



Mid-Level Management Course for EPI Managers

BLOCK II: Planning/organization

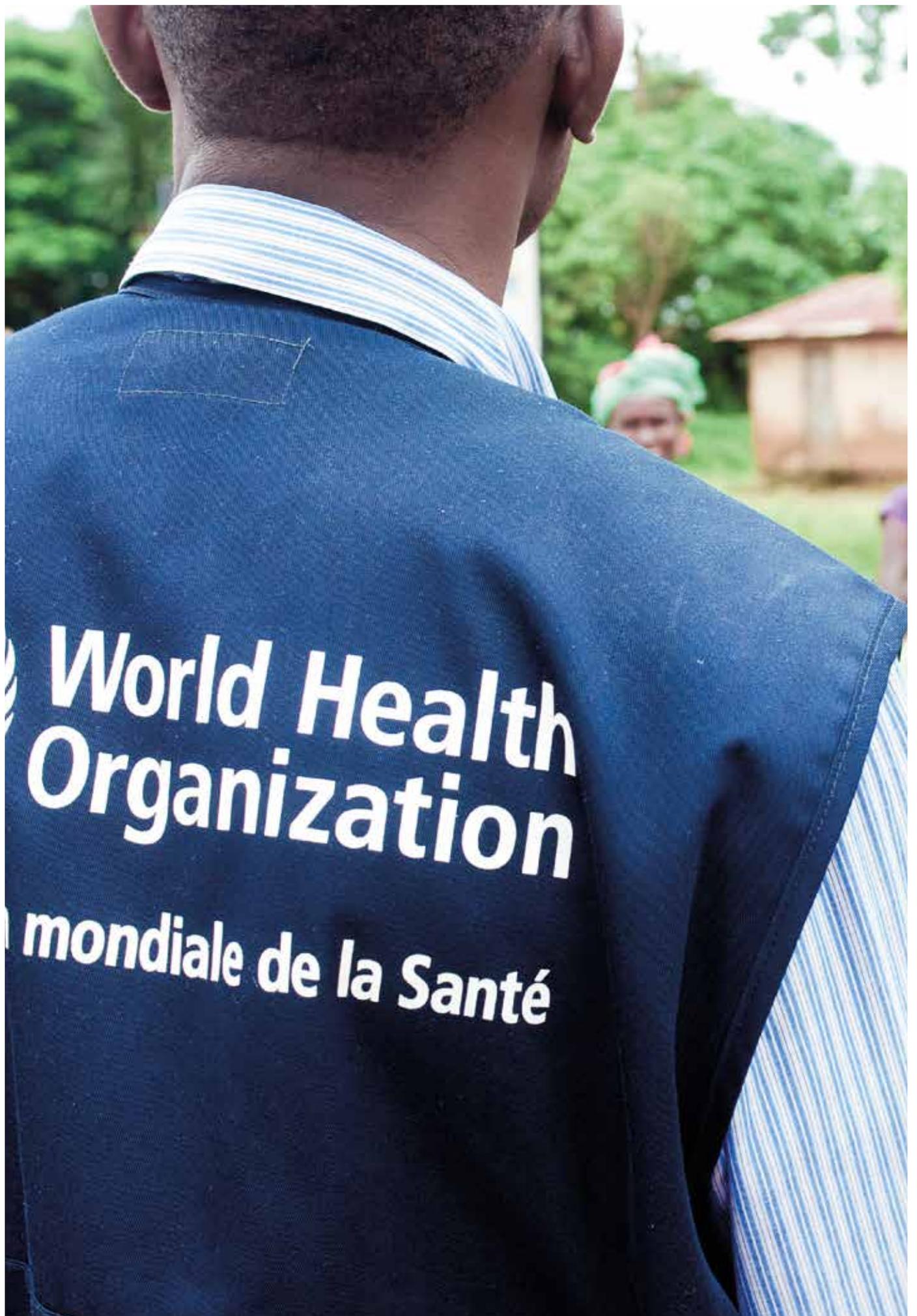
Module 5: Increasing
immunization coverage



World Health
Organization

REGIONAL OFFICE FOR

Africa



**World Health
Organization**

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Mid-Level Management Course for EPI Managers

List of course modules

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Mid-Level Management Course for EPI Managers

BLOCK II: Planning/organization

Module 5: Increasing
immunization coverage

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Abbreviations and acronyms

AD	auto-disable (syringes)
AFP	acute flaccid paralysis
AVW	African Vaccination Week
BCG	Bacillus Calmette-Guérin (vaccine against TB)
CHW	community health worker
cMYP	comprehensive multi-year plan
CSM	cerebrospinal meningitis
DHMT	district health management team
DHS	demographic health survey
DOR	drop-out rate
DTP	diphtheria-tetanus-pertussis containing vaccine
EPI	Expanded Programme on Immunization
GAPPD	Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea
Gavi	Global Alliance for Vaccines and Immunization
GIVS	Global Immunization Vision and Strategy
GVAP	Global Vaccine Action Plan (2012–2020)
HepB	hepatitis B vaccine
Hib	<i>Haemophilus influenzae</i> type b vaccine/infection
ICC	interagency coordination committee
IEC	information, education and communication
IMCI	Integrated Management of Childhood Illness
IPV	inactivated polio vaccine
IST	intercountry support team
ITN	insecticide-treated nets
IVD	immunization and vaccine development
MCH	mother and child health
MCV	measles containing vaccine
MI	Micronutrient Initiative
MNT	maternal and neonatal tetanus
NGO	nongovernmental organization
NIP	national immunization programme
NNT	neonatal tetanus
OPV	oral polio vaccine

PCV	pneumococcal conjugate vaccine
PHC	primary health care
PIRI	periodic intensification of routine immunization
PPP	public-private partnership
RBM	Roll Back Malaria
RED/REC	Reaching Every District/Reaching Every Community
RI	routine immunization
RSPI	Regional Strategic Plan for Immunization (2014–2020)
TB	tuberculosis
TP	target population
TT/Td	tetanus toxoid/diphtheria-tetanus
UNICEF	United Nations Children’s Fund
VHC	village health committee
VPD	vaccine-preventable disease
VVM	vaccine vial monitor
WCBA	women of childbearing age
WHO	World Health Organization

Glossary

Annual plan	A plan of work which covers the period starting January and ending December of each year. In some countries, however, the annual planning cycle may differ.
Catchment area	A catchment area is a geographical area for health interventions that comprises a group of communities determined by the health authorities to be served by the health facility (health centre, health clinic, health post, hospital etc.), or outreach/mobile teams. Each catchment area should have data on the general population, target populations for health interventions and strategies to reach them.
Dropout	Difference between the number of children or women who start receiving immunization and the number who complete the schedule for full immunization. The drop-out rate is expressed as a percentage.
Financial report	An estimated statement of revenue and expenditure, consisting of the objectives, services and budgetary estimations and expenditure.
Hard-to-reach population	People living in remote and difficult to access areas throughout the year or during certain periods of the year (e.g. during the rainy season).
Immunization coverage	The proportion of vaccinated individuals among the target population.
Micro-plan	Translation of an annual plan of work into a detailed operational plan, usually at district (or health facility) level indicating specific activities, implementation schedule, name of the responsible persons and required, human, material and financial resources and their source.
Missed opportunity	When a health worker fails to use every contact with women or caregivers to immunize a child or woman.
Monitoring	A systematic and continuous process of examining data, procedures and practices to identify problems, develop solutions and guide interventions. Monitoring is conducted on a regular basis (daily, weekly, monthly and quarterly). It is linked to implementation of programme activities. The information collected is used to direct programme activities on a continuous basis.
Strategic or multi-year plan	For the purpose of this module, “multi-year plan” covers a period of five years. The plan provides mid-term strategies and resource potentials for achieving strategic goals and objectives (e.g. EPI routine coverage levels exceeding 80% or arriving at certification status of polio eradication, etc.).
Under-immunized child	A child of one year of age who has started their immunizations but not received all doses of vaccines as stipulated by the national immunization schedule for under one-year-old children. For example, if a child has reached one year and had BCG at birth, Penta1/OPV1 and Penta 2/OPV2 but not Penta3/OPV3 or had all three shots of Penta/OPV but not measles, is considered “under-immunized”. However, if the child is under one year of age and still “waiting” for their second or third Penta shots they will not be counted as under-immunized.

For practical reasons, Penta (or DTP containing vaccine) immunization status of children of one year of age is used as an indicator for “under-immunized”.

This definition may change with changes in national EPI schedules. Currently countries may begin recommending a routine second dose of measles vaccine between the ages of 15–18 months. To address this change according to the “age appropriate” concept, the above definition “under-immunized child” will be expanded to accommodate under-immunized children “by 24 months of age”.

Unimmunized child

A child of one year of age who has not received their immunizations as stipulated by the national immunization schedule for under one-year-old children. For practical reasons, Penta (or DTP containing vaccine) immunization status of children of one year of age is used as an indicator for “unimmunized”. However, the national programmes may choose other indicators (e.g. “a child who has not received any of their immunizations as stipulated by the national immunization schedule for under one-year-old children”, or as mentioned in the above definition, if the national schedules include the second dose of measles vaccine between 15–18 months of age, the “unimmunized child” will be used for children “by 24 months of age”). With GVAP recommending vaccination of all ages groups and the life-course approach, this concept is now extended to other age groups depending on the vaccine due for the age of the person as per the national schedule.

1. Introduction

1.1 Context

The Expanded Programme on Immunization (EPI) is a key global health programme. Its overall goal is to provide effective and quality immunization services to target populations. EPI programme managers and staff need to have sound technical and managerial capacities in order to achieve the programme's goals.

The immunization system comprises five key operations: service delivery, communication, logistics, vaccine supply and quality, and surveillance. It also consists of three support components: management, financing and capacity strengthening.

National immunization systems are constantly undergoing change, notably those related to the introduction of new vaccines and new technologies, and programme expansion to reach broader target populations beyond young children. The EPI programme also faces external changes related to administrative decentralization, health reforms, as well as the evolving context of public-private partnerships (PPPs) for health, among others.

To ensure the smooth implementation of immunization programmes, EPI programme staff have to manage these changes. This requires specific skills in problem-solving, setting priorities, decision-making, planning and managing human, financial and material resources as well as monitoring implementation, supervision and evaluation of services.

National immunization programmes (NIPs) operate within the context of national health systems, in alignment with global and regional strategies. For the current decade, 2011–2020, the key global immunization strategies are conveyed through the Global Vaccine Action Plan (2011–2020) (GVAP) and the African Regional Strategic Plan for Immunization (2014–2020) (RSPI).

These strategic plans call on countries to:

- improve immunization coverage beyond current levels;
- complete interruption of poliovirus transmission and ensure virus containment;¹
- attain the elimination of measles and make progress in the elimination of rubella and congenital rubella syndrome;² and
- attain and maintain elimination/control of other vaccine-preventable diseases (VPDs).

The key approaches for implementation of the GVAP/RSPI include:

- implementation of the Reaching Every District/ Reaching Every Community (RED/REC) approach and other locally tailored approaches and move from supply-driven to demand-driven immunization services;
- extending the benefits of new vaccines to all;
- establishing sustainable immunization financing mechanisms;
- integrating immunization into national health policies and plans;
- ensuring that interventions are quantified, costed and incorporated into the various components of national health systems;
- enhancing partnerships for immunization;
- improving monitoring and data quality;
- improving human and institutional capacities;
- improving vaccine safety and regulation; and
- promoting implementation research and innovation.

The RSPI promotes integration using immunization as a platform for a range of priority interventions or as a component of a package of key interventions. Immunization is a central part of initiatives for the elimination and eradication of VPDs, and of the integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) by 2025.

It is understood that while implementing the above strategies, EPI managers will face numerous challenges and constraints that they need to resolve if the 2020 targets are to be met. Building national capacity in immunization service management at all levels of the health system is an essential foundation and key operational approach to achieving the goals of the global and regional strategic plans.

In view of this, the WHO Regional Office for Africa, in collaboration with key immunization partners such as the United Nations Children's Fund (UNICEF), United States Agency for International Development (Maternal and Child Survival Program) (USAID/MCSP), and the Network for Education and Support in Immunisation (NESI), have revised the Mid-Level Management Course for EPI Managers (MLM) training modules. These modules are complementary to other training materials including the Immunization in Practice (IIP) training manuals for health workers and the EPI/Integrated Management of Childhood Illnesses (IMCI) interactive training tool.

¹ WHO, CDC and UNICEF (2012). Polio Eradication and Endgame Strategic Plan 2013–2018.
² WHO (2012). Global Measles and Rubella Strategic Plan 2012–2020.

This module (5) titled *Increasing immunization coverage* is part of Block II: Planning/organization

1.2 Purpose of the module

The purpose of this module is to provide programme managers at national and subnational level with the skills to assist peripheral health workers to raise immunization coverage in their areas. This includes using locally derived data to identify problems and causes of low immunization coverage, and planning solutions to increase this coverage. This module can be adapted to suit local conditions and needs and can be used at other levels of the health system in any country.

This module focuses on how to increase coverage by supporting peripheral health workers to:

- reach the unreached (improving access)
- reduce drop-out rates (improving utilization).

Other aspects of increasing coverage that are dependent on a well-running programme (and hence essential to raising coverage) are covered in more detail in other modules of the MLM course (particularly 1: *The role of the EPI manager*; 3: *Communication and community involvement for immunization programmes*; 7: *Cold chain management*; 8: *Vaccine management*; and 16: *Supportive supervision by EPI managers*).

1.3 Target audience

This module has been designed to enhance the knowledge of EPI staff at all levels in increasing immunization coverage. It can be used for self-learning or for workshop training with facilitators.

1.4 Learning objectives

At the end of the module, participants will be able to:

- Describe the principal approaches used to deliver immunization services:
 - apply the RED/REC approach
 - describe the integration of immunization with other key health interventions.
- Analyse population and coverage data:
 - describing the population and area to be served
 - calculating annual target population
 - calculating vaccination coverage by antigen:
 - calculating the number of unimmunized children and women
 - calculating drop-out rates.
- Analyse and identify immunization coverage problems and causes:
 - conduct analysis of programme data to identify problems

- identify causes of problems
- identify and prioritize possible solutions.
- Use data to plan activities to increase immunization coverage:
 - prepare a plan of work aimed at increasing immunization coverage
 - develop a health facility micro-plan.
- Implement monitoring of progress:
 - use appropriate tools to monitor the implementation of planned activities.

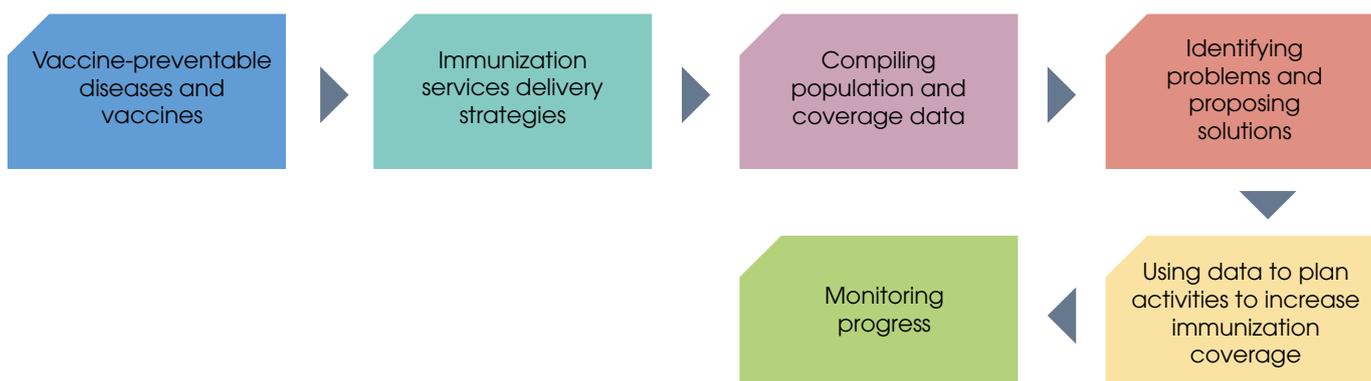


1.5 Contents of the module

For the EPI manager to improve immunization coverage there are five key tasks that must be performed at district and health facility level.

1. Compile data on population and immunization coverage for your area.
2. Analyse the data you have collected to:
 - determine the main problems associated with low coverage in your health service area;
 - determine access or utilization problems;
 - determine the causes behind these problems: supply, staffing, service (delivery and demand), information, education and communication (IEC) and others;
 - decide what solutions you need to implement to address these causes; and
 - decide what resources are needed (existing or extra resources).
3. Prioritize according to which geographic area and what solutions you need to implement first.
4. Plan priority activities for the year, including outreach.
5. Monitor the implementation and impact of the workplan.

The module is divided into six sections, including examples and additional information in the annexes. The module gives a brief background on the VPDs and the immunization services delivery strategies and then discusses the key tasks to be performed at district and health facility level to improve coverage. The six sections are:



1.6 How to use this module

Read all the text and do all the exercises, using data from different health facilities in your district. This process will help you to identify low-performing health facilities in your district. This will then be used to develop appropriate solutions to address the problems.

