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Ministry of Health
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Government of India
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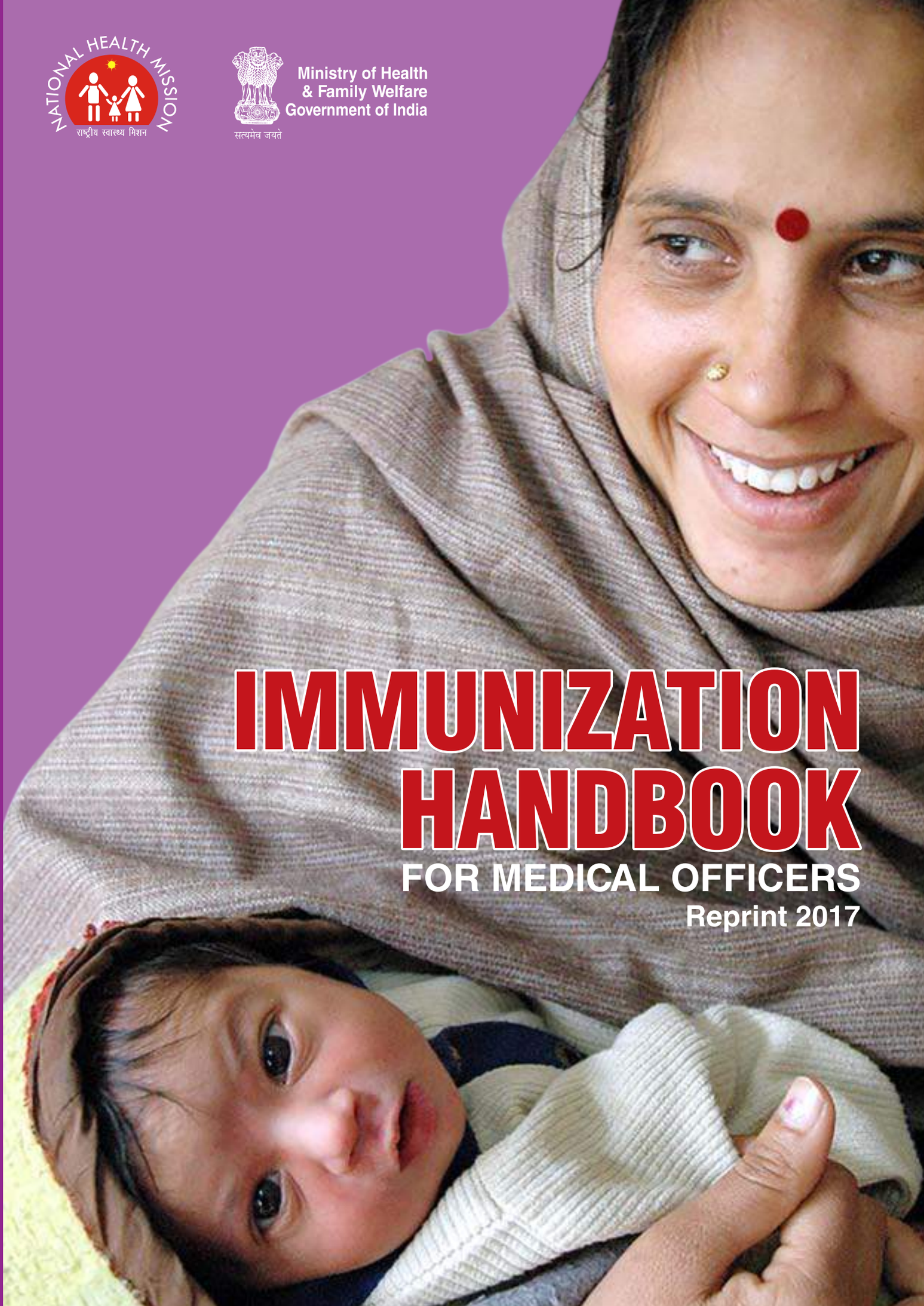

IMMUNIZATION HANDBOOK

FOR MEDICAL OFFICERS

Reprint 2017

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Ministry of Health & Family Welfare
Government of India

Hkku iirki 'kekl fpo
B.P. SHARMA
Secretary

भारत सरकार
स्वास्थ्य एवं परिवार कल्याण विभाग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Government of India
Department of Health and Family Welfare
Ministry of Health & FamilyWelfare

MESSAGE

Two monumental public health milestones have been achieved recently with India completing five years of being Polio free and the WHO certification of India having eliminated Maternal and Neonatal Tetanus. I commend the hard work and commitment of medical officers and all health workers on achieving these commendable milestones.

The Universal Immunization Program has grown from strength to strength over the years and has also responded to the public health challenges across the country. With an attempt to bridge the gap in immunization, Mission Indradhanush has made tremendous gains towards this goal. This special countrywide initiative has been successful mainly due the unstinted support and active involvement of the state governments, health staff at all levels, partner agencies and other stakeholders.

While Mission Indradhanush has resulted in immediate gains, it is imperative that the routine immunization planning and delivery mechanism are also strengthened. This will build up sustainable capacity to ensure that every single pregnant woman and child are immunized, thus preventing the avoidable loss of precious lives and the burden of health care costs.

The Immunization Handbook 2016 will provide guidance to the officers in the field and prove to be a source of reference to support their efforts to provide quality immunization services. I congratulate the Immunization Division of the Ministry of Health and Family Welfare and the partner agencies who have contributed to bringing out this important document.

(B.P. Sharma)

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FOREWORD

Routine Immunization (RI) is a nation's strategic investment in its future. India's routine immunization program is dynamic and over the years has evolved to address the changing public health needs of the county.

Tremendous gains have been made in immunization coverage in a country where challenges reflect accessibility, acceptability and availability issues. The medical officers and health workers of the health system delivering the RI program continue to be the backbone and strength in preventing morbidity and mortality from Vaccine Preventable Diseases (VPDs).

Since the printing of the last edition of the RI medical officers handbook, India and South East Asia have been certified Polio-Free and India has achieved the certification of having eliminated Maternal and Neonatal Tetanus. Both these achievements are the direct result of the RI program and attributed to the hard work and commitment of the frontline health workers, medical officers and program managers at all levels.

The Government of India continues to encourage and support all endeavours to strengthen and improve the capacity of the health workers to help them improve the quality of their work. The RI medical officer's handbook has been the guiding force providing the necessary knowledge and skills for the medical officers to be effective leaders of the immunization program.

With the introduction of newer vaccines, this revised Immunization handbook will play a critical role in the coming years. Its renewed focus on microplanning will provide the platform necessary to build a stronger base for ensuring immunization of all beneficiaries and prevent needless mortality and morbidity due to VPDs.

(C.K.Mishra)

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PREFACE

It gives me immense pleasure to present the revised Immunization Handbook for Medical Officers, 2016. This unique handbook has been the mainstay for Immunization-specific training of medical officers since 2006 and continues to contribute to improving the capacity of medical officers to lead their teams in increasing the reach and quality of the routine immunization program in the country.

Improving equity and quality of service is a goal that is achievable by using techniques to strengthen systems, build capacity of health staff and ensure the confidence of the community in the services provided.

While the existing infrastructure of manpower and material continues to be effective, it is necessary to focus on enhanced efficiency through systematic development of micro plans and management of immunization services. Towards this aim, the unit on microplanning has been enhanced with a detailed description of the process and formats needed for developing and maintaining high quality RI microplans and beneficiary due lists. The unit on high risk populations and urban areas defines such areas as well as describes area demarcation and identification of vulnerable populations with the objective of ensuring that beneficiaries in such areas are less likely to be missed. This will make medical officers and health workers to bring about equity of services.

The units on cold chain, supervision and monitoring, and use of data will improve the capacity of medical officers to interpret data, better manage storage and handling of vaccines, and provide supportive supervision to health staff at the field level. As team leaders, medical officers will benefit from the unit on capacity building which provides agendas as well as the key messages to be disseminated during trainings and review meetings. This will contribute to enhancing knowledge and skill of frontline health workers, which in turn will improve the quality of services.

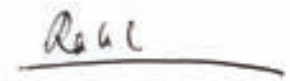
The success of the routine immunization program is also influenced by the confidence the community holds in the services. Safety of injections administered as well as safety of health staff is detailed

in the unit on safe injections and waste management which will help to build staff and community confidence. The unit on communication for behavior change focuses on how to strategically use information as well as innovative methods to tackle vaccine hesitancy and bring in community support for the program.

Surveillance for Vaccine Preventable Diseases (VPD) and Adverse Events Following Immunization (AEFI) are critical to the immunization program as timely investigation will provide information for program managers and field staff to address community concerns. The units on VPDs and AEFI are aimed to sensitize readers to the importance of timely reporting with reference to the operational guidelines.

With the introduction of newer vaccines such as Inactivated Polio Vaccine (IPV), Rotavirus vaccine and Pneumococcal vaccine (PCV), it is an opportune time to regularly review immunization services in order to identify gaps and determine local actions necessary to address them. These activities well ensure rational use of manpower and logistics thus strengthening systems and reducing avoidable wastage of valuable vaccines.

I am confident that this edition of the Handbook will continue to be an effective guide for immunization training and a reference book for medical officers to address immunization issues in the field. I commend the efforts of all those who have contributed to making this a much valuable document.



(Dr. Rakesh Kumar)

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Message from Deputy Commissioner (Immunization)

With the success of Small Pox eradication, the Immunization programme was implemented in a more organized manner as Expanded Programme of Immunization (EPI) in 1978 targeting under 5 year children only in urban areas. In 1985 Immunization programme expanded as Universal Immunization Programme (UIP) with focus for under 1 year children, expansion of cold chain etc. The program reached every corner of the country in 1990 and now the program has become an integral part of India's public health infrastructure.

The last five years has seen a dramatic change in the landscape of routine immunization with new vaccines being introduced, the vaccination schedule for Measles and JE changed to 2 dose schedule, open vial policy implemented, strengthening of AEFI system etc. Implementation has been strengthened with capacity building of personnel as well as improvements in service delivery.

One of the key instruments for building capacity of medical officers has been the "Immunization handbook" which provides essential information, guidelines and exercises for skill development of medical officers.

The 3rd edition has grown in both size and content. This edition has been redesigned to serve two purposes, the first as the backbone for the three day MO immunization training and second as a reference for immunization in the field. All the information has been updated to reflect recent changes in policy and guidelines.

The Unit on microplanning has been rewritten to explain the step by step process of microplan development. This Unit includes GoI recommended RI formats at all levels from planning, head-counting and session due-listing at the sub-centre to consolidated formats for the PHC to give an overview of critical RI information on a single sheet. Efforts have been made to explain "how" each step is to be taken rather than what steps to take. Each format has its SOP sheet which explains each variable and how it is to be collected.

Three new Units have been included to cover capacity building, high-risk & urban areas and financial management. These critical areas have been included in response to the changing dynamics in demography, manpower and needs of the program.

References and links have been carefully selected from Government and WHO sites to enable the medical officers to access relevant guidelines and information needed to strengthen existing processes and improve outcomes.

I am certain that medical officers and the program will benefit from this edition of the immunization handbook.

(Dr. Pradeep Haldar)

Table of Contents

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Acronyms

AD	**Auto-Disable**
AEFI	**Adverse Event Following Immunization**
AES	**Acute Encephalitis Syndrome**
AFP	**Acute Flaccid Paralysis**
AHS	**Annual Health Survey**
ANM	**Auxiliary Nurse Midwife**
ANMTC	**ANM Training Centre**
ASHA	**Accredited Social Health Activist**
AVD	**Alternate Vaccine Delivery**
AWC	**Anganwadi Centre**
AWW	**Anganwadi Worker**
BCC	**Behaviour Change Communication**
BCG	**Bacillus Calmette-Guerin**
BDO	**Block Development Officer**
BEE	**Block Extension Educator**
BMO	**Block Medical Officer**
CBHI	**Central Bureau Of Health Intelligence**
CBO	**Community-Based Organization**
CBWTF	**Common Biomedical Waste Treatment Facility**
CCT	**Cold-Chain Technician**
CDPO	**Community Development Project Officer**
CES	**Coverage Evaluation Survey**
CHC	**Community Health Centre**
CMO	**Chief Medical Officer**
CPCB	**Central Pollution Control Board**
CPR	**Cardiopulmonary Resuscitation**
CSO	**Civil Service Organization**
CSSM	**Child Survival and Safe Motherhood**
CSU	**Central Surveillance Unit**
DF	**Deep Freezer**
DGHS	**Directorate General Of Health Services**
DIO	**District Immunization Officer**
DLHS	**District Level Health Survey**
DPT	**Diphtheria–Pertussis–Tetanus**
DTFI	**District Task Force For Immunization**

Dwpt	**Diphtheria, whole Cell Pertussis, Tetanus**
EC	**Executive Committee**
ECCVMC	**Effective Cold Chain Vaccine Management Course**
EDD	**Expected Date Of Delivery**
EEFO	**Early Expiry First Out**
EPI	**Expanded Programme On Immunization**
Evin	**Electronic Vaccine Intelligence Network**
EVM	**Effective Vaccine Management**
FAQ	**Frequently Asked Questions**
FIFO	**First in First Out**
fIPV	**Faractional Inactivated Polio Vaccine**
FLW	**Field Level Worker**
FMR	**Financial Management Report**
GFR	**General Financial Rules**
GMP	**Good Manufacturing Practice**
GMSD	**Government Medical Store Depot**
Goi	**Government of India**
GVAP	**Global Vaccine Action Plan**
Hep B	**Hepatitis B**
HHE	**Hypotonic, Hyporesponsive Episode**
Hib	**Haemophilus Influenzae Type B**
HMIS	**Health Management Information System**
HRA	**High-Risk Area**
HRG	**High-Risk Group**
HS	**Health Supervisor**
HW	**Health Worker**
IAP	**Indian Academy Of Paediatrics**
ICDS	**Integrated Child Development Services**
IDSP	**Integrated Disease Surveillance Project**
IEC	**Information, Education And Communication**
ILR	**Ice-Lined Refrigerator**
IM	**Intramuscular**
IPC	**Inter Personal Communication**
IPV	**Inactivated Polio Vaccine**
ISP	**Immunization Strengthening Project**
ITSU	**Immunization Technical Support Unit**
IV	**Intravenous**
JE	**Japanese Encephalitis**

LAV	**Live Attenuated Vaccine**
LHV	**Lady Health Visitor**
LMIS	**Logistics Management Information System**
LMP	**Last Menstrual Period**
LS	**Ladies Supervisor (ICDS)**
MCH	**Maternal and Child Health**
MCP	**Mother and Child Protection**
MCTS	**Mother and Child Tracking System**
MCUP	**Measles Catch-Up Programme**
MCV	**Measles Containing Vaccine**
MIS	**Management Information System**
MO	**Medical Officer**
Mohfw	**Ministry Of Health And Family Welfare**
MOIC	**Medical Officer In-Charge**
NCC	**National Cadet Corps**
NCCMIS	**National Cold Chain Management Information System**
NCCTC	**National Cold Chain Training Centre**
NCCVMRC	**National Cold Chain and Vaccine Management Resource Centre**
NFHS	**National Family Health Survey**
NGO	**Non-governmental Organization**
NHM	**National Health Mission**
NIHFW	**National Institute Of Health And Family Welfare**
NIS	**National Immunization Schedule**
NPSP	**National Polio Surveillance Project**
NRHM	**National Rural Health Mission**
NSS	**National Social Service**
NTAGI	**National Technical Advisory Group on Immunization**
OPV	**Oral Polio Vaccine**
Penta	**Pentavalent**
PHC	**Primary Health Centre**
PIP	**Program Implementation Plan**
PRI	**Panchayati Raj Institution**
PW	**Pregnant Woman**
RCH	**Reproductive and Child Health**
RI	**Routine Immunization**
RIM	**Routine Immunization Monitoring**
RIMS	**Routine Immunization Management System**
SAGE	**Strategic Advisory Group of Experts**

SBCC	**Social and Behavioural Change Communication**
SC	**Sub-Centre**
SEPIO	**State EPI Officer**
SHG	**Self-Help Group**
SMnet	**Social Mobilization network**
SMO	**Surveillance Medical Officer**
SOP	**Standard Operating Procedure**
SRS	**Sample Registration System**
SSU	**State Surveillance Unit**
STFI	**State Task Force For Immunization**
TBA	**Trained Birth Attendant**
TOT	**Training of Trainers**
RRT	**Rapid Response Team**
TSS	**Toxic Shock Syndrome**
TT	**Tetanus Toxoid**
UHC	**Urban Health Centre**
UIP	**Universal Immunization Programme**
UT	**Union Territory**
VAPP	**Vaccine Associated Paralytic Poliomyelitis**
VCCH	**Vaccine and Cold Chain Handler**
VCCM	**Vaccine and Cold Chain Manager**
VDPV	**Vaccine Derived Polio Virus**
VHND	**Village Health and Nutrition Day**
VHSC	**Village Health and Sanitation Committee**
VPD	**Vaccine Preventable Disease**
VVM	**Vaccine Vial Monitor**
WCO India	**WHO Country Office for India**
WHO	**World Health Organization**
WIC	**Walk-In Cooler**
WIF	**Walk-In Freezer**
WMF	**Wastage Multiplication Factor**
WPV	**Wild Polio Virus**

UNIT-1

Introduction to immunization and role of medical officers in immunization

Learning objectives

- *Explain the milestones in the immunization programme in India*
- *Describe the recent initiatives by Government of India (GoI) to strengthen routine immunization (RI)*
- *List the objectives of the Universal Immunization Programme (UIP)*
- *List the responsibilities of medical officers (MOs) in routine immunization.*

Key Contents

Introduction including role of medical officers in immunization

1

One of the greatest impacts on the health of mankind has been the use of vaccines. From as far back as 496 B.C. when the Greek historian Thucydides observed that those who survived small pox would never get re-infected to 1796 with Edward Jenner's historic cowpox experiment, vaccination has played a major role in the battle on infectious diseases.

Since their acceptance as a public health intervention, vaccines have been instrumental in bringing about a reduction of morbidity and mortality due to vaccine preventable diseases globally. The eradication of smallpox was not only a global public health victory but also a turning point in public health strategy. The power of vaccines and vaccination was proven and thus began an all-out movement to target more diseases.

Vaccines in Routine Immunization (RI) are one of the most cost-effective health investments a country can make. Over the years various strategies to make vaccines universally available, including to the most hard-to-reach and vulnerable populations have saved countless lives.

The benefits to the individual include not only the prevention of disease and disabilities but also the opportunity for a healthier and a more productive life.

The year 2014 marked 40 years since the launch of the Expanded Programme on Immunization (EPI) in 1974. The 27th World Health Assembly (1974) recommended the use of vaccines to protect against six diseases: tuberculosis, diphtheria, tetanus, pertussis measles and poliomyelitis. This program was the starting point for a dramatic change in world's public health strategy.

Today, all countries have national immunization programs, and in most developing countries, children under five years of age are immunized with the standard WHO recommended vaccines that protect against– tuberculosis, diphtheria, tetanus (including neonatal tetanus through immunization of mothers), pertussis, polio, measles, hepatitis B, Haemophilus influenza type b (Hib), Rota Virus and Pneumococcal Vaccines. These vaccines prevent more than 2.5 million child deaths each year.

In May 2012 the 65th World Health Assembly endorsed The Global Vaccine Action Plan (GVAP), which envisages provision of universal access to immunization. The mission goal is to improve health by 2020 and beyond, by extending the full benefits of immunization to all people, regardless of where they are born, who they are, or where they live.

The immunization programme in India – a chronology

The first vaccine to be introduced in India was BCG in 1962 as part of the National Tuberculosis Programme. Over the years, various new vaccines have been introduced and many milestones achieved. Table 1.1 gives a chronological listing of some important milestones in India's immunization programme.

Table 1.1. Immunization milestones – India

1978	Expanded Programme of immunization BCG,DPT,OPV, typhoid (urban areas)
1983	TT vaccine for pregnant women
1985	Universal Immunization Programme – measles added, typhoid removed, Focus on children less than 1yr of age
1990	Vitamin-A supplementation
1995	Polio National Immunization Days
1997	VVM introduced on vaccines in UIP
2002	Hep B introduced as pilot in 33 districts & cities of 10 states
2005	• National Rural Health Mission Launched • Auto Disable (AD) Syringes introduced into UIP
2006	JE vaccine introduced after campaigns in endemic districts
2007-8	Hep B expanded to all districts in 10 states & schedule revised to 4 doses from 3 doses
2010	Measles 2nd dose introduced in RI and MCUP (14 states)
2011	• Hepatitis B universalized and Haemophilus influenza type b introduced as pentavalent in 2 states • Open Vial Policy for vaccines in UIP
2013	• Pentavalent expanded to 9 states • Second dose of JE vaccine
2014	India and South East Asia Region certified POLIO- FREE
2015	• India validated for Maternal and Neonatal Tetanus elimination • Pentavalent expanded to all states • IPV Introduced
2016	• Rotavirus vaccine introduced in 4 states in Phase 1 • tOPV to bOPV Switch • Switch to fractional IPV (Phased) • Rotavirus vaccine introduced (Phased launch)
2017	• MR Vaccine introduced • PCV (Phased launch) • Use of adrenaline IM by ANM in AEFI

In 1985 the program was changed to Universal Immunization Programme (UIP) and Measles vaccine was added in the same year.

India's UIP was given the status of one of the five 'National Technology Missions' in 1986 thus bringing it under the purview of the 20 point program of the Prime Minister's Office. In 1992, UIP and the Safe Motherhood program merged under the umbrella of the Child Survival and Safe Motherhood (CSSM) program. Further in 1997 the program was renamed as the Reproductive and Child Health (RCH) program.

In 2005, along with other programs the UIP became part of the National Rural Health Mission. Below are some of the Initiatives undertaken by the government under NRHM (2005) to strengthen the immunization program:

- introduction of Auto Disable (AD) syringes and hub cutters;
- financial support for alternate vaccine delivery to session sites from the last vaccine storage point;
- mobility support to State and District Immunization Officers and other supervisory staff;
- alternate vaccinators for sessions in urban slums and under-served areas, including vacant SCs;
- mobilization of children and pregnant women by ASHAs;
- preparing microplans for SC, PHC/CHC and district;
- quarterly RI review meetings at state, district and block levels;
- training of HWs, MOs, cold chain and data handlers;
- computer assistants for every district and at state;
- decentralized printing of recording, reporting and monitoring tools (e.g. Immunization cards, monitoring charts, tracking bags, temperature charts);
- injection safety (red and black bags, bleach solution and twin buckets);
- strengthening cold chain maintenance and expansion;
- strengthening vaccine delivery from state to district to the PHC/CHC.

GOI declared the year 2012-13 as the "Year of intensification of routine immunization". During this phase various strategic actions were initiated towards Health systems improvement such as increased funding for supportive supervision and mobilization of beneficiaries. Regular program reviews were conducted at all levels and Special Immunization weeks were conducted in four rounds. The year also saw the introduction of the web based mother and child tracking system (MCTS) with the objective of preventing left out and drop outs.

Towards strengthening Adverse Event Following Immunization (AEFI) surveillance mechanism, activities such as establishing a national AEFI Secretariat, collaboration with medical colleges for technical and research assistance, involvement of the WHO-NPSP SMO network, revision of the guidelines in tune with global guidelines and capacity building across the country were taken up.

To ensure vaccine safety and effective cold chain management, the National cold chain management information system (NCCMIS) was established to track the functioning of cold chain equipment across the country. A National Effective Vaccine Management (EVM) assessment was also conducted to identify issues and provide solutions to strengthen cold chain and vaccine management.

Mission Indradhanush

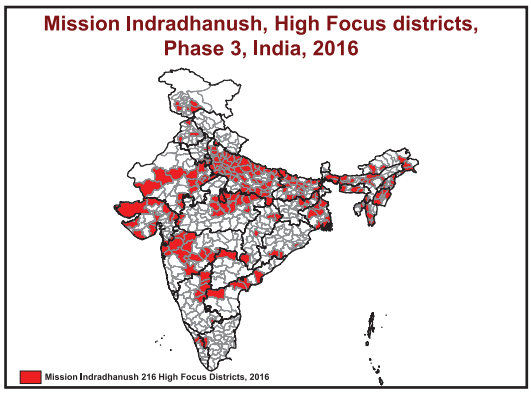
As a strategic endeavor, the Ministry of Health & Family Welfare (MoHFW), Government of India, launched Mission Indradhanush in December 2014.

The Mission focuses on interventions to improve full immunization coverage for children in India from 65% in 2014 to at least 90% over the next five years through special catch-up drives.

Four states – Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh – account for 82 of the 201 high-focus districts and nearly 25% of the unvaccinated or partially vaccinated children.

Based on prioritization, the country has been categorized into high, medium and low focus districts. Phase I of Mission Indradhanush targeted 201 high-focus districts, with four rounds of activity between April and July 2015. Phase II targeted 352 districts (73 districts repeated from phase I) with four rounds of activity between October 2015 and January 2016.

Figure 1.3- Map showing High/medium focus districts in Mission Indradhanush



During these two phases of Mission Indradhanush more than 3.7 million children were fully immunized and about 3.7 million pregnant women. Phase III of MI in 2016 will reach out to 216 high focus districts across 27 states/union territories.

The broad strategy includes four basic elements: -

1. Ensure revision of micro plans in all blocks and urban areas in each district to ensure availability of sufficient vaccinators and all vaccines during routine immunization sessions. Develop special plans to reach the unreached children in more than 400,000 high risk pockets such as urban slums, construction sites, brick kilns, nomadic sites and hard to reach areas.
2. Increase awareness and demand for immunization services by intensive communication efforts to deliver improved community participation.
3. Intensive training of the frontline workers to build the capacity of these workers for quality immunization services.
4. Ensure engagement and accountability of district administrative and health machinery for implementation of this operation by strengthening district task force meetings.

Integration with the polio programme in the following areas:

- Approximately 400 000 high-risk areas identified as a part of emergency preparedness and response plan for polio eradication, linked to RI session sites to ensure RI services;
- State Task Forces for Immunization (STFIs) and District Task Forces for Immunization (DTFIs) constituted;
- Integrated communication with branding and logo for communication;
- Realigning monitoring strategy to generate actionable data and intensified RI monitoring started by hiring and training external monitors in priority states at the sub-district level;
- UIP reviews integrated with acute flaccid paralysis (AFP) surveillance reviews;
- Intensified and focused training of all ANMs, AWWs and ASHAs in 9 priority states to track children missed for immunization with support by WHO Country Office for India (WCO-India).

The immunization program in India – facts and impact

UIP is one of the largest immunization programs in the world on the basis of quantities of vaccine used, number of beneficiaries, number of immunization sessions organized, geographical spread and diversity of areas covered.

The Universal Immunization Program targets to vaccinate nearly 27 million newborn each year with all primary doses and an additional ~100 million children of 1- 5 year age with booster doses. In addition, nearly 30 million pregnant mothers are targeted for TT vaccination each year.

- To vaccinate this cohort of 156 million beneficiaries, ~9 million immunization sessions are conducted.
- To ensure potent and safe vaccines are delivered to children, a network of ~27000 cold chain points have been created across the country where vaccines are stored at recommended temperatures
- As per Coverage Evaluation Survey (2009), 91% of vaccination in India was provided through Public sector while the private sector accounted for 9%. The survey also indentified the location of vaccination in the public sector at the following sites:
    - Fixed sites PHC/CHC/Govt Hospital – 37%
    - Sub center- 19%,
    - Outreach session held at Anganwadi center–26%
    - Outreach session at any place in the village – 9%

The frontline health workers i.e. ASHA's, AWW and link workers play a critical role in the process by mobilizing beneficiaries to the RI session sites.

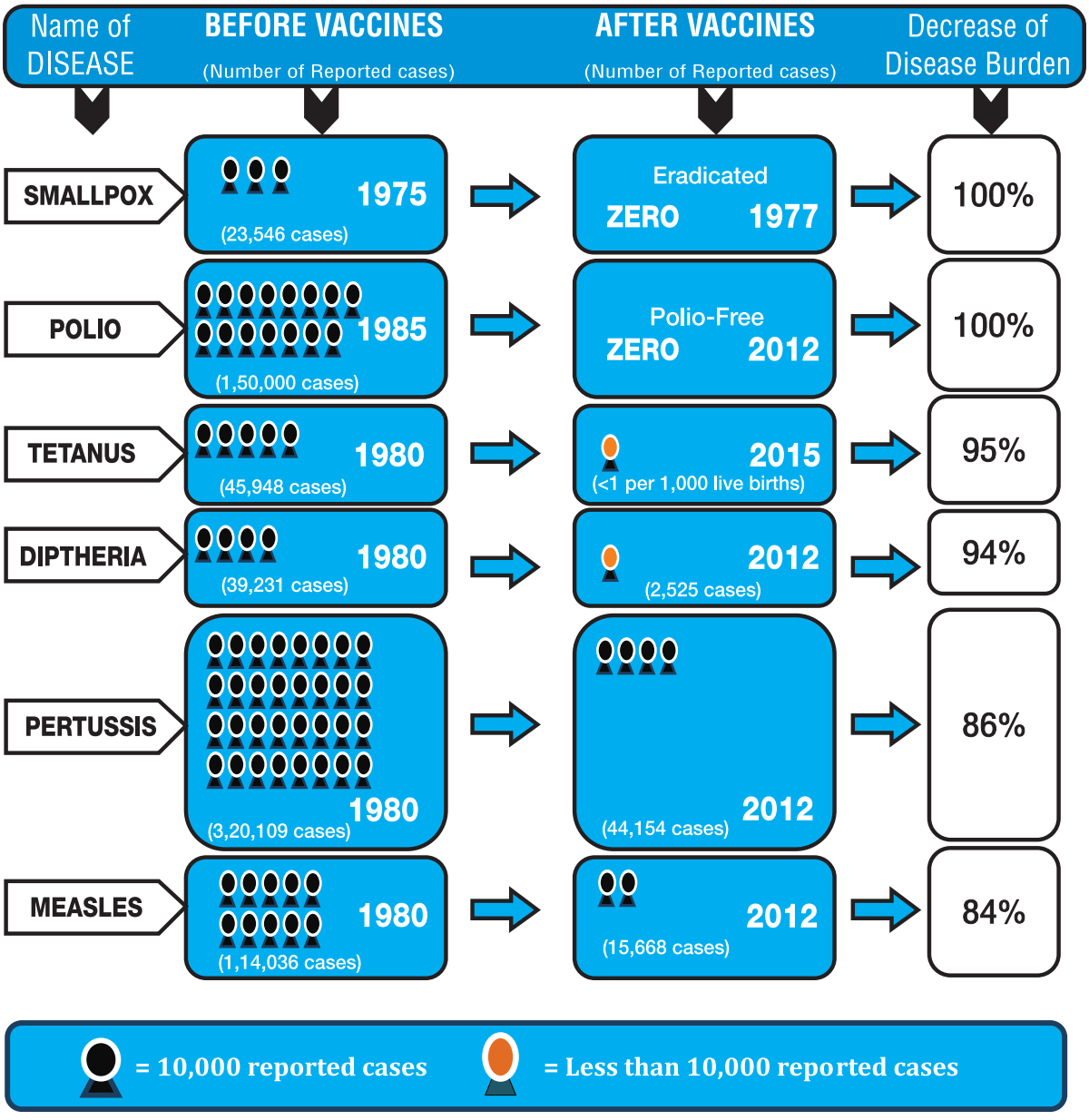
The objectives of UIP are to:

- rapidly increase immunization coverage
- improve the quality of services
- establish a reliable cold chain system up to the health facility level
- introduce a district-wise system for monitoring of performance
- achieve self-sufficiency in vaccine production

INDIA-Public health landmarks

Impact of vaccines in India

The public health use of vaccines in India has had an impressive impact on the morbidity and mortality of Vaccine Preventavle Diseases (VPDs). Various studies and surveys over the years have quantified these changes. The infographic below demonstrates the successes but also reminds us of the need to increase our efforts to further strengthen and sustain RI.



Adapted from Johns Hopkins IVAC.

Improving routine immunization coverage

Improving RI coverage involves an understanding of the factors that impact each process or activity. Many opportunities arise to gather information or data that reflect the various components of the immunization delivery mechanism, such as availability of manpower, finances, communication or vaccine and logistics.

During the RI microplanning strengthening workshops, participants (MOs) were encouraged to identify factors based on their field experiences. Some of the important issues identified by them as having a direct bearing on RI coverage were:

- *Health services*– timely dispersal of funds, vacant SCs, weak tracking of children, fixed timing of sessions, quality of service provided;
- *Planning* – weak or absent RI microplans, absence of validation of areas, difficulties in urban areas planning;
- *Health financing* – delayed incentive payments, project implementation plan (PIP) release and alternate vaccine delivery (AVD) payments;
- *Programme leadership* – supervision by MOs, involvement of MOs in RI microplanning, involvement of other departments like Integrated Child Development Services (ICDS) and urban bodies;
- *Policy related* – delays in receiving guidelines;
- *Human Resources*- vacancies of ANMs and doctors, irrational distribution of ANMs;
- *Training* – regular training of manpower, refresher training, quality of training, availability of trainers;
- *Vaccine and logistics* – vaccine requirement calculations, vaccine shortages, vaccine wastage, maintenance of stock register;
- *Health information* – availability of IEC material, session site communication, interpersonal communication skills.

In addition to the above, geographical and social factors also play an important role. Coverage evaluation surveys continue to identify differences as shown in Figs. 1.4 and 1.5.

***Utilize opportunities such as block level meetings, review meetings and field visits to discuss with your staff and identify similar factors*.**

Figure 1.4 – Differences in vaccine coverage across geography, caste and wealth status – CES 2009

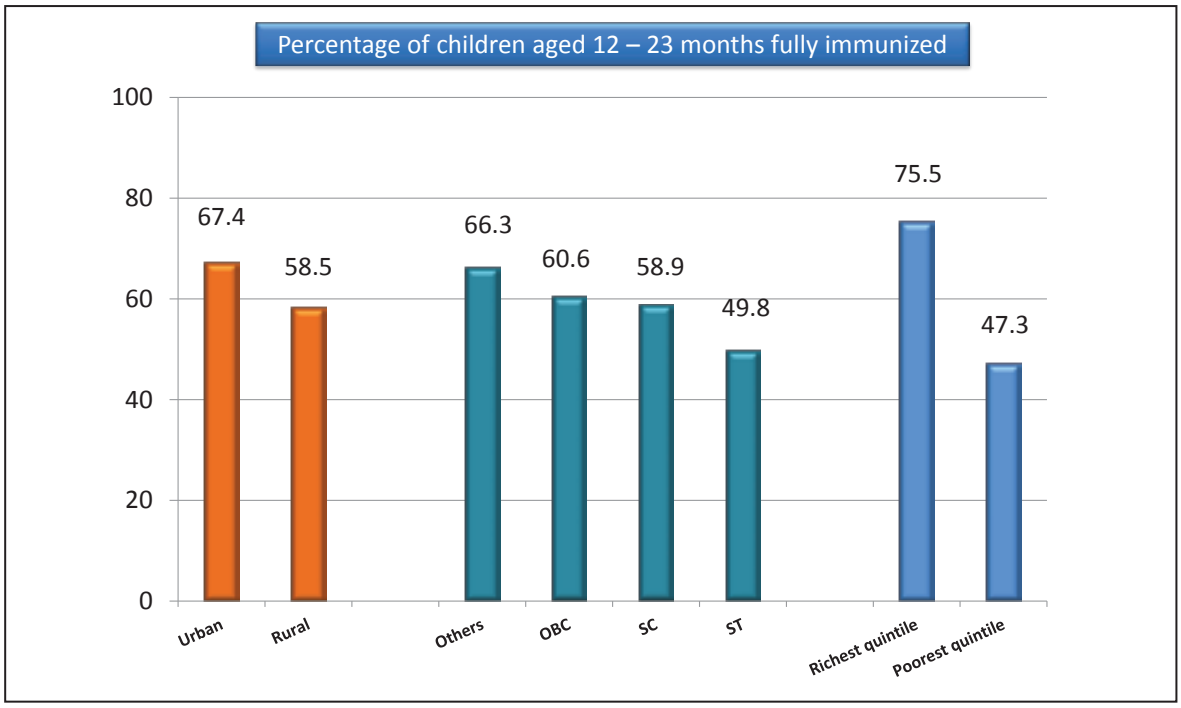
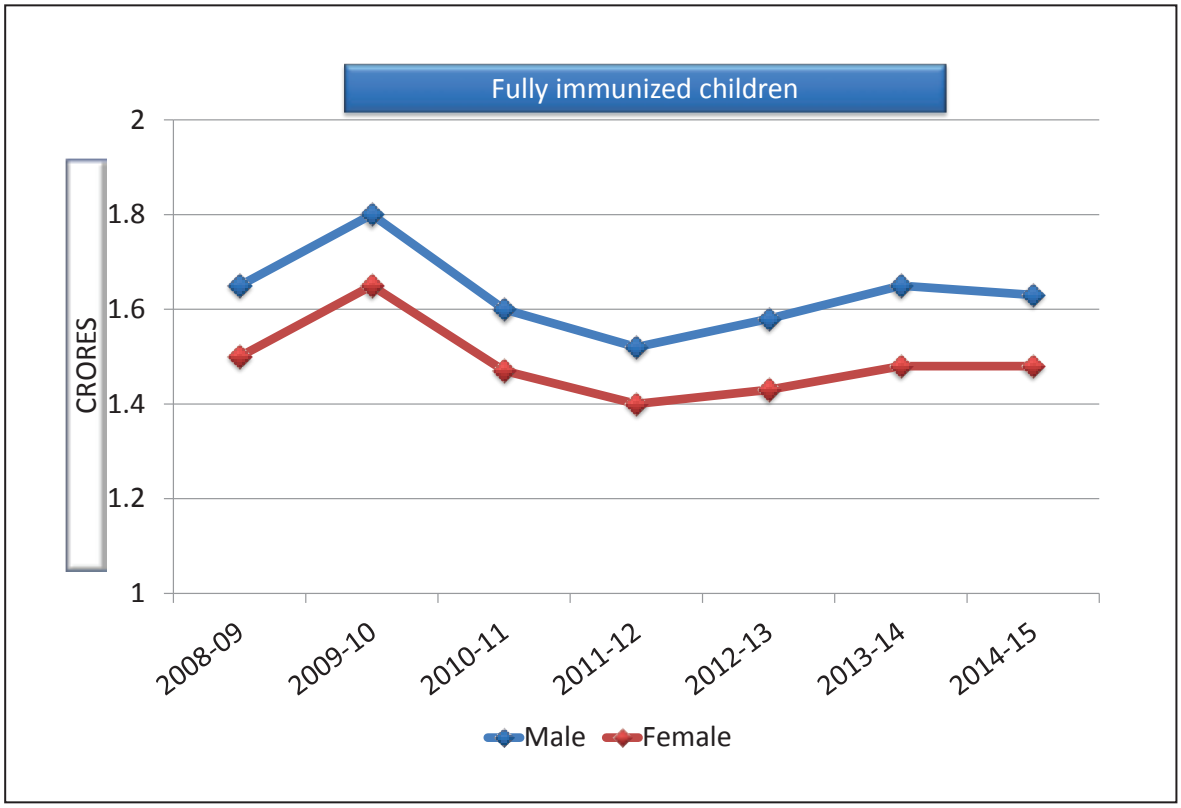


Figure 1.5- Gender differences in vaccine coverage – HMIS



The data in Fig 1.4 and 1.5 shows differences in coverage between rural/urban areas, within socio-economic strata and even in gender. Why do these differences exist? Is it because of accessibility, awareness, acceptability or health seeking behaviour? Analyzing the available data at planning unit level can help to identify the issues and answers to these questions as well as guide you to find practical local solutions through dialogue.

There is no "panacea" or "cure all" to address these differences. We must constantly be aware that gaps exist and all attempts should be made to close these gaps by finding practical local solutions which target the contributing factors.

If information or data to identify these differences is not readily available, you can explore the utilization of information from other departments such as – census data, land records information for list of areas, election department area listing, Department of social welfare or women and child development, NGOs etc. Another important and real-time source of data is RI monitoring (session and house to house) which can be used even though this may not have a large sample size, it is indicative of issues and can be used locally to initiate measures to close these gaps.

New vaccine introduction

The GoI is vigilant to the changing public health needs of the country and continues to be responsive to the epidemiology of VPDs and actively spearheads introduction of newer vaccines that will have an impact in reducing morbidity and mortality from these VPDs. The commitment to introducing newer vaccines is stated under the key objective 4 of the cMYP 2013-2017 - "Introduce and expand the use of new and underutilized vaccines and technology in UIP".

The successful elimination of polio and the polio free certification of India and SEARO on 27th March, 2014 is a public health milestone which is a credit for the entire health workforce. India's commitment to a world free of polio is reiterated by the introduction of IPV as an additional dose along with OPV on 30th November, 2016.

The globally synchronized switch from the use of tOPV to bOPV was done in April 2016 and all activities to ensure a smooth switch across India were successful.

Rotavirus vaccine has been approved by the GoI for inclusion in to the UIP with the phase 1 launch of the vaccine in 4 states (Himachal Pradesh, Odisha, Andhra Pradesh and Haryana) in February, 2016.

Rubella vaccine has been approved for introduction as MR vaccine, thus replacing the measles containing vaccine first dose (MCV1) at 9 months and second dose (MCV2) at 16-24 months.

To address the burden of pneumococcal diseases such as bacterial pneumonia, meningitis and sepsis in children, Pneumococcal Conjugate Vaccine has been approved by the NTAGI for introduction in UIP.

These introductions provide opportunities for strengthening systems and personnel through the introduction preparedness evaluations and trainings which will be conducted prior to the launching of each of these vaccines.

-Globally there are many vaccines available for use in public health programs. Presently there are vaccines for more than 25 diseases.

-Research on newer vaccines continues across the world and these vaccines are called " Pipeline vaccines".

For details and listing go to:
http://www.who.int/immunization/diseases/en/

Responsibilities of medical officers in immunization programme management

Planning and review

- Develop comprehensive **action plan to improve routine immunization.**
- Conduct **review of the immunization program** at block level. **(Refer Unit- 8)**
- **Prioritize** sub centres/areas after data analysis (quantitative and qualitative) and identify areas for additional support and interventions.
- **Conduct Block Task Force – Immunization meetings with all stakeholders**
- **Prepare RI-Microplan** for the next year including map, plan for alternate vaccine delivery, supervision, social mobilization and waste disposal.**(Refer- Unit 3)**
- **Prepare annual plan** with budget corresponding to part C of PIP at block level in consultation with other stakeholders including field personnel involved in immunization. **(Refer Unit- 13)**

Implementation

- Guide the health workers to **analyse their data,** in order to observe coverage trends, identify bottlenecks/constraints and **prepare micro-plan.(Refer Unit-3 and 7)**
- Regularly review and update of **microplans, HRAs tagging** in RI-microplans and provision of immunization services. Regular feedback to health workers. **(Refer Unit-3)**
- Ensure updated technical and operational **guidelines** are available with all health workers, including guidelines for use of adrenaline IM in AEFI.
- **Respond to AFP/Measles/AEFI as per protocol.**

Maintaining beneficiary linelist at block level

- Ensure that health workers **conduct annual survey** to list all immunization beneficiaries and update this beneficiary list monthly. **(Refer Unit-3)**
- **Validate** during field visits sample lists to ensure completeness, correctness and regular updating. **Review ANMs RCH registers and guide them to ensure quality.**
- **Support the data handler** in compiling and maintaining the line list of beneficiaries with records of their successive vaccinations and analyze this list for program progress and intervention.

Supervision, monitoring and surveillance

- Ensure planned outreach sessions are implemented even if HW is on leave by making alternate arrangements.
- **Conduct field visits** as per the supervision plan; ensure visits of other supervisory personnel. **(Refer Unit-8)**
- **Analyze data** from various reports to identify issues for discussion during review meetings. **(Refer Unit-7)**
- **Review monthly sub-center surveillance reports** for completeness, accuracy, VPD and AEFI cases including AEFI block register and take appropriate action
- Organize **periodic review meetings** at sector and block level to review program performance and decide on course of action.
- Organize **inter-sectoral coordination meetings** at PHC to coordinate with ICDS, local village administration and NGOs
- Facilitate **capacity building of HWs** including the use of adrenaline IM in AEFI and support staff in immunization. **(Refer Unit-11)**
- **Ensure use of coverage monitoring chart, supervision checklist, tracking tools, etc.**

Cold chain and logistics management (refer Unit 4)

- **Guide and supervise the Vaccine and Cold Chain Handler** at the ILR point to effectively manage the cold chain and logistics. Refer Cold Chain Handlers Manual.
- Monitor **preventive maintenance** of cold chain equipment
- Ensure availability and use of standard stock register for maintaining vaccine and logistics
- Ensure that sufficient **vaccines and supplies are available** for all planned sessions
- Ensure **regular distribution** of vaccine and logistics to health workers at outreach session sites through **Alternate Vaccine Delivery (AVD) system**

- **Ensure practice of Open Vial Policy** and supervise closely
- Ensure regular NCCMIS entries
- Ensure **proper storage of returned vials** to prevent errors in use
- Ensure **availability and replenishment of AEFI kits. (Refer Unit-6)**
- Ensure availability and **use of job aids** at cold chain point

Community involvementand communication (refer Unit 9)

- Guide the development of a **communication plan**
- Support health workers in establishing regular dialogue with community (IPC)
- **Establish alliances with other programs** (e.g. ICDS) and organizations (e.g., NGOs) with community reach.
- **Meet community/Panchayat** leaders, teachers and volunteers on a regular basis; encourage them to discuss immunization in their meetings; share hand-outs with immunization information.
- In **urban areas** involve all Civil Service Organizations (CSOs) in RI. **(Refer Unit-12)**
- Get **feedback from the community** to ensure a high quality service.
- Use of RI invitation slips to mothers on the previous day to ensure attendance for RI sessions.
- Monitor **tracking of new-borns and dropouts** and ensure that due list is shared with ASHA and AWW. Check during field visits.

Financial management (refer Unit 13)

- Ensure the **timely release of funds.**
- **Keep record** of all funds received and expenditure incurred with vouchers under various heads.
- Monitor timely dispersal of funds at grass root level.
- Send the **statement of expenditure and utilization certificate** to the district.

Responsibilities of District Immunization Officers in Immunization programme management

Planning

- Guide medical officers in data analysis and attend meetings at block/PHC
- Oversee the **quarterly review of RI microplans** and provide feedback and solutions
- Ensure all identified **HRAs** (Including from Mission Indradhanush if applicable) are tagged / incorporated into RI microplans
- Organize **inter-sectoral coordination** meetings at district to coordinate with ICDS, local/Urban administration and NGOs
- Ensure tracking of newborns, dropouts and availability of session due lists.

Review

- Coordinate the **RI review meetings** at district level
- Participate in periodic review meetings at sector and block level to **review program performance** and decide course of action
- Provide feedback to district administration of issues through meetings **District Task Force – Immunization** and with state through state level meetings
- Review and respond to **feedback on immunization** activities from various agencies
- Provide regular feedback to CMO/DHO on immunization.

Supervision, monitoring and surveillance

- Develop a rational **supervision plan** for self and other district officials
- Conduct **field visits** as per the supervision plan; ensure visits of other supervisory personnel
- Conduct RI session site and House to house monitoring
- Respond to AFP/Measles/AEFI or any other outbreaks as per protocol.
- **Analyze data from all reports** to identify issues for discussion with MOs during district review meetings
- **Review monthly block/PHC reports** for completeness, accuracy, VPD and AEFI cases and take appropriate action. Review AEFI data to identify issues.
- **Ensure use** of coverage monitoring chart, supervision checklist, tracking bag and other tracking tools.

Cold chain and logistics management

- Regularly guide and supervise the Vaccine and Cold Chain Handler at the **district vaccine store**
- Monitor preventive maintenance of cold chain equipment at district and during field visits
- Ensure that sufficient vaccines and supplies are available for the district at all times
- Ensure **regular distribution** of vaccine and logistics to all blocks/PHCs and monitor use of **vaccine stock registers** at all levels
- Ensure availability and timely **replenishment of AEFI kits.**

Community involvement and communication

- Guide the development the **district communication plan**
- Establish **alliances with programs** (e.g. ICDS), Civil Service Organizations (CSOs)/ organizations (e.g., NGOs) with community reach
- **Meet community**/Panchayat leaders on a regular basis; encourage them to discuss immunization in their meetings; share immunization/monitoring information if required
- In interactions with community seek feedback on quality of RI services.

Training

- Facilitate capacity building of MOs and support staff in immunization.
- Guide MOs in data analysis.
- Facilitate organization of training for ANMs and ASHAs.
- Participate in district level ICDS trainings to sensitize them for their role in RI.

Financial management (refer Unit 13)

- Ensure the timely release of funds to the blocks/PHCs.
- Keep record of all funds received and expenditure incurred with vouchers under various heads.
- Effectively utilise mobility funds for monitoring and field visits
- Monitor timely dispersal of funds at grass root level.
- Send the statement of expenditure and utilization certificate to the state.

