immunization services.
- Assess cold chain gaps and follow-up to close them, which is important for routine immunization, outreach, and supplemental immunizations.
- Map communities and conduct baby-tracking by identifying households with infants and pregnant women to help with house-to-house campaigns and prioritize outreach activities.
- Identify refusal households or chronically under-served areas and develop an effective communication plan; raising immunity through all feasible means will reduce morbidity and mortality.
- Recognize cases of reportable VPDs and alert the responsible surveillance officer to improve the reach of surveillance, improve early detection of disease outbreaks, and help prioritize high-risk areas.

Key Resources for Polio Eradication

- WHO, 2013. [Polio Eradication and Endgame Strategic Plan, 2013-2018](#)
- [Global Polio Eradication Initiative](#)
- CORE Group, 2012. [Social Mobilization: Lessons from the CORE Group Polio Project in Angola, Ethiopia, and India](#)
- [CORE Group Polio Project](#)

Measles, Rubella and CRS Mortality Reduction and Elimination

Measles is responsible for more deaths than any of the traditional VPDs and is a leading cause of death among young children. Measles seriously depletes vitamin A in children, making them more susceptible to complications such as pneumonia, diarrhea, and blindness. While measles deaths have fallen by 78% from 2000 to 2012, it is estimated that 122,000 people died of measles globally in 2012, most of whom were children under age 5 years.⁶ Measles is possibly the most infectious disease that affects humans. Nearly all non-immune children will contract measles if they are not protected by vaccination. Even when vaccination coverage rates are very high, massive outbreaks can erupt when the number of susceptible (unvaccinated) people accumulates.

Because of measles' lethality and its highly infectious nature, it is imperative to achieve and maintain uniformly high levels of vaccination coverage. Since 2009, WHO has recommended that all countries provide children with two doses of measles-containing vaccine, either through routine immunization alone or through a combination of routine immunization and SIAs. A growing number of countries with high routine coverage are choosing to introduce a second dose of measles at 18 months of age or later through routine immunization. Elimination of measles will require sustained coverage of at least 95% for both doses of vaccine.

A growing number of countries are adopting the use of the combined measles-rubella vaccine. Although rubella is usually a mild viral disease affecting susceptible children and young adults, when infection occurs just before conception or early in pregnancy, it may result in miscarriage, fetal death or congenital defects known as congenital rubella syndrome.

As described earlier for polio eradication and routine immunization, PVOs and NGOs can play an important role in reducing death and disease from measles and rubella. Here are some possible activities:

- Help ensure that all children are brought for routine immunization as soon as they are eligible. This can be done in many ways, for example, on a person-to-person basis, through community meetings, or through school activities or clubs (a child-to-child approach).
- Mobilize all families to participate in SIAs and encourage them to bring the child's vaccination card to the SIA so that the vaccinator can remind them of when to bring the child for their next vaccination—after the SIA—provided through routine immunization.
- Talk with local community leaders and decision-makers before and after SIAs, and urge them to provide the resources needed for routine immunization so that future measles outbreaks are averted.

Key Resources for Measles, Rubella and CRS Mortality Reduction and Elimination

- WHO, 2012. [Global Measles Rubella Strategic Plan for 2012-2020](#)
- [Measles Rubella Initiative](#)

Maternal and Neonatal Tetanus Elimination

When deliveries occur under unhygienic circumstances, mothers and their newborns are at risk of contracting maternal and neonatal tetanus (MNT). The mortality rates for these forms of tetanus are extremely high, especially when appropriate medical care is not available.

The MNT Elimination Initiative aims to reduce the number of maternal and neonatal tetanus cases to such low levels that MNT is no longer a major public health problem; that means reducing the incidence to less than one case of neonatal tetanus per 1,000 live births in every district. The key strategies are to vaccinate all women of childbearing age with tetanus vaccine and ensure hygienic deliveries.

Unlike polio and smallpox, tetanus cannot be eradicated (tetanus spores are present in the environment worldwide), but through immunization of pregnant and childbearing-age women and promotion of more hygienic deliveries, MNT can be eliminated (defined as less than one case of neonatal tetanus per 1,000 live births in every district). WHO estimates that in 2010, 58,000 newborns died from MNT, a 93% reduction from the situation in the late 1980s, when approximately 787,000 children died of the disease each year. PVOs and NGOs can support the MNT Elimination Initiative efforts by encouraging all women of childbearing age to get vaccinated with TT and ensuring that pregnant women in particular have received at least two doses of TT by the time of their first pregnancy.

Key Tetanus Resource

- UNICEF/WHO/UNFPA, 2000. [Maternal and Neonatal Tetanus Elimination by 2005: Strategies for achieving and maintaining elimination](#)

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GAVI CSO Constituency, <http://www.gavialliance.org/about/governance/gavi-board/composition/cso-constituency/>

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Key Resource on Vaccines and Schedules:

WHO, database of national vaccination schedules,
http://apps.who.int/immunization_monitoring/globalsummary/schedules

Key Resources for New and Underutilized Vaccines:

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<http://www.who.int/immunization/documents/positionpapers/en/>

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