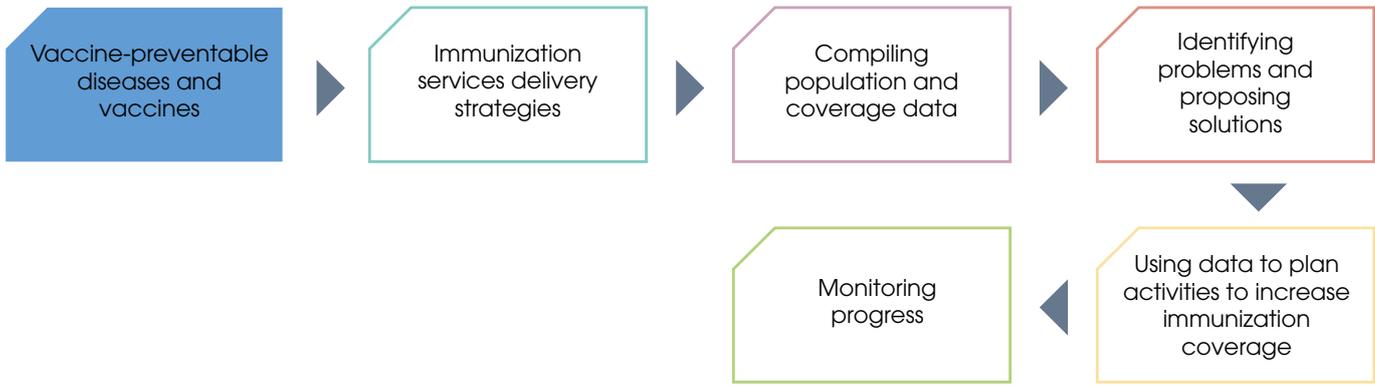
Assist staff in the use of this module in each health facility. You can do this during supervisory visits to health facilities and during meetings and seminars with health facility staff.

Monitor the performance of each health facility at district level using the various monitoring techniques in this module. You can do this through regular supervisory visits and using monthly reports.

1.6.1 Health facility level

This module has been designed for self-study and for group work with facilitators from district level. Read all the text and do all the exercises using data from the different areas served by your health facility. District staff will be able to assist you during supervisory visits or meetings. Ask questions at every opportunity. Remember, this module is designed to help you make a realistic workplan with specific activities.





2. Vaccine-preventable diseases and vaccines

2.1 Target diseases and their prevention by immunization

This section describes the various vaccine-preventable infectious diseases that kill or disable children and the vaccines that can prevent them.

Tuberculosis (TB): Tuberculosis is caused by a bacterium called *Mycobacterium tuberculosis*. It usually attacks the lungs, and other parts of the body, including the bones, joints and brain. People of all ages can contract tuberculosis but especially children aged under three years. The best protection available for children against tuberculosis infection is immunization with the Bacillus Calmette–Guérin (BCG) vaccine. BCG vaccine comes in powder form and before use must be reconstituted with the accompanying diluent. The reconstituted vaccine is even more sensitive to heat than the powder and must be used within six hours or discarded thereafter.

Diphtheria: Diphtheria is caused by *Corynebacterium diphtheriae* which produces a toxin that can seriously damage the mucous membrane of the nose and throat causing respiratory problems and even death in some cases. A mother can pass protective antibodies to her baby, but this protection only lasts for around six months after birth. The most effective way of preventing diphtheria is to maintain a high level of immunization in the community. Diphtheria toxoid vaccine is given together with pertussis vaccine and tetanus toxoid (TT) in DPT-containing vaccine, e.g. DPT-HepB-Hib.

Pertussis (whooping cough): Pertussis, or whooping cough, is a disease of the respiratory tract caused by *Bordetella pertussis*. The bacterium lives in the mouth, nose and throat. The disease is common in non-immunized children all over the world and is most dangerous in children under one year. Newborns and infants are not protected against pertussis by maternal antibodies. Prevention involves immunization with pertussis vaccine,

which is usually given in combination with diphtheria and tetanus in DPT-containing vaccine, e.g. DPT-HepB-Hib.

Maternal and neonatal tetanus (MNT): Tetanus, or lockjaw, is caused by *Clostridium tetani*, which grows in damaged tissue (e.g. in a wound or in a baby's umbilical cord). The bacterium is common in the environment, often occurring in soil containing manure. The bacteria form spores that can survive in the environment for years. The toxin they produce poisons the nerves that control the muscles, and this causes stiffness. People of all ages can contract tetanus. Maternal tetanus commonly occurs following an abortion or after delivery. But the disease called neonatal tetanus (NNT) is also serious in newborn babies. Almost all babies who contract the disease die. In the African Region, NNT is a major cause of neonatal deaths. The prevention of neonatal tetanus requires women of childbearing age (WCBA) to receive up to five doses of tetanus toxoid (TT) as per schedule. This results in the protection of mothers and newborn babies. Clean practices during delivery and clean wound care are also very important in preventing tetanus. DPT vaccine contains diphtheria and tetanus toxoid and pertussis vaccine that can prevent these three diseases.

Hepatitis B: Hepatitis B is a disease caused by the hepatitis B virus, which affects the liver. People infected may carry the virus for many years and can spread the infection to others. The hepatitis B virus is carried in the blood, saliva, semen, vaginal fluids and most other body fluids. Hepatitis B can be prevented by hepatitis B vaccine given at birth or as soon as possible after birth at 6, 10 and 14 weeks of age. The vaccine is also given to high-risk groups. These include adolescents and young adults, since the virus is sexually transmitted and is also easily spread through needle sharing. Health workers are also offered the vaccine because they are at risk from needle-stick injuries and exposure to contaminated blood and blood products.

Poliomyelitis (polio): Polio is caused by the poliomyelitis virus; it is a crippling disease that is more common in children but can occur in adults too. Polio prevention involves immunization with live oral polio vaccine (OPV). Antibodies from the mother provide protection to the infant for two to three months after birth. OPV is recommended by EPI for the eradication of polio. It is cheap, easy to give, highly effective and safe. The EPI schedule for routine immunization (RI) is comprised of four doses. The first dose is given at birth. The other three doses are given with Penta vaccine at 6, 10 and 14 weeks of age. A dose includes two drops of the vaccine given into the mouth (orally). The OPV vaccine (trivalent vaccine) that has been mostly in use in developing countries in the past decades is a combination of three types of inactivated polio virus: 1, 2 and 3. As from April 2016, type 2 was removed from OPV as it is interfering with the immune response from types 1 and 3. The current OPV vaccine (bivalent vaccine) has inactivated polio virus types 1 and 3. In addition, one dose of inactivated polio vaccine (IPV) was introduced in the NIPs of most countries in 2015.

Measles: Measles is caused by a virus and is highly infectious. It kills more children than any other EPI target disease. It is constantly present in some populations and often occurs in epidemic proportions, especially in conditions of crowding and poverty where large numbers of non-immunized people are in close contact. The prevention of measles involves immunization with measles vaccine, which is highly effective. Children aged less than 12 months, if not immunized, are the most likely to acquire the measles infection. Therefore, all children should receive one dose of measles vaccine at nine months or before the age of one year. Currently WHO recommends to include a second dose of measles vaccine – also called MCV2 (preferably in the second year of life in countries with high disease burden, and before school entry in countries with very low disease burden) – to contribute to the achievement of measles elimination worldwide. WHO recommends that this be done within the second year of life so that an additional routine contact is provided for vaccination. This should help to provide missing primary doses, booster doses and second doses of vaccines, and create the opportunity to improve coverage. The second year of life platform is an opportunity to further integrate immunization with other health interventions such as vitamin A and nutritional supplementation, growth monitoring and deworming. Measles vaccine comes in powder form together with a diluent. It must be reconstituted before use. The reconstituted vaccine should be used within six hours or at the end of the immunization session, whichever comes first.

Yellow fever: Yellow fever is a viral disease of high mortality. During epidemics, when large numbers of

people are infected in a short period, up to 50% of infected people may die. The yellow fever virus is spread by mosquitoes of the *Aedes* species. The disease is endemic in some countries in Africa (the yellow fever zone comprises 31 countries) as well as in Latin America. The disease is prevented by immunization with yellow fever vaccine. In the RI schedule the vaccine is given at nine months at the same time as the measles vaccine and with the same route of administration. A single dose provides lifelong protection against yellow fever disease; a booster dose of yellow fever vaccine is not needed.

Epidemic meningitis: Epidemic meningitis is caused by the *Neisseria meningitidis* bacteria. The disease affects the meninges, which cover the brain and spinal cord. The disease occurs worldwide with explosive epidemics periodically in the meningitis belt which extends from West to East Africa. Cerebrospinal meningitis (CSM) is spread by droplets and direct contact. It can spread rapidly in overcrowded and poor sanitary conditions. Children and young adults are the most susceptible but during epidemics all age groups may be affected. During mass campaigns the vaccine should be targeted at persons between 2 and 30 years of age. During epidemics, the vaccine is administered to everyone aged two years and above in the affected areas.

***Haemophilus influenzae* type b:** *Haemophilus influenzae* type b (Hib) is one of six related types of bacterium that attacks lungs and meninges causing pneumonia and meningitis. In 2000, *H. influenzae* type B (Hib) was estimated to have caused 2 to 3 million cases of serious disease, notably pneumonia and meningitis, and 450 000 deaths in young children. The risk of disease is highest for children between six months and two years of age. Highly effective conjugate Hib vaccine is available to protect these children in early infancy. Hib vaccine is given in combination vaccines with DPT-HepB (often referred to as pentavalent vaccine or “Penta”).

Human papilloma virus (HPV) infections: Human papilloma virus is common throughout the world. Most infections with HPV cause no symptoms; however, persistent genital HPV infection can cause cervical cancer in women. HPV can also cause other types of ano-genital, urethral, head and neck cancers, and genital warts, in both men and women. Genital HPV infection is primarily transmitted by sexual contact. The only known way of prevention is immunization with the HPV vaccine. The vaccines are given as a series of two doses with a six-month interval.

Rotavirus infections: Rotavirus is the most common cause of severe gastroenteritis in children worldwide. It is found in all countries and is responsible for approximately 3 million cases of diarrhoea and 55 000 hospitalizations

due to diarrhoea and dehydration in children under five years each year. The disease can be prevented by the live attenuated oral rotavirus vaccines which have been available in liquid form since 2006 and demonstrated a good safety and efficacy profile.

Pneumococcal infections: Pneumococcal infections are caused by bacteria called *Streptococcus pneumoniae*, resulting in several different infections including meningitis, bacteraemia, pneumonia and otitis media. The disease

can be prevented by the immunization of infants with the pneumococcal conjugate vaccines (PCV). Children can be protected against some of the most common serotypes of pneumococcal bacteria using PCV

Figure 2.1 (“Table 1”) provides a summary of WHO position papers giving recommendations for RI of 12 antigens. The table is regularly updated and available at: http://www.who.int/immunization/policy/Immunization_routine_table1.pdf?ua=1

Figure 2.1 Summary of WHO position papers – recommendations for routine immunization (“Table 1”)

(updated: March 2017)				
Table 1: Summary of WHO Position Papers - Recommendations for Routine Immunization				
Antigen	Children (see Table 2 for details)	Adolescents	Adults	Considerations (see footnotes for details)
Recommendations for all immunization programmes				
BCG¹	1 dose			Exceptions HIV
Hepatitis B²	3-4-doses (see footnote for schedule options)	3 doses (for high-risk groups if not previously immunized) (see footnote)		Birth dose Premature and low birth weight Co-administration and combination vaccine Definition high-risk
Polio³	3-4 doses (at least one dose of IPV) with DTP			BoPV birth dose Type of vaccine Transmission and importation risk criteria
DTP-containing vaccine⁴	3 doses	1 Booster 9-15 yrs (Td)		Delayed/interrupted schedule Combination vaccine Maternal immunization
	2 Boosters 12-23 months (DTP- containing vaccine) and 4-7 years (Td)			
Haemophilus influenzae type b⁵	Option 1 3 doses, with DTP			Single dose if > 12 months of age Not recommended for children > 5 yrs old
	Option 2 2 or 3 doses, with booster at least 6 months after last dose			Delayed/interrupted schedule Co-administration and combination vaccine
Pneumococcal (Conjugate)⁶	Option 1 3 doses, with DTP			Vaccine options Initiate before 6 months of age Co-administration HIV+ and preterm neonates booster
	Option 2 2 doses before 6 months of age, plus booster dose at 9-15 months of age			
Rotavirus⁷	Rotarix: 2 doses with DTP RotaTeq: 3 doses with DTP			Vaccine options Not recommended if > 24 months old
Measles⁸	2 doses			Combination vaccine; HIV early vaccination; Pregnancy
Rubella⁹	1 dose (see footnote)	1 dose (adolescent girls and/or child bearing aged women if not previously vaccinated; see footnote)		Achieve and sustain 80% coverage Combination vaccine and Co-administration Pregnancy
		2 doses (females)		Target 9-14 year old girls; Multi-age cohort vaccination; Pregnancy Older age groups ≥ 15 years 3 doses HIV and immunocompromised
HPV¹⁰				

Refer to <http://www.who.int/immunization/documents/positionpapers/> for most recent version of this table and position papers.

This table summarizes the WHO child vaccination recommendations. It is designed to assist the development of country specific schedules and is not intended for direct use by health care workers. Country specific schedules should be based on local epidemiologic, programmatic, resource and policy considerations.

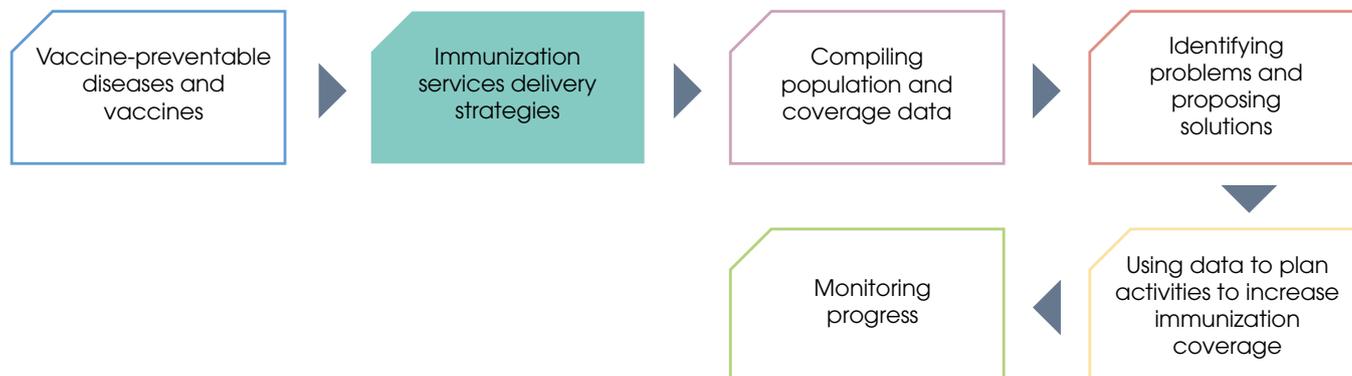
While vaccines are universally recommended, some children may have contraindications to particular vaccines.

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(updated: March 2017)

Table 1: Summary of WHO Position Papers - Recommendations for Routine Immunization

Antigen	Children (see Table 2 for details)	Adolescents	Adults	Considerations (see footnotes for details)
Recommendations for certain regions				
Japanese Encephalitis ¹¹	Inactivated Vero cell-derived vaccine: generally, 2 doses Live attenuated vaccine: 1 dose Live recombinant vaccine: 1 dose			Vaccine options and manufacturer's recommendations; Pregnancy; Immunocompromised
Yellow Fever ¹²	1 dose, with measles containing vaccine			
Tick-Borne Encephalitis ¹³	3 doses (> 1 yr FSME-Immun and Encepur; > 3 yrs TBE-Moscow and EnceVir) with at least 1 booster dose (every 3 years for TBE-Moscow and EnceVir)			Definition of high-risk Vaccine options; Timing of booster
Recommendations for some high-risk populations				
Typhoid ¹⁴	Vi polysaccharide vaccine: 1 dose; <i>Ty21a live oral vaccine</i> : 3-4 doses (see footnote). Booster dose 3-7 years after primary series			Definition of high-risk Vaccine options
Cholera ¹⁵	Dukoral (WC-rBS): 3 doses ≥ 2-5 yrs; booster every 6 months; 2 doses adults/children > 6 yrs; booster every 2nd year; Shanchol & mORCVAX: 2 doses ≥ 1 yrs; booster dose after 2 yrs			Minimum age Definition of high-risk
Meningococcal ¹⁶	MenA conjugate	1 dose 9-18 months (5µg)		2 doses if < 9 months with 8 week interval
	MenC conjugate	2 doses (2-11 months) with booster 1 year after 1 dose (≥12 months)		
	Quadrivalent conjugate	2 doses (9-23 months) 1 dose (≥2 years)		Definition of high-risk; Vaccine options
Hepatitis A ¹⁷		At least 1 dose ≥ 1 year of age		Level of endemicity; Vaccine options; Definition of high risk groups
Rabies ¹⁸		3 doses		Definition of high-risk; Booster
Dengue (CYD-TDV) ¹⁹		3 doses 9-45 years of age		Seroprevalence; Pregnancy & lactation
Recommendations for immunization programmes with certain characteristics				
Mumps ²⁰	2 doses; with measles containing vaccine			Coverage criteria > 80% Combination vaccine
Seasonal influenza (inactivated tri- and quadri-valent) ²¹	First vaccine use: 2 doses Revaccinate annually; 1 dose only (see footnote)		Priority for pregnant women 1 dose ≥ 9 years of age Revaccinate annually	Priority risk groups Lower dosage for children 6-35 months
Varicella ²²	1 - 2 doses		2 doses	Achieve & sustain ≥ 80% coverage Pregnancy Co-admin with other live vaccines



3. Immunization services delivery strategies

3.1 The Reaching Every District/Reaching Every Community (RED/REC) approach

3.1.1 What is the RED approach?

The RED approach focuses on steps in planning, managing and monitoring health services that, if carried out appropriately, will improve immunization coverage and its impact. The primary implementation level for RED is the district (or the equivalent administrative unit). Empowering districts to plan, implement and monitor their own immunization services is an important objective of the RED approach. RED also promotes partnerships between districts, health workers and communities to improve the population's access to and utilization of services, and emphasizes the continuous use of programme data to monitor progress and solve problems.