Notes:

UNIT-2

National Immunization Schedule

Learning objectives

- *List the diseases preventable by vaccination under the UIP*
- *Explain the vaccines given under the National Immunization Schedule*
- *Describe the dose, route, site and technique of administration of vaccines.*

National Immunization Schedule

2

Under the UIP, vaccines are provided to prevent the following VPDs:

- Diphtheria
- Pertussis
- Tetanus
- Polio
- Measles
- Tuberculosis
- Hepatitis B
- Haemophilus Influenzae Type B related diseases (bacterial meningitis, pneumonia and others)
- Japanese Encephalitis
- Encephalitis
- Diarrhoeas due to rotavirus
- Rubella
- Pneumococcal disease

The goal of Universal Immunization Programme is to reach out to the following beneficiaries:

Pregnant women
• **As early as possible** - appropriate TT doses
Infants & children
• **At birth** - HepB, BCG, OPV • **Before age 1 year - for Full Immunization** ▪ 3 doses of OPV, 3 doses of Rotavirus (where applicable), 3 doses of Pentavalent, 2 doses of fractional IPV, 3 doses of PCV (where applicable), MR vacccine -1st dose , JE 1st dose (where applicable) • **Before age 2 years - for Complete Immunization** ▪ MR vaccine - 2nd dose, DPT booster, Polio booster and JE 2nd dose (where applicable)

OPV – oral polio vaccine; BCG – bacillus Calmette-Guerin; Hep B – hepatitis B;

PCV – Pneumococcal Conjugate Vaccine

DPT – diphtheria–pertussis–tetanus

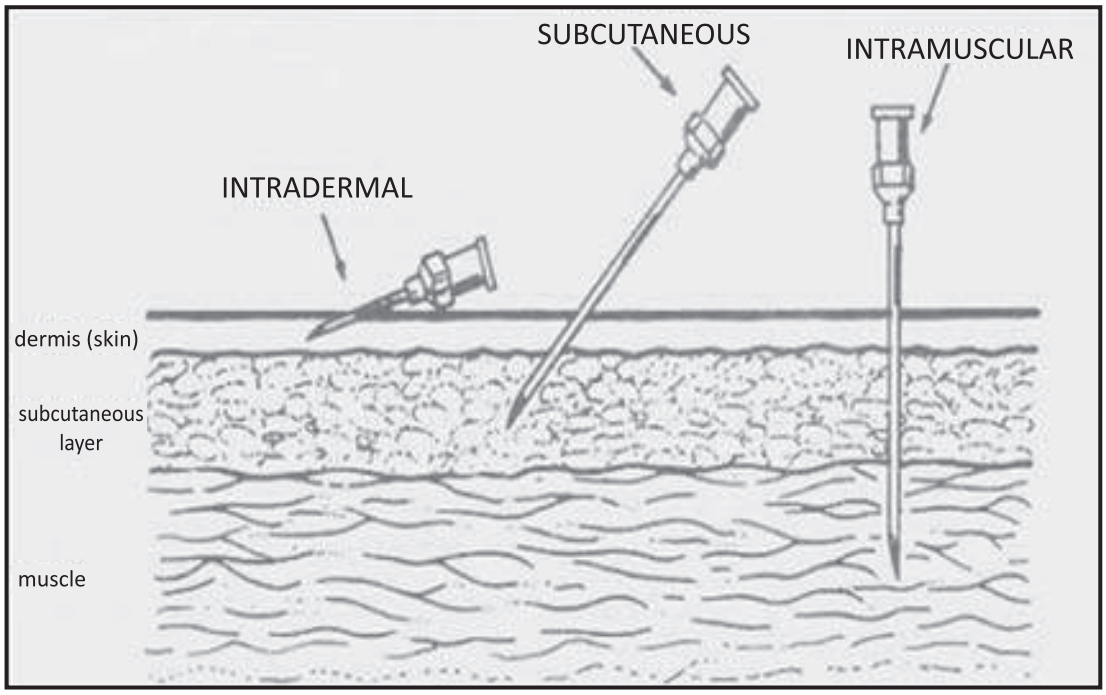


Fig. 2.1. Different needle positions for vaccine administration

National Immunization Schedule

Table 2.1. National Immunization Schedule for infants, children and pregnant women

Vaccine	Due age	Max age	Dose	Diluent	Route	Site
For Pregnant Women						
TT-1	Early in pregnancy	Give as early as possible in pregnancy	0.5 ml	NO	Intra-muscular	Upper Arm
TT-2*	4 weeks after TT-1*		0.5 ml	NO	Intra-muscular	Upper Arm
TT- Booster	If received 2 TT doses in a pregnancy within the last 3 years*		0.5 ml	NO	Intra-muscular	Upper Arm

Vaccine	Due age	Max age	Dose	Diluent	Route	Site
For Infants						
BCG	At birth	till one year of age	(0.05 ml until 1 month) 0.1ml Beyond age 1 month	YES Manufacturer supplied diluent (Sodium chloride)	Intra-dermal	Upper Arm - LEFT
Hepatitis B - Birth dose	At birth	within 24 hours	0.5 ml	NO	Intra-muscular	Antero-lateral side of mid-thigh - LEFT
OPV-0	At birth	within the first 15 days	2 drops	-	Oral	Oral
OPV 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks	till 5 years of age	2 drops	-	Oral	Oral
Pentavalent 1, 2 & 3** (Diphtheria+ Pertussis + Tetanus + Hepatitis B + Hib)	At 6 weeks, 10 weeks & 14 weeks**	1 year of age	0.5 ml	NO	Intra-muscular	Antero-lateral side of mid-thigh - LEFT
Fractional IPV (Inactivated Polio Vaccine)	At 6 & 14 weeks	1 year of age	0.1 ml	NO	Intra-dermal	Upper Arm - RIGHT
Rotavirus‡ (Where applicable)	At 6 weeks, 10 weeks & 14 weeks	1 year of age	5 drops	NO	Oral	Oral
Pneumococcal Conjugate Vaccine (PCV) (Where applicable)	At 6 weeks & 14 weeks At 9 completed months - booster	1 year of age	0.5 ml	NO	Intra-muscular	Antero-lateral side of mid-thigh - RIGHT
Measles / Rubella 1st dose ##	At 9 completed months-12 months.	5 years of age	0.5 ml	YES Manufacturer supplied diluent (Sterile water)	Sub-cutaneous	Upper Arm - RIGHT
Japanese Encephalitis – 1 @ (Where applicable)	At 9 months-12 months@	15 years of age	0.5 ml	YES - Manufacturer supplied diluent (Phosphate Buffer Solution)	Sub-cutaneous	Upper Arm - LEFT
Vitamin A (1st dose)	At 9 months	5 years of age (1 lakh IU)	1 ml	-	Oral	Oral

Vaccine	When to give	Max age	Dose	Diluent	Route	Site
For Children						
DPT Booster-1	16-24 months	7 years of age	0.5 ml	NO	Intra-muscular	Antero-lateral side of mid-thigh – LEFT
Measles / Rubella 2nd dose ##	16-24 months	5 years of age	0.5 ml	YES Manufacturer supplied diluent (Sterile water)	Sub-cutaneous	Upper Arm - RIGHT
OPV Booster	16-24 months	5 Years	2 drops	NO	Oral	Oral
Japanese Encephalitis – 2 @ (Where applicable)	16-24 months @	till 15 years of age	0.5 ml	YES Manufacturer supplied diluent (Phosphate Buffer Solution)	Sub-cutaneous	Upper Arm - LEFT
Vitamin A $ (2nd to 9th dose)	At 16 months. Then, one dose every 6 months.	up to the age of 5 years	2 ml (2 lakh IU)	-	Oral	Oral
DPT Booster-2	5-6 years	7 Years of age	0.5 ml	NO	Intra-muscular	Upper Arm
TT	10 years & 16 years	16 Years	0.5 ml	NO	Intra-muscular	Upper Arm

***** Give TT-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give TT to a woman in labour, if she has not previously received TT.

****** Pentavalent vaccine is introduced in place of DPT and HepB 1, 2 and 3.

‡ Rotavirus vaccine is being in troduced in phases.

MR vaccine introduced in phases replacing measles vaccine in the UIP schedule. **If first dose delayed beyond 12 months ensure minimum 1 month gap between 2 MR doses.**

@ JE Vaccine has been introduced in select endemic districts. **If first dose delayed beyond 12 months ensure minimum 3 months gap between 2 JE doses.**

$ The 2nd to 9th doses of Vitamin A can be administered to children 1-5 years old during biannual rounds, in collaboration with ICDS.

- Human Papilloma Virus (HPV) Vaccine – presently not in schedule.
- Td - Tetanus diphtheria to replace TT - to be added in schedule

The goal of UIP is to provide every child and pregnant woman protection from vaccine preventable diseases

UNIT-3

Routine Immunization Microplanning

Learning objectives

- *List the steps involved in developing RI microplans*
- *Describe the utility of formats in RI microplanning*
- *Guide HWs to prepare SC/urban health centre (UHC) microplans including maps*
- *Prepare microplan for block/PHC/urban planning unit*
- *Review and update the RI microplans to ensure that all HRAs are included.*

Key Contents

Microplanning for immunization services

3

RI microplanning is the basis for the delivery of RI services to a community. The availability of updated and complete microplans at a planning unit (urban/rural) demonstrates preparedness of a unit and directly affects the quality of services provided. Microplans are prepared for a one year period but must be reviewed every quarter.

Common RI microplan issues found in the field

- NO microplan available, RI sessions conducted unplanned
- Not aware of the need for mapping and microplanning
- Formats / guidelines not received from district/state
- Microplans prepared by ANMs/health workers not reviewed
- Not aware about method of estimation of beneficiaries
- Logistics calculation was not based on due beneficiaries
- Available at the PHC but not in use.
- Vaccine distribution done on last minute estimation.
- Available but not updated with information on HRA sites
- Recently settled nomadic population not updated in RI microplan
- Not taking into consideration vacant SC
- One microplan is in the computer and a different microplan is used during RI days.

Improving the RI microplan helps to:

- Define the area and population covered by each SC
- Prevents/reduces dropouts
- Prevents left outs
- IdentifiesHRAs/HRGs including nomadic populations
- Increases the RI coverage
- Strengthens capacity to use data for action.

Levels of RI microplanning

The levels of the health system from the Sub Centre (SC) to the state level is shown in Fig. 3.1. Microplans begin at the SC level and cascade to the district level through the Primary Health Centre (PHC). A sub centre microplan must incorporate all the villages and areas under its administrative area. The PHC microplan incorporates the SC information which is essential for planning and logistics management . Information from PHCs is to be consolidated at the next level which may be the taluk in some states and then to the district or directly to the district in others. Fig 3.2 shows the RI microplanning from SC to district level.

Fig. 3.1. Levels of the health system

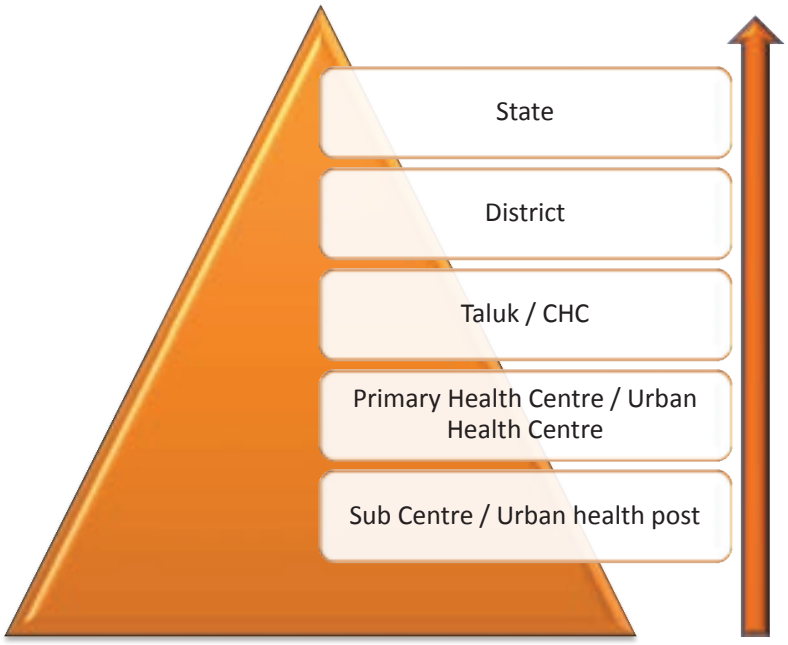


Fig. 3.2. RI microplanning from SC to district

Components of an RI microplan

An RI microplan is an integrated set of components to:

- enlist and map all villages/wards/tolas/HRAs
- identifiy all beneficiaries for RI services through surveys
- estimate and plan the vaccine and logistic requirements including modes of delivery
- preparation of plans for a strong RI service delivery.

An RI microplan consists of a number of formats and documents at various levels. Availability of all the components at the relevant levels will facilitate effective implementation. Table 3.1 lists the components for microplanning in RI at each level.

Table 3.1.List of components for microplanning in RI at each level

Level	Components of RI microplan
SC/Urban Health Centre 5,000 population in rural and 10,000 – 12,000 population in urban areas (ANM to coordinate activities with ASHA & AWW at least 2 days before session) ***Responsible person :*** ANM	a) Map of area under SC with names of villages, urban areas including all hamlets (tola), sub-villages, sub-wards, sector, mohalla, hard to reach areas, etc.) b) Demarcation map – allocate areas for each ANM if more than 2 ANMs are present in a SC. It can also show the exact boundaries and areas for ASHAs and AWWs c) Master list of the area– this list includes all villages/tolas/HRAs/wards/mohalls d) An estimation of beneficiaries e) An estimation of vaccines and logistics f) ANM work plan including mobilization plan
PHC/Urban Planning unit ***Responsible person :*** Medical officer in-charge / RI nodal MO	a) Map of PHC showing the SC area demarcation b) RI microplans from all SC c) Alternate Vaccine Delivery (AVD) plan and route chart d) Supervision plan e) Cold chain contingency plan f) Immunization waste disposal plan g) IEC and social mobilization h) Training plan (if applicable) i) Budget

District Review PHC plans including utilization of funds ***Responsible person :*** District Immunization Officer (DIO)	a) Map of district showing all the blocks and PHCs b) RI microplans from all PHCs – compiled forms c) Supervision plan of district officials d) Latest Penta 3 coverage chart for the district e) Distribution and maintenance of vaccines, cold chain and logistics including contingency plan f) District-specific activities for intensification of RI g) IEC and social mobilization plan h) Training plan i) Budget
State ***Responsible person :*** State Expanded Programme on Immunization Officer (SEPIO)	a) Map showing the districts b) Compiled district plans c) State specific activities d) Budget

An updated microplan ensures:

- All boundaries of the catchment area are identified
- Complete maps are in place to ensure that all personnel are aware of their areas and that no villages or high-risk population pockets have been left out
- All beneficiaries have been identified and information is available on who has to be vaccinated and with which antigen.

Process of microplanning

The RI microplan is a dynamic tool that requires regular conduction of reviews and surveys in order to be effective. These activities provide opportunities for planning units, districts and the state to modify RI microplans based on real-time manpower availability, movement of beneficiaries and also respond to important coverage and monitoring indicators. Table 3.2 gives the frequency of major RI activities.

Frequency of major RI activities

Table 3.2. Frequency of major RI activities

Frequency	Activity
Annually	Preparing and generating new RI microplans
Half yearly	House to house survey and head counting
Quarterly	RI microplan review
Monthly	Session due list review at sub centre
Weekly	Session due list update after every session

Annually: Preparing and generating new RI microplans including house to house survey and head counting

- Ensures that all areas are included into the list; confirm the master list of villages and HRAs.
- Provides actual population and beneficiary counts through house to house survey and head counting,
- Generates needed information for planning sessions, vaccine and logistic calculations.

This activity is large scale and needs to be synchronized with district.

Half yearly: Only conduct the house to house survey and head counting. This activity will:

- Help to identify any new sites for inclusion / mobilization
- Update the beneficiary due lists for effective mobilization

This activity needs to be supervised and planned in coordination with ICDS and partners

Quarterly: RI microplan review, helps to :

- Update the plans to incorporate information on sub centres where staff is on leave or if it has become vacant.
- Respond to changes in vaccine delivery and inclusion of new areas - nomads / HRAs and other issues based on monitoring results.

This activity takes time and requires planning.

Monthly: At Sub centre ANM should

- Review due lists of all the sessions held in the previous month.
- Update coverage monitoring chart to quantify left outs and dropouts.

ANM should share the salient points with the sector medical officer. MO can make plans to visit Sub centre during this activity.

Weekly:

After every RI session ANM and ASHA/AWW workers should review the session due list, identify drop-out / left-out beneficiaries and enter their names into the next session's due list for follow-up and mobilization.

The medical officer should try to attend a full RI session at least once in two weeks. This is an opportunity to provide solutions to practical problems in the field.

Microplanning process overview

Microplans should be prepared annually based on head count/survey and be reviewed every quarter. The steps in the process of developing RI microplans are shown in Figs. 3.3 while Fig. 3.4 gives an overview of the major activities to be conducted. The process to prepare new microplans should be initiated when the state/district task force for immunization decides to conduct this activity. Refer Gantt chart in Fig 3.5 for suggested timelines.

Fig. 3.3. Steps for developing RI microplans

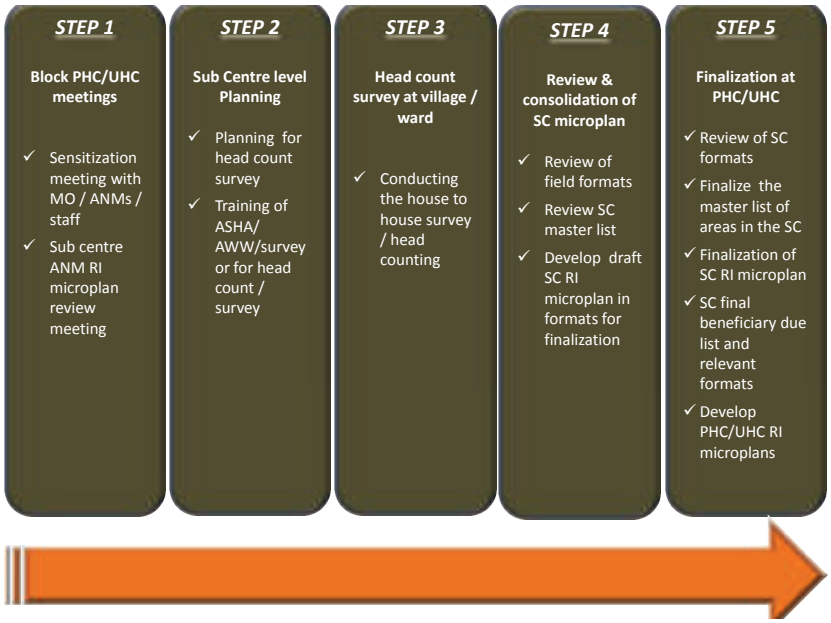
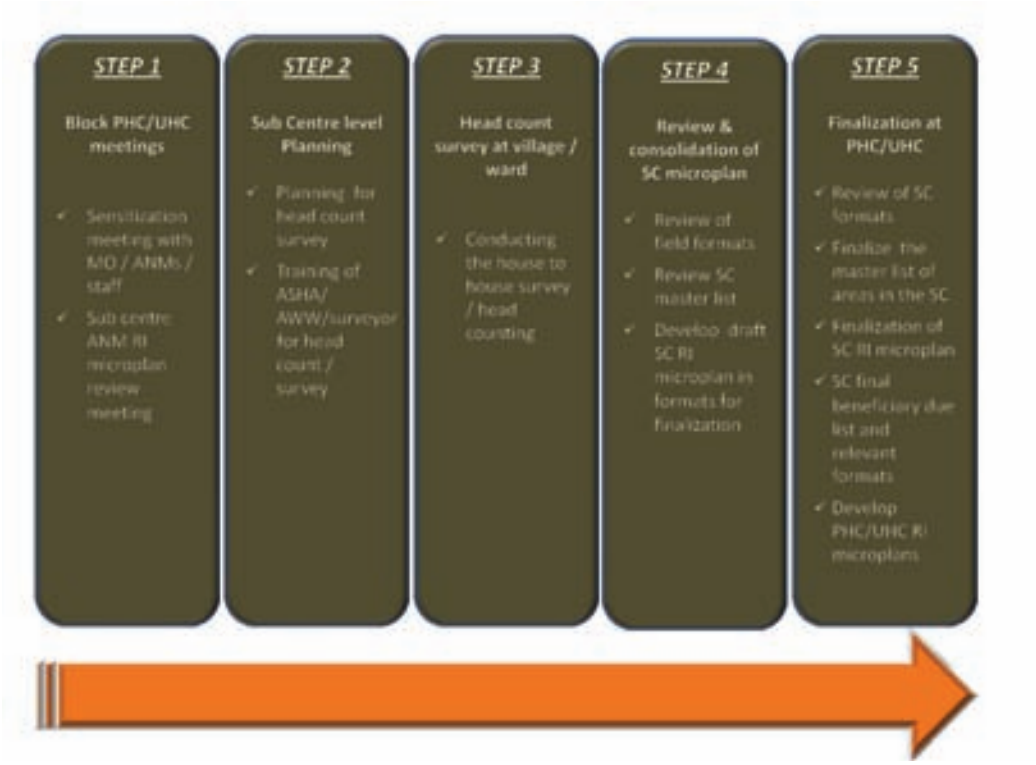


Fig 3.4. Overview of major activities in RI microplan development process



Detailed list of activities at RI microplan development

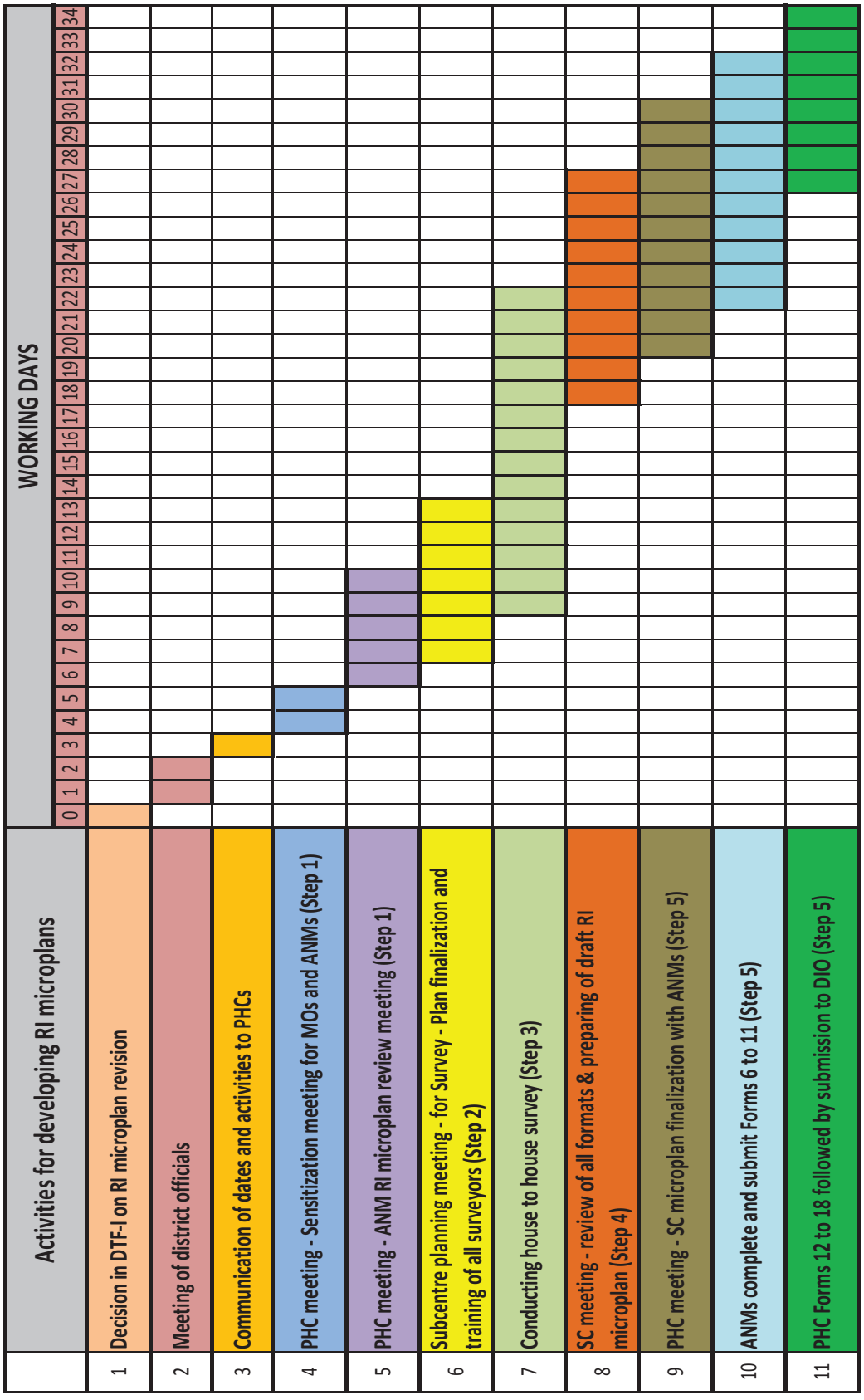
To simplify the process of developing RI microplans, Table 3.3 below enlists in detail the activities at each step. This table can also be used as a checklist to review the process and guide the actions of medical officers and ANMs.

Table 3.3. Steps and activities for RI microplanning

Steps	Activities
STEP 1 **Block PHC/UHC meeting–** ➢ Orientation meeting ➢ ANM RI review meeting- review of existing microplans & inclusion of all areas	• Confirm area demarcation of subcentres • Confirm area demarcation among ANMs, especially in subcentres where more than one ANM is posted. • Generate a master list of villages/areas, Include ALL areas in RI microplan • Record sub centre wise information • Use data on SC performance • Conduct training of ANMs for area survey • Prepare SC plan for head count / survey
STEP 2 **Planning for SC level head count survey and training of ASHA/AWW/ Link worker/Surveyor**	**MO to decide venue of meeting– at each SC or if at PHC then conduct with only 2 to 3 SC combined at a time** • Confirm area demarcation between ASHA, AWW /LW/ surveyor • Create working maps for each area • Conduct training to undertake head count & generate beneficiary list • Plan to walk through areas to ensure clear area demarcation/ HRA identification
STEP 3 **House to house survey** village/ward level -ASHA/AWW/Surveyor	• As per the plan, the ASHA/AWW/LW/Surveyor with assistance from mobilizers will conduct the area survey. This is NOT to be done on RI days. • During the survey ▪ Maximum of 25 to 30 houses should be covered per day. ▪ Collect information of pregnant women, infants and children. ▪ Survey to be completed in 7 to 10 days • Generate beneficiary list for the village/ward • Ensure monitoring of the process by ANM , ICDS supervisors, Sector Medical Officer, any other

STEP 4 **Review & consolidation of the Sub centre microplan**	**Conduct review meeting at SC – involving AWW /ASHA / Link worker / surveyor. Sector MO oversight will be beneficial.** **ANM to:** • Review completeness of all formats of the area • Review the master list of areas in the SC • Review the area of demarcation • Review the number of HRA in the SC • Review lists of identified beneficiaries • Develop SC RI microplan for finalization • Develop community mobilization plan for each session site and sub centre area
STEP 5 **Review and finalization of SC plans and development of final block PHC plan**	• Finalization of area demarcation of ANMs • Finalization of areas and HRAs in all SC microplans • Review of all SC formats and approval of microplans • ANM to complete filling of all SC formats and submit • Develop the session due list for RI sessions • Ensure availability of beneficiary due listing for all sessions • SC Maps availability • Development of PHC RI microplan

Fig. 3.5. Timeline of activities in RI microplanning



This Gantt chart is indicative of average times needed for the major activities in developing the RI microplan. Variations are a reality and reasonable timelines specific to your area can be decided in discussion with district/colleagues.

Step 1

- **Block PHC/UHC meeting** – Sensitization and Review of existing microplans

Step 1 of the process for developing/updating the RI microplans involves 2 meetings:

1. A sensitisation meeting of all MOs, ANMs and other staff
2. ANM RI microplan review meeting

1. Sensitization meeting at PHC/Urban health center:

Call for a meeting at your PHC/ UHC to bring the focus on routine immunization and the process.

This meeting will:

- Sensitize all the staff on the process and their roles in RI microplanning
- Delegate activities to specific personnel with timelines
- Encourage discussion on issues
- Train ANMs on use of formats and conduction of head count / survey
- Finalize dates and schedule for the meeting with ANMs at PHC

In setups with multiple medical officers (Block/PHC/UHC): Conduct a meeting of all the MOs and ANMs to inform them of the plan for improving / updating the RI Microplan. Demarcate area of the PHC into sectors and allot each to a MO for supervision and follow-up. Sensitize them of the need for this activity and the process. Define roles; give specific responsibilities with reasonable timelines. Give specific responsibilities with focus on “what has to be done” “by whom” and “when”.

In setups with single Medical Officer (PHC/Additional PHC/UHC): Call for a meeting of all staff and inform them of the plan for improving / updating the RI Microplan. Sensitize them of the need, describe the contents of RI microplan forms and address any queries. Give specific responsibilities with focus on “what has to be done” “by whom” and “when”.

During this sensitization meeting:

For ANMs -

- Distribute at least 2 blank Form 1 sheets to all ANMs. Using the SOP for RI form 1 (page 39) discuss the format with them and ensure they are clear on how to use it.
- In Form 1 explain that a key element is to confirm areas under each subcentre and this form will become the master list. Ensure inclusion of:
    - All villages and their hamlets, tolas
    - Urban/peri-urban areas and their wards/sub wards/mohalla
    - Migratory and non migratory high risk settlements (slums, constructions sites, nomads, brick kilns)
- Record each HRA/Brick Kiln etc. in a separate row in the master list of areas
- Train ANMs on the proccess of conducting headcount survey (refer SOP for RI form 3).
- Instruct them to come prepared for the ANM RI review meeting with any RI microplan documentation available with them
- Finalize a schedule for meeting the ANMs.

2. ANM RI microplan review meeting - as per decided schedule:

This meeting should be conducted in small batches over 2 or 3 days to ensure that each ANM gets enough time to discuss and bring out issues in the planning process for RI.

The agenda points for discussion with each ANM must include -

a. Clear area demarcation for each sub center and ANM area
b. Review of Form 1 – master list
c. Proposing plan for missed areas, vacant sub centers including plans for areas without ANMs
d. Prepare maps (this will require a realistic timeline) also refer Unit 12
e. Assess adequacy of RI sessions
f. Proposing a communication plan
g. Any other issues related to RI microplanning

This step should not be completed in a SINGLE meeting – 2 to 3 days will be required, which need not be consecutive days. Plan these days taking into consideration all other activities and develop a schedule so ANMs can plan well.

Participants :

- Sector MO, Health supervisors, LHV, ANMs, key persons assisting MO/IC, Block program manager-National Health Mission, CDPO, ICDS supervisors etc.
- Immunization Field Monitor / WHO-Field monitor/SMNet partners where applicable

Preparations for the ANM RI microplan review :

The data manager of the PHC should generate the needed data for the PHC and each SC.

Data to be used: Review monitoring and coverage reports to identify issues in provision of immunization services with special emphasis on HRAs. Some suggestions are given below:

a) Vacant sub-centre areas
b) Areas with no sessions planned
c) Areas with no mobilizer assigned
d) Sessions with poor mobilization
e) Where planned sessions were not held
f) Areas with low coverage
g) Status of due-list updating, especially for migrants and new-borns
h) Inadequate supply of vaccines and logistics
i) Any serious AEFI
j) Staff position of ANM, AWW, ASHA, Supervisor etc.
k) Status of AVD/transportation (vehicle breakdown etc.)

Calculation of drop-out figures for each subcenter will help in identification of issues. However, this may not reflect specifically to each RI session site or village. Few suggested differences to be calculated per subcentre are between BCG and MCV1; Penta1 and Penta 3; MCV1 and MCV2; Penta 1 and OPV1 and Penta 3 and OPV3. **Refer Unit 7 for details.**

Table 3.4 below provides some of the data sources that can be used to help in planning the RI microplan . However, this is not an exhaustive list and if other data sources are available, they may also be used to compare information.

Table 3.4 - Sources of information for listing of areas and beneficiaries

Information / Data required	MOIC	ANM	ICDS Super-visor
Geographic	List & map of villages including hamlets / urban areas/wards	List & map of villages including hamlets /urban areas/wards (SC catchment area)	List & map of villages including hamlets / urban areas/ wards
Demographic	Total & beneficiary population (Census/ revenue records)	Total & beneficiary population (service records), migrants	0 -6 years registers, eligible couple register, etc.
Programmatic	Existing RI microplans, Polio microplans, monitoring feedback, Mission Indradhanush microplans (where applicable) List of HRAs	Existing sub centre RI microplans, Polio microplans, monitoring feedback, Mission Indradhanush microplans (where applicable) List of HRAs, VHND microplans	VHND microplans
Administrative	Staff vacancy to identify vacant SC	ASHA/ Mobilisers list to identify villages for focus	AWW/ helper list
Epidemiologic	VPD outbreaks	VPD data	
Social mapping	NGOs, Practitioners, Community centres, schools	Influencers, Possible session sites	

Suggested questions during ANM RI review meeting:

- Are all areas identified and included in the SC plan?
- Where are the unreached populations?
  - Areas with highest number of unimmunized children
  - Areas with mobile/migrant populations
- Where are the hard-to-reach populations?
  - Low coverage areas
  - Accessibility compromised areas

- Where is the population?
  - Are there areas/villages with large population?
  - Border/peri-urban areas?
- Are there problems with access to immunization services?
  - Catchment areas with Penta or other antigen <80%
- Where is utilization of services low?
  - Areas with high drop-outs

Outputs expected from this meeting:

- Master list of all areas for each sub centre in Form 1
- Plan for conducting house to house survey for each Sub centre
- Timeline for conducting the house to house survey / head counting

Roles and responsibilities:

Personnel	Activities to perform	Follow up by
MO/Ic	• Preparing for and conducting first meeting at PHC • Conduct SC RI review with few ANMs per day	DIO
Sector MO	• Actively participate in first meeting at PHC • Review progress of SC areas in allotted sector	Medical Officer in charge
ANM	Generate village list for each SC in coordination with frontline workers for the meeting	Sector MO / LHV / designated ANM
CDPO	Sharing of village list and AWW centre details	BPO
ICDS supervisors	Provide information on any areas / populations that may be overlooked	CDPO

DIO – District Immunization Officer; BDO – block development officer; LHV – lady health visitor

Each of the steps in the following pages includes detailed explanation of the RI microplanning formats to be used for each activity

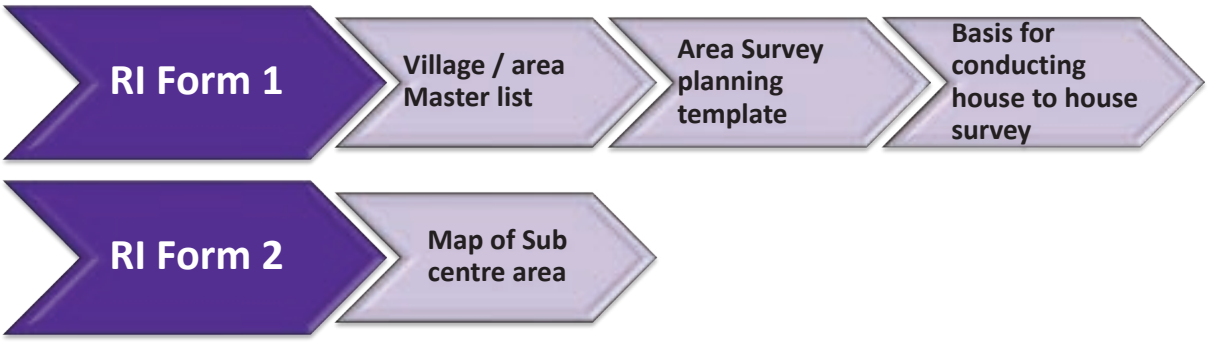
Overview and utility of the RI formats

A set of formats have been developed to collect and collate data to prepare RI microplans for an area . The table 3.5 below enlists these formats and the information they collect.

Table 3.5. RI microplanning formats and utility

Level of use	RI Form	Utility
PLANNING FORMS to be filled by ANM	1	• Master list of all the villages in sub centre area • Plan for conduction of survey
	2	Sub centre map
SURVEY FORMS Used In the Survey by ASHA / assessor area	3	Enlists all houses and occupants with focus on pregnant women and children in the age group of 0 to 2 years
	4	Enlists details of identified pregnant women
	5	Enlists details of infants / children identified
SUB CENTRE FORMS To be filled by ANM	6	RI Session beneficiary due list (to be made after SC microplan is approved by MO)
	7	RI session plan
	8	RI Session injection load and vaccine distribution plan
	9	Per session estimation of vaccines & logistics
	10	ANM work plan / roster
	11	Communication plan for SC
PHC FORMS	12	SC workload and Sessions plan
	13	PHC vaccine delivery plan including alternate vaccine delivery plan
	14	PHC vaccine and logistics per sub centre
	15	PHC – RI session supervision plan
	16	Emergency plan for vaccine storage
	17	Bio-medical waste management plan
	18	Communication plan for PHC/UHC

Overview of RI Forms 1 and 2



RI Microplan Form 1 – Sub-centre area survey planning form & Master List

SUB CENTRE AREA MASTER LIST and SURVEY PLANNING FORM

RI Form 1

Sub centre name:_______________

ANM Name/Ph No.:____________________

PHC Name: ______________________

District:_________

s.no	Name of Villages / Hamlets / Tolas / HRA #	Total number of households in this area?	High Risk Area #	Name of ASHA designated for this area?	Name and contact number of person doing survey	Designation (encircle applicable)	Dates of Survey - From / To	FILL AFTER Survey - FOR ANM USE ONLY				
								Total Population	Total Pregnant Women	Number of new born (0 to 1 month) of age	Number of of Infants(1 month to 1 yr of age)	Number of children (1to 2 yr of age)
A	B	C	D	E	F	G	H	I				
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
			Y / N			ASHA/AWW/Other						
	TOTAL						TOTAL					

Signature of ANM_____________________

Signature of Medical Officer:__________________

 # 1- Slums with migration; 2 - Nomads; 3 - Brick Kiln; 4 - Construction Site; 5 - Others (fisherman villages, riverine areas with shifting populations, etc.); 6 - Non migratory (settled population), hard to reach areas

SOPs for using RI Form 1

This format is to be used by the ANM of a sub centre area. Each ANM should list the areas in her sub centre including HRAs/nomadic sites in separate rows.

Column A - Serial numbers are to be allotted to each area. Numbers are not to be repeated and must be in serial for one sub-centre area. If the areas per sub-centre need to be entered on more than one sheet, the numbering will continue until the last area for that sub-centre.

Column B- Ensure all the Villages / Hamlets / Tolas / High Risk Areas (HRAs) details are entered. The classification of the HRAs is given as footer and the relevant number to be entered in brackets along with the name of HRA.

- For HRAs, (including brick kilns or nomadic/construction sites) ***each site must be entered into a separate row.*** Refer to existing polio microplans, census lists, maps, high risk area lists, and interactions with ASHA / AWW or Panchayat Raj Institution (PRI) members to ensure the inclusion of all areas in the sub centre area. This will form the **master list** for each sub centre. ***This is a critical activity***. Update this format as information is received or every quarter. (Refer Unit 12 for details on high risk areas)

Column C – enter the number of houses as per information available. If information is not available an approximate number can be entered. For areas such as nomadic sites and brick kilns household numbers are important or approximations must be entered.

Column D, if the entered area is an HRA then encircle “yes”.

Column E, Enter the name of the ASHA responsible for the area.

Column F, the name and contact number of the person who will conduct the survey should be entered.If the area does not have an ASHA or the position is vacant then, name of the person who will be delegated to conduct the area assessment should be entered.

Column G, The survey can be done by the local AWW / link worker / others in consultation with the Medical Officer (MO) **ONLY** after undergoing training. Enter the relevant designation.

Column H, The area survey is to be completed in seven to 10 days (See Fig 3.5). The dates for conducting this activity and the persons who will conduct the survey will be decided by the ANM in consultation with the MO. The **From** and **To** dates are to be entered here.

Columns I, The last shaded columns are for use **AFTER** the survey.

RI Form 2– Sub-centre map

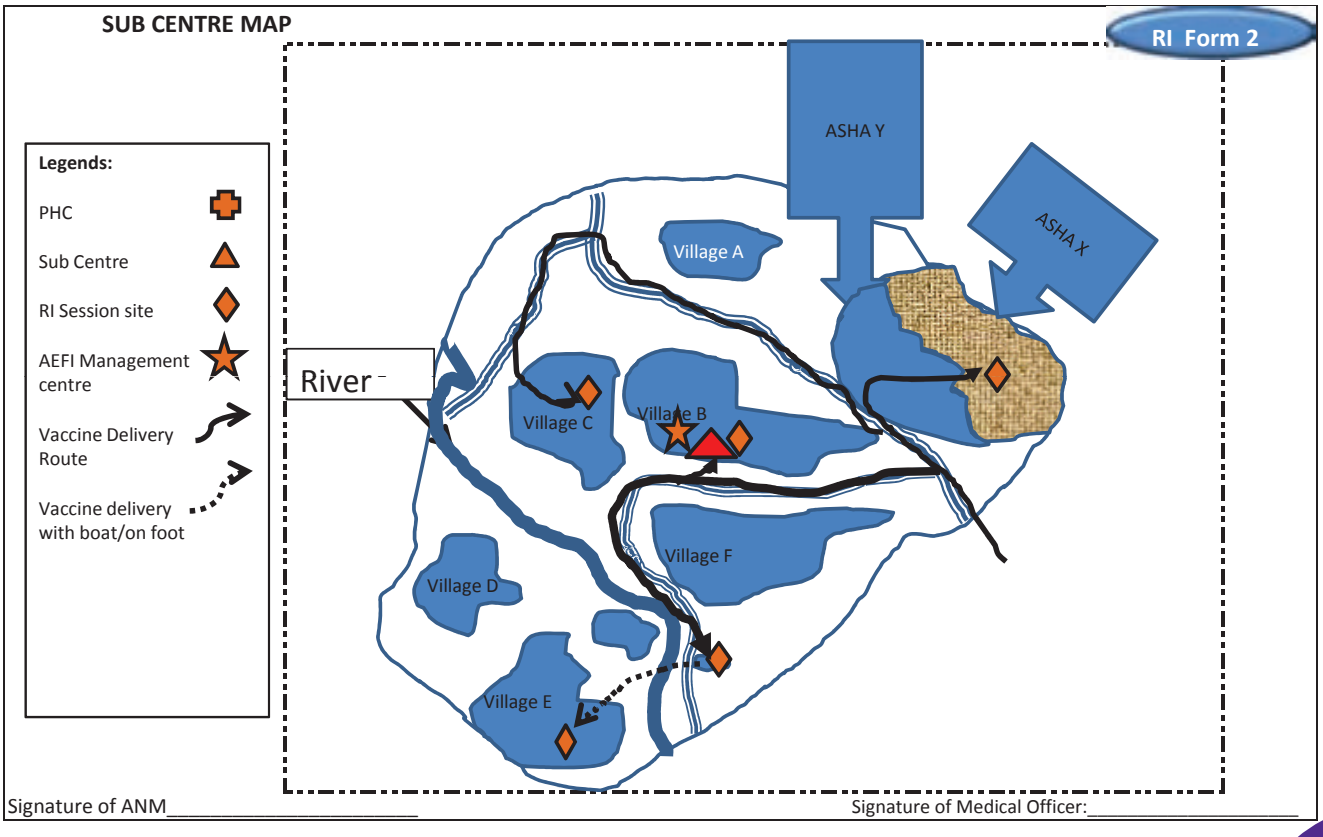
This form provides space for drawing a map of the SC area. A sample map is also given and health workers are encouraged to put forward simple drawings (see Figs 3.6, 3.7 and 3.8). The maps should be able to show at least the following:

- All the villages in the SC area, with names
- Shading of parts of a village to demonstrate the ASHA demarcation areas
- Location of the SC
- Location of all RI session sites
- Major roads
- Rivers streams.
- AEFI management centres

Each SC should have a map which helps to clearly demarcate the villages and areas to ensure that the frontline workers have clarity in operations, and avoid overlap or loss of services to the beneficiaries.

Encourage ANMs and ASHA to draw simple line diagrams of the areas; it is not necessary to have elaborate maps. (see next section)

Form 2 – Sub centre area map (Sample)



Making maps: updating maps made simple

Maps help to identify borders and areas of administration. They also help to identify areas that are in dispute or where workers have confusion.

In RI, simple maps are required (see Figs 3.6/3.7/3.8). The capacity to draw varies from person to person. Encourage your ANMs by showing printouts of the maps given as examples in this unit or demonstrate how simple line drawings can help them to be more sure and confident of their areas. Convey this message also to the respective ASHAs and AWWs of the area in subsequent meetings.

A good start for making maps begins with already existing maps. You should access the following sources:

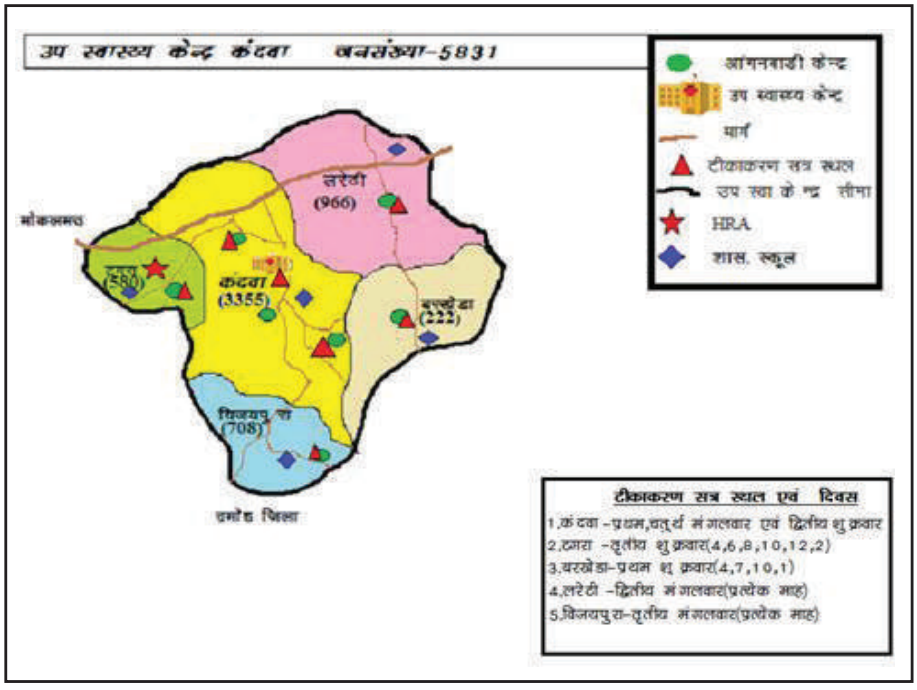
- Polio maps
- Maps from local administration, e.g. municipal corporation, land department, election section, local panchayat
- Local area maps from other sources.

(Refer Unit 12 for map utilization)

Ask the HWs to come to PHC with all the required data and guide them to prepare the SC/UHC microplans including maps.

Prepare a **map** of the block/PHC/Urban Planning Unit area, i.e. map showing the boundaries of SC/UHC, session sites, HRAs and demarcation of areas by each supervisor.

Fig. 3.6. Sample map showing area demarcation 1



Update the map of SC/urban health centre showing:

- the SC, villages, areas, hamlets and HRAs
- all Anganwadi centres, session sites and session days
- distance from the ILR point and the mode of transport
- landmarks such as panchayat bhavan, schools, roads,etc.

Fig. 3.7. Sample map showing area demarcation 2

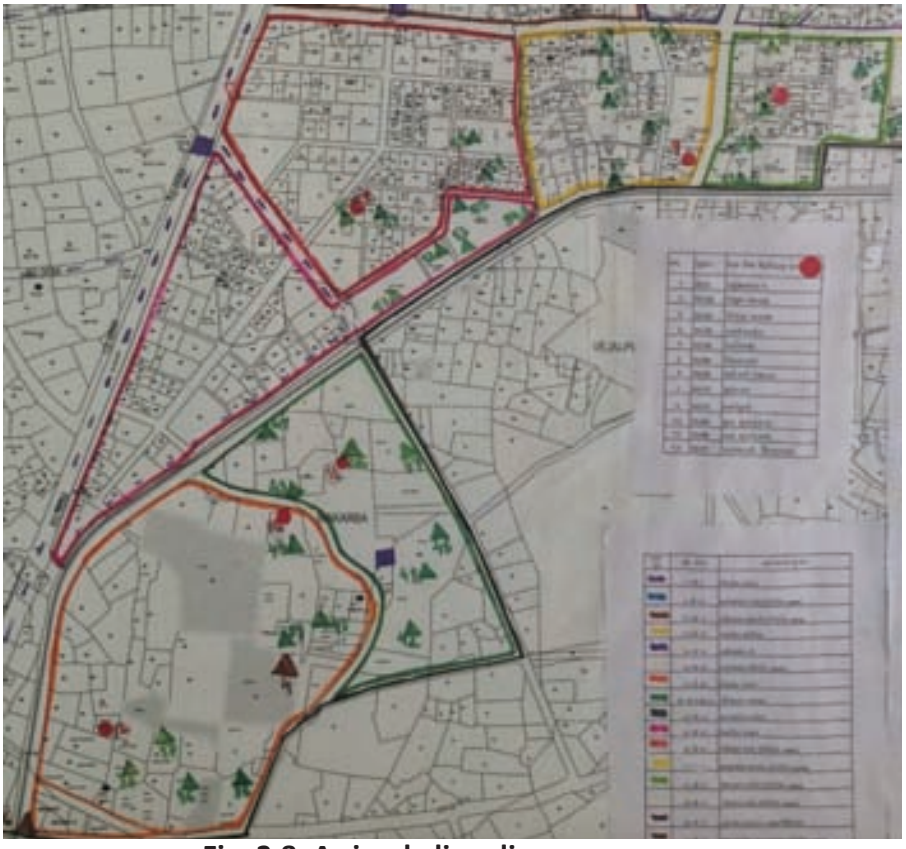
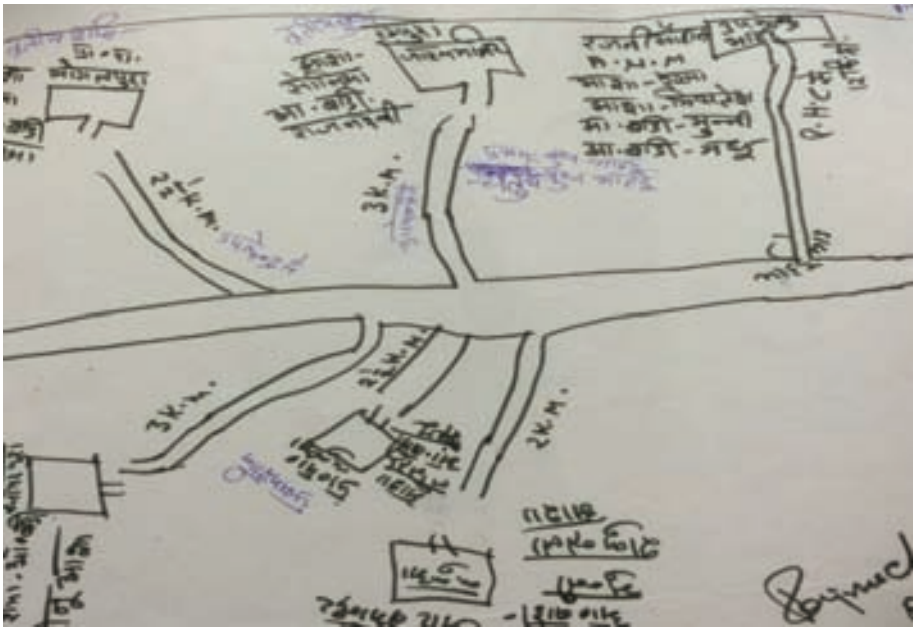


Fig. 3.8. A simple line diagram map

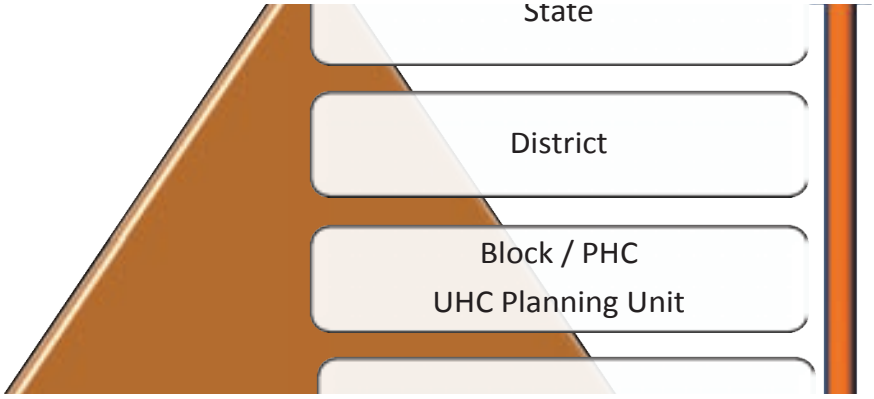


Step 2

- **Sub Centre level Planning** for head count survey and **training** of ASHA/AWW/Link worker/surveyor

The finalization of the head count survey plan and the training of the ASHAs/AWWs/Link workers/surveyors is the second step in the process for developing RI microplans. The role of the ANM is to guide the ASHAs and AWWs of the area in order to conduct the survey effectively and to use of their close ties with the community to identify all beneficiaries.