The five elements of RED are:

1. Planning and management of resources – better management of human and financial resources.
2. Reaching target populations – improving access to immunization services to all.
3. Linking services with communities – partnering with communities to promote and deliver services.
4. Supportive supervision – regular on-site teaching, feedback and follow up with health staff.
5. Monitoring for action – using tools and providing feedback for continuous self-assessment and improvement.

The intent of RED is to:

- Focus on planning at the district, health facility and community level.
- Target resources to where they are needed most.
- Enable and encourage districts to analyse their problems and evolve practical solutions.
- Provide support to frontline workers at the health facility and district level.

3.1.2 Steps for putting the RED approach into action

RED's success is dependent upon strong leadership and the active engagement of authorities at national and

subnational levels. Good leadership and governance increases programme ownership and involvement in planning, resource mobilization and budgeting. It also encourages transparency and accountability at all levels and by incorporating the five components into plans of action. The roles of each level in implementing the RED/REC approach include:

Health facility: Each health facility should develop a micro-plan based on analysis of their own data, identifying problems and defining solutions, using the RED/REC strategy as a framework.

District: Each district will be required to develop a detailed plan of action that includes all five components of the strategy for Reaching Every District (see Annex 1 for an expanded list of activities by level of implementation).

First subnational/intermediate level: The first subnational level (often the provincial or regional level) is the focus for district capacity building, including training, supportive supervision and monitoring, and for aggregating budgeted district plans of action.

National: The national level is the focus for macro-planning, coordination, data management (including data analysis and feedback), and technical assistance for achieving increased routine vaccination coverage. Technical assistance can be made available through the extensive cadre of national and international EPI officers, epidemiologists and logisticians currently working on polio, measles and neonatal tetanus initiatives.

3.2 Key strategies for conducting immunization services

This section describes how to provide immunization services to target populations. There are several strategies for the routine delivery of immunization services in or from health facilities.

3.2.1 Common delivery strategies

Fixed strategy: This refers to the regular daily delivery of vaccinations in a health facility. In health facilities serving smaller catchment populations, this takes place on specified days of the week and hours of the day. Larger facilities such as hospital mother and child health (MCH) departments may give vaccinations whenever eligible clients come. This strategy is normally used to provide RI services to communities that are located close to the health facility (usually within 5 km). The health facility health workers should meet with the village or community health worker (CHW) on a regular basis to discuss the session plan with the community and monitor the fixed sessions with the village health committees (VHC) in the catchment area. During these meetings the health workers should request the following support from the VHC to:

- publicize immunization session days and times by town announcer;
- use community health workers and volunteers to support sessions during immunizations; and
- assist in defaulter tracing.

The health worker should also send reminder letters to schools and churches in the communities.

Where the facility does not have a refrigerator, health facility workers should collect vaccines from the district store and keep in a cold box or vaccine carrier.

Outreach visits: Outreach is the delivery of services to people who cannot get to health facilities or who can do so only with difficulty. This usually covers settlements that are more than 5 km away, but less than 10 km from the health facility. Trips to outreach sites are usually completed within a day and are made by health facility staff on foot or using motorized vehicles, bicycles or pack animals.

Careful planning involving representatives of distant communities (VHC members) is important to increase efficiency of visits as well as facilitating proper site selection, venue arrangement, mobilization of families etc. Monthly visits provide timely protection for children, although less frequent visits may be necessary where distances are far or staff resources are limited. Outreach visits should be scheduled to be conducted before and after the rainy seasons so that access to the target populations is assured. The health facility mapping should include all outreach visit sites, frequency of visits, number of target population and other details.

Mobile strategy: These usually are visits of more than one day by district or ward health workers to deliver services to people living in remote areas not covered by health facilities. Mobile teams may spend several days travelling to reach the people and can cover several settlements in

one trip. This is usually planned and conducted by the district or ward team with the following preparation:

- Preparing/reviewing the list of the communities to be visited (this is especially important for migrant populations such as pastoralists, seasonal farmers, fishermen and nomads).
- Having estimated population figures of the settlements.
- Mapping out the route to be followed by the mobile team.
- The timing of the visit by mobile team should be decided carefully especially for nomadic settlements.
- Securing appropriate transport and funds for subsistence according to the plan for the visit.
- Preparing a checklist to ensure that the team is fully equipped with vaccines, diluents and light cold chain equipment, etc. before leaving the base.

Periodic intensification of routine immunization (PIRI):

This strategy is important if the population coverage is to be raised to very high levels or to maintain high coverage that has been previously achieved. Immunization days, child health days/weeks, African Vaccination Week (AVW) and other community mobilizing campaigns can be classified under this category. The aim, in fact, is to catch up on RI coverage, and reach children who have not received doses of vaccines through the RI programme.

For initiating this strategy, the district/provincial health team should analyse their data and identify areas that are performing below optimum in terms of coverage and select them for a PIRI activity. The scope of the intensified activities depends on the number of poor performing areas. PIRI activities fall between routine service delivery and campaigns, and are periodic events which aim to boost routine coverage, i.e. increase doses of some or all vaccines in children under one, as well as among pregnant women, rather than be the primary means of providing immunization. They may also provide other health interventions.

Alternatively, such events may take the form of communication or information campaigns to increase community support and demand for RI. The standard process for planning and monitoring PIRI activities should be followed.

To be able to support the health facilities, the EPI manager needs to know the steps in organizing an immunization session. Immunization sessions must be arranged so that clients will attend the first time and return for subsequent doses. Preparations include:

- Scheduling the days and time for sessions. Immunization services should be scheduled so that people can use them. If people are not coming to sessions or if too many people are attending you may need to change the days or times when sessions are held.
 - Make sure that the health centre staff will be available to give immunizations on the proposed dates and times and that you will have vaccines and other supplies that you need for those days.
 - Tell everyone in the community about the days and times when immunizations will be given.
- Making sure that the vaccines, supplies and equipment are available. Generally, the same supplies are needed for fixed, outreach and mobile sessions. These include vaccines, injection materials, safety boxes, record keeping materials (registers for children and women, immunization cards for children and women, tally sheets).
- Arranging space for the convenience and comfort of health workers and clients. The space that you set up for immunization should be:
 - In a clean area and not directly exposed to sunlight, rain or dust – immunizations during an outreach visit may be given in a building or outside.
 - Convenient for the health worker who is preparing vaccines and immunizing.
 - Easily accessible to clients but arranged so that they are not crowding around the immunization station.
 - Quiet enough for the health worker to be able to explain what they are doing and give advice.

For more information on organizing immunization sessions refer to *Immunization in Practice Module 5: Managing an immunization session* (WHO, 2015).

3.2.2 Providing immunization services to hard-to-reach populations

Displaced populations: Refugees and people in emergency situations are often more susceptible to infection because of unsettled conditions, lack of services, population movements and crowded living conditions. All children and women in refugee camps and other disaster situations must therefore be targeted for immediate vaccination against possible outbreaks. Weekly immunization outreach clinics should be established in these camps in order to raise immunization coverage levels. Measles poses a particular risk in emergencies because measles case fatality can be as high as 50%. Therefore, the minimum immunization target should be to rapidly reach all children from 6 or 9 months up to 15 years of age with measles vaccine and vitamin A supplementation for children from 6–59

months. In addition, vaccination campaigns to vaccinate people in emergencies can prevent outbreaks and may also supplement RI services.

Nomadic populations: Nomadic populations in our countries are communities that do not have permanent settlements, hence they are periodically on the move during which they set up temporary settlements. Establishing a RI service delivery programme to regularly provide immunization to these groups of people is very critical as their culture and way of life make the women and children among them very vulnerable to disease. The first step to address this problem is for district teams to identify and map out the movement pattern of these communities and develop a plan to provide immunization services in their nomadic routes and settlements using the mobile approach. It should be emphasized that all plans for outreach and mobile activities should always have a budget for transport, including transport means, number of sessions, distances from the health facility and fuel costs to and from the immunization sites.

Geographically isolated populations: Some populations are isolated from accessing services by distance, physical barriers, such as mountains, forests or water bodies, and lack of appropriate means of transport. The EPI manager must make a conscious attempt and plans to provide immunization services to these populations.

Urban slums: Major cities often have urban slums which are usually underserved, as immunization and other health services are usually not available in these areas. The EPI manager must make plans to provide immunization services to this population within the settings, by advocating for the establishment of permanent health facilities or by using outreach services.

Population belonging to reluctant sects: Some groups/religious sects are against immunization and may harbour large groups of vulnerable children and women. These groups tend to experience explosive outbreaks of VPDs like measles and diphtheria. It is important for the EPI programme to identify those groups, identify the specifics of the vaccine hesitancy in these sects/groups, and advocate for their acceptance through sensitizing their leaders. In some cases, administrative authorities should be involved for the sake of protecting the wider community.

3.3 Integrating immunization with other key health interventions

The services conducted at fixed, outreach, mobile delivery or during PIRI sessions should be integrated with other primary health-care (PHC) interventions.

Strengthening immunization services must be seen as an opportunity to deliver other priority interventions in an equitable way. Potential linkages exist for the acceleration of primary service delivery at health facility level involving RI of infants and WCBA and major public health initiatives.

Why integrate? Integration of health services helps to improve acceptability of interventions. In addition, many communities do not have regular access to health services except during immunization sessions (outreach, mobile and PIRI), and so the immunization platform provides a very good opportunity to bring services to target populations. It also helps to share costs of implementing programmes and thus makes PHC interventions more cost effective.

What to integrate: The health worker should not integrate all PHC activities but should ensure that the interventions complement each other, the supplies are available and there is ease of administering the intervention. For instance, interventions like the administration of vitamin A and measles vaccines complement each other.

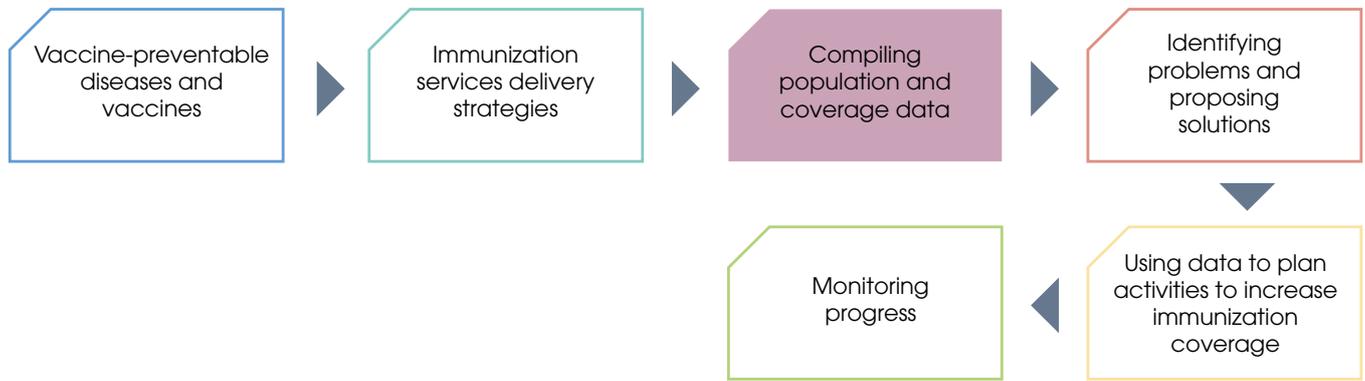
How to integrate: This should be done at fixed session, outreach or mobile services. In PIRI, integration should always be practised. Depending on the interventions to be integrated, you may need separate logistics arrangements, dedicated space and equipment for the additional services and this may involve setting up a separate station for each of them, e.g. weighing babies; charting their growth; provision of treatments; vaccination, antenatal care, insecticide-treated nets (ITN) distribution, health education etc.

Interventions suitable for integration with immunization include:

- **Micronutrient Initiative (MI):** The Micronutrient Initiative is already successfully linking vitamin A provision with immunization of infants. In addition, iron and vitamin A supplementation for pregnant women presenting at a health facility during antenatal care is commonly linked with tetanus toxoid vaccination.
- **Roll Back Malaria (RBM):** During RI ITNs can be distributed to pregnant women or to children who have completed their immunization schedule. In addition, ITN distribution can take place with measles immunization during campaigns, especially in the African Region where infant mortality from both measles and malaria is very high.

- **Integrated Management of Childhood Illness (IMCI):** Immunization sessions (fixed, outreach or mobile) are ideal opportunities for implementing the IMCI strategy by following a comprehensive strategy of routinely weighing and examining children for illness. Any childhood illness detected, such as diarrhoea, cough or malaria, can then be appropriately treated.





4. Compiling population and coverage data

The first step in the strategy of increasing immunization coverage is to collect and compile population and immunization coverage data. The population data will be obtained from the official census or locally derived data. The information on immunization coverage or number of doses administered will be obtained from the health facilities or districts.

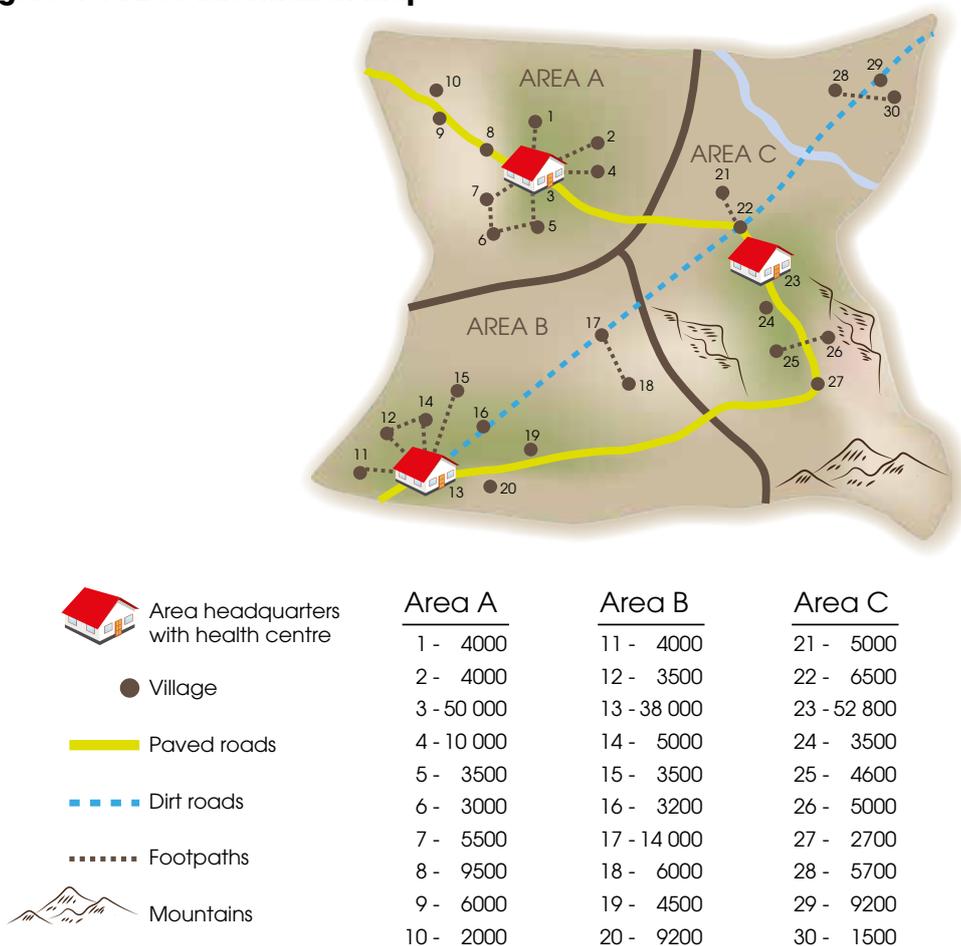
4.1 Describing population and area to be served

Obtaining information about the population and area to be served will help you to assess why people are not using

Figure 4.1 Area information map

immunization services, to identify ways to increase the use of services and to plan outreach activities. Listed below is the kind of information you should collect:

- location of villages, total population of each village, distances from villages to health centres;
- roads, railways, climate and seasonal barriers (e.g. road wash away in rainy season), geographical barriers, streams, mountains, time required to travel;
- other barriers, cultural, ethnic divisions, language; and
- cultural organizations, community groups and leaders, nongovernmental organizations (NGOs).



Exercise 1

List the name of each of the major geographical areas or communities that you serve through fixed or outreach services and their total population.

Task 1: Insert the names in column a in Table 4.1a and 4.1b.

Task 2: Insert the total population for each area in column b in Table 4.1a and 4.1b.

4.2 Calculating annual target population

Traditionally EPI programmes have worked with two types of annual target populations: one for children's vaccines and the other for women's tetanus toxoid vaccine. However, as immunization expands across the life course, the target population should take into account the different groups from the schedule implemented in different countries (e.g. adolescent girls for HPV and others). For these other groups, target populations should be calculated from the national census/demographic health surveys (DHS) in collaboration with national statistical institutes.

4.2.1 For children's vaccines

To calculate the number of children born in any given year who will need vaccinations with vaccines in the national immunization schedule (i.e. BCG, DTP or Penta, OPV, hepatitis B, measles, yellow fever and Hib), use the following formula:

$$\text{Number of children under one year of age} = \text{Total population} \times p/100$$

(p = percentage of children under one year of age among the total population)

Example: If the total population is 300 000 inhabitants and children under one year of age represent 3%, then the number of children under one year of age is 9000 ($300\,000 \times 3/100 = 9000$).

Generally, children under one year of age represent 3–4% of the total population. If you have a more precise estimation from the census in your country, use it. Be sure to use the latest official population statistics.

4.2.2 For tetanus toxoid vaccination

Women of childbearing age constitute the target population for tetanus toxoid. However, the population of “pregnant women” is used to monitor the trend of TT administration. For practical reasons, EPI presupposes that the number of pregnant women is equal to the number of births, i.e. children under one year of age. If you do not have the population statistics, you may use the following formula to determine the size of the target population:

$$\text{Number of pregnant women} = \text{Total population} \times p^*/100$$

(p = percentage of children under one year of age among the total population)

Example: If the total population is 300 000 inhabitants and children under one year of age represent 3%, then the number of pregnant women is 9000 ($300\,000 \times 3/100 = 9000$).

(You will notice that the number is the same as that of children under one year of age.*

Exercise 2

Refer to Tables 4.1a and 4.1b.

Task 1: List your target population numbers: infants 0–11 months (column c).

Task 2: Enter the number of doses of vaccine administered in the target age group during the preceding 12-month period, e.g. Penta1, Penta3, measles (column d to f).

Task 3: Calculate the previous year's immunization coverage, e.g. Penta1, Penta3, measles (columns g to i). You can calculate coverage for any other vaccines administered (hepatitis B, yellow fever, Hib, TT1, TT2+) and vitamin A.

4.3 Calculating vaccination coverage by antigen/vaccine

To determine the level of coverage, you need to know:

- The total number of the target population (the denominator), children aged from 0–11 months (surviving infants) for BCG, Penta, OPV, hepatitis B, measles, yellow fever and Hib vaccines, and pregnant women receiving tetanus toxoid. The most reliable source should be used – this may be the national population census or the regularly updated data in the register of the local area.
- For each vaccine, the number of doses administered to the target population within a given period (the numerator).

Depending on your service level, collect these data by:

- Reviewing regular reports from health facilities.
- Examining the registers available at the health information unit or health facility.
- Getting information from other health-care providers or programme managers on their immunization activities.

Use the formula below to calculate the level of immunization coverage:

$$\text{Coverage rate (\%)} = \frac{\text{Numerator (doses administered to target population over preceding 12 months)}}{\text{Denominator (number of annual target population)}} \times 100$$

Example: Annual coverage for childhood immunization (BCG, Penta, OPV, measles, hepatitis B, yellow fever, Hib and vitamin A):

$$\frac{\text{Number of infants <1 year receiving correct number of doses during the last 12 months}}{\text{Annual target population of <1 year infants}} \times 100$$

Example: Annual coverage for TT2+:

$$\frac{\text{Number of pregnant women receiving TT2 + doses during the last 12 months}}{\text{Annual target population of pregnant women}} \times 100$$

4.4 Calculating number of unimmunized children

An unimmunized child is a child of one year who has not received their immunizations as stipulated by the national immunization schedule for under one-year-old children.

$$\text{Target population for antigen} - \text{immunized children with antigen} = \text{Unimmunized in target age group children for antigen}$$

4.5 Calculating drop-out rates

Dropout is the difference between of the number of children who start receiving immunizations and the number who receive the later doses for full immunization.

Dropout can be estimated for many combinations of vaccines and their doses, for example:

- between BCG and MCV vaccine
- between Penta1 and Penta2
- between Penta1 and MCV vaccine
- between Penta1 and Penta3
- between MCV 1 and MCV2 doses, etc.

This analysis enables you to identify obstacles confronting immunization services.



Exercise 3

Use Table 4.1a.

Task 1: Estimate the annual number of unimmunized children who have not received Penta3 (column j) or measles vaccine (k).

Target population (c) - Immunized children with Penta3 in = Unimmunized target age group (e) children with Penta3 (j)

Using the same formula make calculations for measles vaccine (column k).

Task 2: Calculate annual drop-out rates using your data in Table 4.1a for Penta1-Penta3; Penta1-measles (columns l and m) or for any other combination of vaccines you have selected.

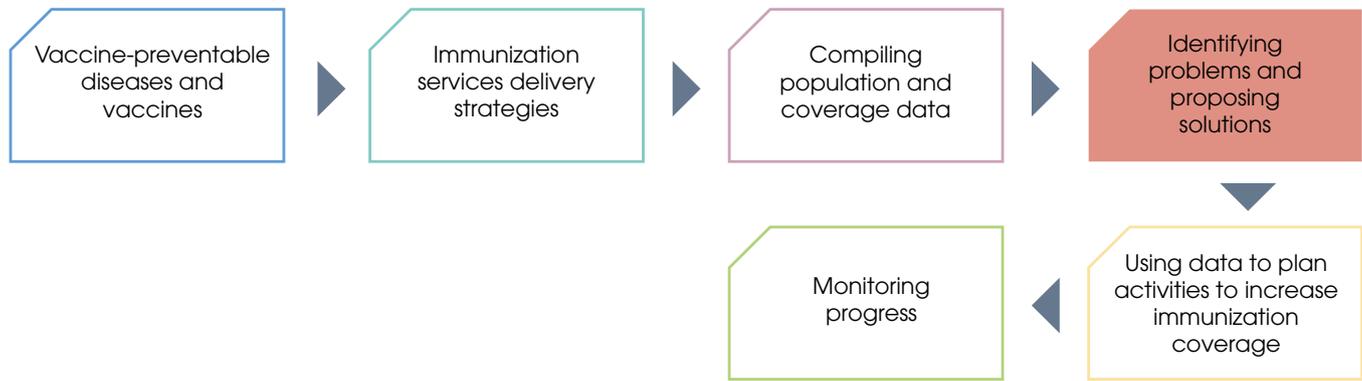
Penta1-Penta3 drop-out rate:

$$\frac{\text{Penta1 (d)} - \text{Penta3 (e)}}{\text{Penta1 (d)}} \times 100 = \text{Penta1-Penta3 drop-out rate (\%)} \quad (l)$$

Penta1-measles drop-out rate:

$$\frac{\text{Penta1 (d)} - \text{Doses of measles administered (f)}}{\text{Penta1 (d)}} \times 100 = \text{Penta1-measles drop-out rate (\%)} \quad (m)$$





5. Identifying problems and proposing solutions

5.1 Initiate data analysis to identify problems

For immunization to be effective in preventing cases and deaths, every child should be fully immunized. There are two ways to estimate the disease reduction potential of immunization:

- By measuring immunization coverage for each vaccine, i.e. by comparing the number of doses given with the number of infants eligible to receive them.
- By measuring drop-out rates, i.e. by comparing the number of infants that started receiving immunizations with the number of infants who received all needed doses of vaccines.

The sources of information on the number of doses given are:

- tally sheets
- vaccination register
- vaccination cards
- vaccination summary sheet.

After determining immunization coverage, you need to interpret the data in relation to planned targets. You should answer the following specific questions:

- How does the immunization coverage compare with the objectives (see Module 4: *Planning immunization activities*)?
- How does the coverage compare with the figures for the previous period?
- What were the achievements of each health facility?
- What can you say about physical access (inferred from Penta1 coverage)?
- Is there a difference between coverage levels of various vaccines given at the same time?
- Do all those who have access continue to use the services?

You have set your immunization objectives and have been monitoring your services. You have noticed that the coverage rate is not increasing. To address this situation, you should first identify the existing problems and then determine the causes of each problem. Low coverage may be caused by any, or a combination, of these main categories of problems:

1. **Inaccessibility (geographical, other barriers):** In this case the children and women are not reached at all or do not utilize the services.
2. **Dropouts:** This group starts immunization but does not return to complete the schedule.
3. **Missed opportunities:** In this group, children and women have had contact with health workers for other reasons, e.g. a woman bringing her child suffering from diarrhoea, but neither her or her child were screened for immunization status and were not immunized by the health worker.
4. **Lack of awareness:** People are unaware of immunization services or reject vaccination due to sociocultural reasons.

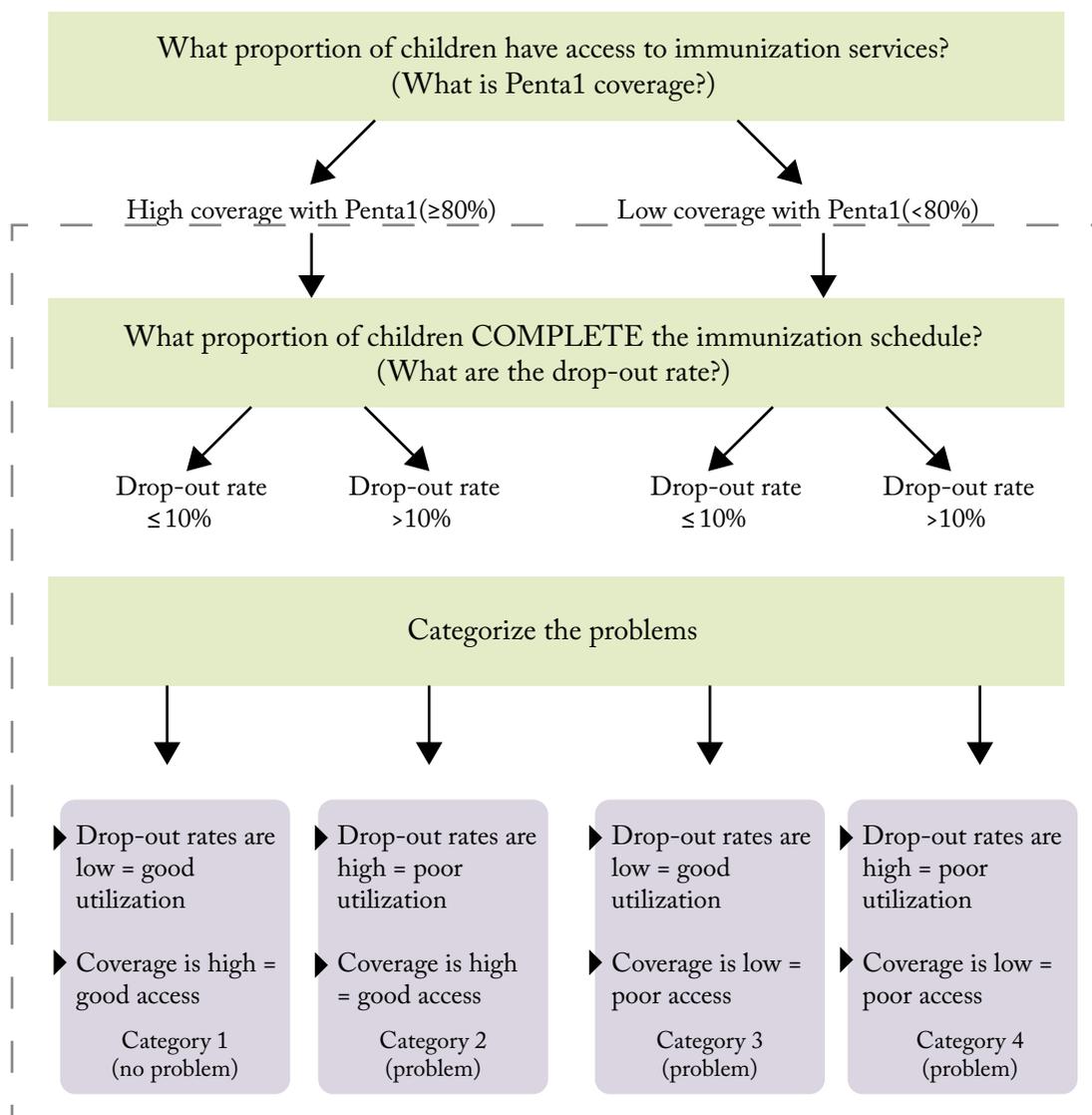
Observing results of (low) immunization coverage can help identify the nature of the problem and its causes (Table 5.1).



Table 5.1 District immunization coverage observations and problems

Observation in a district	Diagnosing a problem
High Penta1 coverage, low drop-out rate	No problem
High Penta1 coverage, high drop-out rate	Utilization problem
Low Penta1 coverage, low drop-out rate	Access problem
Low Penta1 coverage, high drop-out rate	Utilization and access problems

Figure 5.1 All possible options in drop-out and vaccination coverage rates, categorizing them into four groups



Exercise 4
Still using Table 4.1a

Specify in column n the quality of access (good or poor) depending on the value of Penta1 coverage (“good” is defined, in this exercise, as Penta1 coverage >80% in the target age group; and “poor” corresponds to a Penta1 coverage in the target age group <80%).

Specify in column o the quality of utilization (good or poor) depending on the value of drop-out rates (“good” is defined, in this exercise, as a drop-out rate in the target age group ≤10%; and “poor” corresponds to a drop-out rate in the target age group >10%).

Write the problem category number (1, 2, 3, 4) in column p.

Note: Remember that an increase in accessibility and hence a rise in Penta1 coverage will initially be accompanied by a rise in dropouts. Within the next two to three months, however, if you continue providing Penta2 and Penta3 in a systematic manner, you will notice a gradual improvement in the drop-out rates.

5.2 Identify causes of problems

To identify the causes of the problems you should hold discussions with the community and health staff. To promote completion of the full immunization schedule, include community members by asking them how the

service can be made more accessible to them. In addition, health staff should discuss why children do not begin or complete the immunization schedule. Exit interviews and observations during sessions by the supervisor provide important hints too. While identifying the causes of low uptake, it is important always to ask *but why?*

Exercise 5

As a group, list the main causes of problems associated with high drop-out rates and poor access in your facility under the following headings:

- supply
- staffing
- service delivery
- community participation/demand.

Exercise 6

Working individually, determine why the immunization coverage rate is not higher in the health facility. You will need to identify the problems and then their causes. (**Note:** You will be asked to find solutions to these problems later in another exercise). Proceed as follows:

Identify problems and their causes in a health facility:

Task 1: Determine whether dropouts constitute a problem.

Use the relevant formula to calculate the drop-out rates for the health facility, on the basis of the following coverage levels:

Penta1 71%; OPV1 55%; TT1 25%; measles 31%; OPV3 44%; Penta3 57%; TT2 18%.

- What is the drop-out rate between Penta1 and measles?
- What is the drop-out rate between Penta1 and Penta3?
- What is the dropout rate between TT1 and TT2?

Do dropouts constitute a problem in the health facility? If yes:

- Describe the problem on the worksheet provided. Record the drop-out rate and indicate why, in your view, there is a problem.
- Indicate in the second column of the worksheet, the possible causes of dropouts.

Task 2: Determine whether the difficulty of geographical access constitutes a problem.

Does the difficulty of geographical access constitute a problem in health facility? If yes:

- Describe the problem in the first column of the worksheet.
- Indicate in the second column the possible causes of the problem.

After completing this exercise, discuss your answers with the facilitator.

By studying routine data collected from each health facility, you can find out if problems exist, where they

exist, and make some sensible conclusions about the type of problems.

5.3 Identify possible solutions

Once the causes of low immunization coverage have been identified, you should find appropriate solutions to eliminate them. Ask yourself the following questions:

- What are the possible solutions?

- Which of them are most appropriate?
- Are the solutions proposed feasible?
- Who will implement these solutions?
- What resources will be required?

The following framework (Table 5.2) may help you in your analysis.