Fig. 3.9. Sub centre survey planning meeting– personnel and activities



Key components this activity should include:

- Review of area demarcation between ASHA, AWW & surveyors as per Form 1
- Sharing dates of survey and finalize with ASHAs/AWWs/link workers
- Creating working maps for each area
- Training ASHAs/AWWs/link workers to undertake head count & generate beneficiary list
- If required, plan to walk through areas to ensure clear area demarcation/HRA identification.

Medical Officer to decide on the venue for holding this meeting:

- At PHC for 2 to 3 Sub centres at a time– about 15 to 20 ASHA/AWW/Link workers in each batch, OR
- At Additional PHC, OR
- At the Sub centre.

Participants for this meeting : Sector Medical Officers, sub centre ANM, ICDS- lady supervisor, all ASHAs,AWWs,Link Workers, Mobilizers as well as ASHA facillitator of the villages in the sub centre.

Preparations

On meeting day

- Share the information and requirements for the meeting with respective ASHAs/ AWWs/link workers at **least a week in advance**. Encourage them to identify any new areas that may not have been included or any new nomadic or construction sites in their areas.
- Each ASHA and AWW should prepare a list of villages/areas as per the available information. This list should also include the HRAs and any other identified populations that require special services. Cross check and make corrections in the master list, if any.
- Discuss and plan logistics for the survey – adequate number of formats (Forms 3,4,5) ; chalk for house marking;

The MO/ANM need to share the status of RI in their area and explain the importance of the RI microplanning. Aspects that should be covered during the discussions are listed below.

Area demarcation between ASHA, AWW, link worker and mobilizer: Ask each ASHA/link worker to readout the list of villages/urban areas she visits/has been allocated. The AWWs of these areas can refer to the list they have prepared and add to or clarify the list of the ASHA. In some urban areas where AWW workers are not available, other key local persons can be approached for listing of areas.

Identify areas in each SC requiring a walk-through to verify demarcation and that all HRAs are included in the list of areas.

Using Form1 distributed during the PHC planing meeting, finalize the personnel who will conduct the headcounting and the approximate dates for completing the survey (if not already done). Allow for corrections of the master list at all times. Any information is important and will benefit the area.

Training of ASHA/AWW to undertake head count and generate due beneficiary list: Distribute copies of Forms 3, 4 and 5 to each ASHA/AWW. Explain the process (use SOPs of each form) for conducting the house to house survey of the areas, the information they will collect and the process for filling up these forms.

Develop a practical timeline considering that a maximum of 25 to 30 houses are to be covered in one day. This will ensure quality and allow the workers to collect detailed information on each family. **Rushing this process will lead to a compromise in quality.**

Creating working maps for each area: Working maps are simple maps (Figs 3.6/3.7/3.8) which need not be to scale, but provide an overview of the areas with clear lines of demarcations if there are more than one HW. These maps should be developed before going out into the area. Finer details may be added to this map during or in the next part of the process. Refer section on "Making maps" in this unit and also Unit 12.

Walk through of areas to ensure clear area demarcation/HRA identification: Once the training is completed the MO/ANM along with the ICDS LS should visit some areas. Priority should be given to those areas where confusion of demarcation exists and HRA areas. A walk through will bring an agreement on the lines of demarcation and will verify all HRAs are included in the list of areas. If there are a large number of areas, or the identified areas are accessibility compromised, the field visit can be covered as per a practical timeline over a few days.

Before closing the meeting, confirm the dates for the area survey by each person as per Form 1 and clarifi any doubts of the participants. Coordinate with ICDS supervisors to ensure monitoring and oversight. Working maps generated can be strengthened with additional information during the survey. Any changes should be intimated to the concerned ANM and ICDS supervisors.

Outputs expected

- Confirmed plan for area survey with timelines and names mentioned in Form 1.
- Refined master list of all areas in the SC
- Simple area maps for each ASHA area

Roles and responsibilities

Personnel	Activities to be performed	Supervisor
MO/Sector MO	• Will support the SC personnel to finalize plan for area survey • Supervise the survey with field visits	MOIC
ANM	• Area demarcation for ASHAs/AWWs • Develop a reasonable timeline for survey • Will support the ASHA/AWW for survey • Supervise the survey with field visits	Sector MO/LHV/ designated ANM
ASHA	• Contribute to finalizing the master list • Conduct the house-to-house survey	SC ANM/ASHA facilitator
AWW	• Conduct/assist in the house to house survey • Identify beneficiaries/HRAs/missed areas/ dropouts/left-outs	SC ANM/LS

Step 3 • **Conducting** head count survey at village /ward

The head count survey or house-to-house survey is the third step of the RI microplanning process. The survey will ensure enrolment of all beneficiaries in an area. It is to be conducted by the ASHA/AWW/Link worker/surveyor (after training) as specified in Form 1. No person will conduct this activity without having undergone the training as mentioned in Step 2. Each ANM will have a list of the SC areas and the dates for conducting the visits. This is to be shared with the LHV/Ladies Supervisor (LS) of ICDS to enable field visits and monitoring.

Key activities to be conducted:

- ASHA/AWW/LW/surveyor will conduct the survey as per the plan in Form 1. Support may be sought from local residents while conducting the survey. This survey is NOT to be done on RI days.
- During the survey
  - A maximum of 25 to 30 houses should be covered per day.
  - Information of ALL households to be entered in Form 3.
  - On identifying a pregnant woman in a household, enter her information into Form 4
  - On identifying infants and children up to 2 years of age, enter information in Form 5.
  - Process to be completed in 7 to 10 days per area.
- Monitoring of the process by ANM/LHV/LS/Sector Medical Officer/Medical Officer In-charge/DIO.
- Involve other departments (e.g. education, PRI, etc.) and block/district administration in supervision of this activity.

The minimum activities to be conducted are as follows:

Participants

Designated ANM, ASHA, AWW, LW or identified person for conducting the survey, Sector MO, ASHA supervisor, LS, others.

Preparations

The ANM should review the available lists and maps from Step 2 before beginning Step 3. During the period of survey, ANM and LS (ICDS) will make coordinated visits to ensure that the ASHAs/AWWs/LW/surveyors conduct the activity as per the training given.

ANM/ASHA facilitator/LS should verify at least 5 households. Adequate numbers of formats need to be made available for this activity to make maximum use of the resources in the field. All queries need to be addressed at the earliest. Upon completion of the activity and after verification the ANM should sign the Forms 3, 4 and 5.

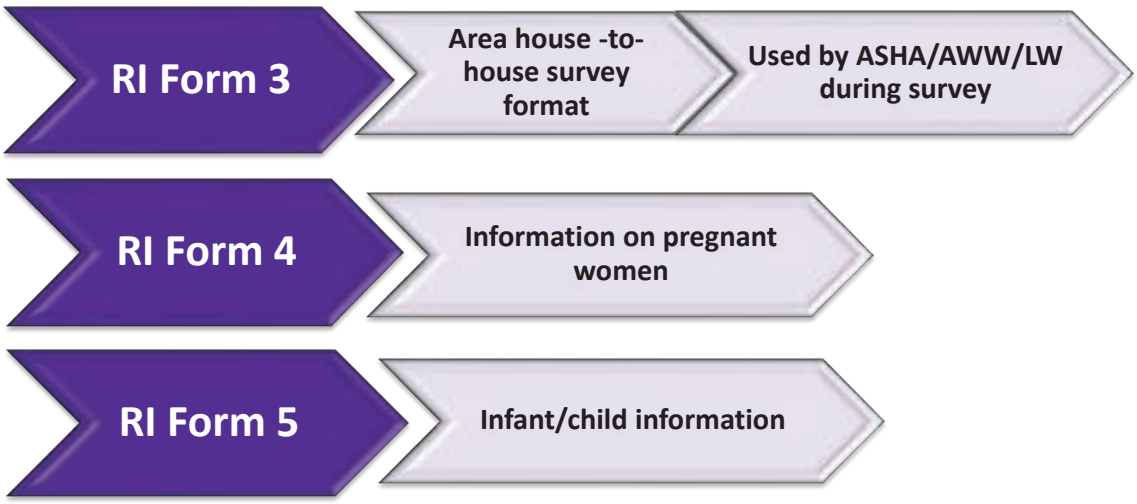
Use of local mobilizers

It is essential that the ANM interacts with the mobilizers and encourages other influencers in the village to participate in the survey activity.

Supervision

Sector MOs will visit the areas and provide oversight during this important phase of the microplanning exercise. An overview of Forms 3, 4 and 5 is given in Fig. 3.10.

Fig. 3.10. Overview of RI Forms 3 to 5



Outputs expected

- ASHA/AWW/LW/surveyor conducting the survey as per training
- Completion of house-to-house survey
- Forms 3 ,4 and 5 identifying all beneficiaries for each area.

Roles and responsibilities

Personnel	Activities to be performed	Supervisor
Sector MO	Supervise with field visits	MOIC
ANM	Supervise with field visits	Sector MO/LHV/designated ANM
ASHA	Conduct survey and fill Forms 3,4,5	SC ANM/ASHA facilitator
AWW	Conduct survey and fill Forms 3,4 and 5/ assist in survey	SC ANM/LS

RI Microplan Form 3 – Area survey/house to house survey form

House to House Survey form

RI Form 3

ASHA/AWW-Assessor Name/Ph No.: ________
ASHA/AWW-Facilitator Name/Ph No.:______________________
Sub-Centre name:________
Name of ANM: ____________
Area Name and No as per Form 1: ________
Date of Visit : dd/mm/yy

First house visited today - House No. :_________
Name: Address with landmark:

Last house visited today - House No. :________
Name: Address with landmark:

	Family Details			Pregnant Woman	Children 0 to 2 years - (if YES , go to form 5)		
House number (as per chullah)	Name of head of family	Fathers name	How many family members are living in this house? (Include All adults & children including new borns)	Is there any woman pregnant in the family ? (If YES, go to form 4)	Is there any Newborn/child aged less than 1 month in the family (if YES , go to form 5)	Is there any child aged between 1 month and 1 year in the family (if YES , go to form 5)	Is there any child aged between 1 to 2 Years in the family (if YES , go to form 5)
A	B	C	D	E	F	G	H
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
				Yes / No	Yes / No	Yes / No	Yes / No
Total	▨	TOTAL		Total Yes	Total Yes	Total Yes	Total Yes

Signature of ASHA/assessor:______________________
Verified by ASHA Facilitator (Signature):____________________
Verified by ANM (Signature):_______________

SHEET NUMBER :________

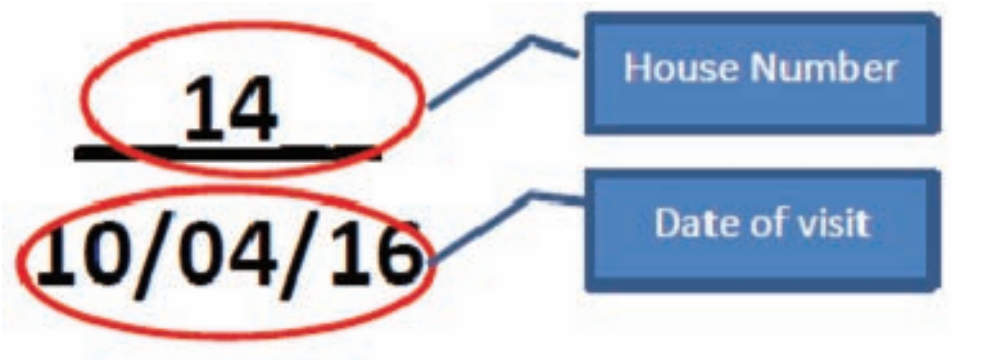
SOPs for using RI Form 3

- Form 3 is to be used when conducting the house to house survey.
- Each sheet must have the area name and number as given in Form 1. The ANM must instruct the surveyor to enter this.
- This assessment is not to be done on RI days.
- A household is defined based on "Kitchen" or "Chullah"
- Each sheet has information for 15 households. Multiple sheets for each area will be required and must be made available.
- A maximum of 25 to 30 houses should be covered per day. Calculations for the number of days will depend on the timeline as per DTF-I decisions.

Details of the first house visited and the last house on each sheet must be entered in the space provided. When multiple sheets are used in an area, each sheet must be numbered in the space provided at the bottom right of the form. The working map of the area prepared will help in identifying the roads and location of houses. Changes to this map can be made during the survey.

All houses in the area must be visited and information entered into the form. Each household is to be identified by a number (Column A). **This is the household identification number.** The numbering of households is to be continuous until the area is completed. The assessment of the area may take more than one day but the **numbering of the houses will be in serial order for the entire area.** Restart of numbering will be done when a new area is being assessed by the same person. House marking should be done with chalk/geru indicating the serial No of the household and date of survey, as shown in Fig. 3.11.

Fig. 3.11. House marking during house-to-house survey for RI



Interview each household and gather information on the head of household (Column B) and the total number of members in each household (Column C). This must include all newborn children.

Next, enquire if there is any currently pregnant woman in this household. This does not depend on if she is a resident / visitor to the area. Include all pregnant women as each is a beneficiary. If yes, then encircle yes (Column D) and collect information on the pregnant woman and enter in Form 4.

Similarly for Columns F, G and H enquire if there is:

- A newborn child
- A child up to 1 month of age
- A child between 1 month and 1 year of age
- A child between 1 and 2 years of age.

If a child is identified in any of these columns, encircle "Yes" and enter information on the newborn/infant/child in Form 5.

VILLAGE/ AREA - Pregnant Women Survey Listing

RI Form 4

Name of ASHA/AWW/ assessor: _____ Area Name and No as IN Form 3: _____

Name of ANM:_____

House No as in Form 3	Name of the pregnant woman	Age in years	Husbands name	Mobile / Telephone Number	Is MCP card available: Yes / No	Expected date of delivery/ LMP	Tetanus Toxoid Vaccination			Ante Natal Check Up				FOR ANM ONLY	
							TT-1	TT-2	TT-Booster (If 2 doses of TT have been given within 3 years of the current pregnancy)	1st ANC	2nd ANC	3rd ANC	4th ANC	TT due Y/N	ANC due - Y/N
A	B	C	D	E	F	G	H			I				J	
							Date/Y/N/DNK	Date/Y/N/DNK	Date/Y/N/DNK	Date	Date	Date	Date		
					Y / N										
					Y / N										
					Y / N										
					Y / N										
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					Y / N										
					Y / N										
					Y / N										
					Y / N	TOTALS									

Signature of ASHA_____ Verified by ASHA Facilitator (Signature):_____ Verified by ANM (Signature):_____

SOPs for using RI Form 4

Form 4 has to be filled when a pregnant woman is identified in Form 3 Column E.

The number in Column A must be the same as that used to identify the household in Form 3.

This number is a unique number that will link the pregnant woman to the house details.

Columns B, C, D and E are for information which identifies the pregnant woman.

Column F. Enquire from the woman if she has been issued a mother and child protection (MCP) card and accordingly encircle Yes or No. If she does not have a card, then information should be shared with the ANM of the area to ensure that a card is issued to her during the next visit.

Column G. Determine the expected date of delivery (EDD) of the child. This can be sourced from the RI/MCP card if available or from the mother herself. If she is unaware, then determine the EDD as best as possible by assessing her date of last menstrual period (LMP). **(Surveyor can consult ANM who can refer to the EDD ready reckoner from RCH register/ training manual).**

The administration of TT vaccine to PW as per the UIP schedule prevents maternal and neonatal tetanus; details of the same are to be entered in the three H Columns.

Antenatal check-ups help to identify a high-risk pregnancy and reduce chances of any complications. Details of these checks are to be entered in the four (I Columns).

Column J. this is for the ANM to enter if the woman is due for any ANC or TT vaccination. These two columns make it easier for the ANM to extract the information and develop the beneficiary due list for each RI session.

The dates of administration of TT injections and ANC check-ups should ideally be obtained from the RI/MCP card.

RI Form 5– list and details of infants / children identified

SOPs for using RI Form 5

This form collates all the information of infants/children identified during the house to house survey.

When filled correctly, this form provides information needed to develop the beneficiary list of infants/children of the area. **Accurate information on the number of children and the vaccines that they are due for will help to identify which vaccines a child is to receive, and when.**

Name of ASHA/AWW/ assessor: _____ Area Name and No as per Form 1: _____ Infants

House No as in Form 2	Name of the child	Age in yrs and months	Sex M/ F	Name of the father and mobile number	Is MCP card available: Yes / No	Vaccines at birth			Vaccines at 6 weeks				
						Hepatitis B birth dose (Witin 24 hours of birth)	OPV-Zero dose (within 15 days of birth)	BCG (At birth or upto 1 year of age and as early as possible)	OPV-1	Penta-1	RVV-1	fIPV-1	PCV
A	B	C	D	E	F	G			H				
						Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/
					Yes /No								
					Yes /No								
					Yes /No								
					Yes /No								
					Yes /No								
					Yes /No								
					Yes /No								
					Yes /No								

Signature of ASHA/AWW/ Assessor_____

Column A. The number in Column A must be the same as that used to identify the household in Form 3. **If there is more than one child in a house, the same number will have to be entered for each of these children.**

Columns B, C, D and E. These columns are used to collect identification information of each child. Attempt to collect the latest mobile number from the parent/household.

Column F - Enquire if the infant/child has been issued an RI/MCP card. If not, information should be shared with the ANM of the area to ensure that a card is issued at the earliest.

Column G. This records detail of vaccines administered at birth. Dates are to be entered of when BCG, OPV birth dose and Hepatitis B (within 24 h) were administered.

Column H. Dates of administration of Penta 1, Rotavirus 1 (where applicable), PCV 1 (where applicable), fIPV 1 and OPV 1

Column I. Dates of administration of Penta 2, Rotavirus 2 (where applicable) and OPV 2

Column J. Dates of administration of Penta 3, Rotavirus 3 (where applicable), PCV 2 (where applicable), fIPV 2, and OPV3

Column K. Enter the dates of administration of vaccines due between the age of 9 months and 1 year – MR first dose, Vitamin A, PCV Booster (where applicable) and JE (where applicable) vaccines

RI Form 5

ants / children survey listing Name of ANM: _____

	Vaccines at 10 weeks			Vaccines at 14 weeks					Vaccines at 9 to 12 months					Booster and 2nd doses of Vaccines at 16 to 24 months of age					
PCV-1	OPV-2	Penta -2	RVV-2	OPV-3	Penta -3	RVV-3	fIPV-2	PCV-2	Measles / Rubella 1st dose	JE 1st dose	PCV Booster	Vitamin A 1st dose	For Fully Immunized (FI) child - has incentive been given to ASHA	OPV Booster	DPT Booster	Vitamin A	Measles / Rubella 2nd dose	JE 2nd dose	For Completely Immunized (CI) child - has incentive been given to ASHA
	I			J					K				L	M					N
Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	Date/Y/N	
													Yes /No						Yes /No
													Yes /No						Yes /No
													Yes /No						Yes /No
													Yes /No						Yes /No
													Yes /No						Yes /No
													Yes /No						Yes /No
													Yes /No						Yes /No
													Yes /No						Yes /No
																			TOTAL

Verified by ASHA/AWW Facilitator (Signature):_____

Column L. Record whether the ASHA has received the incentive for the child who is fully immunized – encircle "Yes" or "No". A child is to be considered as **fully immunized** if s/he has received all the due vaccines up to 1 year of age.

Column M. Dates of administration of vaccines due for a child between the ages of 1 and 2 years are to be entered in column M. This includes MR second dose, OPV booster dose and JE vaccine (where applicable).

Column N. Has ASHA has received the incentive for the child who is completely immunized– encircle "Yes" or "No". A child is to be considered as **completely immunized** if s/he has received all the due vaccines up to 2 years of age.

Step 4 • **Review** of all survey forms & **consolidation** of Sub Centre microplans

Each ASHA/AWW/LW/surveyor submits Forms 3, 4 and 5 to the ANM after completing the area survey. Step 4 is to review and collate this information.

ANM should plan for this meeting and inform all participants of the venue, date and time at least 2–3 days in advance so that they attend the meeting with completed survey forms.

Facilitator: ANM/Sector MO
Participants: ASHA/AWW/surveyor with ASHA facilitator, LHV/LS to attend if possible
Key activities to be conducted:

- Area demarcation to be finalized on map
- Review and refine RI plans as per actual head counts & identification of any missed (migratory/ settled) pocket in sub centre area
- Ensure functional tagging – areas tagged to existing RI sites should be practical
- Consolidation of Routine Immunization Microplan at sub centre – Form 6,7,8 & 9
- Develop mobilization plans
- Update the map of sub-centre/urban health centre showing:
    - All HRAs, villages with hamlets, urban areas with wards, sub wards & mohallas
    - All session sites and session days including Anganwadi centres
    - Distance from the ILR point and the mode of transport.
    - Landmarks as Panchayat Bhavan, school, roads etc.
    - Demarcate ASHA/mobilizer wise areas for social mobilization on map

Preparations

The Sector MO must review the plan of the ANM; timely oversight will ensure the development of effective RI microplans. MO should guide the ANM and extend support with visits and reviews.

During the meeting

ANM will review the information collected during the house to house survey in Forms 3, 4 and 5 with the ASHA/AWW/link workers/surveyor. A simple map of the SC can then be made from the information and experiences of the workers who have completed the survey. This map need not be to scale, but should include area demarcation for ASHA/AWW/mobilizers and other information as mentioned above.

As the actual head counts and areas are now available, review and refine the RI session plans to address the following issues:

- Are the number of sessions presently sufficient?
- Are all the areas covered?
- Are the migrants/HRAs identified? If so, are RI sessions being conducted for these mobile populations?

Session due list (Form6) –With the information gathered in Form 4 and Form 5, it is now possible to correctly quantify the number of beneficiaries.

The role of the ANM is crucial in this meeting. The focus must be on three points – beneficiary list, area finalization and mapping. The ANM Should remember that these tasks require investment in time and this meeting may take more than one day. RI Form 6 is the session due list and is best to be filled in Step 5 after finalization of the SC micorplans. A draft may be prepared but in discussion with MO Planning by the Sectoral MO should take this into consideration to enable him to attend if possible.

Outputs expected

- Number of new areas identified
- Number of beneficiaries
- Consensus on listing of areas and HRA
- Consensus on demarcation of areas
- Formats collected after cross check and attestation
- Availability of maps.

List of documents after conduct of the SC meeting:

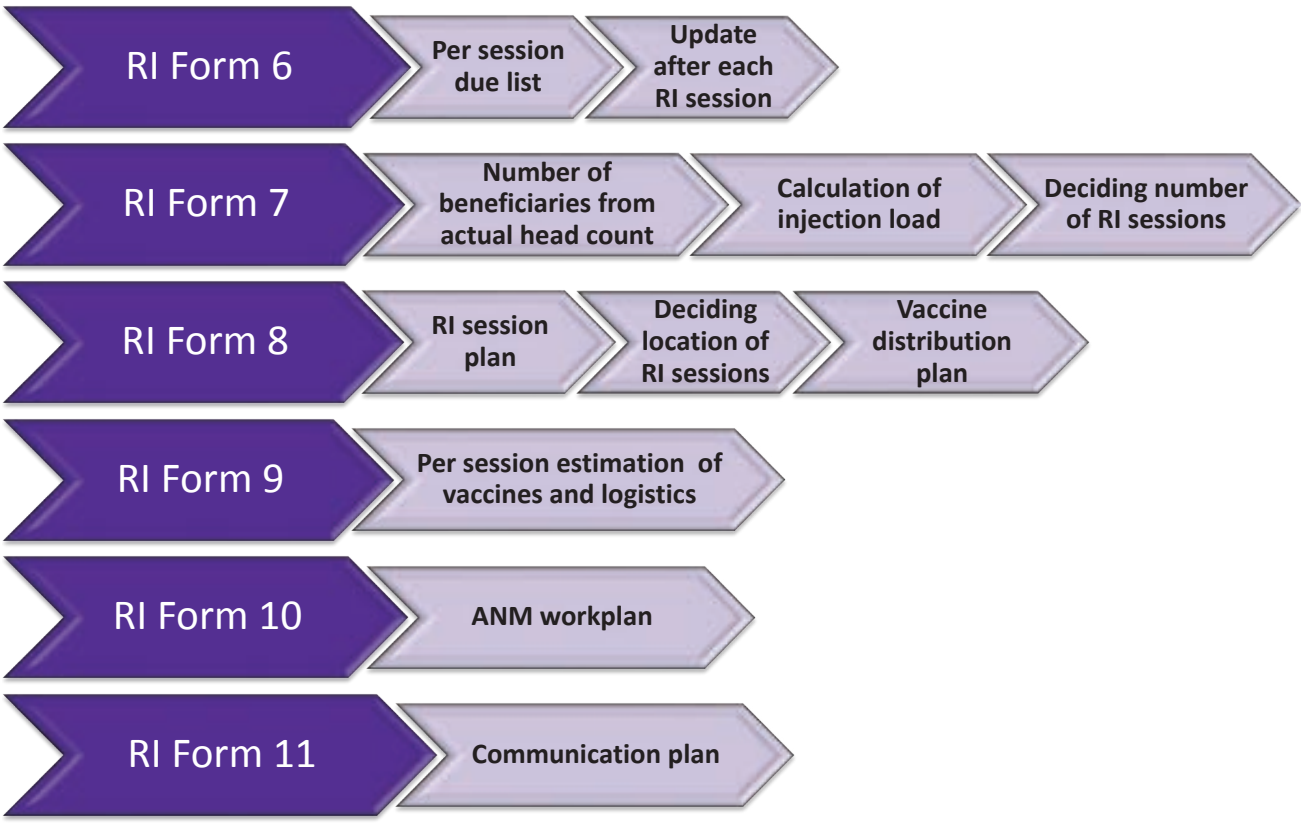
1. Completed RI Form 3 for each area
2. Completed RI Forms 4 and 5 –Beneficiary list – as per ASHA/areas identified
3. RI Form 7– proposed sessions planning for SC
4. Map of the SC – Form 2 showing demarcation of areas for ANMs (if applicable), ASHAs and AWWs

An overview of RI Forms 6 to 11 used in the SC RI microplan is given in Fig. 3.12.

Roles and responsibilities

Personnel	Activities to be performed	Supervisor
Sector MO	Monitor surveys, review forms in the field Oversee the meeting at SC where possible	MOIC , DIO
ANM	Conduct the meeting at SC Finalize area listing and draft of plan for conducting RI sessions in the areas	MOIC ,Sector MO
ASHA	Contribute to final forms	SC ANM/ASHA facilitator
AWW	Contribute to final forms	SC ANM/LS

Fig. 3.12. Overview of Sub Centre RI Microplan – Forms 6 to 11



RI Microplan Form 6 – Session beneficiary due list

RI SESSION DUE LIST **PHC:** _____

Name of Sub-Centre : _____ **Block :** _____

Name Session Site : _____

Name & No of ANM : _____ Name & No of ASHA : _____ Name & No of AWW : _____

RI Form 6

										After the RI session		
	Details of Pregnant Women / Children due for vaccination for RI session											
Sl. No.	MCTS Registration No.	Name of Child / Pregnant Woman	Date Of Birth / Expected date of Delivery	Age	Sex M / F	Name of Father/Husband	Vaccines due in this session	Did the pregnant woman / child arrive today? (Yes/No)	Vaccines which were administered to pregnant woman / child (If not given mention reason)	*Incentive money Rs. 100 will be payable to ASHA under Part C.S.A. for Full Immunization	**Incentive money Rs. 50 will be payable to ASHA under Part C.S.B. for Complete Immunization
A	B	C	D	E	F	G	H	I	J	K	L
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											

Total amount received

Number of beneficiaries who did not attend	Out of Village	Sick	Refused	Vaccinated outside	Other
Have these beneficiaries been included in the next session?	Y/N	Y/N	Y/N	Y/N	Y/N

Total Number of Pregnant women as per the due list	
Total women vaccinated	
Total number of children as per due list	
Total children vaccinated	

Signature of ANM *Signature of ASHA* *Signature of AWW*

This form is to be filled after finalization of SC microplans with medical officer

SOPs for using RI Form 6

This form is the session due list. **It identifies the number of beneficiaries per session and the vaccines for which they are eligible during the RI session.** This is also the record of payment of ASHA incentives.

This format is to be prepared by the ANM with support of the ASHA/AWW/LW after the proposed microplan is approved by the medical officer.

This session due list will help the ASHA in mobilizing beneficiaries to the session/s. Use a calendar and share the dates of upcoming sessions with ASHA/AWW/LW in advance to allow for mobilization.

Form 6 – Note

- This is a session due list and incentive recording sheet
- To be filled after finalization of microplan with medical officer
- ANM to compile the session beneficiary due list from the information
- Where possible, the MCTS number of PW is to be entered

Column A: The serial number for each beneficiary is to be entered here.

Column B: MCTS registration number is to be entered where available. ANM can provide this information from her RCH register. This unique number will help track the beneficiaries for complete immunization.

Column C: Name of the child/pregnant woman identified for services during this session is entered here.

Column D: For children enter the date of birth and for PW the expected date of delivery, if known.

Column E: Enter the age of the child in months or age of pregnant woman in years and months.

Column F: Enter the sex of the child.

Column G: Enter the name of the father or husband for easy identification at the village level.

Column H: Enlist all the vaccines that the beneficiary is due for in the upcoming session.

The following columns are to be filled at the end of the RI session:

Column I: After the completion of the RI session, cross check that all beneficiaries had arrived, answer as Yes or No

Column J: Enter all the vaccines were received by the beneficiary during this session. If not received,mention reasons.

Columns K and L: These are to be filled as and when ASHA receives her payments.

Presentation of this form

This format is not to be used singly. Each sheet to be in triplicate (different colours) and numbered. ANMs should use carbon sheets while filling the form. It is recommended that a booklet containing enough sheets for one year be printed to enable continuous use of the information and developing of a realistic RI session due list.

Maintaining the session due list after every RI session

- Who are the children who were due for vaccination today but did not turn up?
- Why did they not turn up?
- Who are the children we did not list for today's session?

It is essential that the left-out and drop-out children be identified. These children are at maximum risk as their immunization cover will not be complete and makes them susceptible to VPDs. Incomplete immunization contributes to child deaths under the age of 2 years.

Therefore, after each session the ANM, ASHA and AWW must review the children who have not come to the session. The reasons for not coming, once identified, must be addressed by the team. Seek support from local influencers/key persons to identify any children or beneficiaries before leaving the session site.

Enlist all children **who had not come** in for the session conducted, irrespective of the reason. After these names, enter the names of children **who will be due** for any vaccine in the next session. Share this list with the ASHA/AWW/LW so as to give them sufficient time to visit these houses and use all possible methods to convince the parents or ensure that the children are vaccinated at the fixed site at the PHC or in the next session.

As per the SC RI microplan, the ANM should remind the ASHA/AWW/LW on the next session date before leaving the session site.

Subcenter / UHC - RI Sessions plan

RI Form 7

District: _____ Block/PHC/Urban Planning Unit: _____ **SC/UHC: _____**

Name of IO / ICC: _____ Mobile no.: _____ Name of Medical Officer I/C: _____ Mobile no.: _____

Name of ANM: _____ Mobile no.: _____ Name & Designation of Supervisor: _____ Mobile no.: _____

S.No	Name of Villages / Hamlets / Tolas / HRA #	Total Population of Area (Totals of form 3 Column D)	Beneficiary Targets				Monthly Injection Load	Number of Sessions	Name and location of the Session site / sites	Name of the mobilizer	Type of area / terrain - plain / hilly / riverine	Type of Session - Fixed / outreach/ mobile / tagged
			Annual Target (PW = Actual Head count X2 , Infants =Actual Head count)		Monthly Target							
			PW	Infants	PW	Infants						
A	B	C	D	E	F	G	H	I	J	K	L	M
					D/12	E/12						

 # 1- Slums with migration; 2 - Nomads; 3 - Brick Kiln; 4 - Construction Site; 5 - Others (fisherman villages, riverine areas with shifting populations, etc.); 6 - Non migratory (settled population), hard to reach areas

Less than 25 injections: One session every alternate month**; 26-50 injections:** one session per month**; more than 50 injections:** two sessions per month as per need**; For hard to reach areas or less than 1000 population, where not tagged,** plan for sessions every quarter for a minimum of 4 sessions a year **; for a busy PHC/CHC/RH: plan daily sessions.**

SOPs for using RI Form 7

Enter the serial number and name of the villages in **Columns A and B**, keeping the same order as in Form 1. **New areas /identified missed areas should be entered towards the end with clear marking that this is a new area, using an asterisk (*).**

Using Form 3 Column D, the individual areas actual population (from the survey) should be entered into **Column C.**

The information for Column D is of the annual target of PW in each area.

Annual target of PW = Number of PW identified in the area survey X 2

The information for **Column E**

Annual target of infants = actual number of infants identified during the area assessment.

Calculating annual and monthly target population

Beneficiaries in the UIP are the PW and the children of an area who are eligible for any vaccinations. The cardinal numbers of these beneficiaries is obtained by conducting the area and house to house survey. Once the survey is completed, these figures will be available from Form 3.

However, for calculation of the yearly and monthly number of beneficiaries it is necessary to do the following:

- **For pregnant women:**

  The survey will give the number of PW identified in an area at the time of conducting the survey.

  The annual target of PW = actual number of PW as per head count X2

- **For children:**

  The house to house survey also identifies child beneficiaries. For the calculation of the annual target the actual number identified is considered.

  The annual target of children = actual number of children as per headcount

For columns F and G

Monthly target of PW = Annual target divided by 12

Monthly target of children = Annual target divided by 12

In column H

Enter the monthly **injection load for each area.**

Calculating injection load (only for determining the number of sessions)

This calculation is to be used only as a planning tool and ***not for estimation of vaccines or logistics.***

Firstly, determine the total number of injections needed per beneficiary.

This gives a multiplying factor of **15 injections.**

- BCG – 1 injection
- DPT – 2 booster injection
- HiB containing Pentavalent – 3 injections
- fIPV – 2 injections
- MR Vaccine – 2 injections
- PCV – 3 injections (where applicable)
- TT– 2 injections (for pregnant women)

For districts where JE is included in the schedule **add 2** to the above number, giving the multiplying factor of **17 injections.**

Injection load = Monthly target of children from **Column G** multiplied by the above factor

Column I

Based on the monthly injection load the number of RI sessions to be conducted for each village/area is to be entered as per the guideline below.

Frequency of RI sessions depending on injection load –

- 1 to 25 injections – 1 session every alternate month
- 26 to 50 injections – 1 session every month
- 51 to 100 injections - 2 sessions every month

For hard to reach areas or less than 1000 population, where not tagged, plan for sessions every quarter for a minimum of 4 sessions a year

Column J describes the location of the vaccination site. It is important that the exact location be entered, preferably with a landmark. This helps to collate the information and makes it easier to develop the overall plan for RI sessions under the SC area.

Mobilizers play an important role in mobilizing beneficiaries to the RI session site. The name of the mobilizer is to be entered into **Column K.**

Column L. Describes the type of terrain as this is a factor that contributes to determining

the number of sessions in the area and the method of vaccine delivery. The areas may be as follows:

- Plain – flat and accessible with no compromise in accessibility
- Hilly – hilly area
- Riverine – area divided by a river or rivulets making access difficult
- Inaccessible – hard to reach due to absence of roads or is approachable only by foot.

Column M. Describes the type of session. Sessions can be:

- **Fixed.** These sessions are held where vaccine storage is possible because of availability of ILR and deep freezer (DF), i.e. the sessions conducted at PHC/CHC
- **Outreach.** All sessions conducted where vaccine has to be taken by vaccine carrier
- **Mobile.** Sessions conducted using a vehicle which moves from site to site along with the immunization team and vaccine
- **Tagged.** Site/area which does not have a session but is linked to the nearest session site.

Ensuring “Same day, Same site, Same time”policy will help to increase community acceptance and in turn the utilization of services provided.

Sub Centre/ UHC: Per Session Injection load and vaccine distribution plan

RI Form 8

District: _____ Block/PHC/Urban Planning Unit: _____ SC/UHC: _____

Name of Medical Officer I/C: _____ Mobile no.: _____ Name of IO / ICC: _____ Mobile no.: _____

Name of ANM: _____ Mobile no.: _____ Name of Supervisor: _____ Designation:_____ Mobile no.: _____

S.No	Name and location of Session Site (Exact location) **If >1 session sites in big villages mention each separately**	Name/s of village/sub village area /hamlet/ urban ward/ mohalla/ tola covered by the site with its sl no. from Format 1 **(all areas in one cell separated by comma)**	**Frequency of Sessions** (Once a quarter / once in 2 months / number)	**Target for the session** (add if multiple areas / tolas are clubbed or divide in case of big village)		**Per Session doses required for each vaccine & vitamin A**											**Injection Load for the session** (TT+BCG+DPT +Hep B +Penta +MR+JE+PCV)	THESE COLUMNS TO BE FILLED AFTER APPROVAL OF PROPOSED PLAN BY MEDICAL OFFICER					
				PW	**Infants**	TT	BCG	DPT	OPV	Penta	RVV	fIPV	MR	JE	Vit A	PCV		**Month 1** ____	**Month 2** ____	**Month 3** ____	**Vaccine Distribution**		
																					Mode of Transport	**Name of person responsible**	**Contact number**
						EX2	FX1	FX2	FX5	FX3	FX3	FX2	FX2	FX2	FX9	FX3		**Day (Wed 1-5 or Sat 1-5)**					
A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**		
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							
13																							
14																							
15																							

 # 1- Slums with migration; 2 - Nomads; 3 - Brick Kiln; 4 - Construction Site; 5 - Others (fisherman villages, riverine areas with shifting populations, etc.); 6 - Non migratory (settled population), hard to reach areas

The form contains detailed information on each RI session site in the SC. It also contains details on frequency of sessions, the villages/areas covered or tagged with each site, the injection loads per antigen and the vaccine distribution plan for each session.

SOPs for using RI Form 8

In **Column A,** enter the serial number.

In **Column B,** this is the name of the RI session site.

Enter each RI session site in a separate row. It is important that the exact site location be entered. **This will give the exact planning of sessions for the SC on a single page**. If the site is located in an Anganwadi centre, also include the centre number and location. If the site is located in private premises, the house owner's name should also be entered. Include a landmark where possible.

Column C. This contains the names of areas to which a RI session site provides services. Enter the names of the village/s or areas as per Form 1. For multiple areas, write the names separated by commas into this column.

E.g – Village XYZ

The frequency of sessions at this RI site is to be entered in Column D. It may be entered as:

- once in a quarter, i.e. once in three months
- once in two months
- twice a month
- daily.

Column E and F. The target of PW and infants per session is determined for each site.This is obtained from monthly targets in Form 7 Columns F and G. If the site caters to more than one area, add the targets. If there are two RI sites in a large village, then the monthly target is to be divided by 2.

Example – monthly target for each area from Form 7 columns F and G

Village XYZ has 3 PW & 5 infants and tola XYZ has 1 PW & 2 infants for RI site no 1.

Thus for RI site 1 monthly target will be 4 PW & 7 infants.

Village XYZ has 8 PW & 12 infants with two RI sites 2 and 3

Thus for RI site 2 monthly target will be 4 PW & 6 infants and for RI site 3 also is 4 PW & 6 infants

Note: **For fixed site use daily average of PW and children vaccinated (number vaccinated per month/30)**

Columns G to Q. Injection load for each antigen is to be entered in Columns G to Q. Using the target from **Columns E and F** the individual antigen dose requirement can be calculated using the formula in the boxes.

Column R. The **total** injection load for each site is now available to enter into Column R. This is calculated by adding the number of beneficiaries in **Columns G, H, I, K, L, M, N, O, P and Q.** (Note that OPV, Rotavirus vaccine (where applicable) and Vit A should not be considered as injections.)

Columns S, T and U. These columns show the exact time of RI site functioning for the next 3 months.

Each column is for a month. The day is to be entered as follows:

– Days – Mon, Tue, Wed, Thu, Fri, Sat
– Weeks – 1 to 5

Columns Q, R and S. Columns Q, R and S show the exact time of RI site functioning in the next 3 months.

Each column is for a month. The day is to be entered as follows:

E.g. If the session is held in Month 2 on the fourth Wednesday, the entry will be "Wed 4" in Column S.

Each state can customise this format for their own RI days and immunization schedule.

Method of vaccine distribution to each site is to be entered in the three **Columns V.**

- Information on the mode of transport – two wheeler/three wheeler/four wheeler with its registration number, if possible
- Name of the person transporting the vaccine and his contact number are to be entered.

RI Form 9

Sub Centre area: Per Session Estimation of Vaccines & logistics

TO BE USED WITH FORMAT 8

District: _____ Block/PHC/Urban Planning Unit: _____ SC/UHC: _____

Name of Medical Officer I/C: _____ Mobile no.: _____ Name of IO / ICC:_____ Mobile No._____

Name of ANM: _____ Mobile no.: _____ Name of Supervisor:_____ Mobile No._____

S.No	Location of session site	Estimation of vaccine vials and logistics for each session (At least one vial of each vaccine in each session) This should be filled with the help of Format 8																		
		TT	BCG	DPT	OPV	Penta	RVV	fIPV	MR	JE	Vitamin A	PCV	ADS 0.1 ml	ADS 5 ml	Reconstitution syringes	Paracetamol tablet/syrup	IFA tablets	Zinc tablet / syrup	ORS packet	RI / MCP card	Family welfare materials
Calculations with help of columns in Format 8		G x1.11 /10	H x 2 /10	I x1.11 /10	J x1.11 /20	K x 1.11 /10	L x 1.33 / 10	M x 1.11 /50	N x1.33 /5	O x1.33 /5	(Px 1ml) + {(f x 8) x 2ml)} x 1.11	Q x 1.11 /4	(H+M) x 1.11	(Total of DPT/Penta/ MR /PCV/ JE inj) x 1.11	no. of BCG, Measles & JE vials x 1.11						
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
	TOTAL																				

Signature of ANM_____ Verified by Medical Officer (Signature):_____

SOPs for using RI Form 9

This format collates the exact requirement of vaccines and logistics (considering wastage) for each session site. This information is calculated using data **from Form 8.**

Columns A and B should be in the same order as in **Form 8.**

Columns C through M, These columns, provide the number of vials/units of vaccine required for each session site. For the calculations, use the information from columns mentioned from Form 8 for each session site. (Number of doses **x** WMF) ÷ no. of doses per vial.

Columns N, O and P - Calculates the requirement of syringes including reconstitution syringes. Calculation is based on number of vials from **Columns C to M of this format.** Remember – only calculate reconstitution syringes for **BCG, MR and JE.**

In the format wastage factors are given in the row below the names of antigens.

Columns Q to V are to indicate the requirement of other logistics for each session site.

Wastage multiplication factor (WMF)–

This is for use in estimation of vaccine and logistics. It is calculated using the following equation:

100 divided by [100 – (wastage %)]

E.g. if wastage is 15 %,

100/ [100-15]

100/85 = 1.18

Permissible wastage percentage

	Number of doses	Permissible wastage %	WMF
Hep B	1	10	1.11
BCG	1	50	2
DPT	2 booster	10	1.11
OPV	3+2 booster	10	1.11
Rotavirus	3	25	1.33
IPV	1	10	1.11
Pentavalent	3	10	1.11
MR	2	25	1.33
PCV	3	10	1.11
TT	2	10	1.11
JE	2	25	1.33
Syringes	As per requirement	10	1.11

RIMP – Form 10 - ANM work plan

This form is used by each ANM to plan her movement for the next 3 months.

The day columns may be customized for each state or district.

Entry of the name of the site and time is to be made against each month.

RI Form 10

Sub Centre - ANM's Workplan

District: _____ Block/PHC/Urban Planning Unit: _____ SC: _____

Name & Mobile no. of Medical Officer I/C: _____ Name & Mobile no. of IO / ICC: _____

Name & Mobile no. of ANM: _____ Name & Mobile no. of Sector Medical Officer: _____

Month	Week	Location of RI sessions with timing					
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						

Signature of ANM _____ Verified by Medical Officer (Signature): _____

RI Form 11 - Sub Centre Communication Plan

Sub centre communication plan for RI	Quarter- 1 / 2 / 3 / 4					RI Form 11
Name of Block:_____	Name of ANM:_____			Name of Subcentre:_____		
Name of Village						
Nane of Session site	1-	2-	3-	4-	5-	6-
Activities						
Miking / drum beating- Name and contact number						
Mosque announcement - Contact person and number - announcement time						
Meetings (Mothers meeting,AWW meeting,etc - Contact person and number - Monthly / weekly)						
VHSC meeting - contact person and number - location - attended by ANM Monthly / weekly -						
School Rallies - school name and contact person with number (once a month in villages on						
Celebrations / Special Days (eg Mothers day, health day etc) - contact person and number						
Wall paintings - locations						
Banners - identify 4 key *locations* - *Ensure* display at least one day before RI day						
P**ainting competition / Exihibition** - (once a quarter -school name and contact person with number						
Posters - identify 5 key locations (other than Panchayat ghar, Ration store, AWWcentre, Sub centre, Bus stand) - ensure display at least 2 days before RI day						
Pamphlets / Leaflets - available with - contact person name and number - distribute before RI session day						
Counselling aids / job aids (flip books etc.,) - available with - contact person name and number						
Other						
Manpower involvement - with contact number						
Name of ASHA						
Name of AWW						
Name of Mobilizer / CMC						
Name of community influencer						
Name of PRI member						

Date:_____ Sign of ANM:_____ Sign of MO:_____

SOPs for using RI Form 11

Form 11 is the communication plan for a SC.

Information to be filled for up to 6 session sites under a SC. Multiple formats may be used if needed.

A number of activities have been identified; the medical officer should guide the ANM to identify the activities that can be conducted in her areas. It is important to firstly identify the contact person who will coordinate the activity such as a school principal or community leader. Meetings such as **VHSC, Mothers meetings, AWW meetings** are generally held regularly and the tentative dates should be entered in the columns. Follow up on the dates by ANM and if possible the medical officer can support the visits or include them in MO plan.

With IEC material (Posters / banners) the common issue remains who and where the IEC is to be displayed. When reviewing the SC RI microplan discuss the locations appropriateness with ANM and enter the locations in the columns. MO can suggest changes when visiting the area or during subsequent meetings.

Painting competitions / exhibitions require some planning but have a positive impact on the community. Encourage the conduction of such activities.

Pamphlets / leaflets / counseling aids are material that can be placed at the AWC or other locations and used during RI sessions / other meetings.

Having the **names and contact numbers** of frontline workers of each centre will help the ANM to contact them in advance of RI session days. PRI / Community influencers can play a key role in RI and it is essential to identify them in a village or ward area.

Step 5

- **Finalization** of Sub Centre plans and **development** of **final block PHC plan**

The final step in the RI microplanning exercise at the PHC comprises of two components:

- **Component 1** - Review and finalization of the newly updated/ proposed SC RI microplans and finalization of formats and session due lists
- **Component 2** - Development of the final block PHC/UHC RI microplan.

First component: Review of the updated / proposed RI plans

This meeting is to be conducted on the same lines as the first meeting as demonstrated in step 1. The outputs are now focused on the finalization of SC microplans and the development of the PHC microplan. Each ANM should present her sub centre microplans focusing on the following points:

1. Total number of areas identified – any increase or decrease? Form 1
2. Total number of HRAs identified – any increase or decrease? Form 1
3. Demarcation of areas – who will be looking after which area? Form 1 and 2
4. Number of RI sessions planned? Form 7 and 8
5. Are the maps updated? RI Form 2
6. Is sub centre RI microplan now complete?

Each ANM after finalization of the information, plans and forms should compile the information for her SC. Sector medical officers should review the information for their respective areas. After review the MO should approve the ANMs microplans including the number of sessions and the sites.

The ANM can now develop the RI session due lists (Form 6) as per the RI sessions.

Plans from all sub centre are required including those which are vacant and those where ANM is on leave. It is advisable to review 2 to 3 ANMs per day to allow for other activities and maintain quality.

The second component - development of the PHC plan comprises of forms 12 to 18 as enlisted in figure 3.13. Form 12 is made by collating information from individual sub centre plans (RI form 7 and 8). Remember to include the fixed site session at PHC/Block.

Facilitator: MOIC

Participants: Sector MO,ANM, LHV, Health supervisors

Minimum activities at the final PHC meeting

- Review and finalization of SC plans for
  - inclusion of all HRAs
  - special plans for difficult areas
  - adequate deployment of mobilizers
  - adequate session planning
- Compile plans from all SCs to develop block plan
- Prepare vaccine delivery and supervision plan
- Recalculate vaccine and logistics requirement.