Table 5.2 Framework for identifying causes and solutions for low coverage

Programme	Problem area	Cause of problem	Solutions using existing resources	Solutions using extra resources
Staffing/training				
Logistics				
Service delivery Quantity Quality				
Management/ planning				
Data collection/ reporting				
Monitoring and supervision				
IEC				

For each problem, there are many possible solutions. Here are a few examples:

- improved communication with the community
- training
- supervision
- mobilization of additional resources
- use of other immunization strategies, e.g. outreach, local immunization days, focus group discussions etc. partnership with private sector
- involving NGOs.

Table 5.3 Some problems of low coverage and their possible causes revealed during discussions between health staff and the community

Problems	Possible causes of problems	Solutions
Parents do not bring children for additional immunizations (utilization problem – dropouts)	<ul style="list-style-type: none"> • Health workers have not explained clearly to parents what vaccinations are due, when they are due and why they are needed. • Health workers do not understand which vaccines are due, when they are due and why they are needed. • Barriers discourage parental return, such as hours of clinic operation, cost and long waits. • Staff attitudes are not appropriate – they do not show parents respect or interest in the child’s health. 	
Children and mothers are not immunized when they attend the clinic because one of them is sick (utilization problem – missed opportunity)	<ul style="list-style-type: none"> • Health workers forget to check records or ask about what vaccines and doses a child/mother has received. • Health workers failed to use every contact with women of childbearing age to explain the need for, and importance of, tetanus toxoid immunization, particularly when they bring their children to get immunized. • Health workers do not understand the contraindications for immunization. (Health workers do not understand that children with minor illness may be immunized.) • Health workers fail to explain to parents that it is acceptable to immunize a child with minor illness. • Vaccines are not available on that day. • Other immunization supplies are not available. 	
Health workers cannot determine what immunizations a child has received (utilization problem – missed opportunity)	<ul style="list-style-type: none"> • Parents do not bring the immunization card. • Clinic records are not organized so that it is easy to find a child’s records. • There is no tracking system in the clinic. 	
Pregnant women do not seek immunization for tetanus (utilization problem)	<ul style="list-style-type: none"> • Barriers discourage women from seeking immunization, including cost, gender and cultural issues. • Women do not know they need TT. 	
Children are not receiving all vaccines that they are eligible to receive during a visit (utilization problem – missed opportunity)	<ul style="list-style-type: none"> • Health workers forget to check immunization records or ask about what vaccines and doses a child/mother has received. • Health workers do not understand what vaccinations are due, when they are due and why they are needed. • All vaccines are not available or offered at the clinic on the same day. • Lack of some vaccines at health facility. 	
Children and pregnant women never come to the clinic to begin immunization (access problem)	<ul style="list-style-type: none"> • The clinic is located too far away. • Clinic hours are not convenient or are not understood by the community. • Outreach activities are too infrequent or the community has not been informed properly about the timing and place. • Cultural, financial, racial, gender or other barriers are preventing the use of immunization services. 	

Exercise 7

As with the previous step for identifying causes, solutions would normally be arrived at after consultation with the community and discussions with all health workers in the facility and the supervisor.

Task 1: Select one of the problems in Table 5.3 and indicate possible solutions by various parties.

Community solutions

- 1.
- 2.

Health worker solutions

- 1.
- 2.

Your supervisor's solutions

- 1.
- 2.

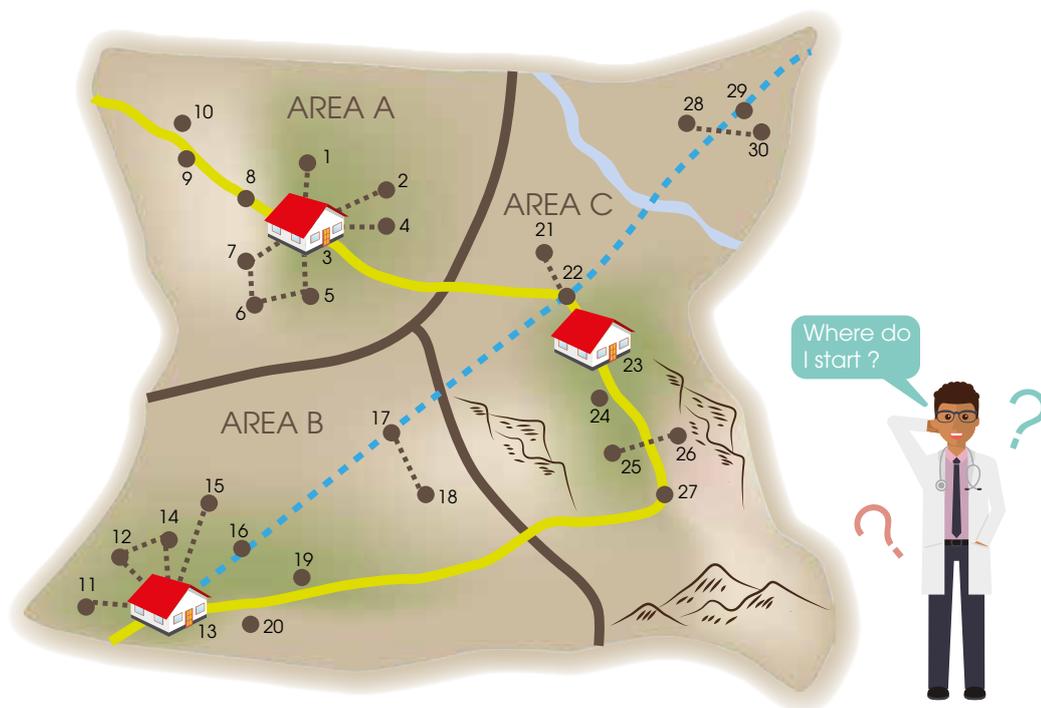
Task 2: Based on a list of possible solutions, arrive at your solution and complete the column entitled "Solutions" in Table 5.3.

5.4 Prioritize your choices: Where first?

Review the data in Table 4.1a and decide the top priority area (listed under column a) where you will start to implement the solutions listed. To do this you will first need to look at the unimmunized population in columns j and k to prioritize the catchment area with

the greatest number of unimmunized children. Then look at the category of problem and prioritize areas that have category 4: high dropouts and low access. Complete column q, writing the order of priority against each area. At the end, the decision on priority must be based on the local situation and feasibility.

Figure 5.2 Area information - prioritizing choices



Exercise 8

Look at Table 5.2 and decide which of the solutions that you identified in Exercise 7 can be met with resources already available. Which need additional external resources? Use the following page to list your answers.

1. Available resources

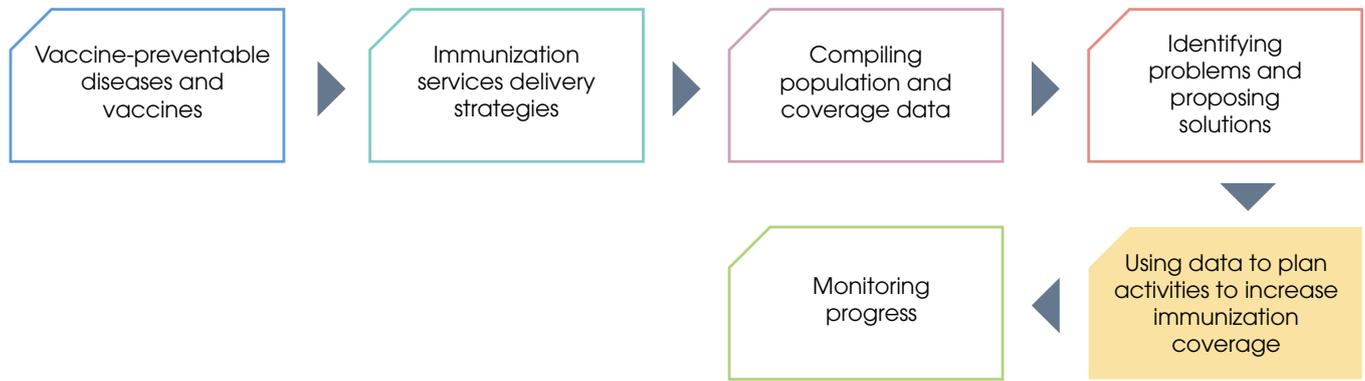
2. Additional resources needed

Quiz: Go back to Figure 5.1. Can you indicate which of the four options will:

- a) Create waste of EPI resources;
- b) Will need more resources to address the problem?

Check your responses with the facilitator.





6. Using data to plan activities to increase immunization coverage

6.1 Preparing your plan of work

6.1.1 Establish coverage objectives

The health facility should set two types of coverage objectives:

A. Coverage objectives for child immunizations (BCG, Penta, OPV, measles, yellow fever, vitamin A and any other vaccines being provided).

B. Coverage objectives for immunization with TT2+ among pregnant women.

A. Setting objectives for child immunization:

The coverage objectives for child immunization are defined for a single year and represent the minimum percentage increase for the year in question. We have come to the end of the year 2016, and you want to define objectives for 2017 in your region. The national objective is to attain 100% coverage by the end of 2020.



Exercise 9

Define the immunization coverage objectives for one year for the following children's vaccines: BCG, Penta, OPV3, measles, yellow fever. To do so, follow the steps below:

Step 1: Deduct the current coverage in your region from the national objective. Perform this operation for each vaccine.

Example:

Vaccine	National objective by 2020 (%)	-	Current coverage rate in your region (%)	=	Difference (%)
BCG	100	-	65	=	35
Penta3					
OPV3	100	-	35	=	65
Measles	100	-	30	=	70
Yellow fever	100	-	30	=	70

Step 2: Determine the number of years between the year for which you are currently defining objectives and the target year of the national objective.

Example: There are four years in the period 2017–2020.

Step 3: Divide the difference between your current coverage value and the coverage value in the national objective by the number of years between 2017–2020 (four). This will give you the minimum increase in your coverage rate for a single year.

Vaccine	Current coverage (%)	+	Minimum annual increase in coverage (%)	=	Objective for 2017 (%)
BCG	65	-	9	=	74
Penta3	35		16		51
OPV3	35	-	16	=	51
Measles	30	-	17	=	47
Yellow fever	30	-	17	=	47

Step 4: Add the minimum percentage increase in your coverage each year to the current coverage rate in your region. The sum of these figures represents your objective for the subsequent year.

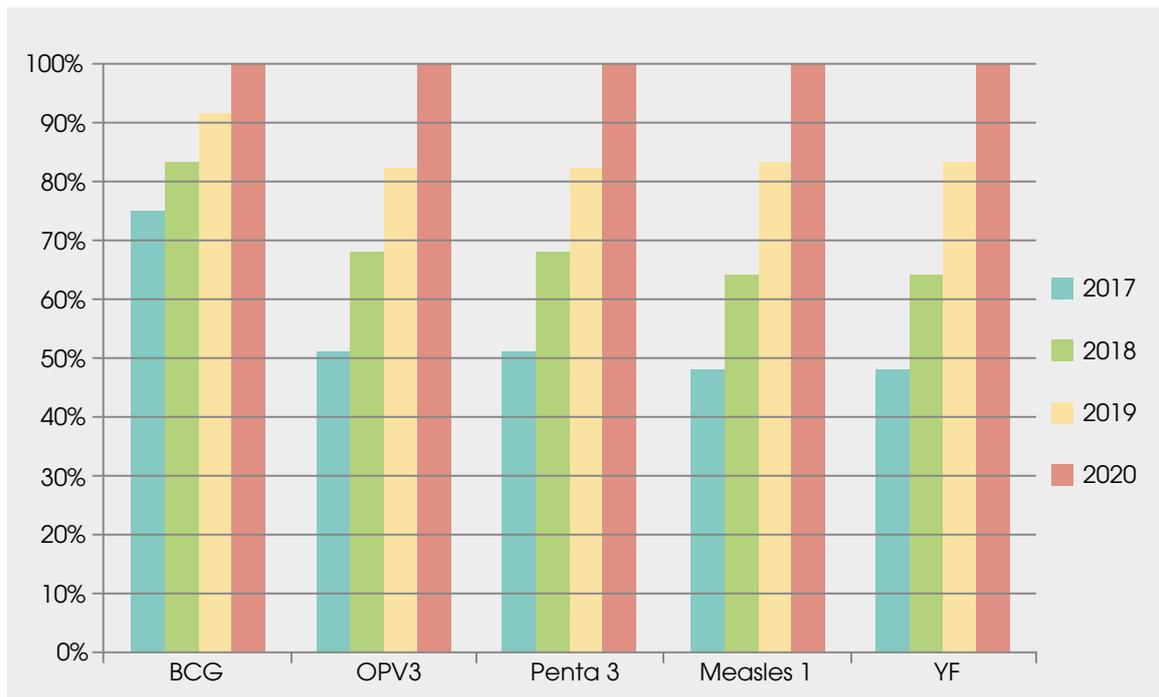
Example:

Vaccine	Difference between current immunization coverage and the national objective	Number of years separating the national objective	Annual minimum percentage between the year of reference and the target year of the national objective
BCG	35%	4	~9
Penta3	65%	4	~16
OPV3	65%	4	~16
Measles	70%	4	~17
Yellow fever	70%	4	~17

Figure 6.1 illustrates the method described above. It shows that the percentage increase in coverage should be

at least the same each year in order to achieve the national objective.

Figure 6.1 Sample annual coverage targets per antigen for 2017–2020



B. Setting objectives for TT/Td immunization coverage:

The main purpose of administering TT/Td to women is to protect their babies against neonatal tetanus, while also protecting the mothers against tetanus. The TT/Td immunization schedule is more complex than that of child immunizations. The period of protection against tetanus is different for each of the five TT/Td doses.

WHO recommends the combination of adult-dose diphtheria toxoid with tetanus toxoid (Td) is the rational choice for both diphtheria and tetanus prophylaxis. Before administering the vaccine in the antenatal care service, check the immunization status of the pregnant woman

(either by history or by card), regardless of whether there is an intention to continue the pregnancy. Administer if the woman has not previously been vaccinated, or if her immunization status is unknown, give two doses of TT/Td one month apart before delivery, and further doses as per the tables in Figure 6.2 – if the woman has had between one to four doses of TT in the past, give one dose of TT/Td before delivery. (A total of five doses protects throughout childbearing years.) For the woman to be protected during pregnancy, the last dose of TT must be given at least two weeks prior to delivery. Record the doses given on a standard TT immunization register and on a personal immunization card or maternal health record. The personal immunization card should be kept with the woman.

Figure 6.2 Maternal immunization against tetanus – immunization schedule

Table 1 Tetanus toxoid immunization schedule for women of childbearing age and pregnant women without previous exposure to TT, Td or DTP^a

Dose of TT or Td (according to card or history)	When to give	Expected duration of protection
1	At first contact or as early as possible in pregnancy	None
2	At least 4 weeks after TT1	1-3 years
3	At least 6 months after TT2 or during subsequent pregnancy	At least 5 years
4	At least one year after TT3 or during subsequent pregnancy	At least 10 years
5	At least one year after TT4 or during subsequent pregnancy	For all childbearing age years and possibly longer

^a Source: *Core information for the development of immunization policy. 2002 update*. Geneva. World Health Organization, 2002 (document WHO/V&B/02.28), page 130.

- If the woman can show written proof of vaccination in infancy, childhood or adolescence with tetanus-containing vaccine (e.g. DTP, DT, Td, TT) administer doses as indicated in the table 2.

Table 2 Guidelines for tetanus toxoid immunization of women who were immunized during infancy, childhood or adolescence^b

Age at last vaccination	Previous immunizations (based on written records)	Recommended immunizations	
		At present contact/pregnancy	Later (at intervals of at least one year)
Infancy	3 DTP	2 doses of TT/Td (min.4 weeks interval between doses)	1 dose of TT/Td
Childhood	4 DTP	1 dose of TT/Td	1 dose of TT/Td
School age	3 DTP + 1 DT/Td	1 dose of TT/Td	1 dose of TT/Td
Adolescence	4 DTP + 1 DT at 4-6 yrs + 1 TT/Td at 14-16 yrs	1 dose of TT/Td	1 dose of TT/Td

^b Adapted from: Galazka AM. *The immunological basis for immunization series. Module 3: tetanus*. Geneva, World Health Organization, 1993 (WHO/EPI/GEN/93.13), page 17.

Source: WHO (2006). Maternal immunization against tetanus. Integrated Management of Pregnancy and Childbirth (IMPAC). Available at: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/immunization_tetanus.pdf

Just like the coverage objectives set for child immunizations, the TT/Td₂₊ objective is an annual objective based on the national objective. To define an

objective for TT/Td₂₊ coverage, follow the four-step procedure described in Exercise 10.

Exercise 10

In this exercise, you will set the TT coverage objectives for women. Assume that you have come to the end of the year 2016 and you want to set annual objectives for TT/Td2+ coverage for health sector C for the year 2020. Assume also that:

- The national objective to be achieved by the end of 2020 is 100% coverage rate for TT/Td 2+.
- The current coverage rate for TT2+ among pregnant women is 46%.

To calculate the objectives for health sector C, follow the procedure for setting coverage objectives. Write down your answers in the following table. After you have completed this exercise, check your answers with the facilitator.