Remember

- Every 6 months– Update the available list of all the HRAs in the block/urban area
- During visits to RI sessions – review existing beneficiary and mobilization lists
- Prioritize block/s having large number of HRAs
- Review monitoring reports and data to identify issues
- Facilitate block level review and revision under guidance of DIO in priority blocks
- Follow-up the progress during weekly and monthly PHC meetings

Outputs expected

Availability of the following documents after Step 5:

- Forms 6, 7, 8, 9 ,10 and 11 for each SC
- Forms 12 to 18 for the PHC

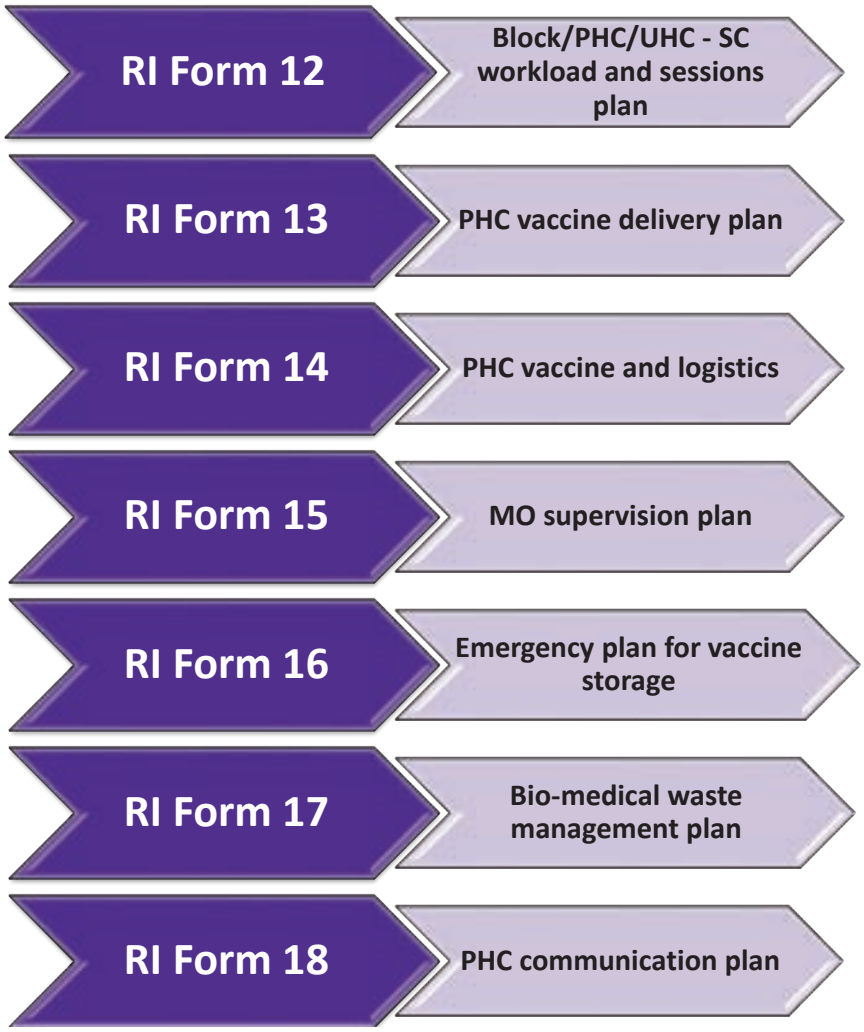
Roles and responsibilities

Personnel	Activities to be performed	Supervisor
MOIC	Coordination of the activity/reviewing each SC plan	DIO
Sector MO	Oversee/review the microplans submitted by ANMs	MOIC
Data manager	Clarify and finalize the names of villages. Data entry for generation of RIMP	MOIC
ANM	Generate SC forms and suggest changes to the reviewing officer	Sector MO

Preparation of a block/PHC/urban planning format

At a PHC or UHC, Seven formats provide overview of a PHC's RI session planning.

Fig. 3.13. Overview of PHC RI Microplan – Forms 12 to 18



RI form 12 – Block workload and sessions plan per Sub Centre

This format is a one page listing of the SCs and the details of the number of beneficiaries, injection load, number of sessions and HRAs. This information is a collation of totals of **Form 8** of each SC. It gives the workload per SC and the details of number of sessions for the PHC.

For fixed sites – at PHC/CHC/UHC – Remember to include as a separate row entry. To determine injection load of the fixed session, use monthly average from tally sheets / register. In very busy centres daily sessions may be held. In form 12 write "Not Applicable"in the columns for information that is not relevant for fixed site.

BLOCK / PHC - Population and injection load

RIMP - FORM 10

BLOCK / PHC / UHC - Subcentre workload and Sessions plan

RI Form 12

District: _____ **Block/PHC/Urban Planning Unit:** _____

Name of IO / ICC: _____ Mobile no.: _____ Name of Medical Officer I/C: _____ Mobile no.: _____

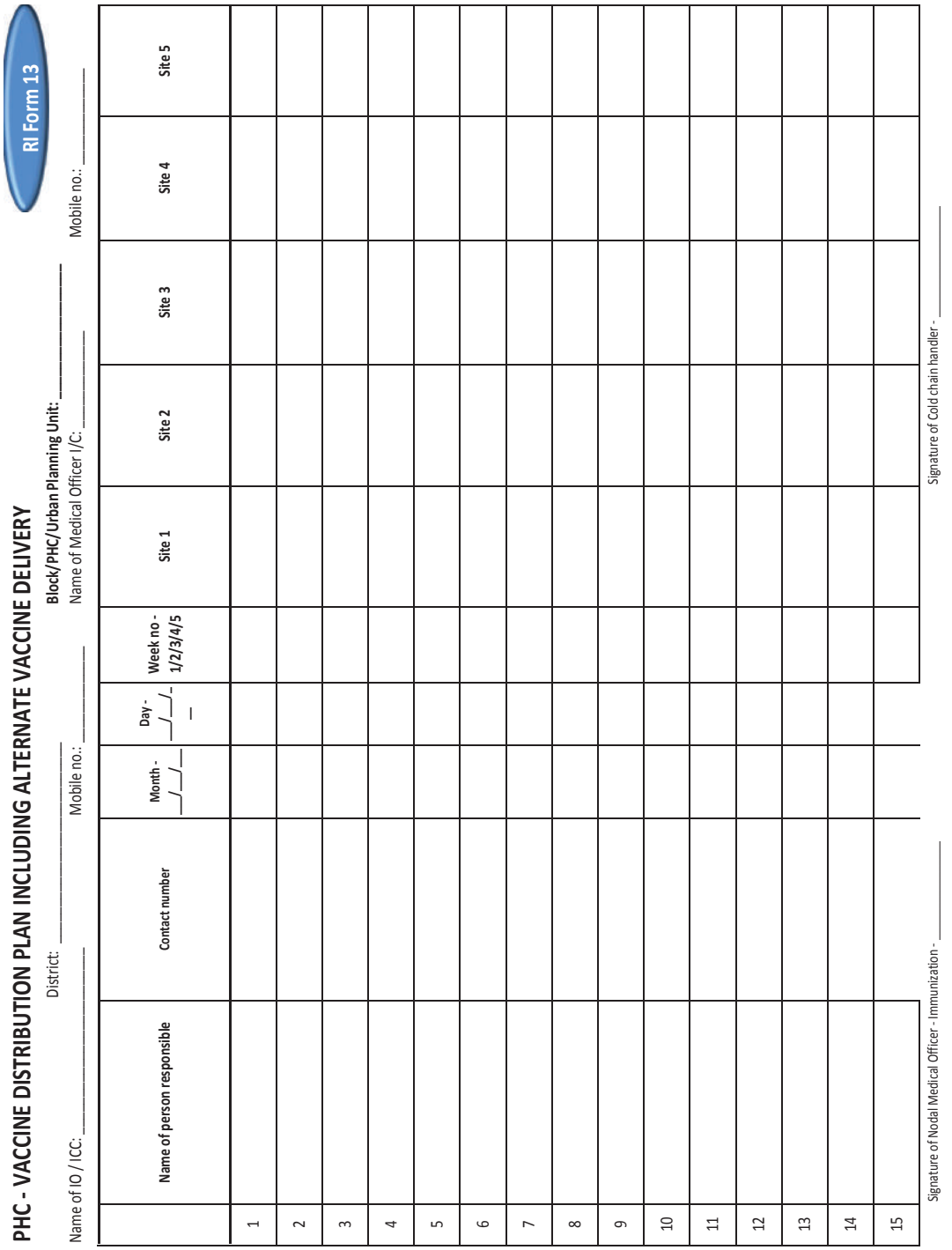
S.No	Name of Sub Centre	Total Population	Estimation of beneficiaries				Monthly Injection Load	Number of Session Sites	Number of sessions per month	Number of polio HRAs	Name of ANM	Contact No
			Annual Target (Based on actual headcount) by ASHA / AWW / ANM etc.		Monthly Target							
			PW	Infants	PW	Infants						
			A	B	C	D	E	F	G	H	I	J
					a/12	b/12						
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
	TOTAL											

Signature of Nodal Medical Officer - Immunization - _____

Signature of Medical Officer I/c- _____

RI Form 13 - Vaccine Delivery Plan including Alternate Delivery.

Vaccine Delivery System refers to the independent person who delivers the vaccine carrier from the PHC to the session site. The ANM has to directly reach the session site in order to maximize the use of her time. It helps to start the session on time, and the HW does not have to come to PHC to collect or return vaccine and other logistics to the PHC at the end of the session. Prepare the AVD plan and route chart for alternate vaccine (and logistics) delivery (AVD) to the session sites from the nearest cold chain storage point for each session day.



RI Form 13

PHC - VACCINE DISTRIBUTION PLAN INCLUDING ALTERNATE VACCINE DELIVERY

Name of IO / ICC: _____ District: _____ Block/PHC/Urban Planning Unit: _____

Mobile no.: _____ Name of Medical Officer I/C: _____ Mobile no.: _____

	Name of person responsible	Contact number	Month - __/__/__	Day - __/__/__	Week no - 1/2/3/4/5	Site 1	Site 2	Site 3	Site 4	Site 5
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Signature of Nodal Medical Officer - Immunization - _____ Signature of Cold chain handler - _____

RI Form 14 - Block / PHC Monthly requirement of vaccines and logistics

This format provides a single sheet to view the requirement of vaccines and logistics for the entire PHC.

RI Form 14

Block / PHC / UHC Monthly requirement of Vaccines & logistics

District: _____ Block/PHC/Urban Planning Unit: _____

Name of Medical Officer I/C: _____ Mobile no.: _____ Name of IO / ICC: _____ Mobile No._____

S.No	Name of Subcenter	Estimation of vaccine vials and logistics for each Subcenter																					
		TT	BCG	DPT	OPV	Hepatitis B	Penta	RVV	IPV	Measles	JE	Vitamin A	PCV	ADS 0.1 ml	ADS 0.5 ml	Reconstitution syringes	Paracetamol tablet/syrup	IFA tablets	Zinc tablet / syrup	ORS packet	RI / MCP card	Family welfare materials
	Source figures from column totals from FORM 9 of each sub centre																					
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
	TOTAL PHC requirement																					

Signature of ANM _____ Verified by Medical Officer (Signature): _____

RI Form 15 - Block medical officer supervision plan

Prepare the supervision plan for a quarter at the Block/PHC/Urban planning unit level.

RI Form 15

Health Centre MO Supervision plan

District: _____ Block/PHC/Urban Planning Unit: _____

Name & Mobile no. of Medical Officer I/C: _____ Name & Mobile no. of IO / ICC: _____

Month	Week	RI session sites and Medical Officers assigned for supervisory visits					
		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						

Signature of Medical Officer _____ Verified by Medical Officer (Signature): _____

RI Form 16 - Emergency plan for vaccine storage

At your PHC/Urban Planning Unit, prepare a plan for safely storing vaccines during equipment breakdown or electricity failure and display in the cold chain room.

EMERGENCY PLAN FOR VACCINE STORAGE				
PHC / UHC:_____		Date: __/__/____	RI Form 16	
When to act: ILR/Deep Freezer breaks down OR Electricty failure for more than 18 hours				
Who will act: : Name and number of Cold Chain Handler/s:_____				
What to do (Recommended actions)				
ILR	1-Shift vaccines in cold boxes with conditioned icepacks. Place thermometer inside the cold box. 2- Arrange shifting of vaccines to nearby PHC or other vaccine storage facility. 3-Contact DISTRTICT FOCAL POINT for arranging cold chain space and arrange shifting.			
Deep Freezer	1- Shift ice-packs into cold boxes, if extra cold box is available after shifting of vaccines from the ILR. 2- Contact ice-factory:_____ , Mr _____ to freeze ice-packs.			
In case of ILR /DF breakdown, IMMEDIATELY INFORM:				
Designation	**Name**	**Contact no**	**E-mail**	**Alternate contact no**
Medical Officer :				
DIO:				
Discrict CC mechanic:				
State Cold chain Officer				
Company direct:				
Record details of breakdown in inventory register , UIP monthly PHC performance report, NCCMIS				
Signature of Medical Officer			Signature of Cold Chain Handler	

BIO-MEDICAL WASTE MANAGEMENT PLAN						
PHC / UHC:_____		Date: __/__/____	RI Form 17			
Name of the outsourcing agency : _____						
Name and contact number of agency supervisor:_____						
Name and contact number of agency waste collection person:						
At PHC/Urban planning unit:						
Name and contact number of nodal medical officer :_____						
Name and contact number of coordination personnel:_____						
Name and contact number of ANM coordinator :_____						
BMW mechanisms at unit						
		Location				
Identified RI session sharps recovery point	Y/N					
identified Disinfection corner/point	Y/N					
Sharps pit location	Y/N					
	Y/N					
Availability of IEC material on BMW :						
Location						
@ OPD	Y/N	**EMERGENCY Contact:**				
@ Injection Room	Y/N	**1**				
@ OT (Minor / Major / Labour)	Y/N	**2**				
@ lab (Liquid waste management)	Y/N	**3**				
@	Y/N					
@	Y/N					
Signature MO/IC :_____		**Signature Nodal Officer :**_____				

RI Form 18 – Communication plan for PHC/UHC

PHC/UHC Block level communication plan for RI		RI Form 18
Name of Block:_____	**Quarter- 1 / 2 / 3 / 4**	
Activities		
Meetings with Block Panchayat / BDO		
Local Press agency / journalist- Names and contact numbers		
Meetings with NGO/Community groups/institutions		
Other		
IEC material and display plan		**dispatched for display**
Banners -	Received on: __/__/____ Quantity: ____	on:__/__/____ to:
Posters -	Received on: __/__/____ Quantity: ____	on:__/__/____ to:
Pamphlets / Leaflets	Received on: __/__/____ Quantity: ____	on:__/__/____ to:
Counselling aids / job aids (flip books etc.,) - available with - contact person name and number	Received on: __/__/____ Quantity: ____	on:__/__/____ to:
Other	Received on: __/__/____ Quantity: ____	
Name & contact number of PRI Chairman		
Name & contact number of BDO		
Name & contact number of BEO		

Date:_____ Signature of MO:_____

SOPs for using RI Form 18

This communication plan has been designed with the objective of collating the information necessary at a PHC level to give an overview of the opportunities available to the MO and staff to enhance immunization coverage. The plan can be made for each quarter with tentative dates. At times it may not be possible to give exact dates however it may be possible to identify a person or time when the dates could be confirmed.

Activities: the sub headings are indicative and medical officers are encouraged to identify any other meetings that could be utilized for vaccination advocacy or enhance community support for RI.

Meetings with Block Panchayat/BDO – the PRI is an important part of RI strengthening and their meetings are held regularly. Interactions with the BDO are essential as they are involved in community development and directly interact with community leaders.

Local press agency / journalist – this list will be useful to disseminate information through channels of mass media. They can also be of help during emergencies or any AEFI. Discuss with the CMO/DHO/DIO to ensure clear messages.

Meetings with NGO/community groups/institutions - wherever possible engage with organizations working with communities or NGOs or institutions such as colleges , medical colleges, industries in the area for support for RI.

Other – any other organizations or meetings

IEC material and display plan

Hoardings – identify points for display of hoardings and or banners – list main areas such as bus stops , market places or prominent locations.

Banners – enter the number and date of receipt of any banners and who will be responsible to ensure timely display. If banners are distributed to SC ensure entry of the same in Form 11 of each ANM.

Posters – enter the number and date of receipt of any banners and who will be responsible to ensure timely display.

Pamphlets / leaflets – same as above

Counselling aids / job aids etc. Enter the number and date of receipt and ensure distribution at the earliest.

Other – refers to other IEC material such as polio posters or other campaign posters.

Contact numbers of PRI Chairman, BDO and BEO - ensure numbers are up to date.

Table 3.7 Checklist for RI microplan components – all levels

Level	Components of Routine Immunization Microplan	Available	
		Yes	No
Sub-centre	Map of area -with name of village, urban area including all hamlets (tola), sub-villages, sub-wards, sector, mohallas, hard to reach areas, etc.)		
	Demarcation Map - This map allocates areas for each ANM if more than 2 ANMs are present in a SC. It can also show the exact boundaries and areas for ASHA and AWW.		
	Master list which includes all villages/areas/HRAs		
	Estimation of beneficiaries and injection load per area		
	Estimation of beneficiaries and injection load per HRA		
	Estimation of beneficiaries, injection load and mobilizers per RI session site		
	Estimation of vaccines and logistics		
	ANM work plan including mobilization plan		
	General information sheet		
	Beneficiary list - PW and children aged 0-2 years		
	Session due list		
	Vaccine coverage chart		
PHC/ Urban planning unit plan	Map of PHC showing SCs area demarcation		
	Master list of all areas		
	RI microplans from each SC		
	Vaccine delivery plan and route chart		
	Vaccine and logistics estimation per SC		
	Vaccine and logistics for entire PHC		
	MO Supervision plan		
	Cold chain contingency plan		
	Bio Medical Waste management plan		
	IEC and social mobilization plan		
	Training plan (if applicable)		
	Latest coverage chart		
District plan	Map of district showing blocks/PHCs in district		
	Compiled RI microplans from all PHCs		
	Supervision plan of district officials		
	Latest coverage chart for district		
	Vaccine and logistics estimation per block		
	Timeline for RI microplan update/beneficiary estimation		
	IEC and social mobilization plan		
	Training plan		

UNIT-4

Cold chain and logistics management

Learning objectives

- *Guide and supervise the vaccine and cold-chain handler (VCCH) at the ILR point to maintain the cold chain and manage the supplies of vaccines and logistics.*
- *Monitor maintenance and facilitate repair of cold-chain equipment.*
- *Ensure regular and adequate supply of vaccines and other related logistics to ILR points.*
- *Supervise and ensure systematic distribution of vaccines and logistics to all session sites and adherence to use of open vial policy guidelines.*

Key Contents

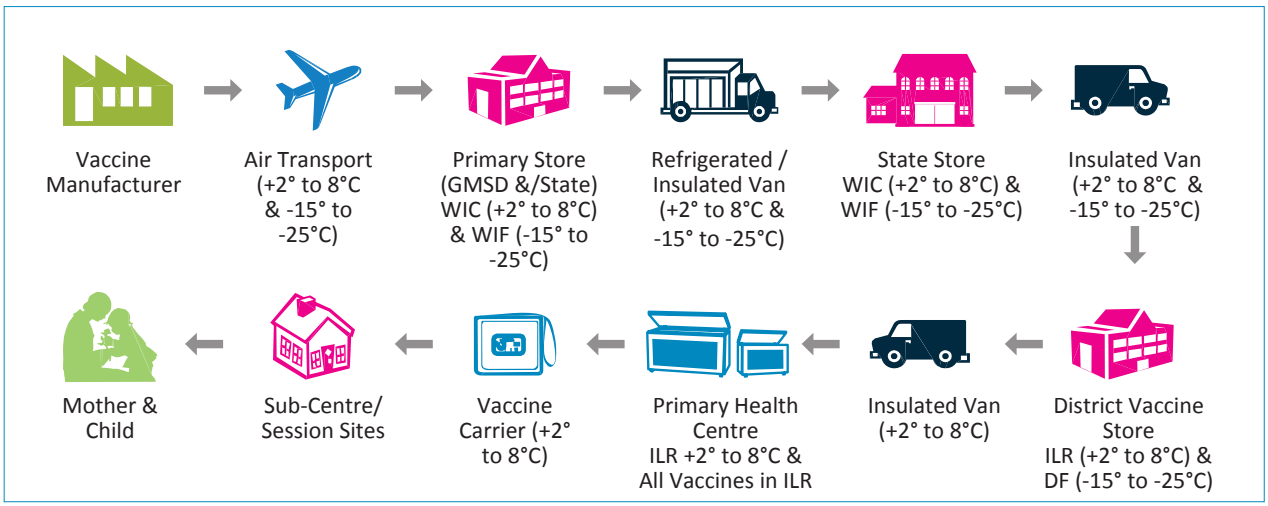
4

Cold Chain and logistics management

Cold chain

Cold chain is a system of storing and transporting vaccines at recommended temperatures from the point of manufacture to the point of use. The cold-chain system is depicted at Fig 4.1.

Fig. 4.1. Cold chain system



Cold Chain - Key elements

The key elements of the cold chain are:

- Personnel: to manage vaccine storage and distribution (vaccine and cold-chain handler at each cold-chain point)
- Equipment: to store and transport vaccine and monitor temperature
- Procedures: to ensure correct utilization of equipment and ensure vaccines are stored and transported safely.

As MO, you need to ensure that cold-chain equipment is functional, storage temperatures are correctly maintained and recorded and that adequate stock of vaccines and logistics are available and issued. A vaccine and cold-chain handler (VCCH) is trained and designated to maintain the cold chain. It is also necessary to look into the dry storage areas, i.e. storage of syringes and diluents, and ensure that they are safely stored and accessible.

Personnel:

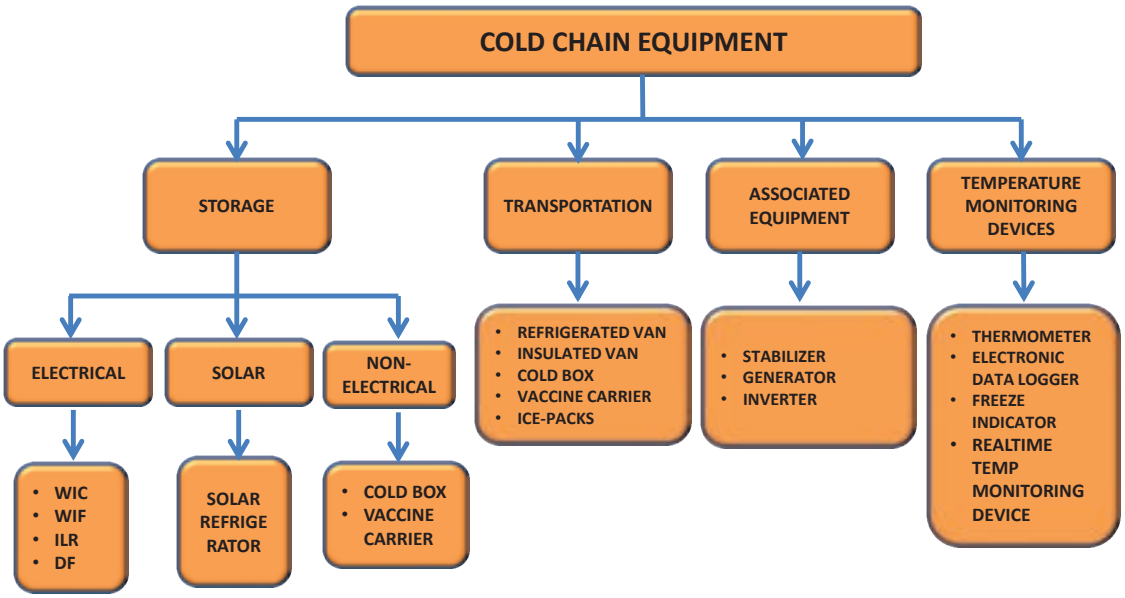
In case more than one MO is posted in the centre, designate one MO for RI, who can also be the focal point for the cold chain.

Vaccine and cold-chain handler: At every ILR point, designate a senior male or female HW (pharmacist/staff nurse/ANM/LHV/MPW/health supervisor) as the VCCH. He/she should be responsible for forecasting, indenting, receiving, storing and distributing vaccines and logistics, maintaining cold-chain equipment and related records. They will require training or update of knowledge and skills in order to perform their roles effectively. **(refer Handbook for Vaccine & Cold Chain Handlers)**

Equipment and procedures

Cold chain equipment: Cold chain equipment, both electrical and non-electrical, is used for storing vaccines and/or transporting them at appropriate temperatures. Figure 4.2 summarizes the cold chain equipment supplied under the UIP. The NCCMIS (National Cold Chain Management Information System) website is the platform where all information on the cold chain equipment and management is being collated.

Fig. 4.2. Overview of cold-chain equipment



WIC – walk-in cooler; WIF – walk-in freezer; ILR – ice-lined refrigerator; DF – deep freezer

Table 4.1 – Technical specifications of cold chain equipment

Equipment	Temperature	Storage Capacity	Holdover time
Electrical			
Deep Freezer (Large)	-15°C to -25°C	Ice packs or OPV stock for 3 months (275 to 300 Litres)	At 43°C for 2 hrs 30 mins (minimum)
ILR (Large)	+2°C to +8°C	BCG, OPV, IPV, RVV, DPT, TT, Measles/ MR, Hep-B , Penta, IPV, Vaccine stock for 3 months (135 to 160 litres)	At 43°C for 20 hrs (minimum)
Deep Freezer (Small)	-15°C to -25°C	Ice packs (105 to 125 litres)	At 43°C for 2 hrs 30 mins (minimum)
ILR (Small)	+2°C to +8°C	BCG, OPV, IPV,RVV, DPT, TT, Measles/ MR, Hep-B vaccine stocks for one month (90-105 litres)	At 43°C for 20 hrs (minimum)
Non-electrical			
Cold Box (Large)	+2°C to +8°C	All vaccines stored for transport or in case of power failure (20 to 25 litres)	At 43°C for 96 hrs (minimum)
Cold Box (Small)	+2°C to +8°C	All vaccines stored for transport or in case of power failure. (5 to 8 litres)	At 43°C for 48 hrs (minimum)
Vaccine carrier (1.7 litres)	+2°C to +8°C	All vaccines carried for 12 hours (4 conditioned Ice packs & 16-20 vials)	At 43°C for 36 Hrs (minimum)

Holdover time

In the event of power failure, "holdover time" for any functional healthy cold-chain equipment is defined as "the time taken by the equipment to raise the inside cabinet temperature from its cut-off temperature to the maximum temperature limit of its recommended range", e.g. in the case of ILR, if the temperature is 4°C, then the time taken to reach 8°C from 4°C will be the holdover time for that ILR.

Holdover time of ILR depends on the following factors:

- Ambient temperature – more the ambient temperature, less will be the holdover time;
- Frequency of opening of lid and use of basket;
- Quantity of vaccines kept inside with adequate space between the containers (equipment empty/loaded);
- Condition of the ice pack lining (frozen/partially frozen/melted) inside electrical/non-electrical cold-chain equipment.

Note: DF does not have holdover time like ILR as it does not have an ice lining inside its wall. It is dependent on the number of frozen ice packs kept inside it.

ILR point or Cold Chain point:

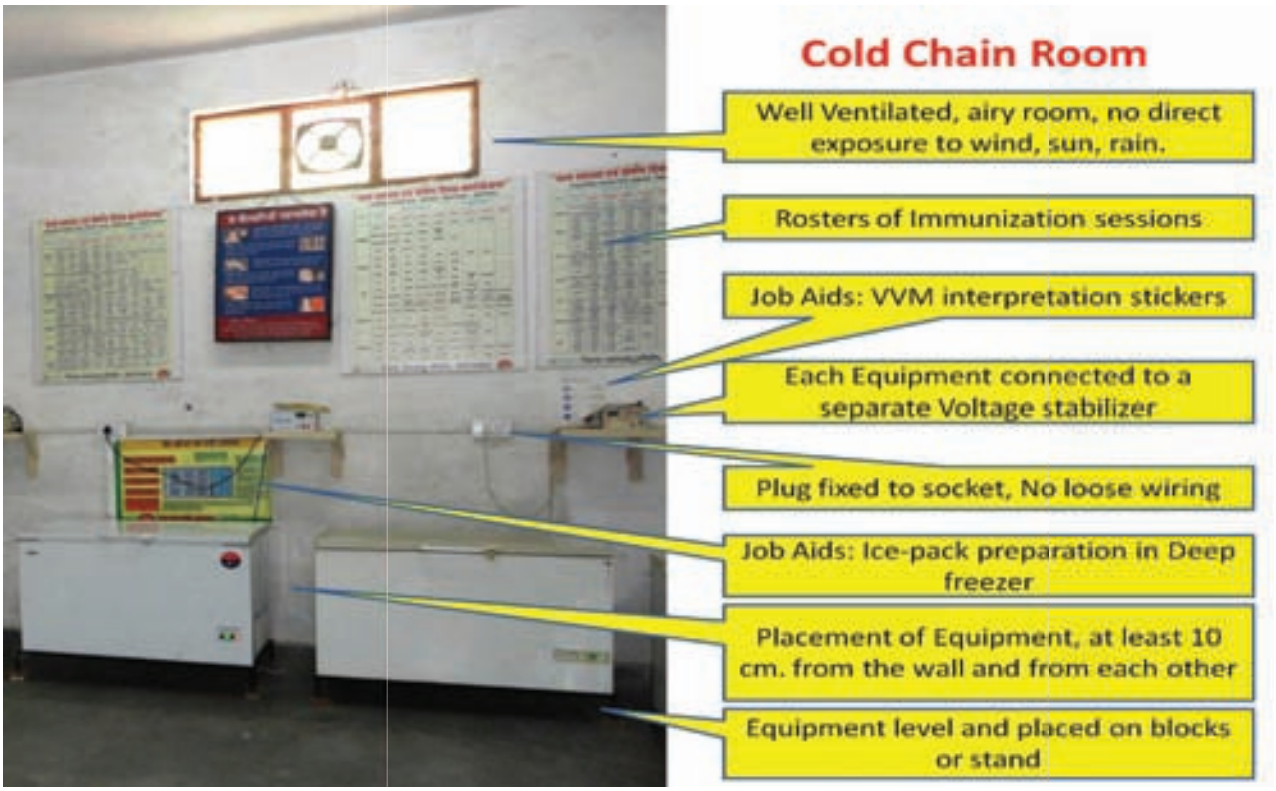
An ILR point or cold chain point (CCP) is located at a health centre (usually PHC/UHC/CHC) with an Ice Lined Refrigerator for storage of vaccines and a deep freezer for preparation of frozen ice packs. The cold chain point must have a generator as power back up.

The function of the CCP point is to receive, store and further distribute vaccines, diluents and other logistics to another ILR point or directly to the session sites.

Cold-chain room

Keep all electrical cold-chain equipment in a separate room (Fig. 4.3) with restricted entry to keep the vaccines and cold-chain equipment safe and secure. During visits to the cold-chain room and the weekly meetings, review the cold chain and vaccine distribution system of your centre. Ensure proper display of all the cold chain related job aids and use them to refresh knowledge and skills.

Fig. 4.3. Cold chain room

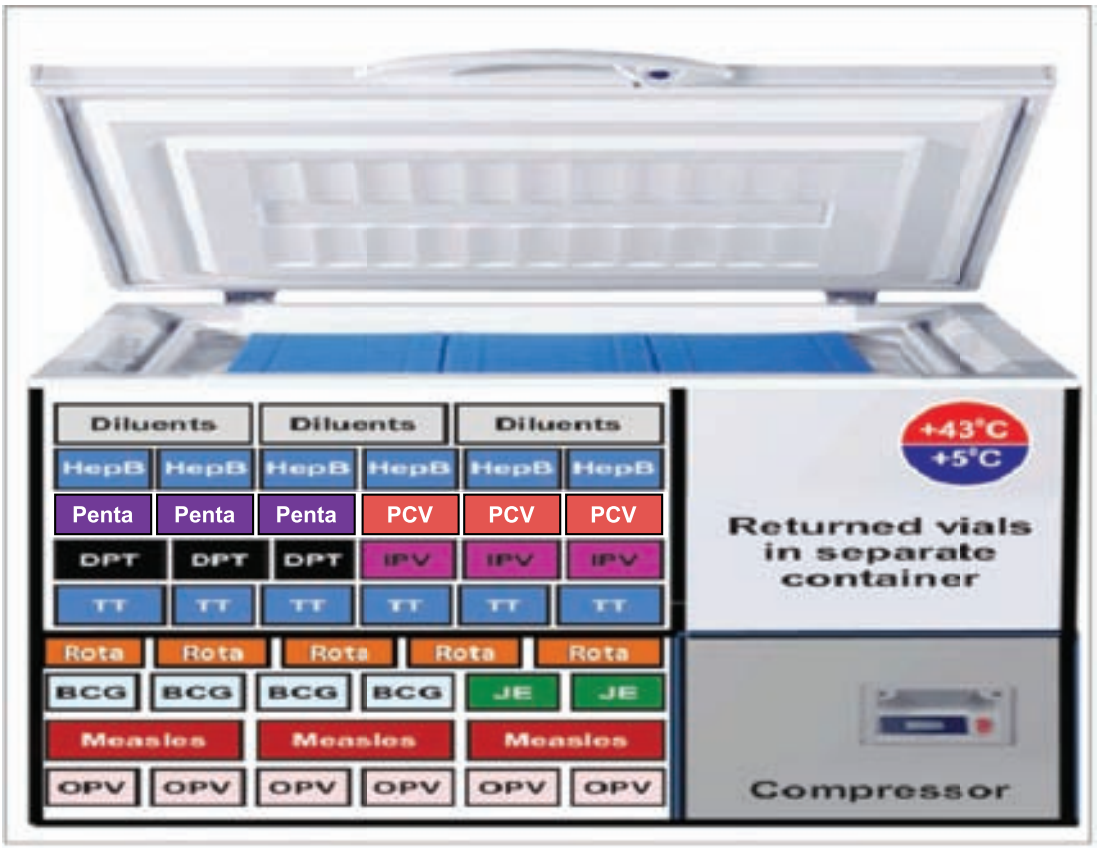


Ice-lined refrigerator (ILR)

A diagrammatic representation of an ILR is given in Fig. 4.4. An ILR maintains a cabinet temperature between +2°C and +8°C. It is used to store UIP vaccines at the PHC and district levels. An ILR with a top-opening lid prevents loss of cold air during door opening and can keep vaccines safe with as little as 8 hours electricity supply in a 24-hour period. ILRs are available in two sizes – large (for districts) and small (for PHCs).

In case baskets are not available, two layers of **empty ice packs** can be laid flat on the bottom of the ILR to avoid contact with the inside floor of the cabinet. **Vaccines should never be kept on the floor of the ILR.** Other dos and dont's for ILR use are given in Table 4.2.

Fig. 4.4. Storing vaccines in ILR



NEVER keep any vials that are expired, frozen or with VVMs beyond the end point in the cold chain, as they may be confused with those containing potent vaccines. Keep them in the red bag for disinfection and disposal.

IDENTIFY A DRY SPACE FOR STORING EXPIRED/UNUSABLE VACCINES BEFORE FINAL DISPOSAL

Table 4.2. Dos and dont's for ILR use

Dos	Dont's
✓ Keep all vaccines including those returned under open vial policy in the basket supplied along with the ILR. ✓ Store diluents at +2°C to +8°C at least 24 hours before use. ✓ Leave space in between the vaccine boxes. ✓ Place a thermometer in the basket in between the vaccines. ✓ Keep freeze-sensitive vaccines at the top of the basket. ✓ Keep heat-sensitive vaccines in the bottom of the basket. ✓ Arrange vaccines as per their expiry dates. (Early expiry should be kept above the later expiry ones).	➢ Do not store any other drugs/non-UIP vaccines in the ILR. ➢ Do not open the ILR frequently. ➢ Do not keep food or drinking water in the ILR. ➢ Do not keep vaccines which have expired and have crossed the discard point of VVM. ➢ Do not disturb the thermostat setting frequently. ➢ Do not place heavy weight on the ILR. ➢ Do not store excess stock of vaccines, i.e. more than the maximum stock.

Deep freezer (DF)

Freezing ice packs in the DF maintains the cabinet temperature between -15°C and -25°C. Unlike the ILR, the DF has little or limited holdover time, which is dependent on the number of frozen ice packs in it (See Fig. 4.5 and 4.6 for correct placement of ice-packs in the DF) and the frequency of opening (See Table 4.3 for Dos and dont's on use of DFs).

- At the PHC level, DF is used only for preparation of ice packs.
- At the district headquarters, DFs have been supplied for storage of recommended vaccines such as OPV and preparation of ice packs.

Table 4.3.Dos and dont's for DF use

Dos	Dont's
✓ Use DF only for preparation of ice packs at the sub-district level cold-chain points(PHC/CHC/SC) ✓ Use DF to store OPV at district level ✓ Keep frozen ice packs in the vaccine storing DF to increase the holdover time	➢ Do not keep any vaccine in the DF at sub-district level ➢ Never keep diluents in the deep freezer ➢ At district level do not use the same DF for simultaneously storing vaccines and preparing ice packs

Fig. 4.5. Freezing ice packs in the deep freezer

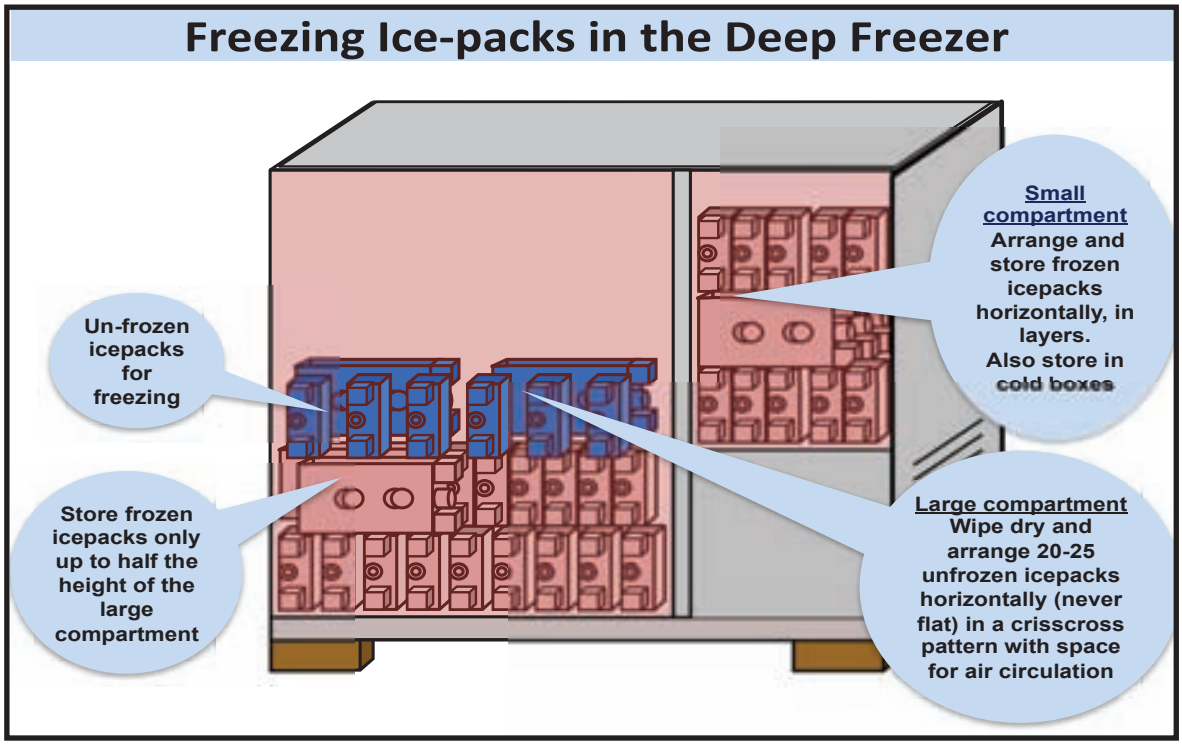
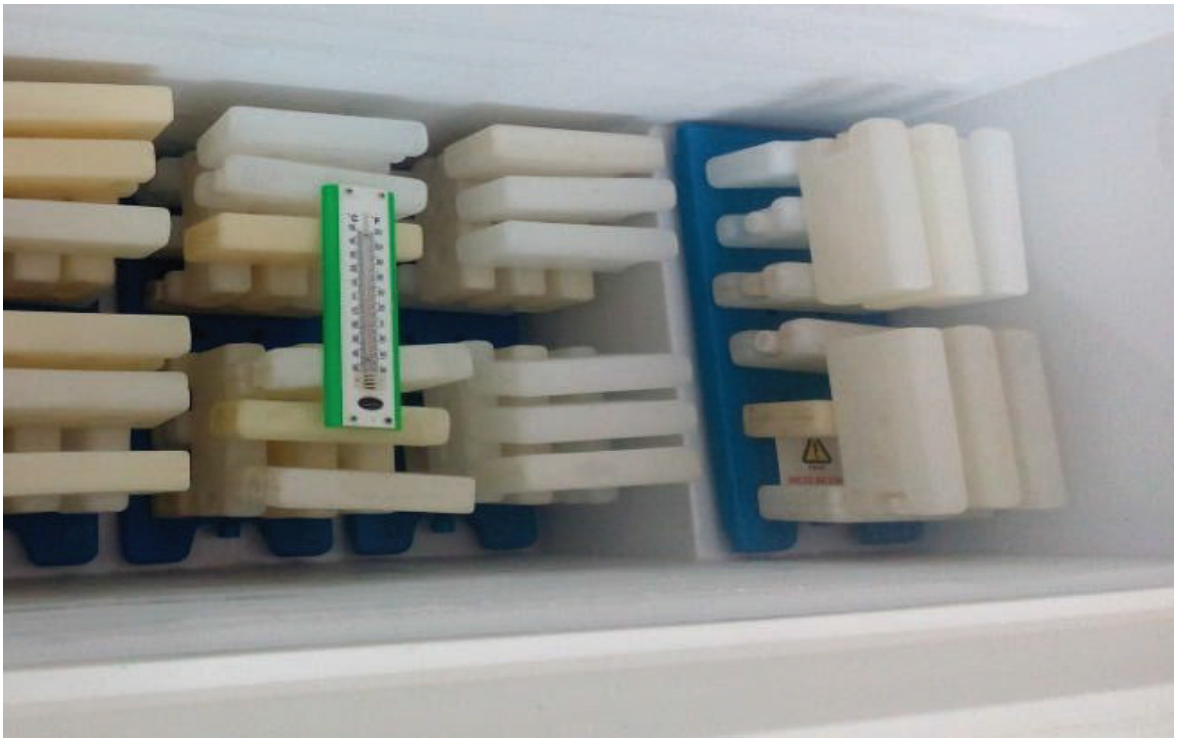


Fig. 4.6. Brick layered ice packs in deep freezer



Domestic refrigerators

Domestic refrigerators also maintain a cabinet temperature between +2°C and +8°C with a holdover time of only 4 hours. Therefore, they are **not recommended for common use** in the UIP. However, they are used in urban dispensaries and by private practitioners in urban areas due to more assured power supply and non-availability of ILRs and DFs.

The refrigerator if used must be:

- Used exclusively for vaccines
- No vaccine should be kept in the compartments of the freezer, chiller, door or basket of the refrigerator
- Follow the guidelines to store vaccines on the shelves of the refrigerator in the same order as used for ILR.

Voltage stabilizer

A voltage stabilizer is electronic equipment that ensures a constant output voltage of 220 volts whatever be the variation in input voltage, and thus safeguards equipment from excessive voltage variation. This is suitable for the working of the ILR and DF. Each ILR or DF should be connected to the mains through its own independent voltage stabilizer with proper earthing.

ILR/DF Control panel

A control panel monitors the temperature/supply voltage and operates the cold-chain equipment. It is placed at the front right bottom side of the ILR and DF. The control panel may differ as per the make/model of the cold-chain equipment. The functions of various components of the control panel are as follows:

- **Green light:** This is an indicator lamp, which shows that electric power is available up to the equipment from the stabilizer.
- **Red light (in DF control panel only):** It indicates that the temperature inside the equipment is not in safe range.

Remember:

- Glowing of green light does not ensure that the equipment is in running condition. Always keep a close watch on the inside temperature of the vaccines stored in the equipment.
- The temperature indicated by the panel thermometer is not the temperature of the vaccine.
- Record the temperature of alcohol stem thermometer kept inside the basket of the ILR.

- **Yellow switch (In ILR control panel only):** It is a thermostat bypass switch used when the ambient temperature is more than 45°C or when it requires lowering down inside temperature quickly.
- **Thermometer:** Shows the inside temperature of the equipment.
- **Thermostat:** A thermostat is a component which senses the temperature of inside the cabinet of the cold-chain equipment so that the system's temperature is maintained near a desired set point. The thermostat does this by switching the compressor on or off to maintain the correct temperature.

Vaccine van

A vaccine van is an insulated van used for transporting of vaccines in bulk. Vaccines should be transported only in cold boxes with the desired number of conditioned ice packs. These cold boxes should be loaded in the vaccine van immediately after packing with vaccines and unloaded at the destination as soon it is reached. Vaccines should be removed from the cold boxes and placed in the ILR immediately after reaching the destination.

Cold box

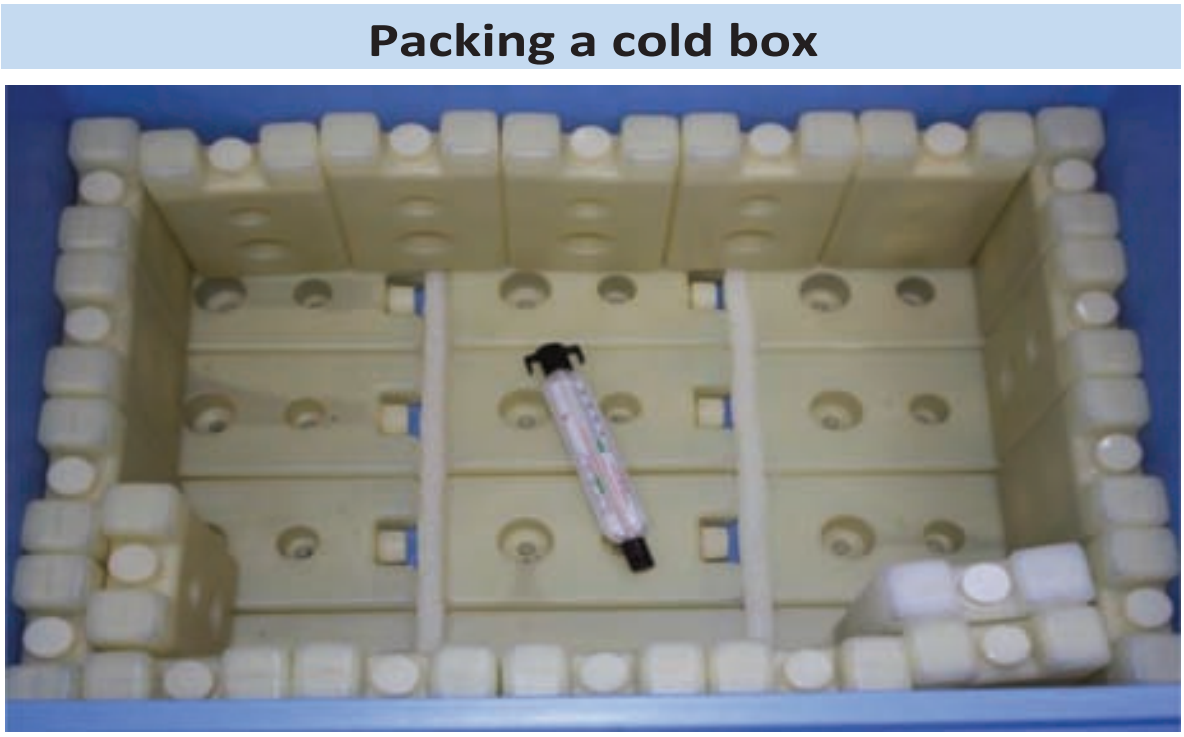
A cold box is an insulated box used for transportation and emergency storage of vaccines and ice packs. It is available in two sizes, large and small. It is used to:

- collect and transport large quantities of vaccines;
- store vaccines for transfer up to 5 days, if necessary for outreach sessions or when there is a power cut;
- store vaccines in case of breakdown of ILR, as a contingency measure;
- also used for storing frozen ice packs, e.g. during emergencies and before campaigns.

Packing a cold box (See Fig 4.7)

- Place conditioned ice packs at the bottom and sides of the cold box.
- Load the vaccines in cardboard cartons or polythene bags.
- Never place freeze-sensitive vaccines in direct contact with the ice packs. Surround them with OPV/BCG/JE vaccines.
- Keep a thermometer in the cold box.
- Place two rows of conditioned ice packs above the vaccine vials.
- Place a plastic sheet to cover the ice packs kept on top to ensure full holdover time.
- Securely close the lid of the cold box.

Fig. 4.7.Packing a cold box



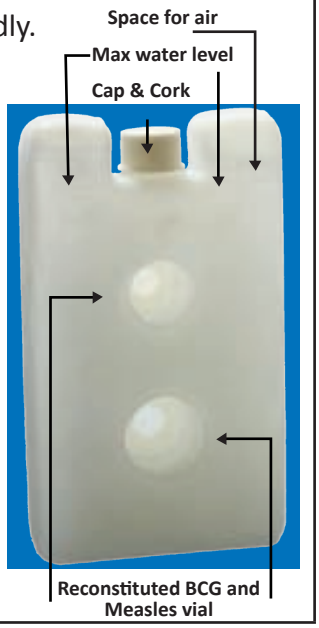
Ice packs

Ice packs are plastic containers filled with water. These are hard frozen in the deep freezer. They are placed inside a vaccine carrier and cold box to improve and maintain the holdover time. They are also used in ILRs as inside lining to improve and maintain holdover time during electricity failure. Dos and dont's for use of ice packs is given in Table 4.7.

About 20–25 ice packs (8–10 kg of ice) and 35–40 ice packs (12–14 kg of ice) can be frozen in one day in small and large deep freezers, respectively. Standard ice packs used in UIP for cold box and vaccine carrier are of 0.4 litre capacity.

Note: The personnel involved in preparing the vaccine carriers and "conditioned" ice packs may include other staff of the health centre.
It is essential to train these staff as well on the importance and method of conditioning ice packs

Table 4.4.Dos and dont's in using ice packs

Dos	Dont's
✓ Fill water only up to the level mark on the side to leave 10 mm room for expansion as water freezes. ✓ While filling, keep the ice pack vertically upwards under the tap so that it will overflow after reaching the desired level. ✓ Fit the stopper and screw on the cap tight. ✓ Check and ensure that ice pack does not leak. ✓ Clean the outer surface of ice packs with dry cloth before putting into the deep freezer. ✓ Keep ice packs horizontally (not flat) in a criss-cross manner in the DF (brick layered pattern see Fig 4.7). ✓ Keep a gap/breathing space between ice packs for freezing to be faster and uniform. ✓ Ensure use of conditioned ice packs when storing / transporting RI vaccines.	➢ Do not use ice packs that are cracked and/or are without cap or cork. ➢ Do not use ice packs with leakage; discard them. ➢ Never add salt to the water as it lowers the temperature to sub-zero level, which is not recommended. ➢ Do not refill an ice pack every time before use; the same water can be used repeatedly. 

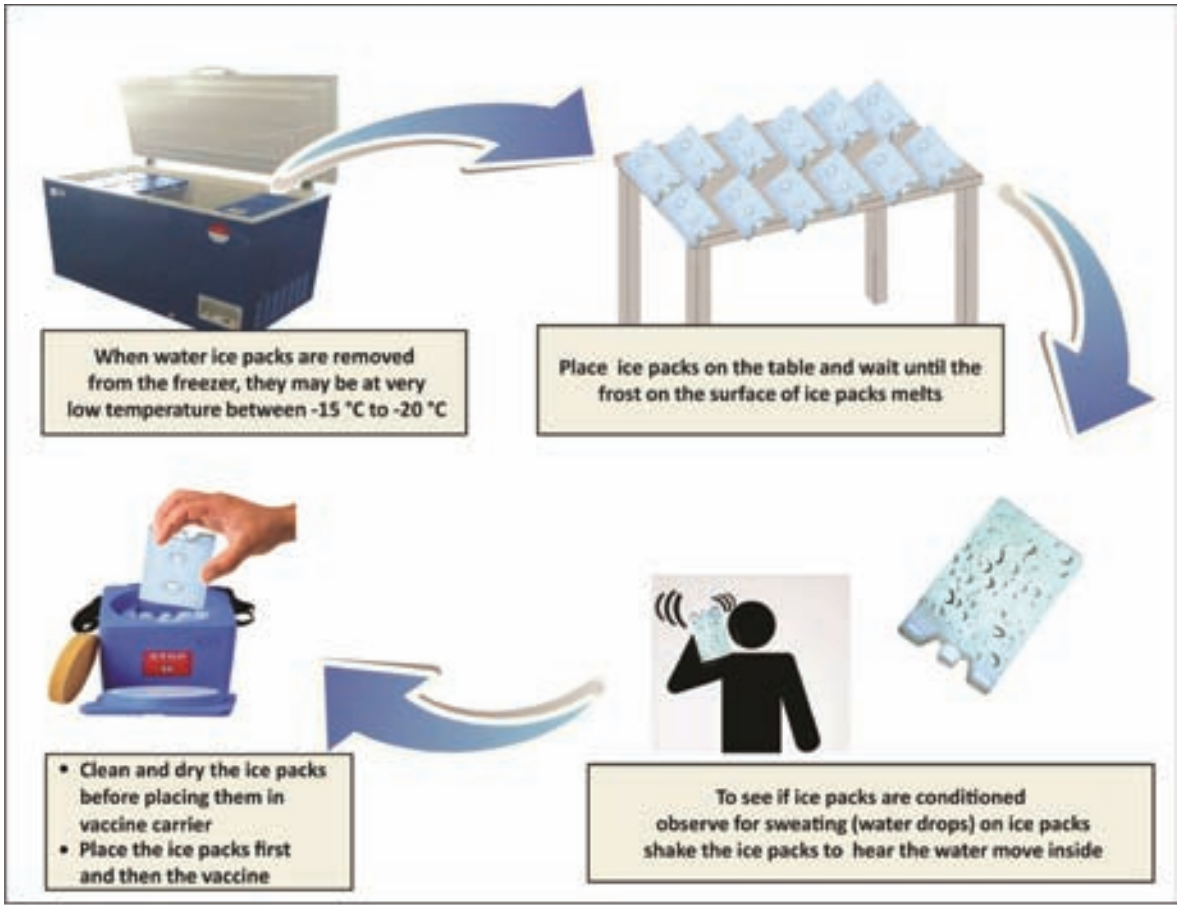
Conditioning of ice packs

Ice packs come out of the freezer at a temperature of about -20°C. They need to be kept at room temperature for a period of time to allow the ice at the core of the ice pack to rise to 0°C. This takes up to one hour at +20°C and rather less at higher temperatures. This process is called "conditioning" (Fig. 4.8).

- Conditioning of ice packs prevents freezing of vaccines (freeze-sensitive vaccines such as Hep B and T series) during transportation.
- Freeze-sensitive vaccines can be damaged if they come in direct contact with the frozen ice packs.
- At the start of session day, take all the frozen ice packs that you need from the freezer and close the door. Lay these out on a table leaving a 5 cm space all round each ice pack.

- Lay out ice packs preferably in single rows but never in more than two rows.
- Wait until there is a small amount of liquid water inside the ice packs.
- Shake one of the ice packs every few minutes. The ice is conditioned as soon as it begins to move about slightly inside its container.

Fig. 4.8.Conditioning of ice packs



Vaccine sensitivities

Vaccines lose their potency due to exposure to heat (temperatures above +8°C) ,cold (temperatures below + 2°C) and light .

Reconstituted BCG, measles/MR and JE vaccines are the most heat and light sensitive. Since these live vaccines do not contain preservatives, there is risk of contamination with Staphylococcus aureus leading to toxic shock syndrome and, therefore, they should be used within 4 hours of reconstitution. These light-sensitive vaccines are supplied in amber-coloured vials.

Under the open vial policy (OVP), any open vaccine vial returned from the field has to be used within 4 weeks (28 days) from the date of opening, provided the vaccine vial monitor (VVM) is in usable condition, vaccine has not been frozen and is within expiry date. The

vaccines that come under this policy are Hep B, OPV, DPT, pentavalent, TT and IPV.

Only those diluents that are provided with the vaccine by the manufacturer should be used. Keep diluents in an ILR at between +2°C and +8°C at least 24 hours before use to ensure that the vaccine and diluent are at the same temperature when being reconstituted. Keep diluents with the vaccines in a plastic zipper bag inside the vaccine carrier during transportation.

Sensitivity of various vaccines to heat, light and freezing is given in Table 4.5.

Table 4.5: Sensitivity of vaccines to heat, light and freezing

Vaccine	Exposure to heat/light	Exposure to cold
Heat and light sensitive vaccines		
OPV	Sensitive to heat	Not damaged by freezing
Measles/MR	Sensitive to heat and light	Not damaged by freezing
BCG, RVV and JE	Relatively heat stable, but sensitive to light	Not damaged by freezing.
Freeze sensitive vaccines		
HepB/Penta/PCV	Relatively heat stable	Freezes at -0.5°C (Should not be frozen)
IPV, DPT and TT	Relatively heat stable	Freezes at -3°C (Should not be frozen)
At the PHC level, all vaccines are kept in the ILR for a period of one month at temperature of +2°C to +8°C		

Vaccines sensitive to heat

- **BCG (after reconstitution)**
- **OPV, Rota**
- **IPV**
- **MR**
- **Rotavirus**
- **JE**
- **DPT**
- **BCG (before reconstitution)**
- **TT,**
- **Penta, HepB, PCV**

Most sensitive

Least sensitive

Vaccines sensitive to freezing

- **HepB**
- **PCV**
- **Penta**
- **IPV**
- **DPT**
- **TT**

Most sensitive

Least sensitive

Do not keep any vials that are expired, frozen or with VVM beyond the end point in the cold chain, as they may be confused with those containing potent vaccines.

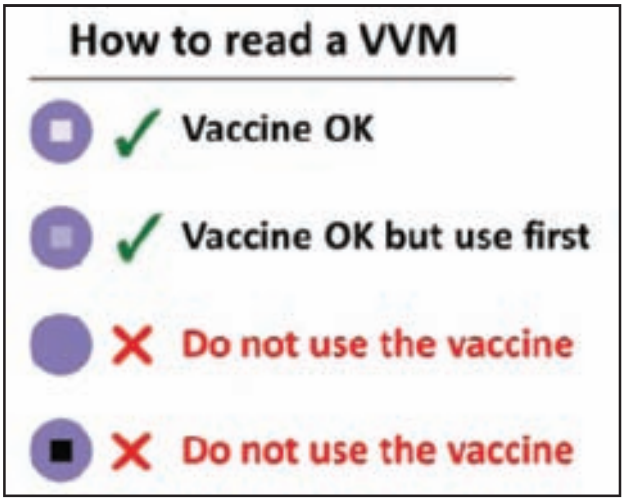
How to check vaccines for correct maintenance of cold chain

Vaccines need to be checked both for damage from excessive heat as well as from freezing. However, the physical appearance of a vaccine may remain unchanged even after it is damaged.

Checking vaccines for heat damage

VVM is a label containing a heat-sensitive material to record cumulative heat exposure over time. The combined effect of time and temperature causes the inner square of the VVM to darken gradually and irreversibly. Before opening a vial, check the status of the VVM (Fig. 4.9). If the VVM shows change in colour to the end point, then discard the vaccines.

Fig. 4.9. Different stages of vaccine vial monitor



Checking vaccines for cold damage (freezing)

DPT, TT, IPV, HepB and penta vaccines lose their potency if frozen. Moreover, the risk of adverse events following immunization (AEFIs) such as sterile abscesses may increase. Freezing can occur at any level in the cold chain. Discard the vial if it is frozen or it contains floccules after shaking. Conduct the shake test (as given below) if you suspect that a large number of vials at the cold-chain point could have been frozen.

Information on vaccine sensitivities is given in Table 4.5, Dos and dont's in cold chain are given in Table 4.6. (Shake test NOT applicable for IPV)

Shake test - Test vial

•1 Take a vaccine vial you suspect that may have been frozen – This is "TEST" vial.

Shake test - Control vial

•1 Take a vaccine vial of the same antigen, same manufacturer, and same batch number as the suspect vaccine vial you want to test.

•1 Freeze solid this vial at -20°C overnight in the DF, and this is the 'CONTROL' vial and label accordingly to avoid its usage.

•1 Let it thaw. Do NOT heat it.

•1 Hold the Control and the Test vials together between thumb and forefinger, and vigorously shake the vials for 10-15 seconds.

•1 Place both vials to rest on a flat surface, side-by-side and observe them for 30 minutes.

•1 Compare for rate of sedimentation.

•1 If the sedimentation rate in the 'Test vial" **is slower** than in the "Frozen vial", the vaccine has not been damaged, it has passed the shake test. Use the vaccine batch – it is not damaged.

•1 If the sedimentation rate is similar in both vials or if sedimentation **is faster** in the "Test" vial than in the "Frozen" vial, the vaccine is damaged, it failed in shake test. Do NOT use. Notify your supervisor.

Fig. 4.10: Shake Test Passed - Vaccine usable

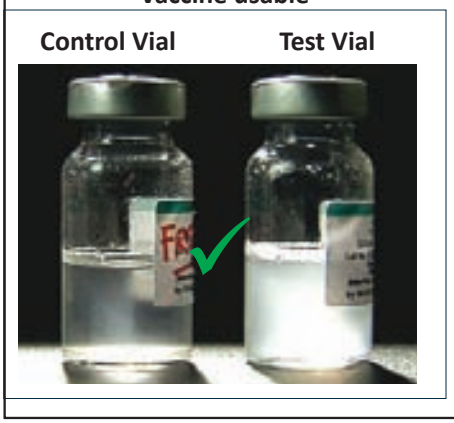
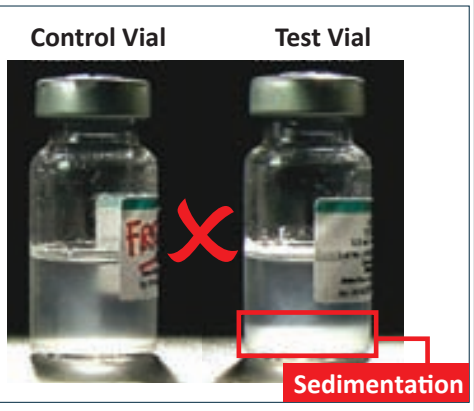


Fig. 4.11: Shake Test Failed - Do not use Vaccine



Information: Types of VVM

VVMs are unique to each vaccine.

There are four types of VVM - VVM 30, VVM 14, VVM 7 and VVM 2. The number corresponds to the number of days the vaccine remains potent with exposure at + 37°C. In combined vaccines the VVM corresponds to the most heat sensitive component of the vaccines, e.g. in DPT vaccine the VVM corresponds to the Pertussis component of the vaccine.

Preventing freezing of vaccines in extreme cold climates:

- 1 Keep cold chain equipment in heated rooms.
- 1 Do not leave cold boxes outdoors or in unheated rooms.
- 1 Use room temperature water packs for vaccine transport. Fill ice-packs with ordinary tap water; do not freeze or chill them. In extremely cold conditions, use ice packs filled with warm water at 20°C.
- 1 Use freeze indicators in all refrigerators and cold boxes, if possible.
- 1 Use a heated vehicle. Never leave cold boxes in an unheated vehicle, especially overnight.

Storage and Use of Diluents

Only use the diluents supplied/packaged by the manufacturer with the vaccine, since the diluents are specifically designed for the needs of that vaccine, with respect to volume, pH level and chemical properties.

The diluents should be stored in the ILR at the last cold chain point. If the ILR has space constraints then the diluents may be stored outside the cold chain. However **diluents must be kept in ILR at least 24 hours** before use or issuing to sessions to ensure that vaccines and diluents are at same temperature (i.e. +2°C to +8°C) during reconstitution. Otherwise, it can lead to thermal shock that is, the death of some or all the essential live organisms in the vaccine. Store the diluents and droppers with the vaccines in the vaccine carrier during transportation.

Table 4.6: Dos and dont's in cold chain and vaccine sensitivities

Do's	Dont's
✓ Keep all vaccines in ILR at +2°C to +8°C at PHC ✓ Use diluent provided by the manufacturer with the vaccine ✓ Keep diluents in ILR at +2°C to +8°C atleast 24 hours before use ✓ Use Rotavirus vaccine, reconstituted BCG, JE and measles/MR within 4 hours ✓ Discard all damaged vials for disinfection and disposal	➢ Do not keep in the cold chain: o Expired vials, o Frozen vials or o Vials with VVM beyond the end point ➢ Do not use Rotavirus vaccines or reconstituted BCG, JE and Measles/MR vaccines after 4 hours

Vaccine carrier

It is an insulated box used for carrying vaccines (16–20 vials) and diluents from the PHC/ cold-chain point to session sites and to bring back the open vials (under the open vial policy) from the session sites to the cold-chain point on the same day after the session for storage and subsequent use. Vaccine carrier (with 4 conditioned ice packs) maintains the inside temperature between +2°C and +8°C for 12 hours, if not opened frequently.

Packing a vaccine carrier

- ✓ Confirm that there are no cracks in the walls of the vaccine carrier.
- ✓ Take out the required number of ice packs from the deep freezer and wipe them dry.
- ✓ Keep them outside for conditioning before placing into the carrier.
- ✓ Place four conditioned ice packs into the vaccine carrier along the sides.
- ✓ Wrap vaccine vials and ampoules in thick paper, e.g. plain white paper before putting in a polythene bag so as to prevent them from touching the ice packs. Place some packing material between "T" series vaccine and the ice packs to prevent them from touching the ice packs.
- ✓ Place the plastic bag in the centre, away from the ice packs. This will prevent labels from peeling off from the vials.
- ✓ Place foam pad on top of the ice packs.
- ✓ If more than one vaccine carrier is being carried, keep the whole range of vaccines required for the day's use in each carrier so that only one carrier is opened at a time.

Fig 4.12. Correct packing of a vaccine carrier

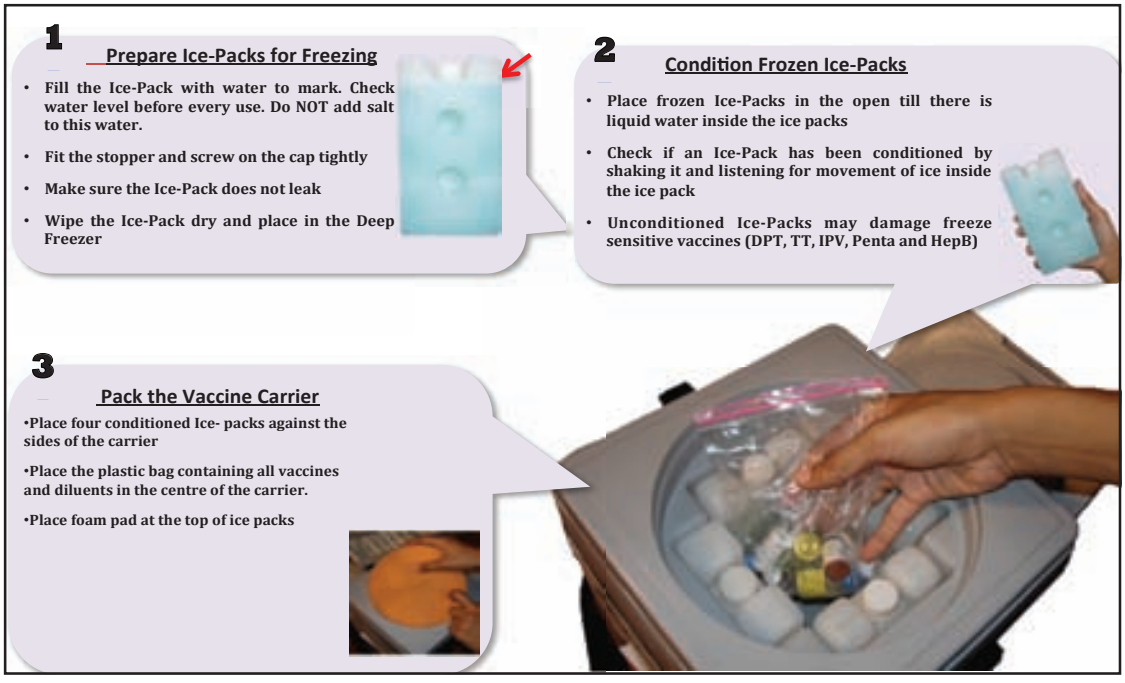
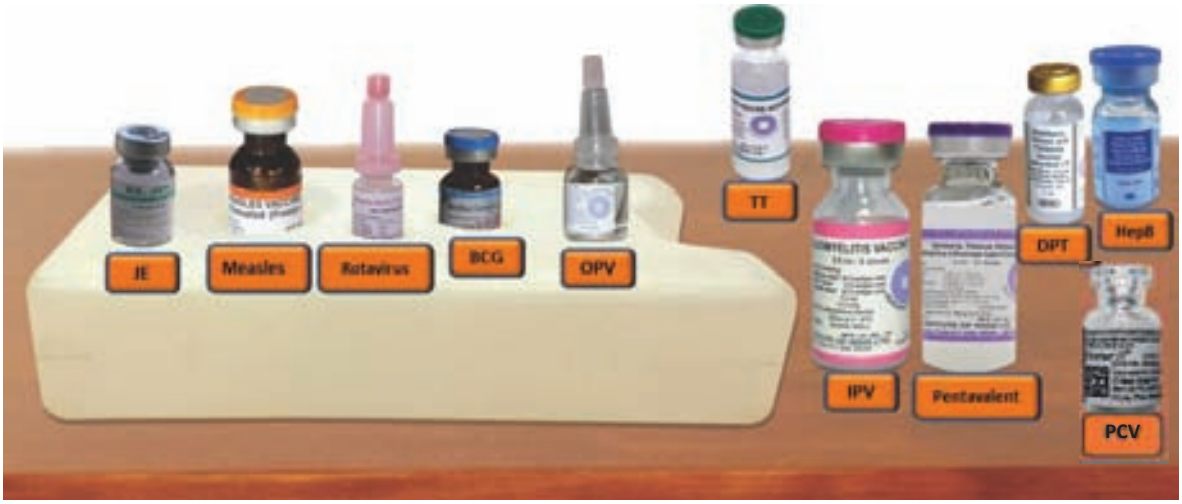


Table 4.7. Dos and dont's in using a vaccine carrier

Dos	Dont's
✓ Place vaccines and diluents in cartons or polythene bags to ensure labels are protected. ✓ Use only conditioned ice packs in the vaccine carrier. ✓ Ensure that some ice is present in the ice packs while conducting the immunization session. ✓ Ensure collection of vaccines in the vaccine carrier on the session day itself. ✓ Close the lid tightly and securely. ✓ Keep the interior of the vaccine carrier clean and dry after every use.	➢ Never use day carriers, which contain 2 ice packs or thermos flasks for routine immunization. ➢ Never use a screwdriver or any other sharp shaft to open the lid of vaccine carrier. ➢ Do not drop, knock or sit on the vaccine carrier. ➢ Do not leave the vaccine carrier in the sunlight. ➢ Do not leave the lid open once packed.

Fig 4.13. Placement of vaccines when at RI session site



Temperature monitoring

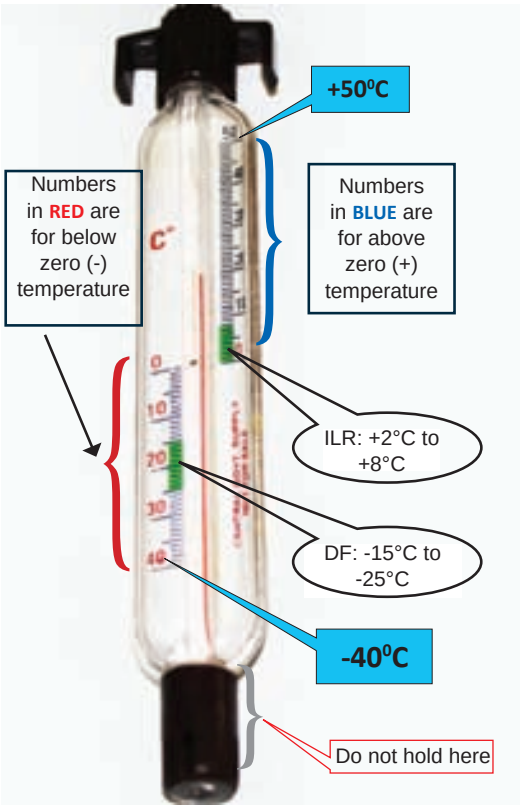
Temperature recording is done in order to ensure that the vaccines are kept at recommended temperatures and the cold-chain equipment is working properly. A break in the cold chain is indicated if the temperature rises above +8°C or falls below +2°C in the ILR and above -15°C in the DF. Different type of thermometers and instruments are used to measure the temperature during storage and transport of vaccines as given below.

Dos and dont's in temperature monitoring of vaccines is given in Table 4.8.

Alcohol stem thermometer

Alcohol thermometers (Fig. 4.14) are very sensitive and more accurate than dial thermometers. They can record temperatures from -40°C to +50°C and can be used for ILRs or DFs.

Fig. 4.14. Alcohol stem thermometer



Temperature logbook

Temperature logbook (Table 4.8) should be used to take action to shift vaccines to cold boxes or other ILRs when the situation requires.

VVM

A VVM attached to vaccine vials is also a temperature monitoring device which records cumulative heat exposure over time.

Electronic data logger (30DTR – 30 days temperature recorder)

Electronic data loggers are being introduced to monitor the temperature of ILR. An electronic logger is an electronic device placed with the vaccines; it records the vaccine temperature for 30 days. It has an alarm that alerts the handlers as soon as the temperature of the equipment storing the vaccines crosses the safe range.

Fig. 4.15. Fridge indicator

Fridge indicator

The fridge indicator (Fig. 4.15) is placed in between freeze sensitive vaccines (Hep B, DPT, TT, IPV, penta, etc.)

Freeze indicator

Fig. 4.16. Freeze indicator

A Freeze indicator is an electronic device to monitor vaccines exposed to temperatures less than 0°C. It contains an electronic temperature measuring circuit with associated LCD display. If the indicator is exposed to a temperature below 0°C for more than 60 minutes, the display will change from the "good" status "✓" to the "alarm" status "X". Once it changes to X, it cannot be re-used or reset and will need to be discarded. Its shelf life is five years. Vaccines should never be used without conducting the shake test when freeze tag shows the "X" mark.

Table 4.8. Temperature log book for ILR

Comprehensive Log book for ILR Month & Year:________________/_____

Temperature/Date	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		23		24		25		26		27		28		29		30		31	
	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E
-2 and below	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
-1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
0	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 2	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 3	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 4	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 5	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 6	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
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(+) 8	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 9	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 10	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 11	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 12	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 13	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 14	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
(+) 15 and above	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
Power failure (in Hrs)																																																														
Defrosting & Cleaning Done (√)																																																														
Defect Reported to CCT (√)																																																														
CCT reported for repair (√)																																																														
Type of defect noticed (1 or 2)*																																																														
Equipment repaired (√)																																																														
Signature of VCCH																																																														
PPM Visit by CCT (Signature)																																																														
Supervisory visit (Signature)																																																														

MOI/C or DIO should review the temp. log book and assess the following parameters once monthly and do stock verification of atleast one vaccine, diluent and syringes								
Paremeters	Y	N		Y	N		Y	N
Is the CCE levelled			Is the CCE Locked			Vaccine are stacked neatly		
Is the CCE away from sunlight			Is the CCE connected with independent functional stabilizer			Vaccine are placed in basket		
Is the CCE placed on wooden platform			Is the CCE plugged permanently to the socket			Vaccine are arranged in FIFO order		
Is the CCE atleast 10 cm away from wall			Is the CCE has a functional thermometer available			Any unusable vaccine (Expired / VVM with Discard point) found?		
Is there atleast 10 cm gap between CCE			Frost less than 5 mm					
Reviewed & Verified by Facility Incharge (Signature/ date)			Inspected during PPM Visit by CCT (Signature/Date)			Supervisory visit (Signature/Date)		

(* 1 = Major, 2 = Minor)

Real time temperature monitoring device

A real time monitoring device will allow time–temperature monitoring for the recorded period. Temperature monitoring is done at the device level using a digital display and LED indicators/buzzer for audio/visual indication that will help local action immediately.

With this type of temperature monitoring data logger having a number of sensors as per requirement (placed at the top/middle/bottom location in the ILR cabinet), real time temperature mapping is possible and it will give an alarm at the local level and SMS alerts to the users in case of temperature excursion.

Table 4.9. Dos and dont's in temperature monitoring of vaccines

Dos	Dont's
✓ Keep one thermometer in each ILR and each DF. ✓ Designate VCCH to record the temperature twice daily for ILR/freezer used for storage of vaccines. ✓ Keep the booklet of 12 monthly temperature recording forms on the top of each unit. ✓ Write the serial number of ILR/deep freezer on the top of the temperature record book. ✓ Keep the thermometer in between the freeze sensitive vaccines inside the basket of the ILR. ✓ VCCH should sign on the temperature record book after recording temperature reading. ✓ MOIC to record the temperature and sign on the log book once every week. ✓ Preserve the temperature logbook of cold-chain equipment for a minimum period of three years. ✓ Adjust the thermostat switch in different seasons to maintain the inside temperature of the equipment well within the prescribed range. ✓ Do the shake test for T-series vaccines if temperature falls below +2°C.	➢ Do not take the alcohol stem thermometer out of ILR while taking reading, as it is very sensitive.

Making an inventory of equipment

An inventory or equipment stock register should have details of cold-chain equipment such as model number, serial number, company, capacity (volume), date or month of manufacture, received on, received from and by, document of receipt, bill and details of warranty. The dates of installation, repair and condemnation should also be mentioned for individual equipment according to their condition.

Condemnation of cold-chain equipment

Cold-chain equipment which is obsolete or unserviceable should be condemned according to state government rules by state/district level committees. In the absence of state-specific rules for condemnation, follow Rule 124 of General Financial Rules (GFR) and GoI decisions read with Schedule VII of Delegation of Financial Power Rules.

Cold-chain maintenance

Cold-chain handlers are responsible for the day-to-day component of preventive maintenance, while the cold-chain technician (CCT) is responsible for undertaking minor/major repairs. Each cold-chain point should keep a logbook to record all the maintenance and repair tasks undertaken. Some terminologies related to cold-chain maintenance are discussed below.

Downtime

Downtime means the time period for which the equipment remains out of service. For example, if an ILR goes out of order on 10 Sept and is functional again on 15 Sept, the downtime is 5 days. Downtime of cold-chain equipment should be less than 7 days in case of minor repairs and 21 days in case of major repairs.

Response time

Response time is the time between sending information regarding breakdown to actually attending. For example, if an ILR goes out of order on 10 Oct and information about the breakdown is also sent on 10 Oct and a CCT attends to it on 12 Oct to check the defect, the response time is 2 days.The aim is to maintain a response time of 2 days.

Sickness reporting

An efficient reporting system contributes greatly to reduce the downtime of the equipment. The reporting should be direct from “who wants the service” to “who will provide the service” (with intimation to the other officers concerned) using the most reliable means of communication (telephone, email, etc.), whichever is the fastest for reporting on breakdown of CCE.

Cold-chain sickness rate

This is the proportion of cold-chain equipment out of order at any point of time.

For example, if there are 100 ILRs/DFs in a district and 5 are out of order **(equipment declared condemned should not be counted),** the cold-chain sickness rate on that day is 5%.

The Cold Chain Sickness Rate should always be less than 2% at any given point of time.

Cold Chain sickness rate

$$= \frac{\text{No. of cold-chain equipment (ILR + DF) non-functional but repairable}}{\text{No. of cold-chain equipment (ILR + DF) functional plus non-functional but repairable}} \times 100$$

Float assembly

A float assembly is a stock of spare ILR/DF units kept at district/state headquarters for immediate replacement of defective units brought from cold-chain points, similar to a spare wheel in a car. The defective units, once repaired, go into the float assembly to meet any future emergency. At district level, following stock should be available in float assembly to ensure timely replacement:

- 5% of total ILR and DF installed in the district
- 20% of voltage stabilizers (1KVA)
- 20% of stem alcohol thermometers.

Repair

When cold chain equipment breaks down, immediately inform the CCT (Cold Chain Technician) at the district headquarters directly by telephone, followed by written communication with copy to the DIO as soon as posible.

Preventive maintenance tasks for cold-chain equipment is given in Table 4.10. A checklist of preventive maintenance tasks is given in Table 4.11. Suggested alternatives to be followed in emergency situations is given in Table 4.12.

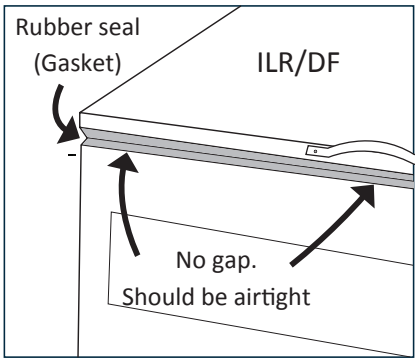
Table 4.10. Preventive maintenance tasks

For ILR/DF	For cold box and vaccine carrier
Daily checkup ✓ Outside of equipment is neat and clean ✓ Equipment is level with wooden planks or wooden stand below each CCE ✓ Temperature recording is done twice daily **Weekly checkup** ✓ MOIC signs on the temperature log book ✓ Rubber seal (gasket) of the lid/door fits tightly. If a piece of paper is placed below the lid/door, it does not come out easily (paper test). ✓ Defrost if necessary **Monthly checkup** ✓ Defrost the equipment	**After every use** • Clean and dry the equipment • Examine the inside and outside surface for cracks • Check that the rubber seal around the lid is not broken • Adjust the tension on the latches (if provided) so that the lid closes tightly • Lubricate hinges and locks routinely • Never keep the lid in locked condition while not in use • Do not leave in sunlight. Keep in shade • Do not leave the lid open once packed • Never drop or sit on the vaccine carrier/cold box

CCE – cold-chain equipment

Defrosting and cleaning

Frost formation is a sign of malfunctioning of the equipment, either due to incorrect setting of the thermostat or incorrect operation of the equipment. Frost increases electricity consumption and also makes the refrigerator less efficient. The accumulated frost must be removed, i.e.the equipment must be "defrosted". This requires technical intervention as the vaccines are put to risk. It is recommended that the appliance be defrosted every month or earlier if the frost thickness on the inner wall is more than 5 mm.



Frost formation increases if:

- ✓ Equipment is opened too frequently
- ✓ Door is not closing properly
- ✓ Door seal is defective
- ✓ There is a high level of humidity.

Defrosting requires planning and support with MO oversight.

Troubleshooting

When the inside temperature of an equipment rises above 8°C or falls below 2°C, it requires to be checked immediately. Please check the following :

- Is power supply on?
- Plug placed correctly in the socket?
- Has the fuse blown?
- Is there a power failure?
- Is the setting of the thermostat correct?
- Is the appliance placed too close to a heat source?
- Is stabilizer supplying the rated output voltage or has its MCB tripped?

Table 4.11. Checklist for preventive maintenance of ILR/DF

A. External			
1	The exterior is clean	Yes □	No □
2	It is firm on the floor	Yes □	No □
3	It is properly levelled	Yes □	No □
4	Its sides are a minimum of 10 cm away from any wall or object	Yes □	No □
5	It is away from direct sunlight	Yes □	No □
6	The room is well ventilated	Yes □	No □
7	Lid is kept locked	Yes □	No □
8	Keys are kept at an easily accessible place	Yes □	No □
B. Internal			
1	Lid seals properly without gap on all sides	Yes □	No □
2	Lid seal is clean on all sides	Yes □	No □
3	Ice packs are in proper position (for DF only)	Yes □	No □
4	Ice packs are filled to the proper level (no leak)	Yes □	No □
5	Thickness of frost formation is not more than 5 mm	Yes □	No □
6	Vaccines are preserved in neat rows	Yes □	No □
7	There is space between rows for air circulation	Yes □	No □
8	Freeze sensitive vaccines are kept in basket and not touching any cooling surface (for ILRs only)	Yes □	No □
9	Separate dial/stem thermometer is kept among the vaccines	Yes □	No □
10	Reading of dial/stem thermometer is within desired temperature range	Yes □	No □
C. Technical			
1	Reading on the built-in thermometer of the equipment is within desired temperature range	Yes □	No □
2	Thermostat setting is correct for the desired cut-in/cut-off temperature	Yes □	No □
3	Temperature indicated is within specified range. (If not, adjust thermostat to obtain steady temperature within specified limits (only if user is fully aware about the setting procedure, otherwise contact the cold-chain technician)		
4	One voltage stabilizer connected for each CCE	Yes □	No □
5	Input voltage reading .....volts	Yes □	No □
6	Output voltage reading.....volts	Yes □	No □
7	Plug of voltage stabilizer fits properly and is not loose in the power socket	Yes □	No □
8	Connections of equipment to voltage stabilizer are proper and not loose	Yes □	No □
9	Compressor compartment and the components inside are clean	Yes □	No □
10	Electrical connections are proper (visual checks)	Yes □	No □
11	No abnormal sound	Yes □	No □
12	Cooling fan (if any) and fan in compressor compartment (if any) works properly	Yes □	No □
13	Compressor and fan mounting bolts are tight	Yes □	No □
14	Pipe of components are not out of position and not touching others	Yes □	No □
15	Temperature is recorded minimum twice a day	Yes □	No □

Table 4.12. Suggested alternatives to be followed in emergency situations

Type of failure	Equipment	Alternatives at Primary Health Centre	Alternatives at District Level
Power failure of longer duration (more than 16 hours in a day)	ILR	• Use alternate source of power supply for at least 8 hours in a day. • If it is not possible, then transfer the vaccines to cold box, which can hold the vaccines for 72 hours if not opened. • After 72 hours, if still alternate source could not be arranged, then shift the vaccines to the nearest cold-chain point.	Same as recommended for PHC At district level, if vaccines are stored in freezer, transfer them to cold box and store with frozen ice packs or commercial ice in polythene bags.
	Freezer	If vaccines are not preserved in freezer, no action is required, otherwise transfer them to cold box.	
Equipment breakdown (Select suitable alternative as indicated)	ILR	• Store vaccines in cold boxes with conditioned ice packs. • Transfer to domestic refrigerator if available in the vicinity. • Transfer to any nearby PHC or other department's vaccine storage facility, if available.	• Store in cold box with conditioned ice packs • Transfer to other ILR or refrigerator available. • Transfer to any other storage facility available.
Equipment breakdown (select suitable alternative as indicated)	Freezer	• Freeze ice packs in domestic refrigerator/s or in commercial ice factory, if available. • Collect required quantity of frozen ice packs from nearby PHC in cold boxes on the day or a day before vaccine distribution. • Distribute vaccine using commercial ice.	• Store vaccines in ILR or refrigerator available • Dispatch vaccines for PHC using commercial ice. • Ask CCP recipient of vaccines to bring frozen ice packs while coming for collection.
	Voltage Stabilizer	• Disconnect the stabilizer and obtain replacement immediately from district/regional HQ and reconnect.	Replace from float assemblies immediately from district/regional HQ stock

Guidelines for use of open vaccine vials in immunization programme

Implementation of Open Vial Policy (OVP) allows reuse of partially used multi-dose vials of applicable vaccines under the UIP in subsequent sessions (both fixed and outreach) up to 4 weeks (28 days) subject to meeting certain conditions. This policy contributes to the reduction of vaccine wastage.

Open Vial Policy is only applicable to DPT, TT, Hep B, OPV, PCV, Hib containing pentavalent vaccine (Penta) and injectable inactivated poliovirus vaccine (IPV).

Conditions that must be fulfilled for the use of open vial policy

Any vial of the applicable vaccines opened/used in a session (fixed or outreach) **can be used** at more than one immunization session up to 4 weeks (28 days) **provided that**:

- The expiry date has not passed;
- The vaccines are stored under appropriate cold-chain conditions both during transportation and storage in cold-chain storage point;
- The vaccine vial septum has not been submerged in water or contaminated in any way;
- Aseptic technique has been used to withdraw vaccine doses, i.e. needle/septum has not been contaminated in anyway;
- The VVM has not reached/crossed the discard point;
- Date and time is written on vial.

DO NOT USE vaccine vial in case any one of the following conditions are met:

- expiry date has passed;
- VVM has reached/crossed discard point (for freeze-dried vaccine, before reconstitution only) or vaccine vials without VVM or disfigured VVM;
- no label/partially torn label and/or writing on label not legible;
- If date and time is not mentioned on vial;
- any vial thought to be exposed to non-sterile procedure for withdrawal;
- open vials that have been under water or vials removed from a vaccine carrier that has water;
- vaccine vial is frozen or contains floccules or any foreign body;
- there is breakage in the continuity of the vials (cracks/leaks);
- there is any AEFI from any of the vials; if so, do not use it, and retain it safely and seperately. Inform MO and/or supervisor.

Open Vial Policy does not apply to measles/MR, Rotavirus, BCG and JE vaccines.

Cold-chain maintenance during vaccine distribution

- Maintain temperature of ILR between +2°C and +8°C for storage of vaccines and diluents. Monitor temperature twice daily regularly including on Sundays/holidays.
- Note the name of the manufacturer, batch number and expiry date of the vaccine and diluent in the stock register.
- Ensure proper recording and reporting of vaccine distribution and usage.
- Keep stock upto date, do not over-stock or under-stock vaccines and diluents.
- Multi-dose vials from which at least one dose has been removed may be at risk of contamination of the vial septum. These vials should therefore never be allowed to be submerged in water (from melted ice for example) and the septum should remain clean and dry.

Note: Well-sealed conditioned ice packs should be used in vaccine carriers and water should not be allowed to accumulate where the vials are stored. Vaccine vials must be transported in properly locked plastic zipper bag.

Fig. 4.17. Magnifying glass for reading vaccine vial labels

Field tip: Small handheld magnifying glasses were distributed to all ANMs in a district to enable them to read the small print of the vaccines vials. This has made it easier to see the small print and encouraged them to check the vials before using!!!

- Keep the “returned, partially used” vials in a separate box and label these accordingly.
- Observe early expiry first out (EEFO) policy for issuing vaccines. If the vaccines are of same expiry date, the partially used vaccine vials should be re-issued. The vial opened earlier, as recorded on the label of the vial, should be issued first.
- Contingency plan (RI Form 16) has to be in place in case of any exigency like power failure, equipment breakdown, etc.

Cold chain maintenance during the immunization session

- Inspect vaccine vials for visible contamination, i.e. check for any change in the appearance of vaccine, any floating particles or breaches of integrity such as cracks and leaks. If found DO NOT USE.
- **All vaccine vials must be marked with date and time of opening at first use.**

- Note the name of the manufacturer, batch number and expiry date of the vaccine and diluent in the tally sheet.
- Always pierce the septum with a sterile needle for drawing vaccine from the multi-dose vials being used. OPV vial dropper should be recapped with stopper (small cap) after each use, and kept on the ice pack. Vials of DPT, HepB, pentavalent, IPV, PCV and TT should not be kept on the ice pack (see Fig 4.13).

Specific attention while implementing open vial policy

- OVP is **not applicable** to vials of **Measles/MR, Rotavirus, BCG and JE vaccine.**
- **Measles/MR, Rotavirus, BCG, and JE vaccine should not be used beyond 4 hours of reconstitution/opening** under any circumstances.
- Rotavirus vaccine does not require reconstitution but **must not be used** beyond 4 hours of opening.
- ANM must NOT USE such vials after 4 hours of reconstitution or at the end of the session, whichever is earlier.
- These OVP vaccines will be used as per following instructions:
  - Before reconstitution check that the vaccine is within the expiry date and that VVM has not reached/crossed the discard point. When reconstituting, do so **only** with the diluent provided by manufacturer for that batch of vaccine.
  - Date and time of reconstitution must be mentioned on the label of the vial immediately following reconstitution. ANM needs to reconstitute the required vaccine vial even if there is a single beneficiary.
  - Reconstituted vials **will only be used for a single session;** they will not be carried from one session to another, even if the session is close by.
  - All vaccine vials have VVM appropriately displayed on them. The vaccine has to be used before reaching the end point.
  - If any AEFI occurs following use of any vial, do not use that vial; mark it and retain safely and seperately for AEFI investigation.

After immunization session is over

- ANM should segregate the vaccine vials (used and unused) and keep these inside in a properly sealed and marked zipper pouch/bag in the vaccine carrier under the cold chain and ensure carrier is picked up by the AVD mechanism to deliver at the designated vaccine/cold storage point.
- Under no circumstances will the vaccine carrier/vaccines be kept in the field at places other than the designated cold-chain point such as ANM/LHV/other HW/ASHA/AWW's house, etc. In such an instance, the vials should not be used for subsequent sessions.

At the vaccine storage/cold-chain point at the end of immunization day

- Cold chain handler should ensure appropriate segregation of the vaccines into opened and unopened vials, and follow the instructions as below:

Unopened vials

- o If VVM is intact and in usable stage, retain the vial in ILR as per guideline, and issue accordingly.
- o If VVM is not in usable stage or there is partial/complete defacement of the label, retain the vial in a plastic box clearly marked "Not to be used" in ILR. Such vial should be discarded after 48 hours or before the next session, whichever is earlier.

Opened vials

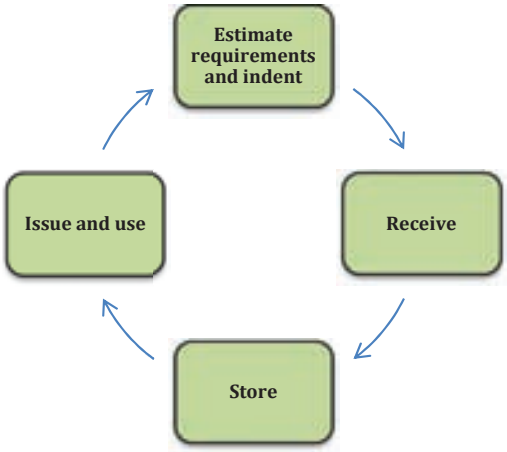
- o Segregate the vials on which OVP is not applicable such as Measles/MR/ Rotavirus /BCG/JE and retain in a plastic box clearly marked **"NOT TO BE USED"** in ILR. These vials should be discarded after 48 hours or before the next session, whichever is earlier. In case of any reported AEFI, they will not be discarded but retained seperately for investigation.
- o Segregate the vials for which OVP is applicable such as OPV/DPT/HepB/pentavalent/ IPV as below:
  - If VVM is intact and is in usable stage, retain the vaccine vial in ILR as per guideline, subject to the condition that the vial is within 28 days of opening (as found from date marked on the vial) and re-issue in the next session after ensuring that it has not exceeded 28 days after opening the vial.
  - If VVM is intact and is in usable stage, but the vaccine vial has exceeded 28 days after opening (as found from date marked on the vial), the vials should be discarded after ascertaining that these vials are not required for AEFI investigation.
  - If VVM is not in usable stage or there is partial/complete defacement of the label, retain in a plastic box clearly marked "Not to be used" in ILR. These vaccine vials should be discarded after 48 hours or before the next session, whichever is earlier (after ascertaining that these vials are not required for AEFI investigation).
- o If there is any vial which has been used and there is a report of an AEFI, that vial (even if it is in usable stage) has to be kept separately in a properly sealed zipper bag earmarked "For AEFI investigation" in ILR under special custody and in the knowledge of the MO. This vial should never be issued to anyone unless authorized by DIO.

- The cold-chain handler should document the return of used (complete/partial) and unused vials in the vaccine distribution register.

Managing logistics of vaccines and other supplies

Vaccine and logistics management is a cyclic process (Fig. 4.18) and involves several steps, namely demand estimation, indenting, receipt, storage and distribution of vaccines and other supplies to health facilities in a timely fashion and at optimum cost.

Fig 4.18. Logistics management cycle



Commonly encountered problems in vaccines and logistics management

Stock out: A condition when no stock of a vaccine or other supplies are available.

Inadequate stock: Stock which is less than the buffer stock, i.e. less than 25% for vaccines and syringes.

Excess stock: Stock which is more than the requirement for one month including the buffer stock, i.e. more than 125% for vaccines and syringes.

Steps in logistics management

Following are the steps involved in logistics management related to vaccines, diluents and AD syringes.

Step 1 – Estimating requirements of vaccines

Compile the microplans of all the SCs at the PHC level and estimate the requirement of vaccines and other supplies (Refer Unit 3 for formats and details). Furthermore, ensure that the overall estimate includes a buffer stock and wastage as per acceptable wastage rates (Refer Unit 3 RI format 9). This allows maximum stock of vaccines at the:

- PHC level – for 1.5 months
- District level – for 2.75 months.

The GoI has laid down recommended stock levels for various levels as given in Table 4.13.

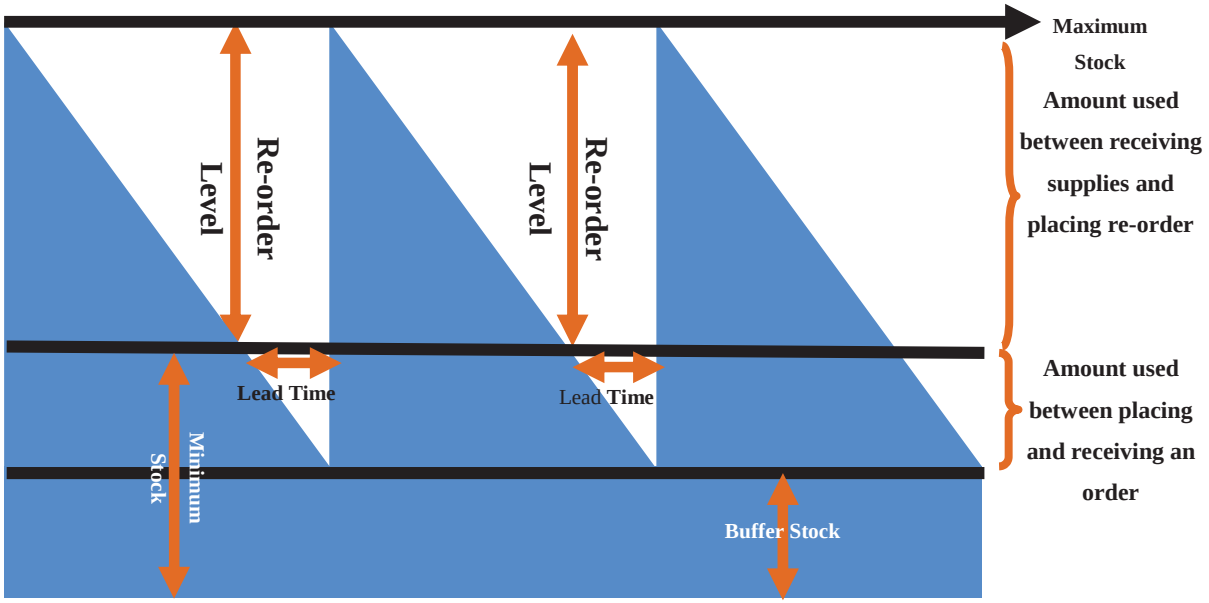
Table 4.13: GoI recommendations for storage of vaccines

Level	Working stock	Buffer stock	Lead time stock	Stocks	
				Max	Min
	Months	Months		Months (Working stock + buffer stock)	Months (Buffer stock + lead time)
District	2	0.5	0.25	2.75	0.75
PHC/UHC	1	0.25	0.25	1.5	0.50

The problems of stock-out, inadequate or excess stock can be avoided if a **minimum/ maximum inventory control system** is implemented. This system ensures that the quantity in hand is always more than the buffer stock and less than the maximum stock.

Relationship between minimum, maximum and buffer stocks is given in Fig 4.19.

Fig. 4.19. Relationship between minimum, maximum and buffer stocks



Lead time

The time between ordering of new stock and its receipt. Leadtime varies depending upon the speed of delivery, availability and reliability of transport and sometimes the weather.

Buffer stock

It serves as a cushion or buffer against emergencies, major fluctuations in vaccine demands or unexpected transport delays. It is 25% extra for vaccines and syringes.

Minimum stock level

This is also known as the **re-order** level. It implies the least amount that you should have in your stock, or the level which, when reached initiates a re-order; usually expressed as the number of weeks/months of supply. It is the amount of stock which will be used in the time between placing and receiving the order, plus the buffer stock. The minimum stock level is the level below which stock should never drop **without having placed an order.**

Maximum stock level (peak stock)

It implies the largest amount of the stock that one should have, usually expressed as the numbers of weeks/months of supply. It is the minimum stock plus amount of the stock used between orders. The maximum stock level is set to guard against excess stock, which results in losing vaccines to expiration before use.

Working stock

Amount of stock used between two orders. It will be 4 weeks in case of a PHC.

Example: For a PHC with monthly requirement of Pentavalent of 280 doses, the buffer stock will be 70 doses (25% or one week's supply). Additionally, if the lead time is one week, then the maximum stock level, therefore, will be the Minimum stock and the stock between used between orders (140 doses + 4 weeks stock of 280 doses = 420 doses).