Calculation of coverage objective for TT/Td2+**Step 1**

(National TT2+ coverage objective) - (Current TT/Td2+ coverage %) = Difference (A)

Step 2

(Target year for national objective) - (Year you set annual objective) = Number of years between the year of national objective and the current year (B)

Step 3

$\frac{A \text{ (Difference between the national objective and current coverage)}}{B \text{ (Number of years between the two objectives)}} = \text{Minimum annual increase in coverage \% (C)}$

Step 4

Current (TT2+) coverage + Minimum annual increase in coverage = Annual objective for TT/Td2+ (%) (D)

6.1.2 Define strategies for sustaining routine immunization coverage

District and health centre action planning should focus on strategies that will contribute to improving and sustaining routine coverage. Some strategies for overcoming common problems are listed below:

1. Increase access to immunization by ensuring that all facilities are providing immunization services and conducting outreach as appropriate.
2. Take every opportunity to immunize all eligible children and women.
3. Organize special activities such as immunization weeks, especially in areas with deficient health services or low coverage.
4. Establish new fixed health facilities as appropriate.
5. Increase capacity of health facilities to provide immunization services through staff allocation and skills development. All facilities should have adequate staff skilled in provision of immunization services.
6. Involve other health-care providers outside ministry of health (e.g. private sector) in providing immunization services.
7. Stimulate community participation through involving communities in awareness-raising and promotion of immunization, community defaulter tracing, family health education and counselling.
8. Ensure that all logistics for immunization are available all the time and are functioning properly.

Strategies to reduce missed opportunities for immunization: According to the EPI, the following are the strategies for reducing missed opportunities:

- Adopting the IMCI strategy, use the opportunities other programmes, included in IMCI package, may present for immunization.
- Screening RI status of children and women visiting outpatient departments.
- Training health workers on true contraindications for vaccines.
- Conducting catch-up immunization activities in hard-to-reach places.
- Opening more outreach clinics to bring services closer to the client.

Strategies to reduce drop-out rates: The EPI programme suggests these measures in place to reduce dropout:

- Ensuring continuous supply of vaccines.
- Re-scheduling of cancelled clinics where possible.
- Initiating social mobilization on the importance and benefits of vaccinations.
- Opening of more outreach clinics to capture the hard-to-reach populations.
- Keeping the immunization registers fully up to date by the health workers.
- Establishing a system for defaulter tracing at health-facility level involving community health workers, village health committees and local NGOs.

Exercise 11

Using Table 6.1 and the example in Annex 6, prepare a workplan (a micro-plan) for increasing immunization coverage, and suggesting various strategies to cover hard-to-reach populations in the district. Indicate at least three strategies to cover populations in inaccessible or remote areas, using the space provided.

Strategy 1:

Strategy 2:

Strategy 3:

After identifying strategies, indicate activities and complete other columns in Table 6.1. (Also refer to Annex 6 to see a hypothetical example of this table.)

Table 6.1 Workplan for increasing coverage by strategy and type of activity

No.	Activities	Where?	Who is responsible?	When?		Resources		Remarks
				Start	End	Available	To raise	
A	Strategy 1							
A1	Activity 1							
A2	Activity 2							
A3	Activity 3							
A4	Activity 4							
A5	Activity n							
A6	Sub-total Strategy 1							
B	Strategy 2							
B1	Activity 1							
B2	Activity 2							
B3	Activity 3							
B4	Activity 4							
B5	Activity n							
B6	Sub-total Strategy 2							
C	Strategy 3							
C1	Activity 1							
C2	Activity 2							
C3	Activity 3							
C4	Activity 4							
C5	Activity n							
C6	Sub-total Strategy 3							
	Total							

6.1.3 Work out activities

Begin to construct a workplan consisting of activities with a high priority that you intend to carry out this year, particularly the ones related to social mobilization and community involvement. These activities should be taken from the analysis of problems, causes and solutions that you have just conducted. For the workplan you will need realistic objectives for vaccination coverage that you can reach by the end of the year. If you know your intended

destination, you stand a better chance of reaching it. That is why it is important that each health facility sets its objectives at the beginning of the year. Having objectives means knowing what you want to do. It also helps you to assess progress made towards your objective and to be satisfied with your work. Moreover, your workplan will also determine resources you need to implement the activities and their expected sources.

6.1.4 Finalize your plan

Using all elements of the plan you have developed so far and following the proposed format in the

box below, finalize your plan for your health facility. Consult Module 4: *Planning immunization activities* for additional guidance in planning process.

Format for preparation of an action plan on immunization

- 1. Introduction:** Give short introductory remarks indicating the reason for preparing the action plan.
- 2. Background information and situation analysis:** Provide overview of childhood diseases in your target area based on disease statistics. Identify major problems and constraints.
- 3. Objectives and targets:** Formulate programme objectives and targets in measurable terms.
- 4. Strategies:** Make a critical analysis of existing EPI strategies. Describe proposed strategies and approaches that will be applied. Try to identify innovative strategies for effective implementation of the programme. Highlight the important role of communities in supporting immunization activities at grassroots level.
- 5. Activities:** To achieve the above targets prepare a table of activities for each individual target. Decide and include implementation dates, responsible officials or organizations.
- 6. Monitoring and evaluation:** Describe how you are going to monitor the implementation of the plan; which indicators measure the achievements of your specific targets. Specify deadlines and procedures for reporting and the level at which you have to report.
- 7. Budget estimate:** From the activity table, extract cost values of each activity and prepare an overall budget for the plan. Summarize the total cost of the plan and indicate available financial resources and the source. This section should also identify resource gaps to enable the programme management to approach partners for support.
- 8. Annexes:** Support your plan with essential information, immunization statistics and graphs showing trends of target diseases or immunization coverage trends in your catchment area.

6.2 Developing health facility micro-plan

The health facility immunization micro-plan should be integrated into the overall health facility plan and be part of the overall district health plan discussed in section 6.1. It should be used as an advocacy tool to gain support from local governments, other government agencies, NGO partners and stakeholders. Micro-plans are dynamic documents that require regular review and periodic updating (at least every six months) to reflect the changing environment. For example, the failure to reach a quarterly target may require a rethinking of strategy and revisions to the micro-plan.

Unexpected changes in the political or financial environment, logistical problems, new national health initiatives (e.g. introduction of new vaccines) requiring staff time, civil unrest and other events that cause shifts in population all have implications for the organization of immunization and should be reflected when updating micro-plans.

Micro-plans should propose realistic solutions to those critical issues and to the challenges that programme managers encounter in specific districts and health facilities. In micro-planning, health teams use a problem-solving approach that focuses attention on past achievements, current barriers to increasing the coverage, quality of services and available resources (time, human, material and financial). They also prioritize activities, set realistic targets with milestones, address sustainability issues and include regular reviews of implementation and achievement to facilitate timely revision.

To prepare a good micro-plan a number of actions should be taken; described in the following sections.

6.2.1 Health facility level

Defining health facility catchment area: A catchment area is a group of communities to be served by the health facility. To identify these communities:

- Obtain list of catchment communities from district (where available).
- Define list of communities in the health facility catchment area with community.
- Meet with the community leaders to confirm the list of settlements.
- Update by including reported “new” (unreached) communities from previous SIA rounds.
- Define boundaries with the community leaders.
- Estimate distances of each community to the health facility.
- Estimate population of each community in the catchment area.

Estimating population of each community in the catchment area: This can be obtained from the population census figures where the number of children below one year of age and WCBA has been provided. Alternatively, the total population of the communities can be obtained from census figures and 4% of the population taken as target for children under one year and 22% taken for WCBA (15–49 years).

Example:	Total population for Kana community = 890
	Children <1 year = $890 \times 4\% = 890 \times 4/100 = 35.6$ (~36)
	WCBA = $890 \times 22\% = 890 \times 22/100 = 195.8$ (~196).

Estimate of the populations of communities can also be obtained from existing SIAs micro-plans and/or information from community leaders. In special situations a simple community census using house-to-house enumeration can be done.

Group the communities by strategy: The strategy for immunization services is determined based on the distance of communities from the health facility. The communities within 5-km radius are expected to receive services directly from the fixed immunization sessions in the clinic (provided there are no other barriers). See below for distance/strategies:

- Less than 5 km: fixed post strategy
- Between 5–10 km: outreach strategy
- More than 10 km: mobile strategy.

These distances are only provided to guide planning; the local situation should be taken into consideration.

Exercise 12

Task 1: List the names of the settlements that are covered by your health facility either for the fixed sessions or for outreach visits and enter them in Table 6.2.

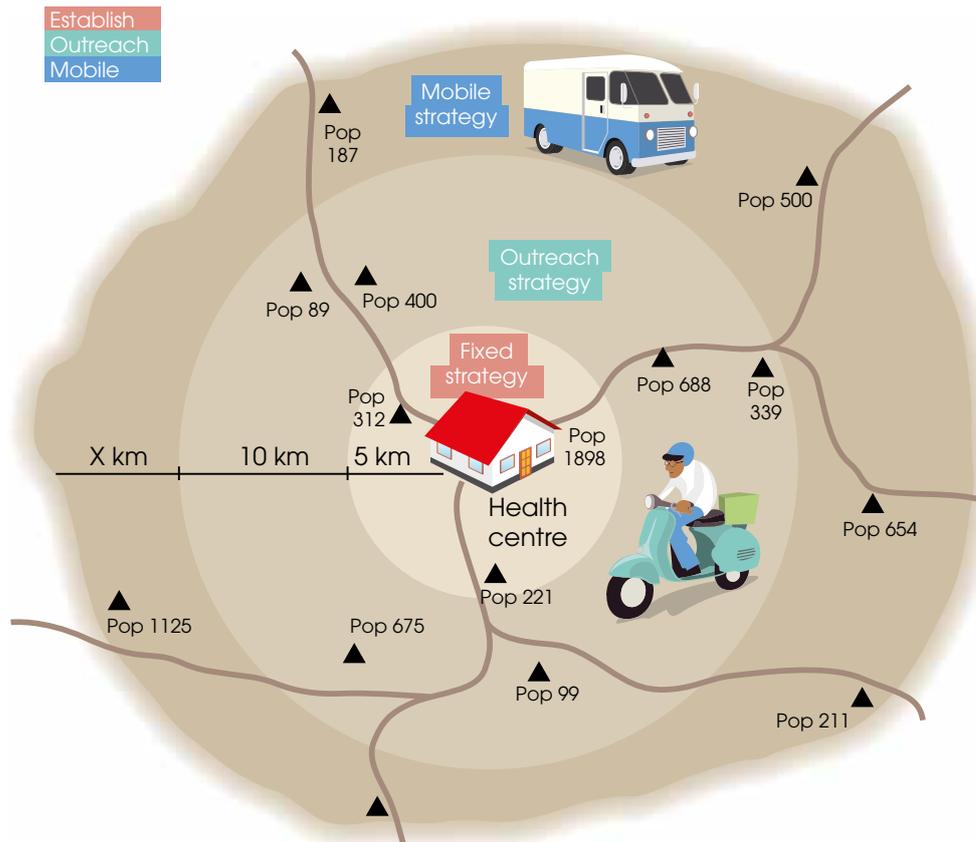
Task 2: Include the settlement total population and target for <1 year and WCBA.

Exercise 13

Task 1: Tabulate the information on the communities shown in Figure 6.3 and also indicate whether the community is hard to reach.

Task 2: Indicate the approximate distance of each settlement from the health centre and group them by strategy.

Task 3: Using all the information develop a catchment area map for the health centre.

Figure 6.3 Communities grouped by distance/strategy**Development of a health facility catchment area map:**

An updated catchment area map is one of the key points in the micro-planning process. Detailed maps of districts and health facility catchment areas should be drawn. District maps should show all health facilities (public and private), major population settlements, roads, distances, rivers, current outreach sites, etc. A health facility map should show these same details plus the borders of its catchment area, the location of any hard-to-reach areas or areas with large numbers of unimmunized children, plus any major barriers to service delivery (i.e. seasonal flooding, mountains, rivers, etc.).

- The map should be simple but informative:
- Indicate the north arrow.
- Show the boundaries of the catchment area and situate the health facility.
- Show all settlements within the catchment area.
- Key geographic features/landmarks on the map (rivers, mountains, major roads, etc.).
- Indicate the estimated population/target population (<1 year) for each settlement.

Indicate strategy to cover each settlement.



Table 6.2 Health facility catchment area background information

District	Name of settlement	Total population	Target population		Estimated distance from health facility			Hard to reach (Y/N)	Strategy F = fixed OR = outreach M = mobile
			Children <1 year (4%)	WCBA (22%)	<5 km	5–10 km	>10 km		

Determining number of sessions by fixed facilities:

You should decide how often to hold sessions. To do this:

1. Calculate your annual target population.
2. Divide the figure by 12 to get the monthly target population.
3. Calculate average number of contacts per month per target child and WCBA for immunization. This figure depends of the vaccination schedule. Take 8 as an average number of contacts for immunization.
4. Multiply your monthly target population figure by 8 to get total number of contacts per month.
5. Now you have to recall your experience and decide how many people you can serve per session: 10, 20 or 30? Let us assume that you can immunize up to 20 mothers and children per session. Divide the total number of your monthly contacts by 20. The sum will tell you how many sessions to hold per month which will be adequate to immunize up to 20 clients per session.

After arriving to the number of sessions per month (or week) discuss with community members which day and time is convenient for them to hold these sessions.

- Ensure that all carers and eligible women know when immunization services are available.
- Provide these services reliably, as advertised.
- Improve stock management and keep a safety stock of one supply cycle of needles, syringes, diluent and vaccines in reserve.

Exercise 14

Using the target population entered in Table 6.2 calculate the number of sessions for the fixed and the outreach strategy.

Plan outreach sessions:

Step 1: Determine the monthly target population (TP). Add the target population of all the communities to be served by outreach visits and divide by 12.

Step 2: Determine the number of sessions per month. Divide the monthly TP by 10 clients and multiply by the number of vaccinators carrying out the vaccination session. For example, if the session will be conducted by two health workers, then determine as follows: $[TP/(10 \times 2)]$.

Step 3: Identify outreach sites within the communities. Meet with the communities' representatives (VHC) to identify a particular site where vaccination sessions can be held.

Re-group settlements that are close to each other for the same outreach session (together with the VHC).

While trying to keep to 10 clients per health worker per session, remember this is a guide for planning purposes.

To be practical, do not plan for more than one outreach session per week.

Develop your micro-plan: Meet with the communities and determine suitable days for fixed post and outreach sessions. Prepare a schedule of activities to be carried out in the month/quarter indicating the vaccination sessions and other activities. The workplan should include:

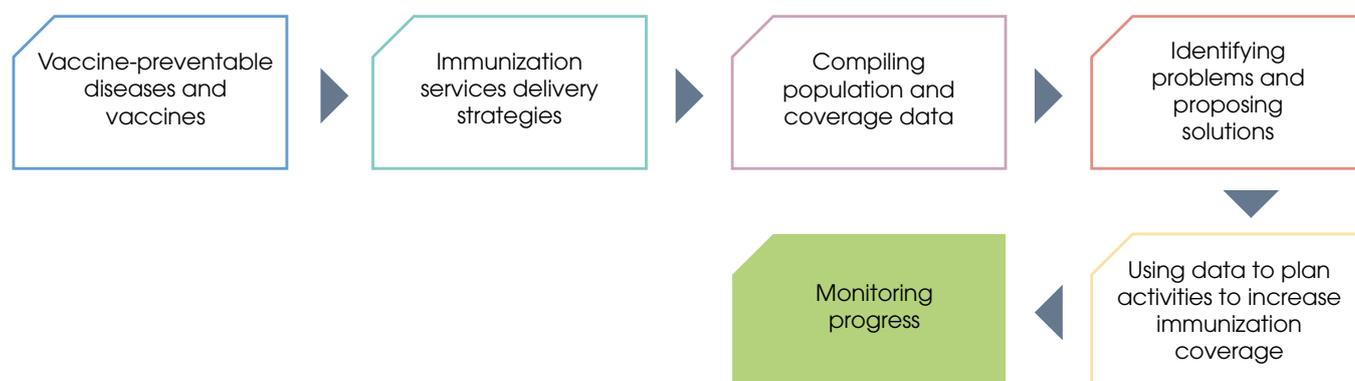
- session plan and days for session
- type of strategy to reach community
- means of transportation
- other activities planned, e.g. need for mobile visits to remote communities with support from district level (transport, etc.)
- activities developed to address identified problems
- monitoring of sessions conducted versus planned.

6.2.2 District level

Each district collates health facility plans and adds district specific activities to form the district micro-plan. The district health management team (DHMT) consolidates all health facility micro-plans into the district micro-plan. This plan should include:

- mobile sessions
- district map showing the wards and major facilities
- vaccine distribution routes
- supervisory schedule and names of supervisors.
- Send the completed plan with costs to district management for approval and budget allocation.





7. Monitoring progress

Comparing what you have achieved with your targets includes several steps. First, you plan your programme and set your targets. Then you carry out your programme activities and record your achievements. Then you compare your results from your immunization summary sheets with your targets. This will provide you with a picture of where you stand. This process is called monitoring.