If the stock level falls to the re-order level, inform the district vaccine stores for replenishment and place an indent to avoid any shortage or stock-out.

Step 2 – Indenting, receipt and issue of vaccines at PHC

For indenting vaccines and supplies, you must check the following:

- Requirements of the PHC (session-wise)
- Utilization during the previous months. Get this information from monthly progress reports
- Find out balance in hand.

On arrival of vaccine:

- Check that type and amount of vaccine and diluents are the same as per the indent
- Check VVM and expiry date on each vial of vaccine
- Transfer vaccines to the ILR immediately after delivery

- Keep separate date-wise records of receipts, distribution and balance for each type of vaccine, logistics and each size of vial
- Keep record of vaccines distributed and utilized at the centres to assess the wastage of vaccine.

Before issuing vaccines, ensure the following:

- Requirement for each RI session
- Adequate number of diluents for the next day's use are kept in the ILR and sent to the session sites in vaccine carriers
- Ice packs in the vaccine carriers are conditioned
- Vaccines and diluents are at the same temperature and from the same manufacturer (Bundling)
- Open vial policy applicable vaccines are issued after carefully checking date of opening.

Step 3 – Update records on vaccine use

- Keep a record of the vaccines you administer
- Keep a record of the batch numbers and expiry dates of vaccine used
- Keep a record of vaccines returned to PHC
- Update eVIN (where applicable).

And then re-start with Step 1: Estimation of requirements.

Before you indent the next batch of vaccine, conduct a physical inventory to make sure that the ledger is accurate, i.e. all supplies issued to sessions are accounted for. Before indenting additional supplies for the next month, subtract your end balance from next month's stock requirements and include a 25% buffer stock.

Dos and dont's for vaccine storage and use are given in Table 4.14.

Vaccine storage and use

Table 4.14. Dos and dont's on vaccine storage and use

Dos	Dont's
• Keep all vaccine in ILR in PHC between +2°C and +8°C • Ensure that vaccine with earlier expiry date is used first (EEFO) if VVM is in usable stage • If two shipments of vaccines have the same expiry date, select the one which has remained longer in the store to be used first – first in first out (FIFO) • Transport vaccines in cold boxes or vaccine carriers only • Check ice packs for conditioning before packing vaccines • Ensure that the stocks are rotated so that no vaccine is kept for more than 1 month in PHC • Select the shortest route for distributing vaccines on session day • Conduct a physical inventory of all vaccines with diluents once every month and other supplies at least once every 3 months	• Do not use any vaccine after expiry • Do not keep vaccines for more than 2.75 months at the district stores and 1.5 months at PHC • Do not store any vaccines at SCs or outside the cold chain • Do not allow DPT, TT, IPV, HepB and penta vaccines to freeze • Do not freeze the diluents, as the ampoules are likely to crack when frozen • Do not keep any expired vials, freeze-damaged vials or vials with VVMs beyond the discard point in the cold chain. These should also not appear in the available stock balance.

Since provision of immunization services depends on the simultaneous availability of a number of related supplies, shortage or stock-out of any of these negatively impact the programme.

"Bundling" ensures that vaccines are always supplied with diluents, droppers, AD syringes and reconstitution syringes, in corresponding quantities, at each level of the supply chain. Other related items such as tablet IFA and ORS required for the conduct of Village Health and Nutrition Day also need to be supplied simultaneously.

National Cold Chain and Vaccine Management Resource Centre (NCCVMRC), NIHFW, Delhi

National Cold Chain and Vaccine Management Resource Centre (NCCVMRC) is a joint initiative of the Ministry of Health & Family Welfare, National Institute of Health and Family Welfare (NIHFW)& UNICEF (GAVI) and was established in 2015 at NIHFW, Delhi. It coordinates with the National Cold Chain Training Centre (NCCTC), Pune to conduct Cold Chain Technicians' training and also coordinates and supports CCTs' training in other cold chain training centres.

Objectives of the NCCVMRC

- To plan, design, conduct, monitor and evaluate cold-chain training courses;
- To act as a resource centre for updated programmes and technical guidelines in immunization;
- To conduct need-based research to achieve an impact in quality and reach of immunization coverage in the country;
- To provide technical inputs to MoHFW for policy level decisions.

Activities

- Standardization of training for CCTs and vaccine logistics managers
- Operationalization, administration and monitoring of National Cold Chain Management Information System (NCCMIS)
- Maintaining training database for CCTs
- Knowledge/information management for cold chain and vaccine management
- Temperature monitoring (online) of State Vaccine Stores in ten states
- Conducting Effective Cold Chain and Vaccine Management Course (ECCVMC) for programme managers at state and district levels
- Support to states to conduct EVM assessments.

National Cold Chain Management Information System (NCCMIS)

Considering the usefulness in managing and monitoring the cold-chain equipment and for taking management decisions for the Immunization Programme, a centralized MIS was developed in 2010 by Ministry of Health and Family Welfare (MoHFW), GoI with technical and financial support from UNICEF India, and was coined as the National Cold Chain Management Information System (NCCMIS). Valuable inputs were taken from all the state EPI officers (SEPIOs) and cold-chain officers while developing this MIS.

NCCMIS serves as a comprehensive web-based database for various cold chain equipment and their related information across the country used in the UIP.

This is a dynamic database, which provides a wide range of information on:

- Cold chain situation of the country;
- Cold-chain points at various levels – Government Medical Stores Depot (GMSD), state, region, district and sub-district;
- Human resource, capacity building;
- Inventory of electrical and non-electrical cold-chain equipment, spare parts and toolkits;
- Analysis of various performance indicators for cold chain;
- Space analysis, etc.

Data collection

Data for this MIS is usually captured in two ways. A set of data which is required to be filled while opening a particular cold-chain point in a district is collected and entered as one-time data. The state-level cold-chain points (state vaccine stores) are created at national level. Cold-chain points up to district level (regional/divisional/district level stores) are created at state level and sub-district level cold chain points are created at district level.

Besides this, there are certain fields which are dynamic and need to be updated as and when there is a change such as breakdowns, repair of any equipment, change in staff, etc.

The data entry is limited to GMSD, state and district level users. The CCTs placed at the respective levels along with the immunization computer assistants are responsible for data collection and entry in the MIS under the supervision of cold-chain officers of the respective states.

State-wise trainings were conducted at the national level for training of trainers, who in turn have trained the district level users (CCTs/immunization computer assistants/stores managers/data entry operators) in a cascading manner for making the NCCMIS operational and updating it regularly.

NIHFW, through the NCCVMRC, is responsible for the overall maintenance, implementation and monitoring of the NCCMIS across the country including providing helpline support to end-users.

Features of NCCMIS

- Common portal for data retrieving (**site:** www.nccvmtc.org; **login ID:** national; **password:** national)
- NCCMIS dashboard (state/district-wise status of cold-chain points, cold-chain equipment)
- Generates around 70 reports at all levels (national, state, district, block and down to PHC) on key cold-chain indicators.

Electronic Vaccine Intelligence Network (eVIN)

Electronic Vaccine Intelligence Network (eVIN) is India's solution for ensuring effective management of the immunization supply chain. It answers three crucial questions for cold-chain handlers:

- Where are my vaccines?
- Are they available in adequate quantities?
- Are they being stored in appropriate conditions?

With data answering these questions, cold-chain handlers will be able to make effective vaccine storage and stock management decisions. eVIN was conceptualized and piloted by the Immunisation Technical Support Unit (ITSU), MoHFW.

eVIN is made up of three components—processes, technology, and human resources, which are all required to ensure vaccine stock, temperature data visibility and improved immunization supply chain performance. Data flow chart of eVIN is shown in Fig. 4.20.

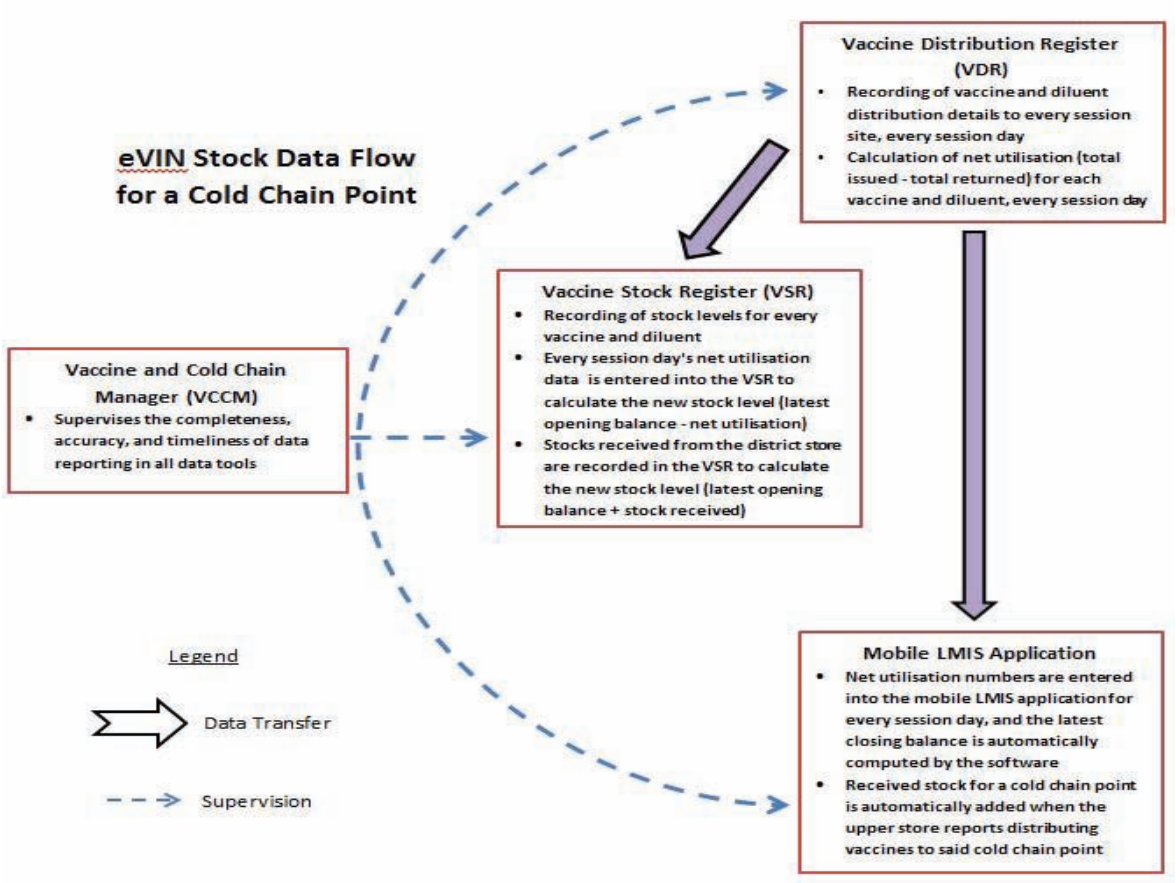
How do cold-chain handlers interact with eVIN?

eVIN supports cold-chain handlers in their routine vaccine handling activities. The interactions between cold-chain handlers and eVIN are simple and clearly defined.

Interaction 1: eVIN's registers

There are two types of registers, one for recording detailed distribution data on every immunisation session day, and another for recording changes in total stock levels.

Fig. 4.20. eVIN – Data flow chart



Vaccine Distribution Register

The number of doses distributed and returned for each vaccine to each session site is recorded in this register. Transactions for open vials and syringes are also similarly recorded. At the end of the session day, cold-chain handlers calculate the net utilization for each vaccine (total distributed - total returned).

Vaccine Stock Register

At the end of a session day, the net utilisation for a vaccine is deducted from the day's opening stock balance to create a closing balance. Vaccines received from higher level stores are recorded as receipts and are added to opening balances. In addition, important information such as batch number, expiry date, name of manufacturer and VVM status is recorded for every transaction.

Interaction 2: eVIN's technology

Mobile phone alerts are sent to cold-chain handlers in case storage temperatures or stock levels are too high or too low.

Mobile Logistics Management Information System (LMIS) application

Cold chain handlers enter the net utilization numbers for each vaccine (from the Vaccine Distribution Register) into the LMIS application on their mobile phones, and the updated stock levels are automatically calculated by the LMIS software.

In case the stock levels are inaccurate or need to be updated due to vaccine expiry or damage, then updated stock levels can be entered into the mobile application. If stock levels are too low (below buffer level), or too high (above maximum level), cold-chain handlers will be alerted on their mobile phones.

Temperature loggers

eVIN's automated temperature loggers monitor and record the storage temperatures of ILRs, DFs, WICs and WIFs and report their temperature data to the LMIS. Instances of low or high temperatures are instantly alerted to cold-chain handlers and refrigerator mechanics through their mobile phones.

Automated temperature monitoring helps cold-chain handlers in ensuring appropriate storage conditions for vaccines.

Interaction 3: Training of cold-chain handlers and VCCMs

The third interaction of cold-chain handlers with eVIN involves training sessions to improve their knowledge and skills.

Training for using eVIN's registers, mobile LMIS and temperature maintenance

Cold chain handlers are trained to ensure effective record keeping in eVIN's registers and quality data reporting into the mobile LMIS. Emphasis on learning the basic steps of operating the mobile LMIS is particularly important among handlers who have had limited prior experience in using mobile phones. A visual guidebook on using the mobile LMIS is provided to cold-chain handlers for referral.

Responses to these alerts are guided by detailed guidelines, which are provided to cold-chain handlers.

Vaccine and Cold Chain Managers (VCCMs)

VCCMs are at the district level and support cold-chain handlers in recordkeeping, stock management and temperature maintenance. They help handlers get comfortable with the LMIS mobile application and are available to answer questions or handle any problems that handlers face with the mobile application. VCCMs also supportively supervise cold-chain handlers in their use of eVIN's registers to help ensure complete data recording.

Additionally, VCCMs work with cold-chain handlers to ensure that their vaccine stock levels are appropriate and that storage temperatures are maintained within the recommended ranges. VCCMs use LMIS data to plan stock distribution to cold-chain points. They also monitor temperature data from the temperature loggers to help cold-chain handlers and refrigerator mechanics maintain the cold-chain equipment.

Stock and distribution registers

Following are the formats required for indent, supply, stock and distribution of vaccines and logistics:

- Stock register formats
- Indent and supply formats
- Vaccine distribution register
- Vaccinator's logistics diary

Stock register formats

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VACCINE STOCK REGISTER - ISSUE AND RECEIPT

Name of the CHC/PHP/SC/UHC/PPC/Others: _____

Name of the Block: _____

Name of the District: _____

Name of the State: _____

Year: _____

Vaccine Stock Register - Issue and Receipt

Name of the Vaccine Store:												
Name of the Vaccine/Diluent/AD Syringe:												
Serial No.	Date	Opening Balance (Dose/Piece)	Received (Dose/ Piece)	Received From	Issued (Dose/ Piece)	Issued to (Name of Cold Chain Point/RI Sessions/ Discarded-Reason)	Challan No.	VVM Status (Usable/ Non-Usable)	Name of the Manufacturer	Batch No.	Expiry Date	Closing Balance (Dose/Piece)

Name of the CHC/PHC/PPC:		Name of the person distributing the vaccines:		Name of the person receiving return vaccines:																			
		Issue and Return of Un-opened Vaccine Vials (VVM Status-Usable)																					
		BCG Doses		BCG Diluent Doses		OPV Doses		OPV Dropper		Doses		Diluent Doses		JE Doses		JE Diluent Doses		DPT Doses		Hep-B Doses		TT Doses		Pentavalent Doses	
	Name of the Sub-centre/ UHP/HF-Session site	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return
1																									
2																									
3																									

Vaccine and logistics indent and supply formats

(Copy for Record for Requester)				(Copy for Record for Receiver)			
Indent No.:		Date:		Indent No.:		Date:	
From:				From:			
To:				To:			
Item	**Total amount received in current year**	**Balance available on date of indent**	**Amount requested**	**Item**	**Total amount received in current year**	**Balance available on date of indent**	**Amount requested**
BCG (doses)				BCG (doses)			
bOPV (doses)				bOPV (doses)			
DPT (doses)				DPT (doses)			
Hep B				Hep B			
Pentavalent				Pentavalent			
IPV (doses)				IPV (doses)			
JE				JE			
TT (doses)				TT (doses)			
BCG Diluent				BCG Diluent			
0.1ml AD Syringes				0.1ml AD Syringes			
0.5 ml AD Syringes				0.5 ml AD Syringes			
5 ml Disp. Syringes				5 ml Disp.Syringes			
VitA Syrup				VitA Syrup			
Signature of Receiver:		**Signature of Requester:**		**Signature of Requester:**		**Signature of Requester:**	
Name:		**Name:**		**Name:**		**Name:**	
Designation:		**Designation:**		**Designation:**		**Designation:**	

(Copy for Record for Supplier)						(Copy for Record for Receiver)					
Supply Voucher No.:			Date:			Indent No.:			Date:		
Reference Indent No			Dated:	Received on:		Reference Indent No			Date:	Received on:	
To:						To:					
	Item	**Amount Released**	**Batch No.**	**Expiry VVM Date Status**	**Remarks**		**Item**	**Amount Released**	**Batch No.**	**Expiry VVM Date Status**	**Remarks**
1	BCG (doses)					1	BCG (doses)				
2	bOPV (doses)					2	bOPV (doses)				
3	DPT (doses)					3	DPT (doses)				
4	Hep B					4	Hep B				
5	Pentavalent					5	Pentavalent				
6	IPV (doses)					6	IPV (doses)				
7	JE					7	JE				
8	TT (doses)					8	TT (doses)				
9	BCG Diluent (amp)					9	BCG Diluent (amp)				
10	Diluent (amp)					10	Diluent (amp)				
11	0.1ml AD Syringes					11	0.1ml AD Syringes				
12	0.5 ml AD Syringes					12	0.5 ml AD Syringes				
13	5 ml Disp. Syringes					13	5 ml Disp. Syringes				
14	VitA Syrup					14	VitA Syrup				
Received above vaccines and logistics in quantity mentioned and in good condition.						**Received above vaccines and logistics in quantity mentioned and in good condition.**					
Signature of Receiver:			**Signature of Store in Charge:**			**Signature of Receiver:**			**Signature of Receiver:**		
Name:			**Name:**			**Name:**			**Name:**		
Designation:			**Designation:**			**Designation:**			**Designation:**		

Vaccine distribution register for immunization session (2 pages)

VACCINE DISTRIBUTION REGISTER FOR IMMUNISATION SESSION

Name of the CHC/PHC/SC/UHC/PPC/Others:_____
Name of the Block:_____
Name of the District:_____
Name of the State:_____
Year:_____

Universal Immunization Programme
Vaccination

HOW TO USE THE VACCINE DISTRIBUTION REGISTER FOR AN IMMUNISATION SESSION

1. Each page of this register should be used for only ONE immunisation session day. If there are more than 28 sessions scheduled on 1 day, continue on the next page.
2. Add the name of the Sub-Centres to whom the vaccines are issued and the session site.
3. Always start transactions for next immunisation session in a new page of the register.

Issue of Un-Opened Vaccine Vials:
-The quantity for all the un-opened vaccine vials that are issued to the session site should be recorded in "doses".
-This should be done for each of the vaccines which are issued to the session site.

Return of Un-Opened Vaccine Vials:
-At the end of the session day, all the returned un-opened vaccine vials should be recorded in "doses".
-It should be recorded next to the quantity of vaccine that were issued in the morning.

Vaccine Distribution Register for Immunization Session

Type of the session (RI/ SIW/Campaign/Others):							**Date:**									
Syringes						**Red and Black Plastic Bags (Yes/ No)**	**Issue and Return of Open Vaccine Vials (VVM Status-Usable)**									
0.1ml		**0.5 ml**		**5 ml**			**DPT vials**		**OPV vials**		**TT vials**		**Hep-B vials**		**Pentavalent vials**	
Issue	Return (un-used)	Issue	Return (un-used)	Issue	Return (un-used)		Issue	Return	Issue	Return	Issue	Return	Issue	Return	Issue	Return

Net Utilised = (Issued Doses - Returned Doses)	BCG doses	BCG Diluent doses	OPV doses	OPV dropper	Doses	Diluent doses	JE doses	JE Diluent doses	DPT doses	Hep B doses	TT doses	Pentavalent doses	0.1ml	0.5 ml	5 ml

VACCINATOR'S LOGISTICS DIARY

1. This diary is to be maintained by the vaccinator and should be available at the session site.
2. This diary should be used for maintaining the records of Received and Returned Vaccines, Syringes and Diluents at the session site.
3. The name of the Vaccinator, Health Facility, Session Site and Session Date should be written in the upper part of the diary in the space provided.
4. The details for 'Un-Opened Vials & Syringes', and 'Open Vaccine Vials' should be recorded separately under the separate headings as provided in the dairy.

At the time of Receiving Vaccines/Diluents/Syringes and Other Logistics

Vaccinator's Logistics Diary

Name of Vaccinator……Name of Health Facility:……..

Session Site: ……Date of session:……

Un-Opened Vials & Syringes											
Item		Received (In Doses)					Returned (In Doses)				
Sl. No.	Name of the Items	Quantity	Manufacturer	Batch No.	Exp.Date	VVM	Quantity	Manufacturer	Batch No.	Exp.Date	VVM
1	OPV										
2	DPT										
3	Hep-B										
4	TT										
5	Pentavalent										
6	BCG										
7	Measles										
8	JE										
9	BCG Diluent										
10	Measles Diluent										
11	JE Diluent										

Other Logistics (in pieces)								
Items	Received	Returned	Items	Received	Returned	Items	Received	Returned
0.1ml			0.5 ml			5 ml		
OPV Dropper			Black Bag			Red Bag		

Open Vaccine Vials											
		Received					Returned				
		Quantity in Vials	Batch No.	Exp.Date	VVM	Date of Opening of vial	Quantity in Vials	Batch No.	Exp.Date	VVM	Date of Opening of vial
1	DPT vials										
2	OPV vials										
3	TT vials										
4	Hep-B vials										
5	Pentavalent vials										

Receiving Details		Returning Details	
Name and designation		Name and designation of Person	
Transport modality		Transport modality (AVD/self	
Date & Time		Date & Time	

1. At the end of the session, the vaccinator should fill the details of all logistics being returned and the mode of return of vaccine carrier.
2. The vaccinator should sign after the complete details are filled. Any supervisor visiting the session site should check the details and verify by counter signing.

At the time of Returning the Vaccines/Diluents/Syringes/and other Logistics

Un-Opened Vials & Syringes											
Item		Received					Returned				
Sl. No.	Name of the Items	Quantity	Manufacturer	Batch No.	Exp.Date	VVM	Quantity	Manufacturer	Batch No.	Exp.Date	VVM
1	OPV										
2	DPT										
3	Hep-B										
4	TT										
5	Pentavalent										
6	BCG										
7	Measles										
8	JE										
9	BCG Diluent										
10	Measles Diluent										
11	JE Diluent										

Other Logistics (in pieces)								
Items	Received	Returned	Items	Received	Returned	Items	Received	Returned
0.1ml			0.5 ml			5 ml		
OPV Dropper			Black Bag			Red Bag		

Open Vaccine Vials										
		Received					Returned				
		Quantity in Vials	Batch No.	Exp.Date	VVM	Date of Opening of vial	Quantity in Vials	Batch No.	Exp.Date	VVM	Date of Opening of vial
1	DPT vials										
2	OPV vials										
3	TT vials										
4	Hep-B vials										
5	Pentavalent vials										

Receiving Details		Returning Details	
Name and designation of Person delivering the stock to session site:		Name and designation of Person collecting the stock from the session and return to cold Chain Point:	
Transport modality (AVD/self collection/other-specify)		Transport modality (AVD/self collection/other-specify)	
Date & Time		Date & Time	

Signature of Vaccinator:

Notes:

UNIT-5

Safe injections and Waste Disposal

Learning objectives

- *Describe the importance of safe injections and ways to improve injection safety*
- *List steps to achieve safe injections and safe disposal of immunization waste according to existing GoI guidelines.*

Key Contents

Safe injections and waste disposal

5

Safe injections

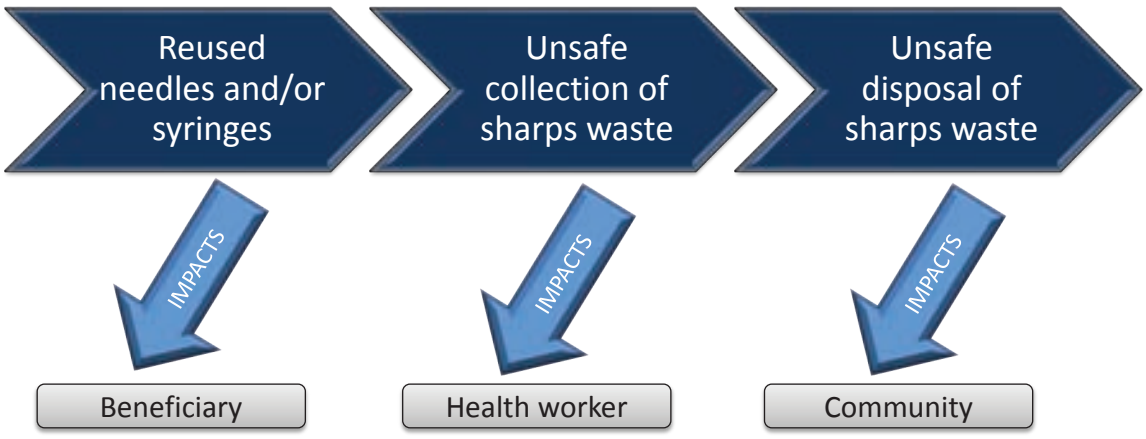
A safe injection is one that:

- does not harm the recipient
- does not expose the HWs to any avoidable risks
- does not result in waste, which is dangerous for the community.

The most common, serious infections transmitted by unsafe injections are Hep B, Hep C, and HIV. Poorly administered injections can also cause injuries or drug toxicity when the wrong injection site, vaccine, diluent, or dose is used. It is important to prevent the risks of accidental needle-stick injury, and it is also necessary to dispose of used syringes and needles safely to prevent risks to the community at large.

Impacts of unsafe injections are illustrated in Fig. 5.1.

Fig. 5.1. Impacts of unsafe injections



The provision of AD syringes by the GoI and the implementation of the Central Pollution Control Board (CPCB) waste management guidelines improves injection safety in the immunization programme.

Simple ways to improve injection safety

Keep hands clean before giving injections

- Wash or disinfect hands prior to preparing injection material.
- Cover any small cuts on the service provider's skin.
- Avoid giving injections if the skin at the site of injection is compromised by any local infection such as a skin lesion, cut, or weeping dermatitis.

Use sterile injection equipment, every time

- Always use AD syringes for each injection and a new disposable syringe to reconstitute each vial of BCG, measles/MR and JE.

Prevent the contamination of vaccine and injection equipment

- Prepare each injection in a designated clean area where contamination from blood or body fluid is unlikely.
- If the injection site is dirty, clean it with clean swab.
- Always pierce the rubber cap (septum) of the vial with a sterile needle.
- Do not touch the needle or rubber cap (septum) of a vial with your finger.
- Follow product-specific recommendations for use, storage and handling of a vaccine.
- Discard any needle that has touched any non-sterile surface.

Assume all used equipment is contaminated

- Cut the used syringe with the hub cutter immediately after use.

Practice safe disposal of all medical sharps waste

- Used sharps (needles) must be collected in a hub cutter and then carried to the PHC for safe disposal.

Prevent needle-stick injuries

- Do not re-cap or bend needles.
- Anticipate sudden movement of the child.
- Collect sharps in a puncture-proof container (hub cutter).

Correct use of AD syringes (Fig 5.2)

Fig. 5.2. Correct use of AD syringes

	1. Select the correct syringe for the vaccine to be administered – 0.1ml for BCG, fIPV and 0.5ml for all others.
	2. Check the packaging. Don't use if the package is damaged, opened, or expired.
	3. Peel open or tear the package from the plunger side and remove the syringe by holding the barrel. Discard the packaging into a **black** plastic bag.
	4. Remove the needle cover/cap and discard it into the black plastic bag. 5. Do not move the plunger until you are ready to fill the syringe with the vaccine and do not inject air into the vial as this will lock the syringe.
	6. Take the appropriate vaccine vial, invert the vial, and insert the needle into the vial through the septum. Insert the needle such that the tip is within the level of the vaccine. If inserted beyond that, you may draw an air bubble which is very difficult to expel. 7. **Do not touch the needle or the rubber cap (septum) of the vial.**
	8. Pull the plunger back slowly to fill the syringe. The plunger will automatically stop when the necessary dose of the vaccine has been drawn (0.1 ml or 0.5 ml). 9. **Do not draw air into the syringe.** In case air accidentally enters the syringe, remove the needle from the vial. Holding the syringe upright, tap the barrel to bring the bubbles towards the tip of syringe. Then carefully push the plunger to the dose mark (0.5 or 0.1 ml) thus expelling the air bubble. 10. Clean the injection site (if dirty) with a clean swab.

11. Administer the vaccine, as follows:

- **BCG:** upper arm **LEFT**
- **DPT and Hep B:** Anterolateral aspect (outer side) of mid-thigh **LEFT**
- **Pentavalent:** Anterolateral aspect of mid-thigh **LEFT**
- **fractional IPV:** Upper arm **RIGHT**
- **PCV:** Anterolateral aspect of mid-thigh **RIGHT**
- **MR:** Upper arm **RIGHT**
- **TT:** Upper arm **RIGHT**
- **JE:** upper arm **LEFT.**

12. Push the plunger completely to deliver the dose. **Do not rub the injection site after vaccine is given.**

13. **Do not re-cap the needle.** Cut the hub of the syringe immediately after use with hubcutter that collects the sharps in its puncture proof container.

14. Then collect the plastic portion of the cut syringes in a red plastic bag.

Follow the guidelines for waste disposal as given in next section.

Steps to ensure safe disposal of immunization waste

The CPCB outlines guidelines for disposal of biomedical waste generated during immunization under the UIP. The concerned CMO/DHO or the officer responsible for implementation of UIP in the respective area, as decided by the MoHFW, will obtain authorization from the "Prescribed authority" notified under the Biomedical Waste (Management & Handling) Rules for generating, collecting, receiving, storing, transporting, treating, disposing and/or handling biomedical waste in any other manner.

Biohazard and cytotoxic symbols are given in Fig. 5.3.

Fig. 5.3. Biohazard and cytotoxic symbols

Disposal of biomedical waste generated at outreach points/PHCs/CHCs/ district hospitals, etc. (refer Fig. 5.6)

Step 1: At the session site, ANMs to cut the needle of the AD syringe immediately after administering the injection using the hub cutter that cuts the plastic hub of the syringe and not the metal part of needle. The cut needles will get collected in the puncture-proof container of the hubcutter (Fig. 5.4).

Step 2: Store the broken vials in a separate white sturdy and puncture proof container or in the same hubcutter, in case its capacity is also able to accommodate broken vials.

Step 3: Segregate and store the plastic portion of the cut syringes and unbroken (but discarded) vials in the red bag or container. Both the containers should bear the biohazard symbol as stipulated in Schedule III of the Bio-Medical Waste (BMW) Rules (Fig. 5.3).

Step 4: Send the red, black bag and the hub cutter to PHC for disinfection (see fig. 5.5) and disposal by the designated person at the PHC. Dispose of the black bag as general waste. PHC may send the collected materials to the Common Biomedical Waste Treatment Facility (CBWTF). If the CBWTF doesn't exist, go to Step 5.

Step 5: Treat the collected material in an autoclave. If unable to impart autoclaving, boil the waste in water for at least 10 minutes or provide chemical treatment using sodium hypochlorite for 30 minutes to ensure that this results in disinfection. However, the district hospital/CHC/PHC will ultimately make the necessary arrangements to autoclave on a regular basis.

Step 6: Dispose the autoclaved (or boiled/chemically disinfected) waste as follows:

- Dispose the needles and broken vials in a safety pit/tank
- Send the syringes and unbroken vials for recycling or to a landfill.

Step 7: Wash the hub cutters properly with sodium hypochlorite before reuse.

Step 8: Maintain a proper record of generation, treatment and disposal of waste at the district hospital/CHC/PHC in order to assess that waste (needles/syringes/vials) reported back matches with the stock issued to HWs at the beginning of the session day. Match by weighing rather than counting to avoid occupational and safety hazards. This helps to prepare annual reports, submitted to the prescribed authority by 31 January of every year.

Fig. 5.4. Using the hub cutter correctly

Fig. 5.5. Pictorial flow chart – disinfection and disposal sharps waste from RI session

Fig. 5.6. Pictorial guide – segregation and safe disposal methods for immunization waste

Red/black plastic bags

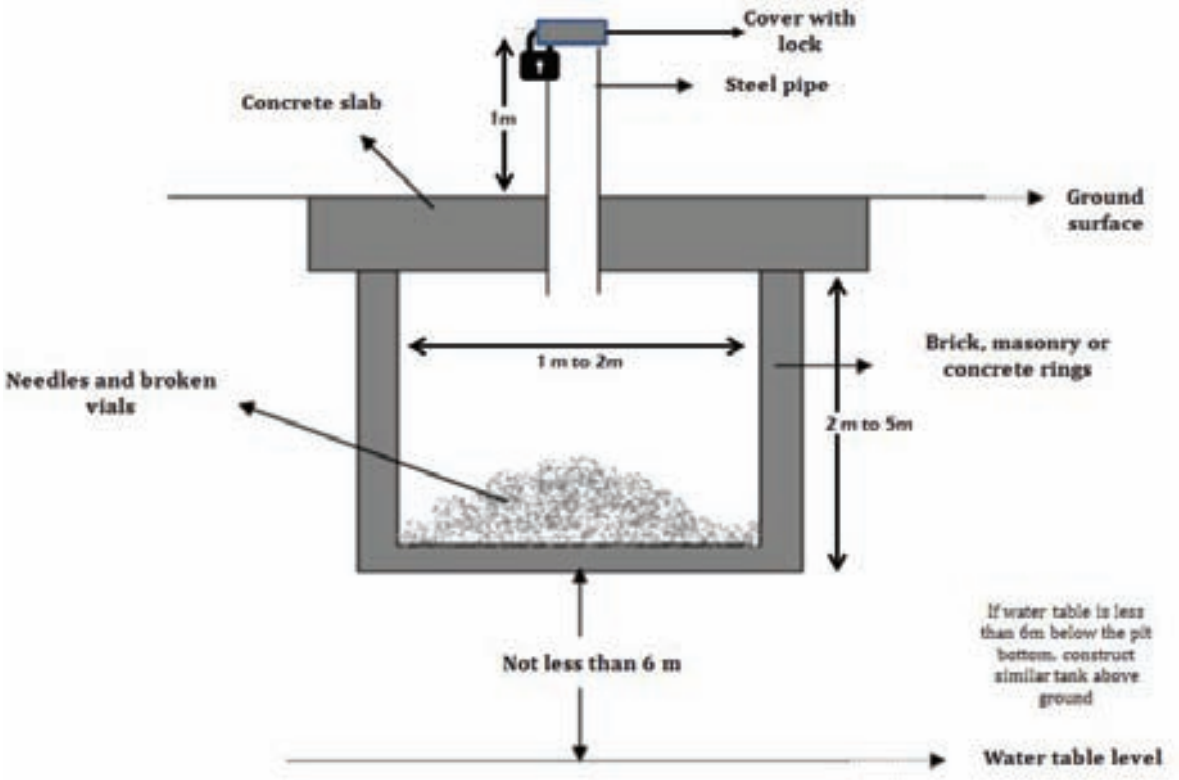
30 Liters (24'' x 28'') (biodegradable) HDPE/LLDPE/PP bags made with virgin, non-chlorinated polymer material with minimum thickness of 55 micron, with easy to hold collar tie/knot arrangement and preprinted as per requirements of Bio Medical Waste Management Rules are to be used.

Final disposal at PHC/UHC/CHC of treated needles and broken vials (sharps)

Treated needles/broken vials should be disposed of in a circular or rectangular pit as shown in Fig. 5.7. Such a rectangular or circular pit can be dug and lined with brick, masonry or concrete rings. The pit should be covered with a heavy concrete slab, which is penetrated by a galvanized steel pipe projecting for about 1 m above the slab, with an internal diameter of up to 50 mm or 1.5 times the length of vials, whichever is more. The top opening of the steel pipe shall have a provision for locking after the treated waste sharps have been disposed.

When the pit is full, it can be sealed completely after another one has been prepared. For high water-table regions where the water table is less than 6 meters beneath the bottom of the pit, a tank with above mentioned arrangements shall be made above the ground.

Fig. 5.7. Design of the pit/tank for disposal of treated needles and broken vials (sharps)



Your role in safe injections, safety of staff and waste management

Medical Officer's role	Activity	How
Ensuring safe injections by health workers	1. Ensuring availability and maintenance of logistics needed for safe injections 2. Ensuring all ANMs both in the field and in health centre are aware and practice injection safety	Use the opportunity during field visits to RI session sites
Further develop and guide safe practices	1. Review of waste segregation and management with all staff to identify issues 2. Involvement of waste handlers	Discuss during meetings and involve all staff
Ensure existing waste management is adequate and in line with guidelines	1. Is at source segregation of waste being practiced at all levels? 2. Ensuring availability of proper logistics 3. Making sure the injection pit and waste storage areas are as per guidelines	When on rounds of hospital or visiting any other department in your centre
Ensuring safe final disposal of waste	1. Ensure timely collection of segregated waste from your health centre. Report delays to district. 2. Ensure safe storage of segregated waste before final disposal 3. Review functioning of sharps pit / landfill	Discuss issues during district level meetings or contact district immediately when issues arise

Global research in new vaccine delivery methods

- **Intra dermal delivery** – Jet injectors, Micro needles,
- **Needle free vaccines delivery** – Needle free patch, inhaled vaccines
- **Transcutaneous route**

Notes...

Notes...

UNIT-6

Adverse events following immunization

Learning objectives

- *Define AEFI and describe the types of AEFIs. List the responsibilities of MOs and other health service providers in managing AEFIs.*
- *Recognise and treat cases of anaphylaxis.*

Key Contents

Adverse events following immunization

6

Adverse event following immunization (AEFI) is defined as any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine.

The adverse event may be any unfavourable or unintended sign, abnormal laboratory finding, symptom or disease.

Reported adverse events can either be true adverse events, i.e. actually a result of the vaccine or immunization process, or coincidental events that are not due to the vaccine or immunization process, but are temporally associated with immunization.

In 2015, revised classification relevant to cause-specific categorization of AEFIs has been introduced (Table 6.1).

Table 6.1. Cause-specific categorization of AEFIs

	Cause-specific type of AEFI	Definition
1	Vaccine product-related reaction	An AEFI that is caused or precipitated by a vaccine due to one or more of the inherent properties of the vaccine product
2	Vaccine quality defect-related reaction (Both 1 & 2 were earlier categorised in Vaccine Reaction)	An AEFI that is caused or precipitated by a vaccine that is due to one or more quality defects of the vaccine product, including its administration device as provided by the manufacturer
3	Immunization error-related reaction (formerly “programme error”)	An AEFI that is caused by inappropriate vaccine handling, prescribing or administration and thus by its nature is preventable
4	Immunization anxiety-related reaction (formerly “injection reaction”)	An AEFI arising from anxiety about the immunization
5	Coincidental event	An AEFI that is caused by something other than the vaccine product, immunization error or immunization anxiety

Vaccine reactions

There are two types of possible vaccine reactions. **First** - a vaccine product-related reaction; this is a reaction (an individual's response) to the inherent properties of the vaccine, even when the vaccine has been prepared, handled and administered correctly. **Second** - vaccine quality defect-related reaction; this is a defect in a vaccine that occurred during the manufacturing process. Due to introduction of improved good manufacturing practices (GMP), such defects are now extremely rare.

Vaccine reactions may be classified into common, minor reactions; severe reactions; or serious reactions. Most vaccine reactions are minor and settle on their own. More severe and serious reactions are very rare and in general do not result in long-term problems.

Common, minor vaccine reactions

A vaccine induces immunity by causing the recipient's immune system to react to the vaccine. Therefore, local reaction, fever and systemic symptoms can result as part of the immune response. In addition, some of the vaccine's components (e.g. aluminium adjuvant, stabilizers or preservatives) can lead to reactions. The proportion of reaction occurrences likely to be observed with the UIP vaccines are listed in Table 6.2.

Table 6.2. Common, minor vaccine reactions and treatment

Vaccine	Local adverse events (pain, swelling, redness)	Fever (> 38°C)	Irritability, malaise and systemic symptoms
BCG	90-95%	-	-
OPV	None	Less than 1%	Less than 1%
Hepatitis B	Adults: up to 15% Children: up to 5%	1-6%	-
Hib	5-15%	2-10%	-
Pertussis (DwPT)	up to 50%	up to 50%	up to 55%
Tetanus	~ 10%	~ 10%	~ 25%
Measles/MR/MMR	~10%	5-15%	5% (Rash)
JE live-attenuated	<1%	-	-

Local reactions include pain, swelling and/or redness at the injection site and can be expected in about 10% of vaccinees, except for those injected with DwPT (whole cell DPT), or tetanus boosters, where up to 50% can be affected. BCG causes a specific local reaction that starts as a papule (lump) two or more weeks after immunization, which becomes ulcerated and heals after several months, leaving a scar.

Systemic reactions include fever and occur in about 10% or less of vaccinees, except for DwPT where the reactions are about half. Other common systemic reactions such as irritability, malaise, "off-colour" and loss of appetite can also occur after DwPT. For Live Attenuated Vaccines (LAV) such as measles/MR and OPV, the systemic reactions arise from vaccine virus infection. Measles/MR vaccine causes fever, rash and/or conjunctivitis, and affects 5–15% of vaccinees. It is very mild compared to "wild" measles.

Paracetamol, at a dose of up to 15mg/kg every 6–8 hours with a maximum of four doses in 24 hours is useful for the common minor reactions. It eases pain and reduces fever. However, it is important to advise not to overuse paracetamol as overdosing may harm the vaccinee. A feverish child can be cooled with a tepid sponge or bath, and by wearing cool clothing. Extra fluids need to be given to feverish children. For a local reaction, a cold cloth applied to the site may ease the pain.

Serious and severe vaccine reactions

An AEFI will be considered serious if it results in death, requires hospitalization, results in persistent or significant disability/incapacity or a cluster (two or more cases) of AEFIs occur in a geographical area.

AEFIs that are not minor but do not result in death, hospitalization or disability are categorized as severe. Examples include non-hospitalized cases of seizures, hypotonic hyporesponsive episodes (HHEs), persistent screaming, anaphylaxis, severe local reaction, injection site abscesses, intussusception, etc. Table 6.3 details these rare vaccine reactions. Most of the rare and more serious vaccine reactions such as seizures, thrombocytopenia, HHEs and persistent inconsolable screaming do not lead to long-term problems. Anaphylaxis, while potentially fatal, is treatable without leaving any long-term effects. Although encephalopathy is included as a rare reaction to measles or DPT vaccine, it is not certain that these vaccines in fact cause encephalopathy.

Table 6.3. Rare vaccine reactions, onset interval and rates

Vaccine	Reaction	Onset interval	Rate/doses
BCG	Suppurative lymphadenitis BCG osteitis Disseminated BCG infection	2-6 months 1-12 months 1-12 months	1 to 10 /10,000 1 to 700/1,000,000 0.19 to 1.56/1,000,000
Oral poliomyelitis	VAPP†	4-30 days	2 to 4 /1,000,000†
Hepatitis B	Anaphylaxis	0-1 hour	1.1/1,000,000
Hib	None		

Pertussis (DwPT)/ Pentavalent vaccine	Persistent (>3 hours) inconsolable screaming	0-24 hours	<1 /100
	Seizures††	0-3 days	<1 /100
	Hypotonic, hypo responsive episode(HHE)	0-48 hours	1 to 2 /1000
	Anaphylaxis	0-1 hour	20/1,000,000
	Encephalopathy§	0-2 days	0 to 1 /1,000,000
Tetanus toxoid	Brachial neuritis	2-28 days	5 to 10 /1,000,000
	Anaphylaxis	0-1 hour	1 to 6 /1,000,000
Measles/MMR/ MR*	Febrile seizures	6-12 days	3 /1000
	Thrombocytopenia	15-35 days	3 /10,000
	Anaphylaxis	0-1 hour	~1 /1,000,000
	Encephalopathy §	6-12 days	< 1 /1,000,000
Rotavirus	Intussusception	3-14 days	1 to 2/100,000

Notes:

† VAPP Risk is higher following the first dose (1 in 750 000 compared to 1 in 5.1 million for subsequent doses), and for adults and immunocompromised.

†† Seizures are mostly febrile and the risk depends on age, with much lower risk in infants under the age of four months.

* Reactions (except anaphylaxis) do not occur if already immune (~90% of those receiving a second dose are immune): children over six years unlikely to have febrile seizures.

§ Although encephalopathy is included as a rare possible reaction to measles or DPT vaccines, it is not certain that these vaccines in fact cause encephalopathy. Hence, further scientific evaluation is necessary.

Though vaccines are very rarely contraindicated, it is important to check for contraindications to avoid serious reactions. For example, vaccines are contraindicated if there is a possibility of serious allergy to a vaccine or its components. Live vaccines should not be given to immune deficient children.

Advice on managing the common reactions should be given to parents, in addition to instructions to return if there are more serious symptoms. Such action will help to reassure parents about immunization and prepare them for common reactions.

It is recommended that facilities be available at all clinic settings to provide initial emergency care. All immunization providers need to have these skills and competence to manage anaphylaxis. Availability of adrenaline (within expiry date) and other basic items in the emergency tray (AEFI kit) is vital.

Administration of one dose of Intra Muscular (IM) adrenaline by ANM as first line management in the field - See annex on Page 294.

Immunization error-related reactions (formerly "programme error")

An adverse event can occur as a result of inappropriate handling, prescribing or administration of a vaccine. It is very important to identify and correct these errors as they are preventable (Table 6.4); otherwise they may derail the benefits of the immunization programme.

An immunization error-related reaction may lead to a cluster of events associated with immunization. These clusters are usually associated with a particular provider, health facility, or even a single vial of vaccine that has been inappropriately prepared or contaminated. Immunization error-related reactions can also affect many vials. For example, freezing vaccine during transport may lead to an increase in local reactions.

Table 6.4. Immunization error-related reactions

Immunization error	Examples	Related reaction
Error in vaccine (and diluent) handling	Exposure to excess heat or cold (using hard frozen ice packs in RI) as a result of inappropriate transport, storage or handling of the vaccine (and its diluent) where applicable. Use of a product after the expiry date.	Systemic or local reactions due to changes in the physical nature of the vaccine, such as agglutination of aluminium-based excipients in freeze-sensitive vaccines. Failure to vaccinate as a result of loss of potency or non-viability of an attenuated product.
Error in vaccine prescribing or non-adherence to recommen-dations for use	Failure to adhere to a contraindication. Failure to adhere to vaccine indications or prescription (dose or schedule).	Anaphylaxis, disseminated infection with an attenuated live vaccine. Systemic and/or local reactions, neurological, muscular, vascular or bony injury due to incorrect injection site, equipment or technique.
Error in adminis-tration	Use of an incorrect diluent or injection of a product other than the intended vaccine. Incorrect sterile technique or inappropriate procedure with a multidose vial.	Failure to vaccinate due to incorrect diluent. Reaction due to the inherent properties of whatever was administered other than the intended vaccine or diluent. Infection at the site of injection/ beyond the site of injection.

With the introduction of AD syringes, infections due to non-sterile injections have reduced significantly. Such an infection could manifest as a local reaction (e.g. suppuration, abscess), systemic effect (e.g. sepsis or toxic shock syndrome), or blood borne-virus infection (e.g. HIV, Hep B or Hep C).

Use of reconstituted vaccine beyond the recommended period can lead to contamination of the vaccine (usually with bacterium *Staphylococcus aureus*). Within a few hours after administration, there may be local tenderness and tissue infiltration, vomiting, diarrhoea, cyanosis, high temperature leading to dehydration and death if not managed in time.

Inadequate shaking of the vaccine before use, superficial injection and use of frozen vaccine increases the risk of sterile abscesses which are rare (~1 per 100 000 doses) and local reactions from aluminium containing vaccines, especially DPT. Contamination of vaccine or injection equipment can also lead to a bacterial abscess. For BCG vaccine, injection abscess can arise from improper injection (subcutaneous rather than intradermal injection).

Immunization anxiety-related reactions (formerly “injection reactions”)

Immunization anxiety-related reactions are common in children over 5 years of age, resulting from fear or pain of injection rather than the vaccine. Vaccinated children or adults can react in anticipation to, and as a result of, an injection of any kind. This reaction is unrelated to the content of the vaccine.

These are common in mass vaccination campaigns. Examples include fainting, light-headedness, and dizziness, tingling around the mouth and in the hands. Younger children may react with vomiting, breath-holding, which in some cases can lead to a brief period of unconsciousness and convulsions.

Minimize overcrowding by proper planning of the immunization sessions to reduce waiting time. Prepare vaccine out of recipient’s view and ensure privacy during the procedure to prevent anxiety.

Coincidental events

Coincidental events have only a temporal association, i.e. event happening after immunization, and are not causally related.

Vaccines are normally scheduled early in life when infections and other illnesses are common, including manifestations of an underlying congenital or neurological condition. It is, therefore, possible to encounter many events, including deaths, to be falsely attributed to vaccine through chance association.

A coincidental event is more likely if the same or similar events also affected others in the same age group around the same time but who did not receive the suspect vaccine(s). There may also be evidence showing that the event is not related to immunization.

Immediate investigation is critical as a response to the community's concern about vaccine safety and to maintain public confidence in immunization.

Ensure appropriate follow-up communication with the affected group or community to avoid misunderstanding or negative rumours.

Responsibilities of health service providers in preventing, managing and reporting AEFIs

Community level

Anganwadi and ASHA/volunteers/frontline workers

- Follow up with beneficiaries to identify AEFIs after the vaccination session, using the beneficiaries list provided by the ANM.
- Inform the adverse event immediately by telephone to concerned ANM, MO, etc.
- Assist in referral of any suspected cases
- Assist the team investigating the event
- Support in building community confidence.

Sub Centre level

ANM

- Follow best immunization practices. Prior to starting vaccination at the RI site, the ANM must note down (in vaccinator's logistics diary) the following particulars. This will help mitigate AEFIs at session site level:
    - manufacturer's name
    - expiry date
    - batch number
    - VVM status (for new and partially used vaccines)
    - Date on the label of partially used vaccine (in case of OVP)
    - In case of reconstituted vaccines, date and time of opening on the label.

- Ensure that vaccine vial septum has not been submerged in water or contaminated in any way.
- Provide a list of children vaccinated during the session to the AWW/ASHA and request them to be alert, follow up and report AEFIs (if any) to her and the concerned MO.
- Ensure reasons for dropouts are entered in the immunization card counterfoils.
- Treat minor/non-serious AEFIs (mild symptoms like fever, pain,etc.) symptomatically.
- For all other cases (serious/severe) provide immediate first aid and refer AEFI to MO(PHC) or to appropriate health facility for prompt treatment and report. Inform the MO(PHC) at the health centre immediately by the fastest means possible.
- Share details of all AEFIs (serious/severe and minor) with the MOIC in the weekly block level meeting. Ensure details of all serious/severe and minor cases are entered in the AEFI case register maintained at the block PHC (see Annexure 1 for suggested format for AEFI Case Register).
- Assist in investigation of AEFIs and take corrective action in response to the guidance from the MO (PHC).

Health supervisors (HSs)

- Supervise and provide hands-on training to the ANMs/vaccinators in the field. This includes provision of information on referral transport and concerned officials in case of crisis.
- Monitor the community for adverse events during supervisory visits to immunization sites or SCs. Also monitor and ensure follow-up of beneficiaries by HWs. Ensure reasons for dropouts are entered in the counterfoils.
- Encourage the HWs to report AEFIs. Serious/severe AEFIs should be notified immediately by the fastest means possible.
- Analyze the reported AEFIs in the SC monthly reports and keep track of HWs who have not reported any AEFI over a period of time.
- Assist the investigation team in conducting the investigation.

Block PHC/CHC/corporation/ward/urban health post

MO In-Charge

Detection of AEFIs

- Train staff in detecting, managing and reporting of AEFIs and differentiating between minor and serious/severe events. Encourage the staff to report AEFIs.
- During case visits, enquire about any recent outbreak of disease/illness or any death in the community which may or may not have been related to vaccination.

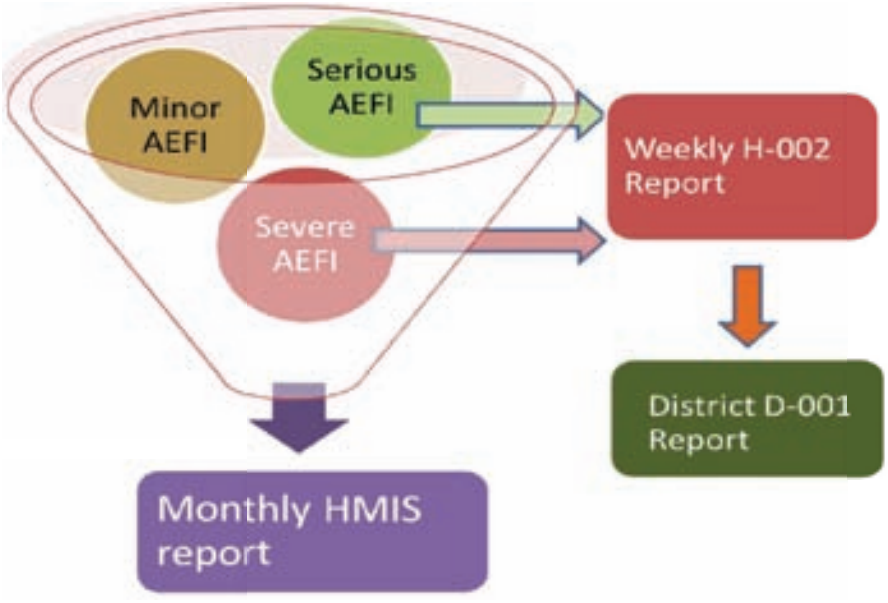
Management of AEFIs

- Ensure clinical case management of AEFIs and referral to the next level if required.
- Ensure availability of emergency drugs and medical equipment to deal with an adverse event. Regularly check the emergency kits (functional status of equipment and expiry of drugs)
- Ensure ANM is familiar with and that the anaphylaxis kit is certified every quarter.

Reporting of AEFIs (Fig. 6.1)

- Ensure timely notification of AEFIs from SC to PHC. Besides immediately informing all serious/severe AEFIs by telephone / in person, ensure that ANMs provide details of all AEFIs in their area on a weekly basis. A weekly NIL report from ANM gets submitted only after an effort has been made to look for these events in the children recently vaccinated.
- Detailed information of all serious, severe and minor AEFIs notified by HWs should be recorded in the block AEFI register.
- Ensure weekly submission of information of the number of serious/severe AEFI cases to the district in the VPD H-002 form. Assessment of Minor AEFI at the BLOCK PHC/PHC level - see page no 168.
- Conduct timely visits when cases are notified. Completely fill up Section A of CRF (Annexure 2) and submit the same to the DIO within 24 hours of case notification.
- Maintain quality (e.g. good clinical history, pre- and post-vaccination health status, community investigation, etc.) during interview and documentation.

Fig. 6.1. Reporting of AEFIs



- Ensure followup and collection of all relevant records including hospital records, laboratory records, other reports for all AEFI hospitalization cases which have been reported and investigated and submit the same to DIO.
- In AEFI death cases where postmortem has been conducted, track and collect postmortem, histo-pathological, toxicology and final cause of death reports and submit them to the DIO.
- Ensure adequate supervision and monitoring in the field.
- Communicate and share the results of investigation with HWs and the community wherever warranted.
- For any query from the media, refer the media person/s to the district authorities and abstain from giving any statements

(Please refer to the AEFI Surveillance and Response Operational Guidelines 2015 for further details and the activities to be conduced at district, state and national level)

The line list of serious, severe and minor AEFI should be maintained at the Block PHC/CHC in the block AEFI register. Number of serious and severe AEFI should be submitted to DIO as part of weekly reporting in the H002 form.

Recognition and treatment of anaphylaxis

Anaphylaxis is a very rare but severe and potentially fatal allergic reaction. Train HWs to distinguish anaphylaxis from fainting (vasovagal syncope), anxiety and breath-holding spells, which are common benign reactions (Table 6.5).

Table 6.5. Distinguish anaphylaxis from fainting (vasovagal reaction)

	Fainting	Anaphylaxis
Onset	Usually at the time or soon after the injection	Usually some delay, between 5 to 30 mins, after injection
Systemic		
Skin	Pale, sweaty, cold and clammy	Red, raised and itchy rash; swollen eyes, face, generalized rash
Respiratory	Normal to deep breaths	Noisy breathing from airways obstruction (wheeze or stridor)
Cardiovascular	Bradycardia, transient hypotension	Tachycardia, hypotension
Gastrointestinal	Nausea, vomiting	Abdominal cramps
Neurological	Transient loss of consciousness, relieved by supine posture	Loss of consciousness, not relieved by supine posture

Before immunization, check for contraindications to immunization by asking about known allergies and previous adverse reactions to vaccines.

Recognition of anaphylaxis

Signs and symptoms of anaphylaxis are given in Table 6.6. In general, the more severe the reaction, the more rapid is the onset. Most life-threatening reactions begin within 10 mins of immunization. **That is why it is advised that the beneficiary be kept under observation for at least 30 mins after the injection.**

Unconsciousness is rarely the sole manifestation of anaphylaxis – it only occurs as a late event in severe cases. A strong central pulse (e.g. carotid) is maintained during a faint, but not in anaphylaxis. Anaphylaxis usually involves multiple body systems. However, symptoms limited to only one body system (e.g. skin itching) can occur, leading to delay in diagnosis. Occasional reports have described reactions where symptoms recur 8 to 12 hours after onset of the original attack and prolonged attacks lasting up to 48 hours.

Table 6.6. Signs and symptoms of anaphylaxis

Clinical progression	Progression of signs and symptoms of anaphylaxis
Mild, early warning signs	Itching of the skin, rash and swelling around injection site. Dizziness, general feeling of warmth. Painless swellings in parts of the body e.g. face or mouth. Flushed, itching skin, nasal congestion, sneezing, tears. Hoarseness, nausea, vomiting Swelling in the throat, difficult breathing, abdominal pain.
Late, life-threatening symptoms	Wheezing, noisy and difficult breathing, collapse, low blood pressure, irregular weak pulse.

Treatment of anaphylaxis

Once the diagnosis is made, consider the patient as being in a potentially fatal condition, regardless of the severity of the current symptoms. Begin treatment immediately; and at the same time, make plans to transfer the patient immediately to the hospital (if not already in a hospital setting).

Role of adrenaline

Adrenaline (epinephrine) stimulates the heart, reverses the spasm in the lung passages and reduces edema and urticaria, thus countering the anaphylaxis. But this very potent agent can cause irregular heartbeat, heart failure, severe hypertension and tissue necrosis if used in inappropriate doses.

Every health facility should have health staff trained in treatment of anaphylaxis and should have rapid access to an emergency kit with adrenaline. They should be familiar with its dosage and administration. **The expiry date of the adrenaline should be written on the outside of the emergency kit and the whole kit should be checked three or four times a year**. Adrenaline that has a brown tinge must be discarded. Adrenaline has a short expiry life, so monitor the expiry date on a regular basis.

Steps in initial management

- If already unconscious, place the patient in the recovery position (pronate) and ensure that the airway is clear.
- Assess heart rate and respiratory rate (if the patient has a strong carotid pulse, he/she is probably not suffering from anaphylaxis).
- If appropriate, begin cardiopulmonary resuscitation (CPR).
- **Give adrenaline 1:1000 (See Table 6.7 for correct dose for age) by deep intramuscular injection into the opposite limb to that in which the vaccine was given.** Subcutaneous administration is acceptable in mild cases. Also, give an additional half dose around the injection site (deep intramuscular injection) to delay antigen absorption.

- If the patient is conscious after the adrenaline is given, place his/her head lower than the feet and keep the patient warm.
- Give Inj. Hydrocortisone IM or slow IV as per dosage chart below (Table 6.8).
- Give oxygen by facemask, if available.
- Call for professional assistance but **never leave the patient alone.** Call an ambulance (or arrange other means of transport, after the first injection of adrenaline, or sooner if there are sufficient people available to help you).
- If there is no improvement in the patient's condition within 10–20 mins of the first injection, repeat the dose of adrenaline up to a maximum of three doses in total. Recovery from anaphylactic shock is usually rapid after adrenaline.
- Record, or get someone to record, vital signs (pulse rate, respiratory rate and blood pressure), as well as time and exact dose of any medication given. **Make sure the medical and treatment details accompany the patient** when s/he is transferred.
- **Mark the immunization card clearly** so that the individual never gets a repeat dose of the offending vaccine. At a suitable moment, explain to parents or relatives the importance of avoiding the vaccine in future.
- Report the occurrence of anaphylaxis to the appropriate officer by phone followed by the reporting form.

Adrenaline dosage: 1:1000 adrenaline (epinephrine) at a dose of **0.01ml/kg up to a maximum of 0.5 ml injected intramuscularly** (or subcutaneously in very mild cases). If the weight of the patient is unknown an approximate guide is given in Table 6.7.

Table 6.7. Injection adrenaline (1:1000 solution) dosage chart IM

Age group (in years)	One inch needle gauge	Dosage (in mL) using 1 mL tuberculin syringe	Dosage (in units) using 40 units insulin syringe
0-1	24G/ 25G	0.05	2
1-6		0.1	4
6-12		0.2	8
12-18		0.3	12
Adults		0.5	20

Table 6.8. Injection hydrocortisone (IM or slow IV): dosage chart

Age	Dosage
Less than 6 months	25 mg
6 months to 6 years	50 mg
6–12 years	100 mg
>12 years	200 mg

AEFI management centres

Each health facility staffed with a MO in the government as well as the private sector should be designated as an AEFI management centre. Each block should prepare a list of such centres dispersed geographically so that in the event of an AEFI, the beneficiary can be quickly managed. The RI microplan of each HW should include the name, address and phone number of the MO of the AEFI management centre. All the MOs of the designated AEFI management centres should be trained in standard AEFI management and reporting procedures. All AEFI management centres should be provided with AEFI treatment kits (Fig.6.2, Table 6.9) and standard AEFI reporting forms. Treatment protocol for anaphylaxis is given in Fig 6.3.

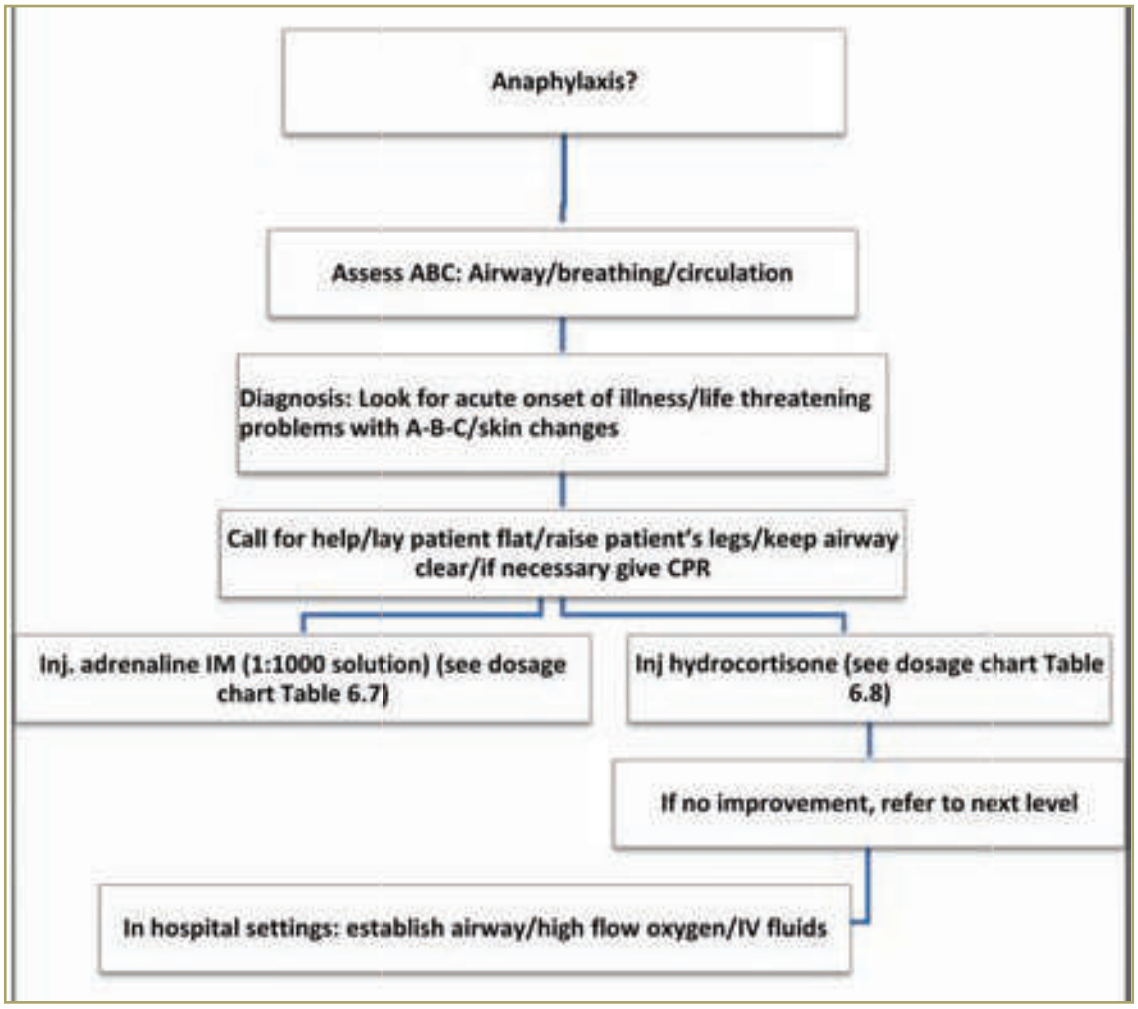
Fig. 6.2.Contents of AEFI kit

Table 6.9.Contents of an AEFI treatment kit

1. Injection adrenalin (1:1000) solution – 2 ampoules	8. IV fluids (5% dextrose): 1 unit in plastic bottle
2. Injection hydrocortisone (100 mg) – 1 vial	9. IV drip set: 1 set
3. Disposable syringe - Tuberculin syringes (1mL) OR insulin syringe (without fixed needle of 40 units) 3 Nos	10. Cotton wool, adhesive tape – 1 each
	11. AEFI Case Reporting Form (CRF)
	12. Label showing date of inspection, expiry date of Inj. adrenaline and shortest expiry date of any of the components
4. Disposable syringe (5 ml) and 24/25G IM needle – 2 sets	13. Drug dosage tables for Inj.adrenaline and hydrocortisone
5. Scalp vein set – 2 sets	14. In hospital settings, oxygen support and airway intubation facility should be available
6. Tab paracetamol (500 mg) – 10 tabs	
7. IV fluids (Ringer lactate/normal saline): 1 unit in plastic bottle	

IV – intravenous

Fig. 6.3. Treatment protocol for anaphylaxis



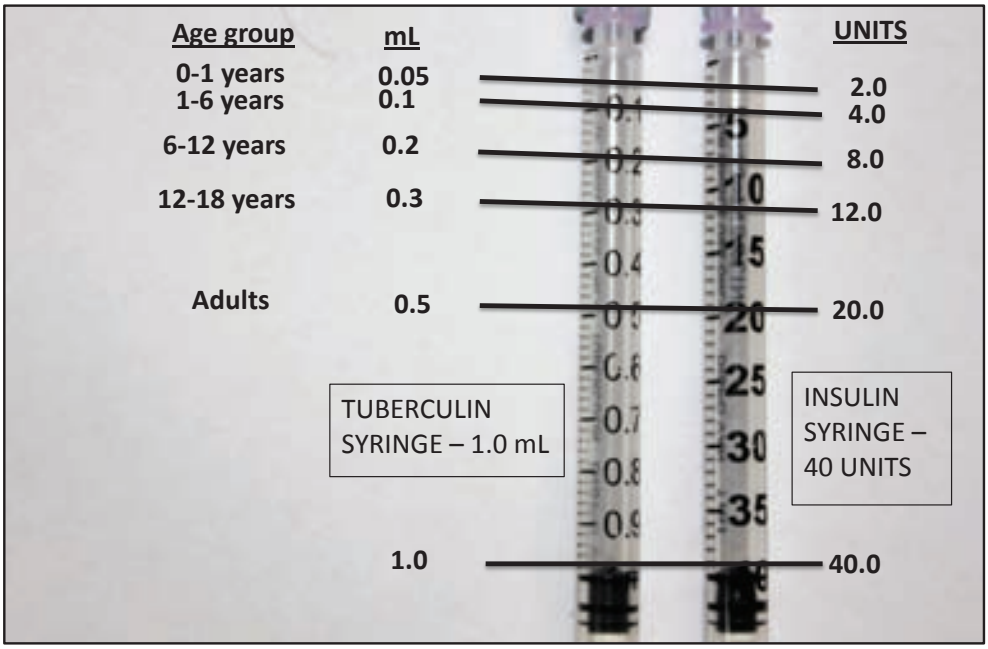
Anaphylaxis kit for ANM

1. Job aid for recognizing anaphylaxis; dose chart for adrenaline as per age
2. 1 ml ampoule of adrenaline (1:1000 aqueous solution) - 3 nos. (adrenaline ampoules may also labeled as epinephrine)
3. Tuberculin syringes (1ml) or insulin syringe (without fixed needle of 40 units)-3 nos.
4. 24G/25G needles (1 inch) - 3 Nos.
5. Swabs - 3 nos.
6. Updated contact information of DIO, Medical Officer(s) of PHC/CHC, referral centre and local ambulance services.
7. Adrenaline administration record slips.

Difference between AEFI kit and Anaphylaxis kit

	AEFI kit	Anaphylaxis kit
Location	**At health facilities with Medical Officer**	**Outreach session**
For use by	**Medical Officer**	**ANM**
Contents		
Equipment for intubation and resuscitation	Yes	No
Ringer lactate, normal saline, 5% dextrose, IV drip set, scalp vein sets(2)	Yes	No
Inj. Hydrocortisone and Tab. Hydrocortisone	Yes	No
Cotton wool	Yes	Yes
Inj. Adrenaline ampoules	Yes	Yes
24G/25G needles 1 inch length	Yes	Yes
Tuberculin syringes (1ml) or Insulin syringes (40 units, without fixed needles)	Yes	Yes

Fig. 6.4



Role of Medical Officer in Anaphylaxis management

Detection of AEFIs

- Encourage staff to insist on caregivers waiting for at least half hour following vaccination
- Train staff in suspecting, detecting and reporting of AEFIs
- Encourage staff to report AEFIs

Management of AEFI

- AEFI management centres in health facilities to be identified in microplans
- Ensure availability of emergency drugs and medical equipment to deal with an adverse event
- Regularly check to emergency tray (Functional status of equipment and expiry of drugs) and AEFI kits
- Provide apporpriate treatment to AEFI cases and refer if needed

Quarterly certification of ANM anaphylaxis kit by Medical Officer

- Medical officer will ensure availability of anaphylaxis kit with all ANMs at session sites/ sub centre during field visits.
- He will examine contents of the anaphylaxis kit at least once a quarter
- He will ensure injection adrenaline and other logistics do not have expiry dates within the next three months of the visit
- If the expiry date of any logistics is within three months of visit, this will be replaced during the next visit of the ANM to the PHC and signed by the Medical Officer in the following format which will be part of the kit

Name of subcenter:		**Name of ANM:**		**Name and contact number of MO**	
Date of Check-ing	**Contents**	**Expiry date of contents**	**Signature of MO**	**Action required (replace am-poule /syringe)**	**Action taken, signature of MO, date**
	1 ml ampoule of adrenaline (1:1000 aqueous solution)-3 Nos.				
	1 ml syringes-3 nos.				
	1 ml ampoule of adrenaline (1:1000 aqueous solution)-3 Nos.				
	1 ml syringes-3 nos.				
	1 ml ampoule of adrenaline (1:1000 aqueous solution)-3 Nos.				
	1 ml syringes-3 nos.				

Annexure 1 – Format for block AEFI register

Week No	Name of sub-centre	Name of vaccinee	Father's name	Age	Date of vaccination	Name of vaccines given	**Batch number of vaccines given**	AEFI noted (symptoms)	**Category (serious/ severe/ minor)**	Case seen by MOIC (Yes/ No)	Entered in case reporting form (Yes/No)

1. Kindly follow the AFP Surveillance Calendar to identify week no.
2. Information on serious and severe AEFI should be shared weekly with the district along with the H-002 form
3. The details of Minor AEFI are to be maintained at Block Level and monthly cumulative data to be entered in HMIS report

Annexure 2 – AEFI Case Reporting Form

AEFI CASE REPORTING FORM (CRF)

AEFI reporting ID: IND (AEFI) /__ST_/DIS_/_YR _/_NUM_ (to be allotted by DIO)

Section A (To be submitted by MO within 24 hours of case notification to DIO)

State	**District**
Block/ward	**Village/urban area**

Name of reporting MO (person filling this form):	Today's date:
Posted at: Designation:	Time of preparing this form: a.m./p.m.
Contact phone number: email:	Date case visited and examined/interviewed: __ __/__ __/__ __ __ __
Notified by (name): Date notified to MO: __ __/__ __/__ __ __ __	Designation (please circle): health worker/government doctor/private practitioner/community/media/others (specify) _____ _____

Patient's name																				

Date of birth DD/MM/YYYY	**Age** (in months): _____ months	**Sex**	Male / Female

Mother's name																				
Father's name																				

Complete address of the case with landmarks *(street name, house number, village, block, tehsil, pin no., telephone no.)*

P	**i**	**n**	-							**P**	**h**	**o**	**n**	**e**	-											

Date of vaccination: __ __/__ __/__ __ __ __ Time of vaccination: __ __: __ __a.m./p.m.	Address of session site:
Session: Routine (including SIW)* **Campaign** (SIA)-IPPI/MR/JE/others (specify):_____ Other _____	**Place of vaccination:** govt health facility/outreach/private health facility/others ____

Names of vaccines received (write vaccine & diluent details in separate rows)	Dose no. (zero/first/second/etc. as applicable)	Name of manufacturer	Batch/lot No.	Expiry date	Date of opening of vial	Time of opening the vial (for reconstituted vaccine)	No. of OTHER beneficiaries who received vaccine from the SAME vial in this session

Date of first symptom	D	D	M	M	Y	Y	Y	Y	Time of first symptom	H	H	M	M	a.m.	p.m.
Hospitalization: No/yes – (Date)	D	D	M	M	Y	Y	Y	Y	Time of hospitalization	H	H	M	M	a.m.	p.m.

Name and address of hospital (if hospitalized):

*Special immunization week

Current status (encircle)	Death/still hospitalized/recovered & discharged with sequelae/recovered completely and discharged/left against medical advice (LAMA)/not hospitalized																	
If died, date of death	D	D	M	M	Y	Y	Y	Y	Time of death	H	H	M	M	a.m.		p.m		
Post mortem done? Yes/no/unknown If yes, then write date post mortem done	D	D	M	M	Y	Y	Y	Y	If not done, but planned, write date planned	H	H	M	M	Y	Y	Y	Y	

Describe AEFI (signs and symptoms):

Suspected adverse event(s) (tick at least one):

☐ Severe local reaction ☐ Seizures
- ○ *>3 days*
- ○ *beyond nearest joint*
- ○ *febrile*
- ○ *afebrile*

☐ Abscess ☐ Sepsis ☐ Encephalopathy ☐ Toxic shock syndrome ☐ Thrombocytopenia ☐ Anaphylaxis ☐ Intussusception

☐ Fever≥39 °C (102 °F) ☐ Hypotonic hyporesponsive episode (HHE) ☐ Acute flaccid paralysis ☐ Sudden unexplained death syndrome

☐ Death due to any reason other than above – specify……

☐ Hospitalization due to any reason other than above – specify…… ☐ Disability

☐ Cluster – is this case part of a cluster? Yes/no/unknown

If Yes, no of other cases in the cluster _____ (use separate form for each case in a cluster)

Signature and name of reporting medical officer:

Section B: District immunization office to complete and forward to state and national level within 24 hours of receiving the above information

Date case reporting form received at the district: __ __/__ __/__ __ __ __

Proposed date of preliminary investigation: __ __/__ __/__ __ __ __

Remarks:

DIO/district nodal person *(officer forwarding this report)*

Name …… Date……Designation……Mobile No……

Landline (with STD code)…… Fax No. ……

email id…… Complete office address (with Pin code)……

……

……Signature/seal

To be sent to: State Immunization Officer & Deputy Commissioner (UIP),
Immunization Division of Govt of India, MoHFW,
Nirman Bhawan, New Delhi – 110108.
Fax: 011-23062728 **email**: aefiindia@gmail.com

Date report received at state level – __ __/__ __/__ __ __ __

Remarks:

Section C: National level to complete

Date report received at national level – __ __/__ __/__ __ __ __

Remarks:

Annexure 3 – AEFI case definitions and treatment

Adverse event	Case definition	Treatment	Vaccines
Acute flaccid paralysis (AFP)	• Acute onset of flaccid paralysis within 4 to 30 days of receipt of OPV, or within 4 to 75 days after contact with a vaccine recipient • Neurological deficits remaining 60 days after onset • Death	No specific treatment available; supportive care	Oral polio vaccine (OPV)
Anaphylactic reaction (acute hypersensitivity reaction)	• Exaggerated acute allergic reaction occurring within 2 hours after immunization, characterized by one or more the following: • wheezing and shortness of breath due to bronchospasm • one or more skin manifestations, e.g. hives, facial oedema, or generalized oedema. Less severe allergic reactions do not need to be reported • laryngospasm, laryngeal oedema	Self-limiting; anti-histamines may be helpful	All
Anaphylaxis	• Severe and immediate allergic reaction (within 1 hour) leading to circulatory failure with or without bronchospasm and/or laryngospasm/laryngeal oedema	Adrenaline injection	All
Arthralgia	• Joint pain, usually including the small peripheral joints. Persistent if lasting longer than 10 days; transient if lasting up to 10 days	Self-limiting; analgesics	Rubella; MMR
Brachial neuritis	• Dysfunction of nerves supplying the arm/shoulder without any other involvement of the nervous system • A deep, steady, often severe aching pain in the shoulder and upper arm, followed in days or weeks by weakness and wasting in arm/shoulder muscles • Sensory loss may be present, but is less prominent. May present on the same or the opposite side to the injections and sometimes affects both arms	Symptomatic only; analgesics	Tetanus
Disseminated BCG infections	• Widespread infections occurring within 1 to 12 months after BCG vaccination and confirmed by isolation of mycobacterium bovis BCG strain. Usually in immunocompromised individuals	Should be treated with anti-tuberculous regimens including isoniazid and rifampicin	BCG

Encephalopathy	• Acute onset of major illness characterized by any two of the following three conditions: • Seizures • Severe alteration in level of consciousness lasting for one day or more • Distinct change in behaviour lasting 1 day or more • Needs to occur within 48 hours of DTP vaccine or from 7 to 12 days after measles or MMR vaccine to be related to immunization	No specific treatment available; supportive care	Measles, pertussis
Fever	• The fever can be classified (based on rectal temperature) as: • Mild: 100.4°F to 102°F (38 to 38.9°C), • High: >102°F to 104.7°F (39 to 40.4°C) and • Extreme: 104.8°F or higher (40.5°C or higher). • High/extreme fever should be reported.	Symptomatic; paracetamol	All
Hypotonic hyporesponsive episode (HHE) or shock-collapse	• Event of sudden onset occurring within 48 (usually less than 12 hours) of vaccination and lasting from 1 min to several hours, in children younger than 10 years of age. All of the following must be present: • Limpness (hypotonic) • Reduced responsiveness (hyporesponsive) • Pallor or cyanosis, or failure to observe/ recall	The episode is transient and self-limiting, and does not require specific treatment. It is not a contraindication to further doses of the vaccine	Mainly DTP, rarely others
Injection site abscess	• Fluctuant or draining fluid-filled lesion at the site of injection • If evidence of infection (purulent, inflammatory signs, fever, culture) then consider as bacterial if not consider as sterile abscess	Incise and drain; antibiotics if bacterial	All
Lymphadenitis (includes suppurative lymphadenitis)	• At least one lymph node enlarged to >1.5 cm in size (one adult finger width), or a draining sinus over a lymph node • Almost exclusively caused by BCG and occurring within 2 to 6 months after receipt of BCG vaccine, on the same side as inoculation (mostly axillary)	Heals spontaneously (over months) and best not to treat unless lesion is sticking to the skin. If so, or if already draining, surgical drainage and local instillation of anti-tuberculosis drug. Systemic treatment with anti-tuberculosis drugs is ineffective	BCG

Osteitis/ osteomyelitis	• Inflammation of the bone with isolation of mycobacterium bovis, BCG strain	Should be treated with anti-tuberculosis regimens including isoniazid and rifampicin	BCG
Persistent inconsolable screaming	• Inconsolable continuous crying lasting 3 hours or longer accompanied by high-pitched screaming	Settles within a day or so; analgesics may help	DTP, pertussis
Seizures	• Occurrence of generalized convulsions that are n**ot accompanied by focal neurological signs or symptoms. Febrile seizures if temperature elevated >10**0.4°F (rectal); afebrile seizures if temperature normal	Self-limiting; supportive care; paracetamol and cooling if febrile; rarely anticonvulsants	All, especially pertussis, measles
Sepsis	• Acute onset of severe generalized illness due to bacterial infection and confirmed (if possible) by positive blood culture. Needs to be reported as possible indicator of immunization error	Critical to recognize and treat early. Urgent transfer to hospital for parenteral antibiotics and fluids	All
Severe local reaction	• Redness and/or swelling centered at the site of injection and one or more of the following: • Swelling beyond the nearest joint • Pain, redness, and swelling of more than 3 days duration • Requires hospitalization • Local reactions of lesser intensity occur commonly; these are trivial and do not need to be reported	Settles spontaneously within a few days to a week. Symptomatic treatment with analgesics. Antibiotics are inappropriate	All
Thrombocy-topaenia	• Serum platelet count of less than 50 000/ml leading to bruising and/or bleeding	Usually mild and self-limiting; occasionally, may need steroid or platelets	MMR
Toxic shock syndrome (TSS)	• Abrupt onset of fever, vomiting and watery diarrhoea within a few hours of immunization. Often leading to death within 24 to 48 hours. Needs to be reported as possible indicator of immunization error.	Critical to recognize and treat early. Urgent transfer to hospital for parenteral antibiotics and fluids	All

Note: Brighton Collaboration has developed case definitions for many vaccines reactions that are available at www.brightoncollaboration.org.

For further details refer to the AEFI Surveillance and Response Operational Guidelines 2015.

Assessment of Minor AEFI at the BLOCK PHC/PHC level

(Format to be shared in the first week of every month to DIO)

To be filled by inchrge Block Medical officer

Month **Year:**

Name of the BLOCK PHC/PHC in charge: Phone Number:	Block Name: District:	Date:
Following table need to be filled up after reviewing block AEFI register of respective month. Tabulate the data for minor AEFIs listed in respective month.		

Name of PHC /SubCenter	Distribution of Minor AEFIs line listed in block AEFI register as per their clinical presentation							
	Fever <39 degree	Local Swelling	Localised Pain	Localised Redness	Irritability	Malaise	Systemic symptoms (ex. Fatigue etc)	Any other unusual MINOR events
Total								

Any Aggregation or Clustering (Tick on appropriate)	Possible reason	Action proposed
A) Antigenwise and Batch wise If antigenwise , does it exceed expected reaction rate. Refer Table No. 1 (Yes /No)		
B) Subcenterwise/Vaccinator wise		
C) Dose wise (First, Second, Booster Etc.)		
D) Any other (ex. Unusual minor event)		

Name of Incharge Medical officer- **Signature-**

UNIT-7

Sources and use of data

Learning objectives

- *Enlist various sources of data available at block level*
- *Generate data outputs – coverage monitoring chart*
- *Identify gaps in RI using data*

Key Contents

Sources and use of data

7

In every situation and/or meeting, there is usually a direct or an indirect reference to "data". As MOs, you are constantly reminded to review your data, analyse your data and to decide your actions based on data. However, many times this is not as straight forward as it appears. Data has to be carefully utilized and interpreted; and when done, should enable you to make very appropriate and confident decisions. Data handling is not limited to the data manager, even the ANM in the field can use the data to better understand how her RI sessions are performing; an ANM in the PHC can look at the immunization records in the labour room and better understand how to ensure all newborns are vaccinated.

Data management process

A flowchart of the data management process is given in Fig 7.1.

Fig. 7.1. Data management process

Collect

This refers to the data collection instruments or sources of information in the raw form. This includes all registers such as OPD Register, Vaccine Stock Register and OT Register, tally sheets (e.g. Polio, RI session) and supervisory formats. All these contain information that can be made useful.

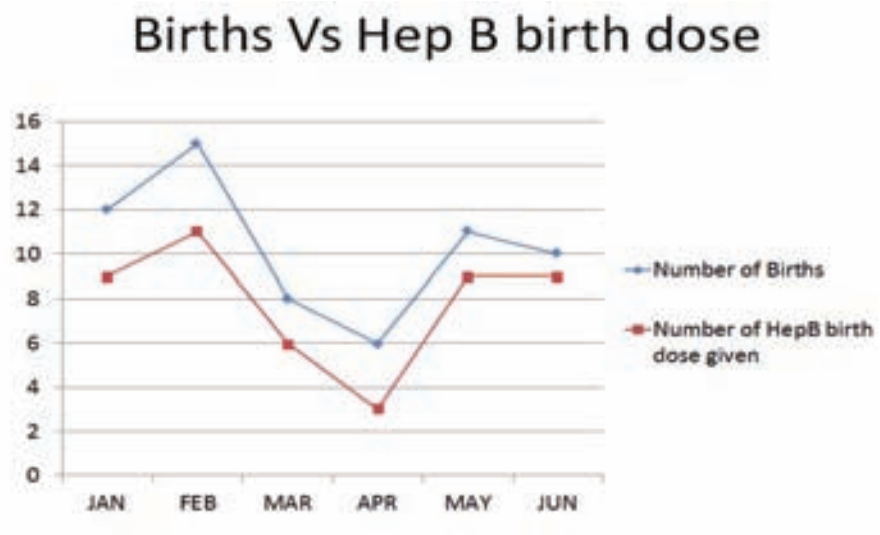
Collate

Collation means entering the data into the system or into a reporting format. Thus, data normally at a block level can be used in making reports when called for by the district or the state. Data can be collated to better understand how your block is functioning, e.g. extracting information on only number of Hep B birth doses administered at your PHC over the last 3 months.

Represent

Presenting data has been made very simple with easily accessible software such as PowerPoint and Excel. It is important to decide which data to present based on which forum it is required for. For example, showing the number of births versus the number of HepB birth doses given at your PHC (Fig 7.2) during a weekly meeting can help to drive home the point to ANMs and staff.

Fig. 7.2. Sample graph – births and Hep B vaccinations



Interpret

What does my data say? Continuing with the above example,the graph in Fig. 7.2 shows that there is a difference between the number of births and HepB birth doses given. The possible reasons are:

- children born on Sunday do not receive the dose
- children are vaccinated during the daytime only
- Some mothers refuse to be admitted for 2 days.

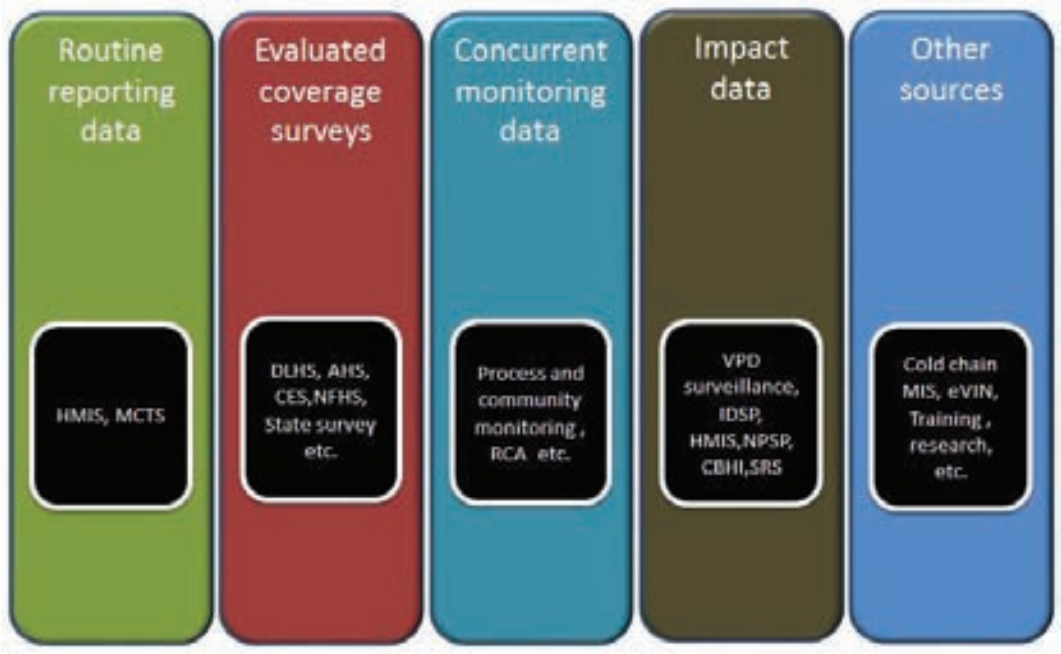
This example demonstrates that when data is presented,you can interpret to an extent; but if discussed with the staff, more reasons can be brought out and solutions identified.

Decide

Based on the above example, the MO can identify an issue, and following discussions with staff or during meetings, can then take decisions on correcting or restructuring systems in the PHC. For example, to increase the HepB birth dose, a decision could be – “one vaccine carrier with RI vaccines will be issued to the labour room to ensure administration of birth doses to all newborns at the PHC”.

Sources of immunization data

Fig. 7.3. Sources of immunization data



***HMIS** – Health Management Information System; **MCTS**- Mother and Child Tracking System; **DLHS** - District Level Health Survey; **AHS** – Annual Health Survey; **CES**- Coverage Evaluvation Survey; **NFHS** – National Family Health Survey; **IDSP** – Integrated Disease Surveillance Project; **NPSP** – National Polio Surveillance Project; **CBHI**– Central Bureau of Health Intelligence; **SRS**– Sample Registration System; **MIS** – Management Information System;*

Monthly Progress Report

The Monthly Progress Report is a report of the SC submitted by the ANM at the end of each month. This report is based on correctly filled tally sheets, Maternal and Child Health (MCH)/ Reproductive and Child Health (RCH) registers and other records. Data must be recorded completely and correctly as follows:

- Yearly target of infants must be based on actual head count.
- Immunization with each antigen dose needs to be filled in correctly.
- All VPDs and AEFIs should be reported to the PHC for followup.

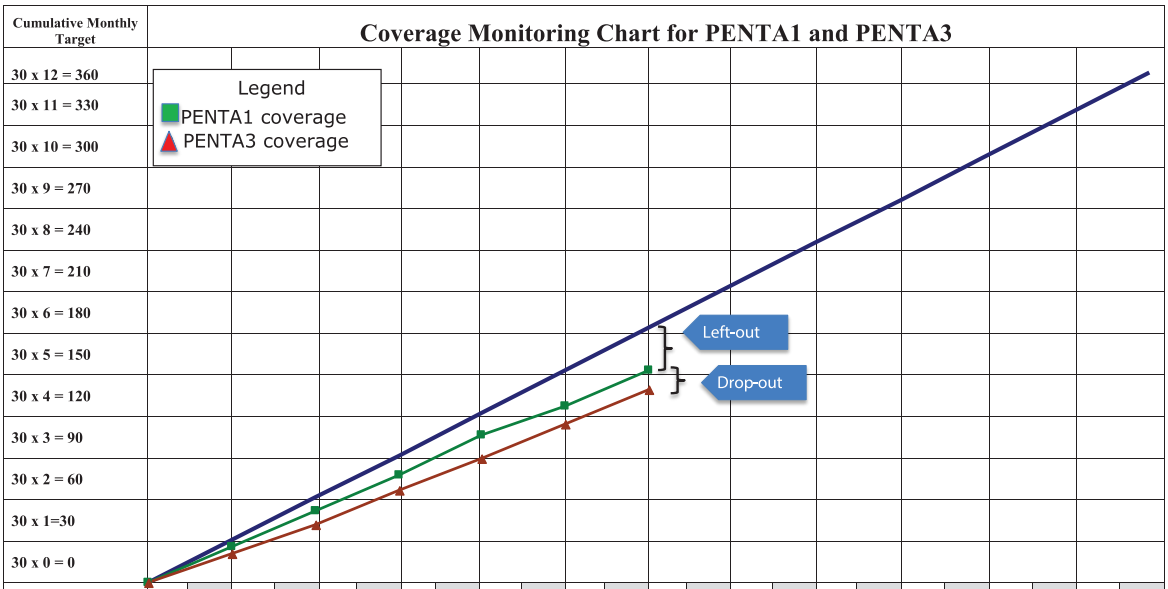
The cumulative coverage will enable you to calculate the coverage of each antigen and the dropout rates. Since this is the basis of obtaining all coverage and epidemiological data at state and national levels, the data must be recorded accurately.

Coverage Monitoring Chart

Coverage monitoring chart is a useful tool which provides information at a glance on target figures and the immunization coverage, particularly in terms of left-outs and dropouts. The supervisor should plot the immunization data on the chart during visits to the SC (as given in Fig.7.4). It should be updated every month.

Here is an example for calculating coverage, dropouts and left-outs for Penta1 and Penta3. A similar chart can be prepared for other vaccines.

Fig 7.4. Coverage Monitoring Chart



Fill in at the end of each month	Apr	Cum Tot.	May	Cum Tot.	Jun	Cum Tot.	Jul	Cum Tot.	Aug	Cum Tot.	Sep	Cum Tot.	Oct	Cum Tot.	Nov	Cum Tot.	Dec	Cum Tot.	Jan	Cum Tot.	Feb	Cum Tot.	Mar	Cum Tot.
Total immunized PENTA1	25	25	26	51	25	76	28	104	21	125	25	150												
Total immunized PENTA3	20	20	21	41	24	65	23	88	24	112	24	136												
Drop out number (DO) (PENTA1-PENTA3)		5		10		11		16		13		14												
Drop out % (DO/PENTA1)*100		20		20		14		15		10		9												

The coverage monitoring chart has a vertical and a horizontal axis. Vertical axis is divided into 12 equal parts, each representing the monthly target. Write cumulative target against each month. If the yearly target of infants in a Sub-centre is 360 children, then the monthly target is 360/12 = 30 children. Therefore, the cumulative target for April will be 30; for May it will be 60 (30 + 30); for June it will be 90 (30 + 30 + 30); for July it will be 120 (30 + 30 + 30 + 30), etc.

On the horizontal axis, the months of the year are given starting from April to March. In the rows below each month, write the total number of children immunized with Penta 1 and Penta 3 during that month and also cumulative till that month. On the graph, plot the cumulative total of Penta 1 for each month (on the right side of the column). Similarly, plot for Penta 3 in a different colour in the same column.

Calculating coverage for an antigen at any time

$$= \frac{\text{Total Antigen administered}}{\text{Yearly target}} \times 100$$

Eg- Coverage for Penta 1 from Apr till July is:

104 / 360 X 100 = 28.8% rounded off = 29%

Calculate the total number of dropouts and the Dropout Rate (%) as follows:

$$= \frac{\text{(Penta 1 cumulative total - Penta 3 cumulative total)}}{\text{Penta 1 Cumulative total}} \times 100$$

Using routine data for action

As a first step to data analysis, you should:

- Ensure that the vaccination coverage report is received from all ANMs through alternate vaccine delivery system after each session;
- Check the data from the monthly progress reports (HMIS/MCTS) for timeliness and completeness.

Steps in using routine data for action (refer data in table 7.1 on page 176)

There are three major steps in using routine data.

Step 1. Quantitative data analysis to identify priority health centres for improving coverage

- Compile the population and coverage data for last quarter / full financial year.
- Calculate the immunization coverage of BCG, Penta 1, Penta 3 and Measles/MR first dose.
- Calculate the number of unimmunized with Penta 3.
- Calculate drop-out rates (BCG- Penta 3, Penta 1- Penta 3 and BCG-MCV1).
- Identify problems of access and utilization as follows:
  - Access is good if Penta 1 coverage is >80% and poor if <80%.
  - Utilization is good if dropout rate is <10% and poor if >10%.
- Prioritize the centres based on number of unimmunized children e.g. UHC Dolatpara with highest number of immunized children is given priority 1 followed by UHC Ganeshnagar, Timbawadi etc.

Step 2. Qualitative data analysis to identify problems (based on local wisdom and observations from the RI monitoring/supervision)

This involves collection, compilation and analysis of data from monitoring checklists.

– **After the supervisory visits, collect the session and house-to-house monitoring checklists to compile the data on the following key indicators:**
  - Percentage of polio HRAs visited;
  - Percentage of sessions held;
  - Percentage of sessions where beneficiaries were found mobilized to session sites by ASHA/AWW;
  - Percentage of sessions where vaccines and logistics found brought to session site by AVD system;
  - Percentage of sessions with any reconstituted vial in use after the specified time has lapsed;
  - Percentage of sessions where due list of beneficiaries found available with ANM;
  - Percentage of sessions where due list of beneficiaries found available with ASHA/AWW;
  - Percentage of sessions where ANM found cutting each syringe with hubcutter immediately after use;
  - Percentage of sessions where session site waste is segregated in red and black bags;
  - Percentage of sessions where four key messages are found given to the parents;
  - Percentage of sessions where caregiver is advised to wait for 30 mins after vaccination.

– **Check for ANM area-wise indicators from the house-to-house monitoring checklists, such as:**
  - Percentage of households where RI/MCP card is available;
  - Percentage of fully immunized children;
  - Percentage of partially immunized children;
  - Percentage of unimmunized children;
  - Drop-out rates (BCG and measles/MR ,Penta1 and Penta3 , Penta3 and DPT booster, MCV1 and MCV2 etc.)

– **Identify areas with large number of left-outs and dropouts; conduct the reason analysis to identify issues.**

– **Correlate the house-to-house monitoring data with data from session site monitoring to identify the root causes of the problems. For example, if the problem is a high dropout rate, then the causes could be:**
  - poor social mobilization as due list not prepared, ASHA not working
  - key messages not given at the session site
  - session not held, etc.

– **Initiate actions. For example, plan to involve volunteers/link workers**

– **Identify root causes of the major problems such as:**
  - o vacant positions of HWs and social mobilizers
  - o cold chain capacity and stock availability
  - o sessions held versus planned
  - o hard-to-reach or HRAs
  - o training issues, behaviour of HWs and community
  - o IEC and IPC issues.

Step 3. Prepare action plan

- Identify interventions to improve coverage in terms of
  - o short-term and long-term activities;
  - o activities that can be done with limited resources (more supervisory visits, training, better use of data tools) and those that need extra resources (mobility support);
- Develop an action plan for implementing the activities with expected timeline, name of responsible person and funds required;
- Identify additional requirements and budget them in the next PIP with appropriate justification.

Table 7.1 gives the steps involved in identifying priority health centres for improving coverage while a sample action plan is given in Table 7.2.