Immunization programme monitoring means continuous observation and collection of data on the immunization programme and making the necessary adjustments where there are deviations in order to ensure that it is progressing as planned.

Depending on the purpose, monitoring may be daily, weekly, monthly or quarterly. To ensure objectives are reached on time, it is essential to monitor progress at least every month. The most important function to monitor is the trend in immunization coverage and drop-out rates at local level. These should be compared with the previous period and the planned objective.

7.1 Monitoring tools

To monitor immunization activities well you need appropriate tools. These include:

- child health card
- immunization register
- immunization tally sheets
- monthly immunization summary sheet
- immunization coverage survey reports
- immunization monitoring chart
- monthly immunization and target diseases reports and others.

One of the best monitoring tools for immunization coverage is the **immunization monitoring chart** (see Annex 2a), which shows the monthly progress health workers are making in raising immunization coverage in the health centre catchment area. This chart enables

health workers to compare the number of people actually immunized each month with the coverage targets. Each vaccine, even each dose of the same vaccine, can have a monitoring chart. In order to be viewer-friendly, no more than two vaccine components should be located on one chart. This will facilitate following progress simultaneously for two components as well as calculating drop-out rates between them. For example, you can record Penta1 and Penta3 on one chart and monitor district achievement of targets for Penta3 and Penta1-Penta3 drop-out rates. It may also be important to monitor the drop-out rates between Penta1 and Penta2/Penta3.

The immunization monitoring chart summarizes the information given in monthly immunization reports. If reports are not complete for a district, the cumulative immunization coverage figure will be smaller and not reflect the true situation. The immunization monitoring chart will be affected as the line showing your actual performance will be far below your planned target line. Hence, the need for monitoring reporting completeness as well as immunization coverage.

The health facility is the typical location to use the chart, but it can also be used at higher levels (district, province, central).

- You should keep charts and other monitoring tools to monitor immunization coverage and drop-out performance in the district (see Annexes 2a, 2b and 2c).
- Regularly update these charts when you obtain new data from health facilities.
- Identify facilities with problems.
- Give more support to those health facilities that do not perform well.

7.2 Monitoring planned activities

Table 7.1 provides a template for monitoring implementation of activities in support of increasing immunization coverage. This sample framework provides

an opportunity to note whether identified problems are followed up to completion by the responsible staff member. Reasons for not reaching targets on time should be noted in the column “Remarks”, and include corrective measures.

Table 7.1 Activity monitoring tool

Area:

Year:

Activity	Person(s) responsible	Timeline	Percentage complete	Remarks
1.				
2.				
3.				
4.				

Recommended reading

WHO (2002). Increasing immunization coverage at health facility level. *Vaccines and Biologicals*, Geneva: World Health Organization. Available at: <http://apps.who.int/iris/handle/10665/67791> (accessed 18 January 2017).

WHO (2008). Implementing the Reaching Every District approach: A guide for district health management teams. Regional Office for Africa: World Health Organization. Available at: http://www.who.int/immunization/programmes_systems/service_delivery/AFRO-RED_Aug2008.pdf (accessed 5 December 2016).

WHO (2009). Periodic intensification of routine immunization (PIRI): Lessons learned and implications for action. Geneva: World Health Organization. Available at: www.immunizationbasics.jsi.com/Docs/PIRImonograph_Feb09.pdf (accessed 18 January 2017).

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WHO (2013). WHO-UNICEF guidelines for comprehensive multi-year planning for immunization. Geneva: World Health Organization. Available at: http://www.who.int/immunization/programmes_systems/financing/tools/cmyp/en/ (accessed 18 January 2017).

WHO (2015). Immunization in practice: A practical guide for health staff, 2015 update. WHO/IVB 2015. Geneva: World Health Organization. Available at: www.who.int/immunization/documents/training/en/ (accessed 18 January 2017).

WHO (2015). Practical guide for the design, use and promotion of home-based records in immunization programmes. WHO/IVB/15.05. Geneva: World Health Organization. Available at: http://apps.who.int/iris/bitstream/10665/175905/2/WHO_IVB_15.05_eng.pdf (accessed 18 January 2017).

WHO (2015). Regional Strategic Plan for Immunization 2014–2020. Regional Office for Africa: World Health Organization. Available at: <https://www.who.int/afro/ahm/issue/19/reports/regional-strategic-plan-immunization-2014-2020> (accessed 5 December 2016).

WHO (2017). Guide for the development of national immunization policies in the African Region. Regional Office for Africa: World Health Organization. Not yet published.

WHO (2017). WHO planning guide to reduce missed opportunities for vaccination (MOV), for decision-makers and programme managers at the national and subnational levels. *Immunization, Vaccines and Biologicals*, Geneva: World Health Organization. Not yet published.

WHO, UNICEF (2005). GIVS Global Immunization Vision and Strategy 2006–2015. Available at: http://apps.who.int/iris/bitstream/10665/69146/1/WHO_IVB_05.05.pdf (accessed 18 January 2017).

Websites

WHO – Immunization, Vaccines and Biologicals:
<http://www.who.int/immunization/diseases/en/>

WHO – Immunization, Vaccines and Biologicals:
http://www.who.int/immunization/programmes_systems/service_delivery/en/

WHO – Immunization, Vaccines and Biologicals (WHO vaccine position papers):
www.who.int/immunization/policy/position_papers/en/

Annex 1: Activities for planning to reach every district

1. Planning and management of resources

At district and facility levels, planning should identify what resources are needed to reach all target populations in a way that can be managed well and thus maintained. Good planning involves: (a) understanding the district/health facility catchment area (situational analysis); (b) prioritizing problems and designing micro-plans that address key gaps; (c) as part of micro-planning, developing a budget that realistically reflects the human, material and financial resources available; and (d) regularly revising, updating and costing micro-plans to address changing needs.

District level

- Develop comprehensive annual micro-plans.
- Plan all supervisory meetings with health workers and communities.
- Conduct periodic review meetings to review data and assess performance.

National level

- Use the cMYP as a basis for realistic costing of human and financial resources necessary to undertake the RED/REC strategy at district level.
- Ensure that all elements of the district micro-plans are included in the plan.
- Identify any gaps in funding or human resources.
- Use the national ICC to raise funds.
- Prepare costing of activities to ensure 80% coverage and above in all districts.
- Review human resources to ensure efficiency and links between immunization and other health programmes.

2. Reaching the target populations

This 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.

District level

- A register tracks target population children.
- A simple hand-drawn map is used to outline villages in the catchment area of each health unit.
- Review session plans for fixed immunization to meet the needs of the community.

- An outreach micro-plan is developed and budgeted using a schedule that is adapted to community convenience.
- Health staff participates in outreach at least every two weeks.
- Appropriate supplies, forms/registers and allowances are assured for every planned outreach trip.
- Appropriate transport is provided for outreach, which could include, for example, a motorcycle for a 6–20-km radius, or a bicycle for less than 5-km radius.
- An influential community focal point is identified and active.
- Outreach is planned and implemented with community participation.
- In negotiation with the community, other interventions are included in outreach (with vitamin A as a minimum).
- Good communication is achieved between service providers and community members.
- Prioritize health facility catchment areas by total number of unimmunized and partially immunized children.
- Develop plans to conduct additional outreach visits or periodic intensification of routine immunization (PIRI) to reduce the number of unimmunized children.
- Immunization advisers are identified to assist with planning and monitoring outreach services.

Subnational (state, provincial or regional) level

- Prioritize districts by total number of unimmunized and under-immunized children.
- Re-orientation workshops for priority districts to produce district micro-plans using MLM Module 5: *Increasing immunization coverage*.
- Support plans and implementation of accelerated activities to increase coverage and reduce unimmunized and under-immunized children in priority districts.

National level

- Analyse all districts, including coverage and drop-out rates, unimmunized and under-immunized population, mapping and feedback.
- Guide districts to conduct bottleneck analysis of immunization coverage and develop appropriate strategies.

- Review national policy, strategies, plans and budgets for outreach and PIRI including transport management.
- Systematic monitoring of fixed and outreach immunization sessions at district level through supportive supervision, follow up and feedback.

3. Supportive supervision

District level

Supportive supervision focuses on promoting quality services by periodically assessing and strengthening service providers' skills, attitudes and working conditions. Regular supervision should go beyond checklists and reports. It should build capacity to carry out safe, good quality immunization services at district level. In addition, it should upgrade the skills of health workers by on-site support, training, monitoring and feedback. This should include preparation of district micro-plans and budgets within the district.

- District supervisor visits health units at least once per month to help with planning, budgeting, monitoring, training and problem-solving.
- During a supervision session the supervisor should:
 - stay for at least two to three hours;
 - provide training on specific subjects including safety and waste management;
 - watch health workers conduct immunization sessions to ensure quality and safety;
 - watch health workers train other colleagues;
 - include a technical update; and
 - monitor progress on a standard wall chart.
- Supervisors must be mobile and transport must be planned, provided and budgeted for each supervisory visit.
- When a health worker visits the district level there should be an opportunity to continue training.
- When a health worker visits the district level he/she should travel with appropriate supplies and forms.
- The supervision visit would not necessarily need to be exclusively focused on immunizations, so long as the supervisor gives immunization due attention.

Subnational (state, provincial or regional) level

- Organize training of trainers and supervisors in priority technical areas.

- Implement regular supportive supervision in priority districts according to plans.

National level

- Review TORs and duties of supervisors and assess national supervisory plan.
- Redefine TORs of supervisors to improve on-site support and/or training at health facility level.
- Determine training needs of supervisors.
- Identify and secure resources necessary to make regular supervisory visits possible.

4. Links between community and health services

Health facility level

- Identify a mobilizer to alert the community that the outreach worker has arrived and the outreach session has begun.
- Attend all sessions.
- Mobilize children and mothers.
- Consult on the time and place of an outreach session.
- Inform the community of the next outreach session.

District level

- In collaboration with health workers, establish regular meetings with stakeholders to discuss performance, identify local health issues and problems and agree on solutions, e.g. reducing dropout through defaulter tracing.
- Build community networks (communication channels).

Subnational (state, provincial or regional) level

- Develop/revise strategies and plans that will result in the systematic identification of community focal points or committees in priority districts.

National level

- Identify national focal point for advocacy, communications and social mobilization.
- Review national plans and strategies including orientation of health workers on improving links between community and service.

5. Monitoring for action

Health facility level

- Determine the target population and catchment area of each health facility in consultation with district level and communicate

- upward to the province and national level.
- Record each dose of vaccine given for all EPI antigens both at fixed posts and during outreach sessions.
- Record vaccine stocks and calculate wastage rates.
- Penta1 is the standard indicator for “access” for the purpose of standardization and simplicity. Other indicators will continue to be used to measure the quality and impact of the service.
- Chart cumulative monthly Penta1 and Penta3 percentage coverage and monitor Penta1-Penta3 dropout.
- Ensure that simple hand-drawn maps are available at each health facility showing villages and populations.
- Ensure the community participates in and is notified about immunization targets.
- Data compiled and discussed at monthly district meetings with the supervisor with a critical review of numerators and denominators.

District level

- Monitor completeness and timeliness of immunization coverage and surveillance reports.
- Chart cumulative monthly Penta1 and Penta3 coverage to monitor doses administered and drop-out rates.
- Distinguish between immunization recording and reporting at fixed post and outreach services.
- Calculate the percentage of health units that had no vaccine stock-outs during the month.
- Record vaccine stocks and utilization rates for each health facility.
- Identify problems and find appropriate local solutions.
- Compile information for reporting to province level on a monthly basis.
- Calculate the percentage of health units that have been supplied with adequate (equal or more) numbers of auto-disable (AD) syringes

- for all routine immunizations during the year.
- Plan supplementary immunization activities when necessary.
- Conduct outbreak investigation and response.

Subnational (state, provincial or regional) level

- Organize quarterly meetings for district teams and supervisors.
- Analyse district data and provide feedback to districts.

National level

- Strengthen national capacity to produce and maintain district-level indicator database including mapping.
- Review timeliness, completeness and accuracy of district reporting system.
- Compare district, subnational and national numerators and denominators to ensure consistency.
- Develop national consensus on denominators and reporting guidelines.
- Identify priority districts and provinces for strengthening monitoring, evaluation, surveillance and reporting system.
- Follow up the implementation of activities designed to correct subnational and district performance deficiencies.

Subregional (intercountry support team – IST) and regional level

- Review national plans and budgets including cMYP to ensure that activities to increase coverage are included and adequately budgeted for.
- Request all countries to report on progress of the implementation of RED/REC and other strategies to increase coverage
- Provide feedback and technical support where needed to all countries regarding key performance indicators.



Annex 2: Tools to monitor immunization coverage and assess community demand for immunization in your health facility

Annex 2a: How to prepare a chart for monitoring doses administered and drop-out rates in children less than one year of age

1. Calculate the annual and monthly target populations for immunization.

- Use existing population figures for children under one year of age obtained from official census data or your own community census. If you do not have these numbers, obtain an estimate by multiplying the total population by 4%.
- To get the monthly target population, divide the number of children under one year of age by 12.

2. Complete the information on the top of the chart (area and year). Label the left and right side of the chart with the monthly target figures. Label the boxes at the bottom with the name of the vaccine and dose, e.g. Penta1 and measles or Penta1 and Penta3.

3. At the end of each month, enter the total number of immunizations given.

- Locate the row boxes underneath the graph. Locate the spaces for the month you are recording. Write the number for that month in the space provided.
- Add the present month's total to the previous cumulative total to calculate the current cumulative total.
- Mark on the chart a dot for the cumulative* total on the right side of the month column you are recording. Draw a line between the new dot and the previous month's dot.

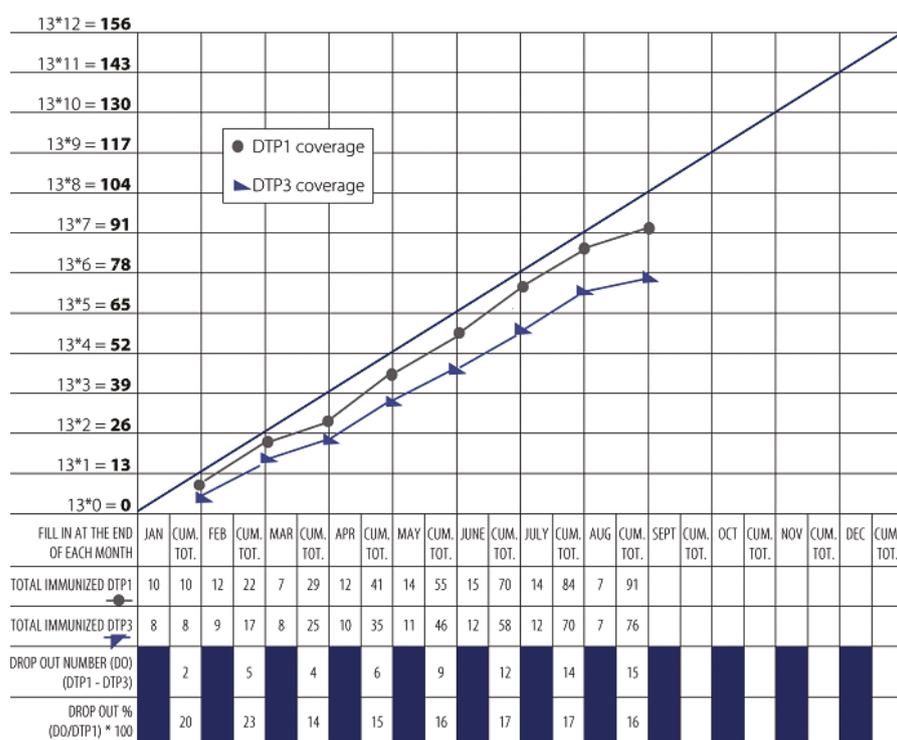
4. Subtract the cumulative total for Penta1 from the cumulative total for Penta3. This is the cumulative total number of drop-outs for Penta1 to Penta3 for this period of the year.

5. Calculate the cumulative drop-out rate (DOR) as follows:

$$\text{DOR} = \frac{(\text{Penta1 cumulative* total} - \text{Penta3 cumulative total})}{\text{Penta1 cumulative total}} \times 100$$

* Cumulative means the total number of doses of vaccines given in the current month plus the monthly totals for the previous months. Use the same time period for each dose and vaccine. For example, the cumulative number of DTP1 doses given by the end of March is the total number of doses given in January plus the total number given in February plus the total number given in March.

Chart for monitoring doses administered and drop-out rates in children less than one year of age



Annex 2b: Tracking systems to identify defaulters by month of birth

To help you identify dropouts (children or women who do not return for immunizations when they are due), set up a tracking system. Tracking systems may be made with immunization registers (either in book form or in the form of a card box) or with individual patient charts. Stamps or stickers are used to identify children with incomplete immunization schedules.

How to set up a tracking system using immunization cards

1. Obtain a box a little larger than the size of the z-cards.
2. Obtain 12 dividers and mark them with each month of the year.
3. Keep a copy of each child's immunization card (the parents keep the original) or a similar card with the following information:
 - the child's birth date (day/month/year)
 - the name of the child
 - the name of the child's mother and father
 - the child's address, name of village
 - dates when vaccinations were given to the child.
4. On the immunization card, enter the vaccine (lot number), dose and date of each immunization the child receives (begin with the child's first immunization). Always inform the parents or caregiver of the child about the next date to bring the child to complete their immunization schedule.
5. Put the card into the file box behind the divider for the month when the child is due for his or her next immunization.
6. Keep the cards in each month-divider in order of child's last name so that they can be found quickly when needed during a busy immunization session.

7. At the end of the month, remove any cards that remain behind the divider for that month.
8. Conduct follow-up activities (e.g. house-to-house visits) for any child whose card remains (to invite them for vaccinations).
9. If all follow-up activities for a specific month have been conducted, move the divider for the month to the back of the box.
10. If follow-up is not complete for any child, move the cards to the next month.
11. At the end of the year, move the remaining cards with the divider marker to the relevant month of the following year.

How to set up a tracking system with an immunization register book

1. Organize your immunization register by child's date of birth, see possible example below. Organization by date of birth is vital. A register organized by date of visit will not allow for easy identification of defaulters.
2. Record dates of all immunizations.
3. At the end of each month, review the immunization register to identify children failing to receive immunizations due (e.g. if your programme gives measles vaccine at nine months of age, then children born in January should be vaccinated during the month of September. On 30 September you can see which children born in January have not received measles vaccine).
4. Note each child with immunizations due.
5. Conduct follow-up activities.

Example: Immunization register and card for children under one year of age.

Core content of a home-based vaccination record

Although not exhaustive, the 10 elements listed below are believed to be necessary in order for the home-based vaccination record to fulfil its role and functions related to immunization services:

1. Unique identification number.
2. Basic child identification information.
3. Medical service contact information.
4. Vaccine name and disease the individual should be protected against.
5. Structured field for date of receipt of each vaccine and each dose.
6. Structured field for date of next routine vaccination visit.
7. Space for vaccines received outside of the routine schedule (including vaccines administered during SIAs) and new vaccine introductions.
8. Health worker narrative notes/known allergies and adverse reactions to vaccination.
9. Space for health worker signature/authorization stamp.
10. Form version control information.

Source: WHO (2015). *Practical guide for the design, use and promotion of home-based records in immunization programmes*.

Moreover, although its importance is often underestimated, good visual design of the home-based vaccination record is essential for effective communication. For example, the placement or sequencing of information in the record has implications for whether it will be noticed, read and reinforced among caregivers. Use of inappropriate font size (too small or too big) and inadequate space for legible handwriting may impact the overall effectiveness of the home-based record.

Actions to be avoided when revising the home-based vaccination record include:

- Do not include so much information that the record looks cluttered and confusing.
- Do not design records containing dense written material for use in areas where literacy among caregivers and health workers is low.
- Do not use colours or languages that are foreign to the local culture or context.
- Do not include subject matter that requires excessive writing or time to complete.
- Do not print large quantities of home-based records before pre-testing the format and content changes.
- After designing the home-based record, its importance should be reinforced by incorporating practice for their use into health programme policies and procedures through:
 - Orienting health workers with repeated training and feedback through supportive supervision.
 - Increasing motivation for retaining the home-based record.
 - Handling transitions between versions of a home-based vaccination record.
 - Forecasting needs and dealing with stock-outs of home-based vaccination records.
 - Adopting a life-course approach to immunization: implications for recording and monitoring.

Annex 2c: Guidelines for community feedback on immunization services through a convenient household survey

This questionnaire provides feedback about the status of immunization services in areas close to the health centre. It gives information on the number of children/mothers who did not complete their immunization schedule, the number of people who are never reached, reasons why children and women do not go or return for immunization, and how women think services can be improved. You will not need much time to conduct this survey; it can be carried out in one day. It is an opportunity to discuss directly with child carers and find out how services could be improved and why they are not used.

The results of this survey are not representative of any population other than the households you interview. It is intended to supplement, not replace, routine reporting.

The purpose is to investigate at least five children/mothers not vaccinated or who did not complete their immunization schedule. Follow the steps :

1. Prepare a questionnaire as shown in the following example to use during interviews.
2. Collect and compile data.
 - Visit households closest to the health centre until you identify at least five children/mothers not vaccinated or who did not complete their immunization schedule. The households do not have to be randomly selected and they may be interviewed in any order. All the women should be asked to give one reason for not going for immunization for their children under two years of age and for each woman of childbearing age who lives in the household. Each woman should also be asked for her suggestions on how to improve the health services.
 - Total the number of households visited from (A) and the immunization status of children and women interviewed in the survey from (B). Record the total in the appropriate space on the form.
3. Analyse the data.
4. Investigate why the children and women were not fully immunized. Make a list of all the reasons given (item C) and of suggestions for improvement (item D). Discuss possible solutions that can be done with current and extra resources, if needed.

Tally sheet and questionnaire for a convenient household survey*

Health centre:

Date of questionnaire:

Number of children <1 year:

Number of households in the catchment area:

Response	Place tally marks here		Total	
A. Number of households visited				
B. Immunizations status	Children (c)	Mothers (m)	(c)	(m)
Not immunized				
Partially immunized				
Fully immunized				
C. Child's name	Reasons given for being partially or not immunized			
1.				
2.				
3.				
4.				
5.				
C. Mother's name	Reasons given for being partially or not immunized			
1.				
2.				
3.				
4.				
5.				
D. Suggestions for improvement				
1.				
2.				
3.				

* Status of vitamin A supplementation can be added to the questionnaire

Annex 3: Examples of basic calculations

A. Calculating target population

Ficticia district has 10 000 inhabitants, 4% are children under one year and 20% are children under five years.

Annual and monthly target population for immunization

$$\text{Annual target population} = \frac{10\,000 \times 4}{100} = 400 \text{ children under one year of age (or pregnant women)}$$

$$\text{Monthly target population} = \frac{400}{12} = \text{approx. 33 children under one year of age (or pregnant women)}$$

B. Calculating immunization coverage

During the previous year, health facilities in the peri-urban area of Ficticia district administered 102 doses of Penta3 and 73 doses of measles vaccine to children under one year of age. If the number of doses of Penta3 immunizations given over the past year is 102 and the target population of children under one year of age in the peri-urban area of the district is 150, then the coverage with Penta3 will be 68%.

$$\text{Penta3 coverage is equal to} = \frac{102 \times 100}{150} = 68\%$$

The measles immunization coverage is calculated in a similar way.

$$\text{Measles coverage is equal to} = \frac{73 \times 100}{150} = 49\%$$

C. Calculating the number of unimmunized children with Penta3

During the previous year, health facilities in the peri-urban area of Ficticia district administered 102 doses of Penta3 and 73 doses of measles vaccine to children under one year of age. If the number of doses of Penta3 immunizations given over the past year is 102 and the target population of children under one year of age in the peri-urban area of the district is 150, then the coverage with Penta3 will be 68%.

$$\text{Unimmunized in population (e)} = \text{Target population (b)} - \text{Immunized children in target age group (c)}$$

or

$$\text{Unimmunized in population (e)} = \text{Target population (b)} - [\text{Target population (b)} \times \text{coverage in target age group (d)}]$$

Name of catchment area	Population under one year of age	Penta3			Measles		
		Number of children immunized with Penta3	Coverage %	Number of unimmunized children with Penta3	Number of children immunized with measles	Coverage %	Number of unimmunized children with measles
a	b	c	d	e	f	g	h
Peri-urban	150	102	68	48	73	49	77
Area 2	100	52	52	48	45	45	55
Area 3	50	27	53	23	26	51	24
Area 4	100	86	86	14	85	85	15
Total	400	267	67	133	229	57	171

D. Calculating drop-out rates between Penta1 and Penta3 in children under one year of age

During the previous year, the health facilities in the peri-urban area of Ficticia district administered up to the month of August 91 doses of Penta1 and 76 doses of Penta3 to children under one year of age. The drop-out rate for the peri-urban area is as follows:

$$\text{Penta1-Penta3 drop-out} = \frac{91-76 \times 100}{91} = 16\%$$

If the drop-out rate is higher than 10%, health workers in the peri-urban area should conduct an assessment to determine the reasons for it.

Annex 4: Analysis of causes and solutions for an area with high drop-out rates and poor access

	Causes of problems associated with high drop-out rates and poor access	SOLUTIONS	
		With limited resources	With extra resources
Supply quality	Vaccine delivered with short shelf-life Refrigerator old, needs replacing	Inform supervisor to ensure better supply of vaccine Improve maintenance of equipment	New refrigerator
Supply quantity	Frequent stock-out Not enough safety boxes Not enough diluent	Better local forecasting of needs and demand Contact supervisor to ensure supply of sufficient safety boxes Contact supervisor to ensure that diluent is always shipped together with vaccines in sufficient quantities	
Staffing quality	Staff not all trained on use of VVM Some trained with vaccine introduction	District supervisors to provide on-the-job training Use OPV campaign planning to conduct VVM training	Organize a formal short-term training seminar/course on EPI
Staffing quantity	One health worker left last month, not yet replaced	Arrange a back-up by another health worker from the same facility after their training in EPI	Recruit replacement
Service quality and demand	Few mothers attend antenatal care TT coverage is low Many mothers lose baby books	Promote the value of antenatal care visit during all contacts Keep complete records at health centre and take these during outreach	Conduct focus group discussions Organize SNIDs to raise TT2+ coverage
Service quantity and demand	Unable to do outreach during rainy season Some outreach sessions poorly attended	Discuss with community best days for sessions	Need use of a 4x4 vehicle for outreach visits

Annex 5: Workplan for outreach and other special activities at community level

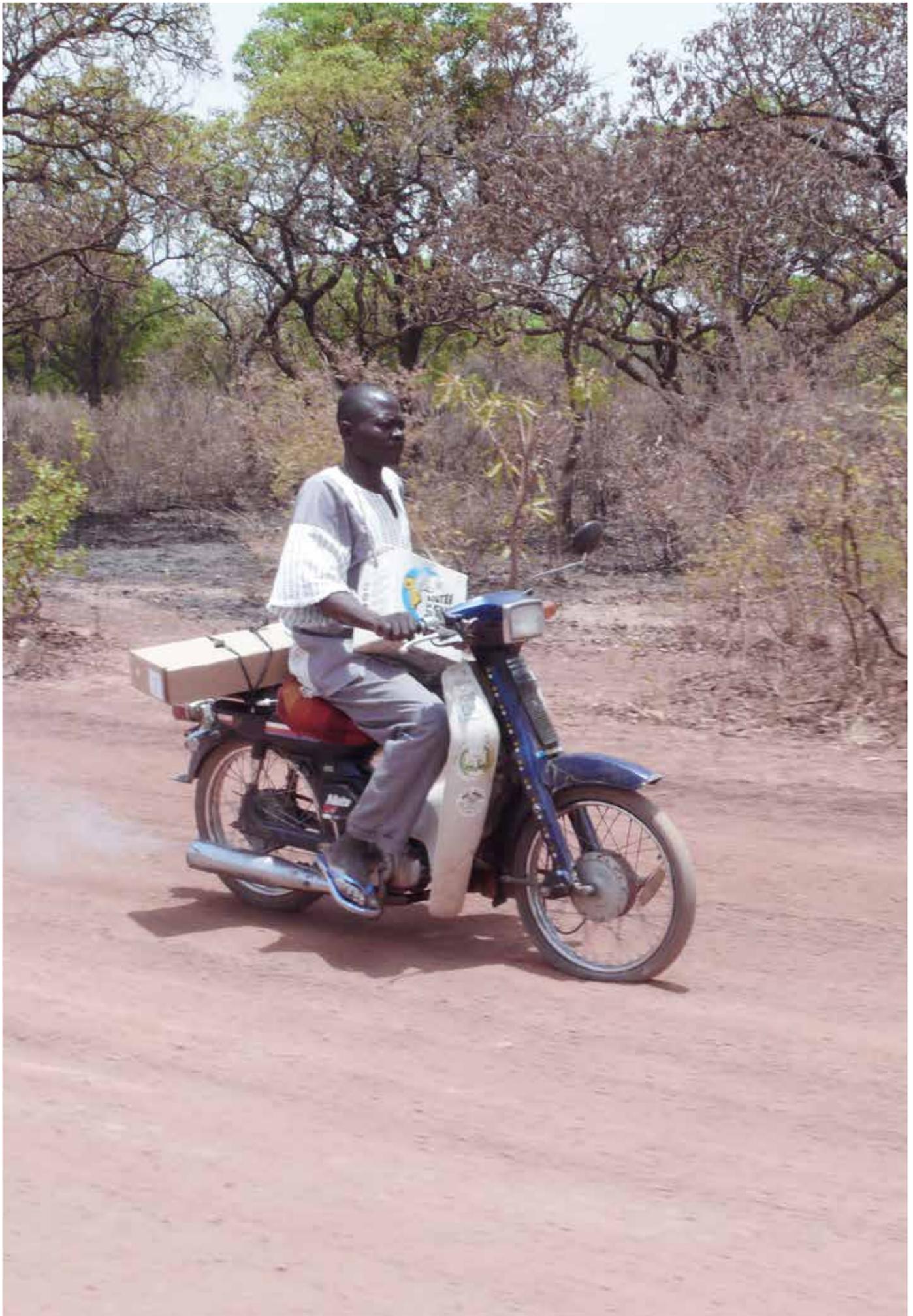
Community	Type of the activity (e.g. outreach or other special interventions)	Planned date		Responsible person	Resource needs			Remarks
		Start	End		Transport	Funds	Other (specify)	
1.	2nd outreach	4 May	4 May	Mrs V	Yes	Per diem (3 days)	Stationery Posters Vaccines Diluents	Jointly with IMCI team
2.	Social mobilization	15 Jun	15 Jun	Mrs B Ms C	Public bus	No	Posters Vaccine Samples	EPI manager with health education unit staff
3.	1st outreach	12 Jun	12 Jun	Mrs V	Private car	No	Posters Pamphlets Vaccines Diluents Syringes safety box	Community already informed in mid-May
3.	2nd outreach	14 Jul	14 Jul	Mrs V	Yes	No	Same as above	See first the community leader
3.	3rd outreach	15 Aug	15 Aug	Mrs V	Yes	No	Same as above	Same as above
4.	Focus group discussion	4 Jul	4 Jul	Mrs B	Public bus	Per diem (1 day)	Questionnaires for group members	Hold the discussion on 5 July morning
5.	Supervision	8 Sep	9 Sep	Mr G	Public bus	Per diem (1 day)	Questionnaire Policy document	Check implementation of previous recommendations

Annex 6: Workplan for increasing coverage by strategy and type of activity

District: Bangoba

Year: 2016

No.	Activities	Where?	Who is responsible?	When?		Resources		Remarks
				Start	End	Available	To raise	
A	Strategy 1: Training							
A1	Activity 1: Prepare training manual	MOH	Mrs C (EPI manager)	Jan	Apr	US\$ 4000 (WHO)		Consultant identified by WHO
A2	Activity 2: Testing the EPI manual (1st course)	District N	Ms L (focal point for training)	4 May	8 May	US\$ 1500 (MOH)		Invite two people from Bangoba
A3	Activity 3: On the job training	Health centres B, F & K	Mrs C/Ms L	15 May	18 May	US\$ 250 (MOH)		Ensure availability of EPI focal person
A4	Activity 4: Training courses	Bangoba and three other health centres	Mrs C/Ms L	12 Jun	8 Jul	No	US\$ 8500 (Rotary)	Arrange resource mobilization meeting with Rotary
A5	Activity 5: Evaluation of training activities	Whole district	Mrs C/Ms L	5 Sep	18 Sep	US\$ 800 (MOH)	US\$ 1200 (WHO)	Funds included in WHO budget
A6	Sub-total Strategy 1					US\$ 6550	US\$ 9700	
B	Strategy 2: Cold chain							
B1	Activity 1: Replace vaccine fridge in health centre facility	Health centre	Mr D (cold chain officer)	Mar	Apr	No	US\$ 1500 (UNICEF)	Visit UNICEF representative
B2	Activity 2: Review temperature monitoring in three health centres	Health centres: A, F & W	Mr D	May	Jun	US\$ 150 (MOH)		Discuss reports with Mr D
B3	Activity 3: Introduce "fast chain" in district B	Bangoba	Mrs C and Mr D	Jul	Oct		US\$ 2000 (UNICEF) US\$ 1200 (UK)	Start as a test then expand if good results obtained
B4	Activity 4: Send Mr J to repair the vaccine fridge	Provincial	Mr D	1 Aug	15 Aug		US\$ 750 (WHO) US\$ 750 (UNICEF)	Verify dates before sending Mr J
B5	Activity: 5: Obtain fuel for fridges	Health centre	Mr D	Jan	Dec	US\$ 200 (MOH)		Routine activity
B6	Sub-total Strategy 2					US\$ 350	US\$ 6200	





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