Table 7.1.Data analysis to identify priority health centres for improving coverage (UHCs Of Junagadh)

Step1: Compile population and immunization coverage data of last financial year (Apr 14–Mar 15)						Step 2: Calculate coverage				Step 3: Analyse the problem				Step 4: Identify problem		Step 5: Prioritize area
a	b	c	d	e	f											
UHC Name	Infant population	BCG doses administered	Penta 1 Doses administered	Penta 3 Doses administered	MCV1	BCG coverage (%)	Penta 1 Coverage (%)	Penta 3 Coverage (%)	MCV1 Coverage (%)	Unimmunized with Penta 3 (No.)	BCG-Penta 3 Drop-out rate (%)	Penta 1 – Penta 3 Drop- out rates (%)	BCG-MCV1 Drop-out rate (%)	Access	Utilization	Priority (1,2,3.)
Ambedkar Nagar	354	273	211	102	29	77	60	29	8	252	63	52	89	Poor	Poor	4
Dolatpara	1076	614	511	342	389	57	47	32	36	734	44	33	37	Poor	Poor	1
Ganeshnagar	963	591	497	370	233	61	52	38	24	593	37	26	61	Poor	Poor	2
Shanteshwar	632	450	455	441	298	71	72	70	47	191	2	3	34	Poor	Good	5
Timbawadi	801	483	431	226	98	60	54	28	12	575	53	48	80	Poor	Poor	3
Total	**3826**	**2411**	**2105**	**1481**	**1047**	**63**	**55**	**39**	**27**	**2345**	**39**	**30**	**57**	Poor	Poor	

Table 7.2 – Action plan for improving RI coverage

Action plan to improve immunization coverage in High risk areas

Key Issues in the block with HRAs	Root causes	Solutions with existing resources	Solutions with extra resources	Person/s responsible	Time-line	Completed (Yes / No), if No, reason
Large numbers of missed children among migratory and HR population	Lack of awareness Fear of AEFI Fear of wage loss Due lists of beneficiaries not prepared Weak IEC and IPC	Orient community leaders and train HWs to inform and counsel the caregivers for immunization	Improve IEC by wall paintings, posters, local cable TV, announcements	MO I/C, BEE and Health supervisors	By the end of 3 months	
Poorly identified geographical boundaries in urban areas	Lack of mapping done	Identify and map the slums and low income neighborhoods called key focus areas	Hire ASHA/Mahila Arogya Samiti (MAS) member, one for every 200 – 500 households in focus areas			
	Lack of health infrastructure	Use available AWCs or any other place available	Establish UPHC for every 50 – 60 000 population			
	Acute shortage of human resources	Conduct RI sessions by deploying staff from rural areas or hiring contractual staff				
			Recruiting the regular ANMs, one for every 10 – 12 000 population			
RI sessions are not held as the HFAs are not included in the RI-microplans	RI microplans not prepared Lack of supervision	Listing and mapping of areas including HRAs and including them in RI microplans	Regular review of microplans to ensure that all HRAs receive the RI services			

Table 7.3. Role of MO in data management

Medical Officer's role	Activity	How
Understanding sources of data	• Explore the sources of data available at your centre • Understand the types of reports generated • Build capacity of data manager to generate data output	• Allocation of time with data handler/data operator/ personnel involved in reporting
Improving quality of data	• Cross check data randomly • Timeliness and completeness of reports • Quality of data capture	• While signing documents/ reports, cross check the data with original formats • During field visits, discuss the tally sheets being used with ANMs/personnel • Involvement of data manager in meetings to identify and solve data issues
Using data for action	• Produce graphs from data • Coverage monitoring charts at PHC/SC • Data interpretation	• Encourage the data manager to produce graphs and represent data • Insist on the use of the coverage monitoring chart both at your PHC and by ANMs at SC to track coverage of various antigens • Use these charts in meetings for tracking progress

UNIT-8

Supervision and monitoring

Learning objectives

- *To describe the importance of supervision and monitoring*
- *To list the steps for conducting supportive supervision*
- *To explain the steps for conducting effective review meetings*
- *To list common issues observed during monitoring and supervision of the immunization programme*
- *To analyse the data from routine and monitoring reports to develop an action plan for improving immunization coverage*
- *To describe various tracking tools available for tracking "missed children".*

Key Contents

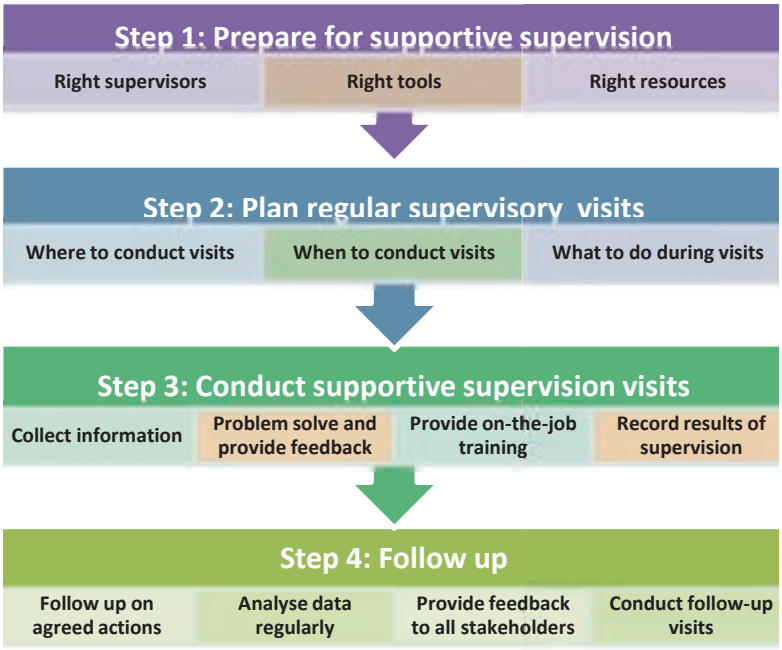
Supervision and monitoring

8

Supportive supervision is a process of guiding and assisting staff to continuously improve their own work performance. It is carried out in a respectful and non-authoritarian way with a focus on using supervisory visits as an opportunity to improve the knowledge and skills of health staff. Supervision encourages open, two-way communication and builds team approaches that facilitate problem solving.

Monitoring involves regular collection and analysis of data on various aspects of programme activities. Monitoring can be done through desk review of reports, providing feedback on phone or by e-mail/letter during the review meetings as well as during supervisory visits.

Fig. 8.1.Supervision matrix



Supervision must involve interaction with staff and usually also has an element of monitoring. During the supervisory visit, the supervisor can monitor the quality of service delivery, find out the reasons for unimmunized and under-immunized children and plan interventions to reach and sustain them. It can be done at session site and house-to-house (community) using the monitoring formats at the end of this Unit.

Steps for conducting supportive supervision

Step 1: Prepare for effective supportive supervision

Ensure the following three main "**Rights**" as follows:

- **Right supervisors**

Identify and prepare a pool from the available staff, i.e. MOs (including AYUSH), health supervisors, ICDS supervisors, block programme managers, immunization field volunteers, etc. Train them on the immunization schedule, the process and the information to be collected.

- **Right tools**

Use monitoring formats and SOPs for session, house-to-house and block (for recording observations) , also use training materials and job aids (to update skills of HWs during the visits).

- **Right resources**

Ensure that sufficient mobility and time is allocated for the visits and followup.

Step 2: Plan regular supervisory visits

Plan regular supervisory visits as per the microplan, considering three "**W**s":

- **Where** to conduct visits (priority areas)
- **When** to conduct visits (on immunization session days after informing the HWs)
- **What** to do during visits (review data and previous supervision and monitoring reports)

Prioritization of areas

An updated RI microplan is a prerequisite for monitoring, as it helps to prioritize the areas for monitoring visits. The priority should be to visit:

- listed HRAs in the microplan
- areas missed in the microplans
- villages with vacant SCs
- peri-urban underserved areas
- ANM with large catchment population
- area with reported measles outbreak, wild polio virus (WPV) or vaccine derived polio virus (VDPV)
- migrant and mobile populations
- areas with low RI coverage/resistance.

Step 3: Conduct supportive supervision visits

Session site visit

After deciding the area to be visited, plan to visit the nearest session site catering to that area. Visit the session site on the scheduled day and time and collect information using the session monitoring format. If the session is held, do the following:

- observe the ongoing session, e.g. who is mobilizing the children, how the HW is vaccinating each child, messages provided by HWs, etc.
- interview the HWs for additional information, e.g. supervisor visits made, Measles/ MR2 dose, RCH register, ASHA incentives, etc.
- interview any three caregivers to know who has mobilized them.

House-to-house visit

- If the session is not being held, (find out the reason for the same) proceed for house-to-house monitoring. House-to-house monitoring helps in rapid assessment of RI coverage in the community. Visit 10 households with children aged 0–35 months (<3 years) and collect data on the house-to-house monitoring format through RI/MCP card and interviews of caregivers.

Before leaving the field

- Provide feedback to the health staff concerned. Start with positive feedback followed by the specific weaknesses
- Identify problems, discuss the causes of the problem with health staff and plan the solutions
- When required, provide on the job training as an immediate solution. First explain and demonstrate the skill, then allow the HWs to practice the skill, providing feedback till they learn.

Step 4: Followup

After the supervisory visit, you should:

- followup on the agreed actions in the implementation plan;
- discuss with other block officials (MOIC, etc.) the issues of RI implementation in the block , if related to their department – e.g. departments of education, women and child development (ICDS), power supply , etc.
- provide a feedback to higher levels for support in problem solving;
- conduct follow-up visits to see if the recommendations are being implemented and if there is improvement in the performance of the HWs.
- Record results of supervision and prepare the report.

Common issues observed during monitoring and supervision of the immunization programme

The following issues have been identified during regular monitoring in the field. This is not an all inclusive list but helps to categorize issues to enable corrective actions.

Human resource issues

- Vacant SCs
- Inadequate hiring of alternate vaccinators for vacant urban and rural areas
- Irrational distribution of the workload/areas among the HWs within a block
- Absenteeism of HWs
- Lack of designated cold chain handlers at cold chain points
- Lack of regular capacity building of knowledge and skills of health staff.

Microplanning issues

- Microplan not prepared or incomplete with only roster of the HW
- Missed areas and population groups, e.g. migratory and mobile population, urban slums, hamlets and geographically distant population not included
- Microplans not based on head count survey
- Map of the SC and PHC not prepared/displayed
- Area demarcation of SC with two ANMs is not done to clarify their individual roles
- Microplans are not reviewed at regular intervals.

Operational issues

- List of due beneficiaries for the sessions is not prepared
- All the planned sessions are not held by ANM due to leave, post being vacant, ANM not going to the site
- Poor attendance at outreach sessions due to poor mobilization by ASHA and AWW
- Late start of session and early closing of session site
- Non-availability of all vaccines and logistics at the session site
- Incorrect route/site/technique used for vaccine administration
- Date and time not recorded on reconstituted vaccine vials
- 4 key messages not conveyed to the beneficiary/caregiver
- Coverage monitoring chart and tracking bags not available at PHC or SC

Cold chain and logistics management issues

- No dedicated trained person in charge of cold chain at PHC level
- Job aids for cold chain maintenance not displayed at cold chain point
- Guidelines for correct storage of vaccines and diluents in ILR not followed
- Temperature not recorded twice a day; recording by cold chain handler not monitored
- Contingency plan for emergencies not prepared/followed
- Preventive maintenance of cold chain equipment not in place
- Presence of snake anti venom/other drugs/eatables in ILR along with vaccines
- Stock registers not updated and supervised for record of issue and balance of vaccines and other logistics
- Timely indenting of vaccines and logistics not done resulting in stock-outs being reported.

Recording and reporting system issues

- RCH/MCTS register not updated regularly and not used in preparation of beneficiary due list.
- Careless recording in immunization/MCP card; counterfoils not maintained
- Due list-cum-tally sheets not used for session-wise recording
- No system for identification and tracking of dropouts and left outs
- Monthly reports – incomplete and not analyzed for feedback and action
- AEFI and VPD cases not being reported or being underreported
- Block AEFI registers not being used.

Injection safety and waste disposal issues

- Hub cutter not available/not being used immediately after vaccination/ reconstitution
- Red and black bags not available/not being used
- Disinfection of immunization waste not practiced before disposal
- Sharps pits for needles not constructed/functional at PHCs.

Monitoring and supervision issues

- Supervisory visits not planned/conducted by health and ICDS supervisors in priority areas
- Review meetings not used for providing feedback of monitoring and use of data for action.

Issues in community involvement and communication

- Weak coordination with other related agencies and sectors such as private and NGO sectors
- Lack of information, education and communication (IEC) and social mobilization activities contributing to poor utilization of services
- Four key messages not being given to beneficiaries at sessions.

Steps for conducting effective RI review meetings

Meetings are regular event at a PHC, use each meeting as an opportunity to identify, solve issues with service delivery.

Prepare for the meeting

- Determine the objectives of the meeting based on review of the minutes of previous meetings, monitoring reports and any new guidelines/topics to be discussed
- Prepare the agenda including objectives, list of topics to be covered, name of the facilitator for each topic and the time duration
- Assign logistic arrangements to the members of the team
- Assign talks on specific technical topics to concerned supervisors and colleagues
- Inform the date, time and place of the meeting to all participants.

Conduct the meeting

- Start the meeting on time
- Enquire if participants are comfortable. Make changes if needed.
- Follow the agenda closely during the meeting to ensure that set objectives are met
- Ensure that the meeting is focused and participatory
- Keep listening and summarizing the key points raised at regular intervals
- Ensure that minutes are taken with actionable points and timelines
- Summarize the action points, including persons responsible and deadlines
- Agree upon date of next meeting
- Thank participants.

Followup

- Forward unresolved issues to the district level for necessary action
- Examine the meeting process. Assess and make a plan to improve the next meeting
- Followup in writing to document key action points.

A sample agenda for a PHC review meeting of ANMs is given in Table 8.1.

Table 8.1: Sample agenda for PHC review meeting of ANMs

Time	Activities	Facilitators
10:00–10:15	Welcome & objectives of the meeting	MOIC
10:15–11:15	Feedback on supervisory visits and monitoring data	MO/health supervisor/ partner
11:15–11:45	Feedback on data analysis from the monthly reports for left-outs and dropouts	health supervisor
11:45–12:30	Review of microplans, immunization records/ reports, any other issues such as ASHA/AWWs involvement in mobilization of beneficiaries	MOIC
12:30 –13:00	Action plan to improve coverage and track missed children	MOIC/health supervisor
13:00–13:15	Summary and conclusion	MOIC

Quarterly review meetings

Under National Health Mission, there is a provision to conducting quarterly review meetings for RI at block level under part C, FMR code c.1.f (refer Unit 13) for ASHAs. As per norms, Rs. 50/ per person as honorarium for ASHA (Travel) and Rs. 25/person at the disposal of MO-IC for meeting expenses (refreshment, stationary and misc. expenses) is available for conducting review meeting four times in a year.

These funds should be utilized for improved planning and supervision of front line health workers for Routine Immunization activities.

Tracking tools to track 'dropouts'

Various tracking tools are as follows:

- MCP Card with counterfoil
- Tracking bag
- Immunization/RCH/MCTS Registers
- Name-based list of due beneficiaries (refer SOP RI form 6 - Unit 3)

Mother and Child Protection (MCP) card with counterfoil

The MCP Card is a tool for families to learn, understand and follow positive practices for achieving good health of pregnant women, young mothers and children.

The card gives information on the immunization schedule and the doses of Vitamin A to be given to the child during the first five years. Boxes in the chart indicate each type of vaccine, date to be given, date when it was given and age.

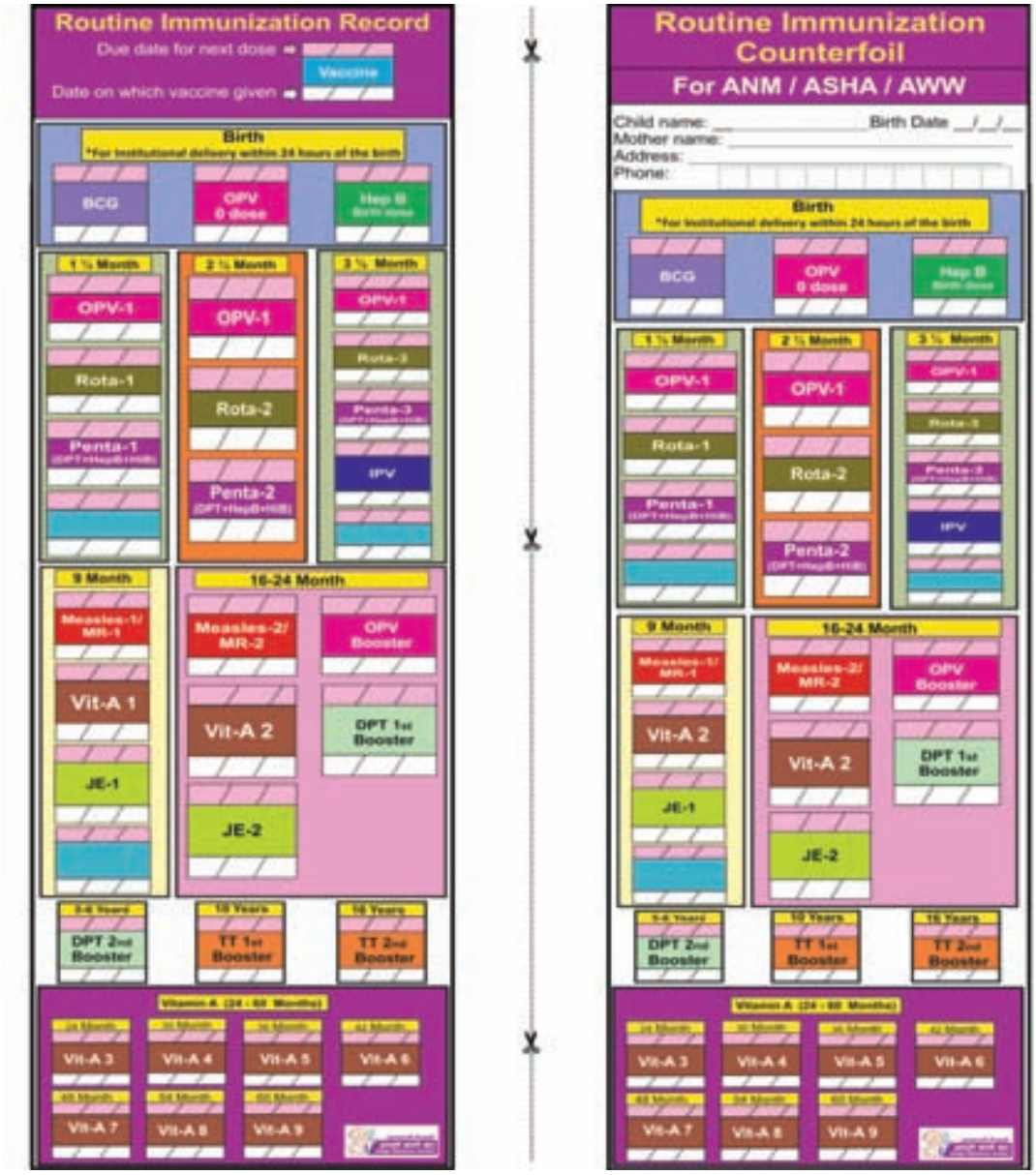
Details that would be available from MCP Card are:

- the date in the pink box when the child is expected to come for next immunization
- the date in the white box when the child came for immunization.

How to use the card

- During the first visit, fill the information on the cover page on "Family Identification and Birth Record".
- Record the date, month and year of all entries clearly.
- Explain the section on immunization by explaining which vaccines have been given and which vaccines are due, with dates.
- Do not leave any cells or columns blank.
- After filling up all the columns, retain the smaller portion of the card (counterfoil).
- Give the rest of the filled-in card to the parent of the child after immunization and ask her to bring the same card during her subsequent visits to the health centre.
- Advise families to keep the card in a safe place to prevent it from damage.
- Advise families to bring the card along when they visit the Anganwadi Centre (AWC), SC, health centre, private doctor or a hospital.
- At the end of each session, the counterfoils should be placed in the appropriate pocket of the tracking bag.
- Each month, look at the counterfoils in the tracking bag and make sure those children come for immunization. If they miss the session, ask the ASHA/AWW to follow up with those families and ensure that they attend the next session.

Fig 8.2 – Infant RI card and counterfoil



Tracking bag

Keeping counterfoils in tracking bag helps in:

- preparing a session-wise name-based list of due beneficiaries for sharing with the ASHA/AWW/mobilizer
- estimating the vaccine requirement for the next session
- tracking the dropouts
- providing information, if the beneficiary/parent has lost the immunization card.

The counterfoils need to be filed separately for each session site. A cloth tracking bag with 15 pockets is a simple, easy to use tool for filing the counterfoils (Fig. 8.3 and 8.4). The first 12 pockets indicate each of the 12 months of the year. The thirteenth pocket is for those who left/died during the period, the fourteenth pocket is for fully immunized children and the fifteenth pocket is to store blank MCP cards.

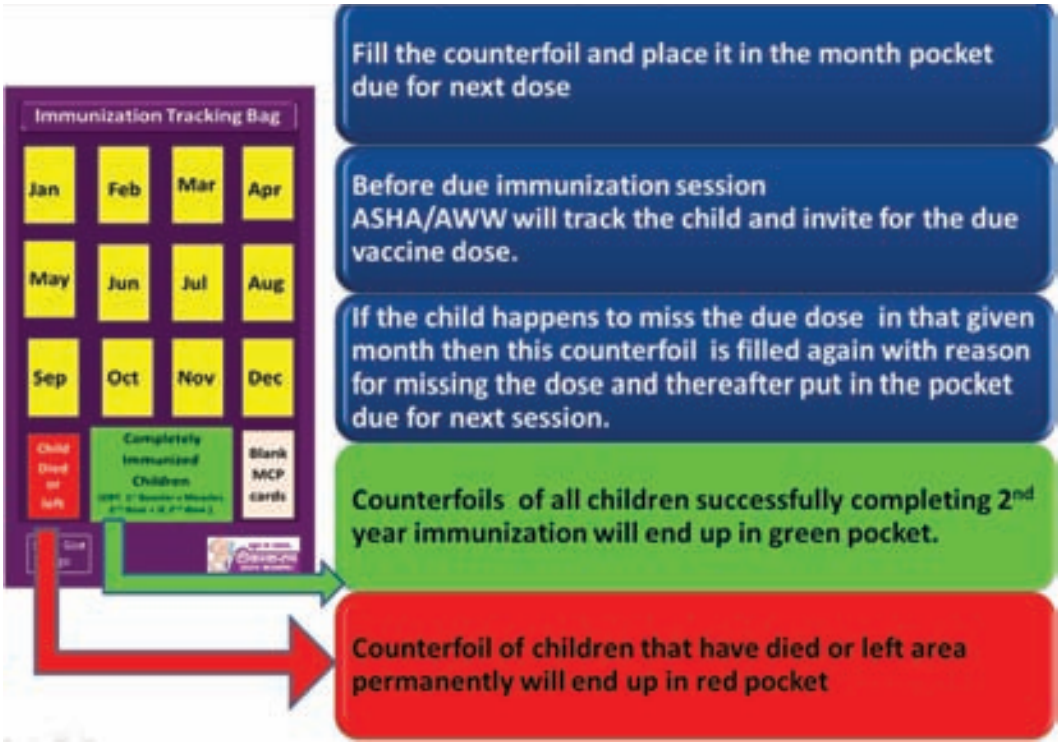
Figure 8.3: Immunization tracking

Once a beneficiary is immunized, the counterfoil would be placed in the month (pocket) due for the next dose (see Fig 8.4). For example, if a child comes for Penta 1 in January, Penta 2 is due in February. Update and place the counterfoil in the February pocket.

When the Penta 2 dose is given in February, update the counterfoil and move to the pocket for March. When the Penta 3 dose is given in March, then update and place the counterfoil in the September/October pocket since the child has to return for measles/MR vaccine.

- If some cards are left in the pocket at the end of the month, it indicates that the beneficiaries are the dropouts.
- Move these cards to the next month's pocket and track them.

Fig 8.4 How to use tracking bag



In case no tracking bag is available, counterfoils for each month can be separately tied with different rubber bands and labelled. File counterfoils for each session site separately and do not forget to carry them to the session.

Immunization/RCH/MCTS Registers

Immunization / RCH / MCTS registers help to record and track each pregnancy and immunization. It should be:

- updated to include new pregnancies and births from the records of AWWs and ASHAs before each immunization session;
- updated after each session on the basis of counterfoils filled during the session;
- if the beneficiary is from outside the catchment area, the HW should issue a new card and give appropriate vaccination. Record should be entered in the non-resident column of the register;
- if the beneficiary receives vaccination from a private practitioner, the HW should record the same in the MCH register and the immunization card and write "P" after the date.

Conducting an effective RI session

For an RI session to be effective, there are some points that need to be addressed. These are enlisted below:

- Appropriateness of location
- Setting up the site for safe injections:
  - Basic furnishings and spacing
  - IEC display
- Advance information to community
- Information on arrival.

Field Tip: "SAME DAY, SAME SITE, SAME TIME"

Ensuring the RI session is conducted on the same day, at the same site and at the same time builds community confidence and faith in the system and health worker.

Appropriateness of location

The RI session site should be:

- easily accessible and identifiable – using the IEC posters/banners at a visible point;
- located in the same place each and every time;
- in a clean area, out of the sun and rain – avoid open-air sites;
- having space either within the premises or near a sheltered/shaded area where those needing vaccination can wait;
- large enough to provide space to have separate stations for—registration and assessment; immunization and record keeping; and screening/education on other health issues;
- quiet enough for HWs to be able to explain what they are doing and to give advice.

All these parameters may not be possible at all places. However, in many instances it is possible with community support to ensure the best resources in the available circumstances. The MOs must visit all the RI session sites over the course of a few months and ascertain their appropriateness.

All communities are very proactive and supportive towards immunization services if they are involved in the planning process. It is necessary at times to reach out to the community through key influencers and local leaders in areas where ground realities make it difficult to identify or locate the site.

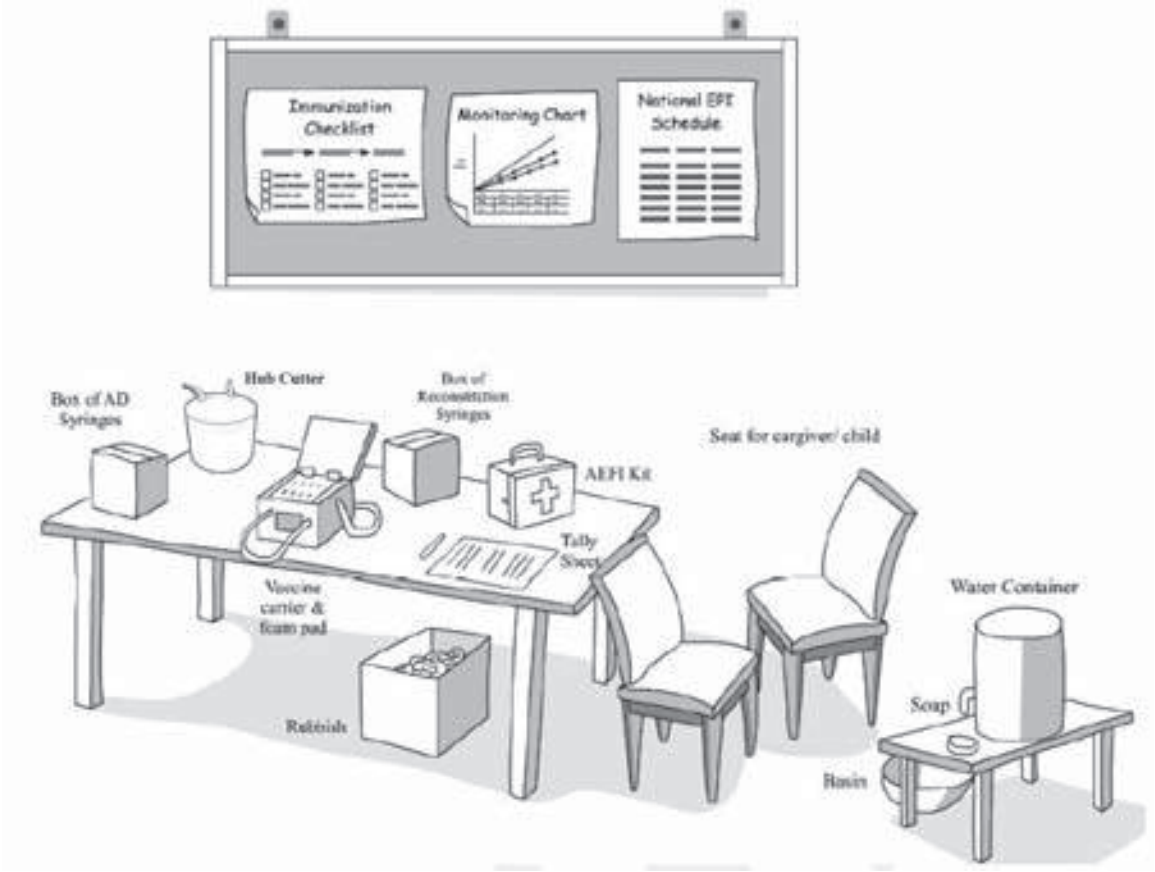
An ideal set-up for an RI session is shown in Fig. 8.5.

Setting up the site

Displaying IEC material, i.e. either the poster or banner or even both outside the session site informs the community of the arrival of the ANM and that the RI session site is now functional. The IEC display should be visible from the approach road and clearly identify the session site. The ANM should spend time after arriving at the session site to arrange the site to make it as convenient as possible for her and her supporting ASHA/AWW and also for the community that comes for services.

Sourcing furniture or requesting support from the community reflects the rapport of HWs and community involvement. In places where there is less support, it is necessary to address the issue with the community leaders at the earliest. Though this may seem an unimportant or minor issue, lack of community involvement is a factor that has a negative impact on RI coverage and mobilization of beneficiaries. A well setup RI session helps to build community confidence and also contributes to providing a quality experience for the HWs and beneficiaries.

Fig. 8.5. Ideal.Set-up for an RI session



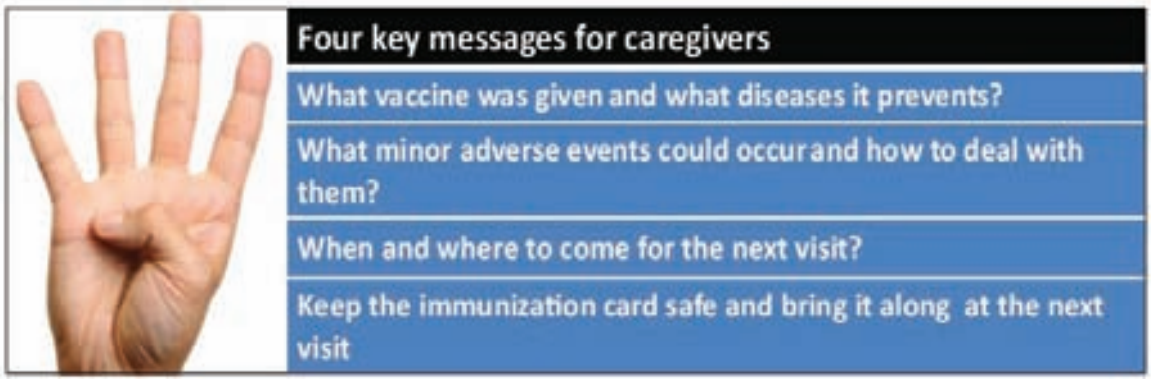
Advance information to the community

Providing advance information of the upcoming RI session in an area has many advantages. Various examples exist across the country, e.g. issuing invitation cards to beneficiaries, house-to-house visits by ASHA/AWW workers 2 days before the session, using mothers' meetings to announce the upcoming date and the beneficiaries. These are some of the innovative ways of informing beneficiaries. Explore what could work in your area.

Information on arrival of ANM

While the ASHA/AWW/mobilizer will visit the beneficiaries to come for immunization, word of the arrival of the ANM can also be spread through using any public address system at a religious or community centre. With support from local leaders, information can also be passed through students or local shopkeepers. The intention is to announce the starting of the session and any other local methodologies should be explored and encouraged.

The four key messages the HW should give to the caregiver are:



Using RI monitoring formats

Monitoring in routine immunization is an essential tool for a medical officer. It provides an opportunity to:

- observe service delivery and practices
- identify issues and provide solutions at field level
- identify training needs of staff
- interact directly with the community
- interact and motivate frontline health care workers at field level
- build confidence in health workers and community
- increase understanding of the RI delivery mechanism

Two types of formats are in use – RI session site and House to house monitoring formats.

1. The RI session format focuses on the following: Microplanning, session due list & its quality, safe injection practices, vaccine availability at session site, implementation of open vial policy, logistics, IEC and ASHA incentives.
2. The house to house format focuses on collecting information from at least 10 children below the age of 35 months in an area. Information on the child's vaccination status including the dates of administration is to be collected, the source of information being the MCP card. However in the absence of the card, parent recall by identifying the sites of injection may be utilized. The rear of the format has a ready reckoner to easily identify if a child has received due vaccine as per age. When a child is found unimmunized or partially immunized information on the reason should also be collected.

Session Site Monitoring Format for Routine Immunization

Encircle appropriate options. For (*) marked questions, multiple responses may be applicable.

_)_ _ / _ _ _ / _ _ _ _ / _ /_ _ _ _
(Not to be filled by monitor)

State/UT: _____ District: _____ Name of Block / Urban: _____ Setting: Rural / Urban Date: _ _ / _ _ / _ _
Planning Unit: _____ Village/Mohalla/Ward: _____ At least 1 session was held in last 3 months: Y / N / Unknown
Sub center/Urban Health Post: _____ Name of session site: _____ CMC area: Yes / No / Not applicable
Name of ANM: _____ Monitoring time: _ _ : _ _ to _ _ : _ _
Name of Monitor: _____ Organization: WHO /Govt/UNICEF /IPE-FM / IPE-SMNet / IFV / UNDP / Others: _____ Designation: _____

Session details	1*	Reason for monitoring	a)Polio High Risk Area/Group- (HRA/HRG) b)Measles outbreak in last 1 yearc) Other VPD outbreak in last 1 year d) Session planned in a vacant sub centre (alternate arrangement)e)Others: ..... (Skip Q-2 if session is not in "Polio HRA/HRG")	
	2*	If polio HRA, type of HRA/HRG:	a)Slum with migration b) Nomads c) Brick kilns d) Construction site e) Other migratory high risk area f) Non migratory (settled high risk area)	
	3	Location of the session as per micropian	a) District Hospital b) CHC c) PHC d) UPHC e) Sub Centre f) Urban Health Post g) ICDS Centre h) HRG site (fixed) i) HRG site (by mobile team) j) Others	
	4	Is the session being held? Yes / No*	If "Yes" Is the session being held at same location as per micro plan?	Yes / No
			* If "No" select reason(s)	a) Early closure b) ANM absent c) Vaccine / logistics not available d) Others:
	If session is not held, skip Q5 to Q34, do house-to-house monitoring in the catchment area & answer Q35-36as applicable at the end of monitoring as per plan for the day in evening. Visit health facility / vaccine storage point and answer Q37 to Q39 in ONLY one of the session monitoring formats under the same vaccine storage point.			
	5	Vaccines / logistics delivered by?	a) Alternate Vaccine Delivery b)ANM c)Others :_____	
	6*	Mobilizers as per micro plan	a) ASHA b) AWW c) Link workers d) CMC e) Others :	f) none
	7*	Mobilizers working today:	a) ASHA b) AWW c) Link workers d) CMC e) Others :	f) none
Headcount Survey / Duelist	8	Headcount survey conducted for children under 2 years and pregnant women for session catchment area within last six months?	If conducted, is the list of beneficiaries available?	Yes / No / In process / NA-(not conducted)
			If not conducted*	a) Not planned b) Planned but not yet conducted c)ASHA/mobilizernot available d)Not aware e)Others
	9*	Due list of beneficiaries for this session is available with	a) ANM b) ASHA c) AWW d) Other mobilizer e) Not available with anyone of them	
	10*	Beneficiaries included in due list? (quality & updation)	a) New born for this session b) beneficiaries missed in last session c) beneficiaries due for next dose d) recent pregnant women	

Vaccine / Diluents	BCG	Yes / No	IPV	Yes / No / Not applicable	TT	Yes / No
	BCG Diluent	Yes / No	Pentavalent	Yes / No	JE*	Yes / No / Not applicable
	tOPV	Yes / No	DPT	Yes / No	JE Diluent	Yes / No / Not applicable
	bOPV	Yes / No	Measles/MR	Yes / No	Pneumococcal (PCV)	Yes / No / Not applicable
	Rotavirus (RVV)	Yes / No / Not applicable	Diluent-Measles/MR	Yes / No		

Open vial policy	12*	Partially used vaccine vials which were issued to this session?	a) OPV b) Pentavalent c) DPT d) IPV e) TT f) None	
	13*	Reconstituted vial of BCG, Measles, JE & partially used RVV supplied to the session site? *Yes / No	if "Yes" encircle : a) BCG b) Measles c) JE d) Rotavirus e) None	

Logistics other than Vaccine & diluents	14	AD (0.1 ml) Syringes	Adequate / Inadequate / Not available	Vitamin A Solution	Available / Not available	Amoxycillin Tab / Syrup	Available / Not available
		AD (0.5 ml) Syringes	Adequate / Inadequate / Not available	Spoon for Vitamin A	Available / Not available	Zinc Tablet / Syrup	Available / Not available
		5ml Reconstitution Syringe	Adequate / Inadequate / Not available	ORS Packet	Available / Not available	Red and Black Bags	Available / Not available
		Paracetamol Tab / Syrup	Available / Not available	IFA Tablet/ syrup	Available / Not available	Tracking Bag	Available / Not available

	15	*Any leakage/locking issues in syringes reported by ANM at session?	Yes / No If Yes, encircle : a) AD (0.1 ml) Syringes b) AD (0.5 ml) Syringes c) 5ml Reconstitution Syringe
	16	Blank RI / MCP card available to provide to caregiver / beneficiaries?	Yes / No (If "No" encircle "not applicable" in Q-16).
	17	Does the MCP/ RI card have counterfoil for ANM for tracking missed doses?	Yes / No / Not applicable
	18*	Encircle "New vaccines" included in blank RI/MCP card	a) Pentavalent b) IPV c) Rotavirus d) MR e) PCV f) Not applicable
	19	Status of hub cutter availability	a)Functional b) Non – functional c) Hub cutter not available

ANMs knowledge and injection practices	20*	Has ANM marked date & time on all opened vaccine vials and Vitamin A?	Yes / No*	If No, encircle unmarked: BCG / OPV / RVV / IPV / Penta / DPT / Hepatitis-B / Measles / MR / JE / TT / PCV / Vitamin A		
	21	Is ANM administering rotavirus vaccine with OPV to eligible children as per guidelines?				Yes / No / Not observed / Not applicable
	22	Is ANM administering 5 drops of Rotavirus vaccine to eligible child?				Yes / No / Not observed / Not applicable
	23*	Encircle ANMs awareness on IPV administration as applicable in the state?	a) age of eligible child b)schedule for IPV c)dose of vaccine d) site of vaccine e) route			
	24	Is ANM administering IPV injection as per guideline for state/UT in National Immunization schedule			Yes / No / Not observed	
	25	Is ANM aware of vaccine administration sequence to a child under one year of age?(OPV →RVV → IPV → Penta)			Yes / No	
	26*	Any vial of BCG, Measles, JE (after reconstitution) and Rotavirus vaccine (after opening) in use beyond 4 hours			a) BCG b) Measles c) JEd) Rotavirus vaccinee) None	
	27*	Observe ANMs injection practices and encircle the responses	a).not cutting syringe immediately after use b).touching needle before administration c) putting thumb/finger post injection at the site d).applying cotton at the injection site following vaccinatione).not observed			
	28	Is ANM asking caregivers to wait for 30 minutes following vaccination?			Yes / No / Not observed	
	29	*Is ANM aware of any serious AEFI within the last three months?*	Yes / No	Whether notified to MOIC? Yes / No / NA	Give details:	

Four key messages	30*	ANM delivering four key messages to all caregivers? (If observed – encircle Yes or No, else select "not observed and skip response on Yes / No)	Message 1. What vaccine was given and what disease it prevents?	Observed / Not observed	Yes / No
			Message 2. What are the minor side effects and how to deal with them?		Yes / No
			Message 3. When to come for the next visit?		Yes / No
			Message 4. Keep immunization card safe and bring it along in the next visit		Yes / No

IEC and mobilization	31	Interview three caregivers separately to assess who mobilized them to the session site (Select "NA" if monitor could not interview).		
		Caregiver – 1	Caregiver – 2	Caregiver –3
		ASHA / AWW / ANM / CMC / link worker / Others / None / NA	ASHA / AWW / ANM / CMC / link worker / Others / None / NA	ASHA / AWW / ANM / CMC / link worker / Others / None / NA
	32	Any display of RI specific IEC material at session site?	a) No display b) Displayed with RI logo (Be Wise, Get your child Fully Immunized) c)S*ome other logo/tagline on immunization*	

Supervision & ASHA Incentive	33*	Has any supervisor visited the session today	a) Health Supervisor b) Medical Officer c) Others (specify):	d) None
	34	Is ASHA aware of her incentives in immunization?	a) Line listing of households (headcount survey) at the beginning of the year and updated after six months@ Rs 100 (maximum)	Yes / No / Not applicable
			b) Preparation of due list of children for immunization to be updated on monthly basis @ Rs 100 every month	Yes / No / Not applicable
			c) Mobilization of children @ Rs 150 / session	Yes / No / Not applicable
			d) Full Immunization @ Rs 100/= per child that has received all due doses up to first year.	Yes / No / Not applicable
			e) For Complete Immunization (CI) @ Rs 50/= per child that has received all doses due up to the second year.	Yes / No / Not applicable
	35	When did ASHA last receive any incentive?	a) Within three months b) Three to six months back c) Six to twelve months back d) Not received for more than a year e) not aware	

Any other important observations :

At Block/Urban Planning unit / Vaccine storage point	Meet MO in charge to ascertain reasons for monitored session not held. Skip Q-36 and/or 37 as applicable.			
	36	Why ANM was not available at session site?	a) On leave b) Vacant post c) Assigned other work e) Started late f) Others (specify) :	
	37	Reason for non-availability of vaccines / logistics?	a) Not issued b) Not picked up c) Picked up but not delivered d) Others (specify) :	
	Visit vaccine storage point to assess the following. Encircle "already answered" if Q-38-39 answered in another session format under the same vaccine storage point today.			
	38	Vaccine distribution register available at the PHC / Urban planning unit / vaccine storage point	Yes / No / already answered	
	39	a) No. of sessions planned as per micro plan today: _____ b) No. of sessions for which vaccines issued today: _____ c) already answered		
	40	Is there a mechanism for segregating partially used returned vials in ILR as per revised open vial policy (OVP) guidelines	Vaccine vials on which OVP is applicable	Yes / No
			Vaccine vials on which OVP is not applicable	Yes / No

House to House Monitoring Format for Routine Immunization

( ) __ / __ / __ / __ / __

Encircle appropriate options. For (*) marked questions multiple responses are allowed; *(not to be filled by monitor)*

Name of Monitor: _____ Organization: WHO/ Govt/ UNICEF/ IPE-FM/ IPE-SMNet/ IFV/ UNDP/ Others. Designation: _____ Date: __ / __ / __ Time: ___ : __ to __ : __

State: _____ District: _____ Name of Block / Urban area: _____ Planning Unit: _____ Setting: Rural / Urban

Village/Mohalla/Ward: _____ Sub center/Urban Health Post: _____ At least 1 session was held in last 3 months: Y / N / Unknown

*Reason for monitoring: 1: Polio HRA 2: Measles Outbreak in last 1 year. 3: Other VPD outbreak in last 1 year. 4: Area under vacant sub-centre 5: Other: (Low coverage area / non HRA not monitored for >=3 months / Follow up) monitoring) *If Polio HRA, type: 1: Slum with migration 2: Nomadic site 3: Brick kiln 4: Construction site 5: Other migratory high risk area 6: non migratory (settled population) high risk area. CMC area: Yes / No / Not applicable

Particulars of the Child including age specific vaccination status		House-1	House-2	House-3	House-4	House-5	House-6	House-7	House-8	House-9	House-10
1	Name of the youngest child (0-35 months) in this household										
2	Name of the mother / father of the selected child										
3	Religion (H=Hindu / M=Muslim / O=Others)	H / M / O	H / M / O	H / M / O	H / M / O	H / M / O	H / M / O	H / M / O	H / M / O	H / M / O	H / M / O
4	Is RI/Mother & Child Protection (MCP) card available with family?	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
5	Sex of the selected child: M=Male / F=Female	M / F	M / F	M / F	M / F	M / F	M / F	M / F	M / F	M / F	M / F
6	Place of delivery: G) Govt - Hospital P) Private Hospital H) Home	G / P / H	G / P / H	G / P / H	G / P / H	G / P / H	G / P / H	G / P / H	G / P / H	G / P / H	G / P / H
7	Date of Birth (In dd/mm/yy format. if not known, write NA)										
8	Age in completed months (Even if Date of Birth is known)										
Use ready-reckoner to ascertain age appropriate vaccination status. If RI/MCP card is available, monitor must write date (dd/mm/yy) for vaccines received and "No" for missed vaccines. If card/date not available, monitor must write "Yes" for received & "No" for missed vaccines. Monitor MUST mention either "date (dd/mm/yy) / Yes / No" against each age appropriate vaccine. Monitor must write "NA" against vaccine not due for age or not introduced in UIP.											
9	Hep B Birth dose										
	OPV-0 dose										
10	BCG										
	OPV-1										
	Rotavirus-1										
	IPV (intradermal wherever applicable)										
	Pentavalent-1										
	Hepatitis B-1										
	DPT-1										
	OPV-2										
	Rotavirus- 2										
	Pentavalent-2										
	Hepatitis B-2										
	DPT-2										
	OPV-3										
	Rotavirus-3										
	IPV (IM / intradermal - as applicable)										
	Pentavalent-3										
	Hepatitis B-3										
	DPT-3										
	Measles / MR-1										
	JE-1 (where applicable)										
	OPV Booster										
	DPT Booster-1										
	Measles / MR 2nd dose										
	JE-2 (where applicable)										
11	Monitors assessment of status of age specific vaccinations received without considering Hepatitis-B birth dose & OPV-0 (Only from Q-10)	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None	All / Partial / None
12*	Ascertain reason(s) why the child missed one/all age specific vaccine(s) as per caregiver and mention codes in boxes (max of 4):										

12* 1) Not aware of need for immunization; 2) Did not know where / when to go for immunization 3) Has no time / no one to take child 4) Concern for loss of work or wages 5) Session inconvenient for time / location / long waiting time; 6) unaware of missed dose 7) Unfriendly vaccinator 8) Session not held 9) Vaccine was not available 10) Child was away from home 11) Sick child - care-giver did not opt vaccination 12) Sick child – HW did not vaccinate; 13) Caregiver did not opt for multiple injections 14) HW did not give multiple injections 15) Experienced minor illness: fever, pain, swelling 16) Experienced severe illness: hospitalization, death, disability 17) Fear of AEFI on hearsay; 18) Adverse media reports, 19) Family is resistant 20) Family has no definite reason 99) Others

Ready reckoner to ascertain age specific due vaccines of a child

(Monitor to assess vaccination status of the child without considering reasons for no or delayed vaccination)

Age (Completed months)	Ideally a child should have received age specific vaccines as per National Immunization Schedule									
	BCG	OPV	Hep-B	*Rotavirus (RVV)	**IPV	DPT + Hepatitis-B / ***Pentavalent	Measles / MR	****JE	DPT Booster-1	OPV Booster
0	BCG	OPV-0 (up to 15 days)	Birth dose (Within 24 hours)	NA	NA	NA	NA	NA	NA	NA
1	BCG	OPV-0 (up to 15 days)	Birth dose (Within 24 hours)	NA	NA	NA	NA	NA	NA	NA
2	BCG	OPV-0,1	Birth dose (Within 24 hours)	RVV-1	NA- IM in 28 States/UT IPV-1 Intradermal dose in select states	(DPT-1+Hepatitis-B-1) / Pentavalent-1	NA	NA	NA	NA
3	BCG	OPV-0,1,2	Birth dose (Within 24 hours)	RVV -1,2	NA- IM in 28 States/UT IPV-1 Intradermal dose in select states	(DPT-1,2 + Hepatitis-B-1,2) / Pentavalent-1,2	NA	NA	NA	NA
4 to 8	BCG	OPV-0,1,2,3	Birth dose (Within 24 hours)	RVV -1,2,3	IM dose in 28 States/UT IPV-1 Intradermal dose in select states	(DPT-1,2,3 + Hepatitis-B-1,2,3) / Pentavalent-1,2,3	NA	NA	NA	NA
9 to 15	BCG	OPV-0,1,2,3	Birth dose (Within 24 hours)	RVV -1,2,3	IM dose in 28 States/UT IPV-1 Intradermal dose in select states	(DPT-1,2,3 + Hepatitis-B-1,2,3) / Pentavalent-1,2,3	Measles -1	JE - 1	NA	NA
16 to 35	BCG	OPV-0,1,2,3	Birth dose (Within 24 hours)	RVV -1,2,3	IM dose in 28 States/UT IPV-1 Intradermal dose in select states	(DPT-1,2,3 + Hepatitis-B-1,2,3) / Pentavalent-1,2,3	Measles - 1,2	JE - 1,2	DPT Booster -1	OPV Booster

- *If the child received the due vaccine(s), write date (dd/mm/yy) as per immunization card. If date is not known (card not available/date not mentioned in card) but the child has received due vaccine as revealed from the parents-caregiver, write **"Yes"** and if the child did not receive due vaccine (missed dose), write **"No"** in the format. If the child is not due for vaccine or vaccine not yet introduced in the district or vaccine phased out, write **"NA".***

If immunization card is not available, interact with parents-caregiver with the simple questionnaires to ascertain vaccines the child has received for his/her age.

- ***BCG:** Enquire whether any vaccination was given into the skin on the left upper arm, which may have formed a pustule after vaccination. BCG is given only up to one year of age and not beyond.*
- ***Hepatitis B birth dose:** Enquire for intramuscular (IM) injection of any vaccine in the thigh at birth/within 24 hours. (Parents may say/direct towards buttock occasionally).*
- ***OPV-0:** Enquire whether polio drops were given at birth or within 15 days from birth.*
- ***OPV:** Enquire if 2 drops of polio vaccine were given orally at 1.5 / 2.5 / 3.5 months of age along with injections in the thigh.*
- ***Rotavirus vaccine:** Enquire if 5 drops of vaccine were administered after giving 2 drops of polio vaccine.*
- ***IPV:** Enquire if an injection is given in the right thigh along with 3rd dose of OPV when the child aged within 3.5 months to one year of age **OR** given in right arm at 1.5 and 3.5 months similar to BCG vaccine.*
- ***Pentavalent vaccine:** Enquire if the child received only one injection in the thigh (left), any time at/after 1.5 months repeated at monthly interval two times (total of 3). The child might have developed fever. Pentavalent vaccine is never started after one year of age.*
- ***Hepatitis B:** 3 doses of Hepatitis B along with DPT is given in left thigh. DPT + Hepatitis is given in a child who has started with DPT series when Pentavalent vaccine was introduced. Hepatitis B is never initiated after one year of age.*
- ***DPT:** Similar with Hepatitis B. However DPT is a painful injection causing fever, induration similar to DPT containing pentavalent vaccine.*
- ***Measles/MR** vaccine: Enquire if any injection was given on the right upper arm after 9 months of age (1st dose) and after 16-24 months of age (2nd dose).*
- ***JE vaccine:** This vaccine wherever introduced (in select endemic districts) is given in two doses in left upper arm at the same time as measles/MR vaccine.*
- ***OPV booster:** Enquire whether 2 polio drops given between after 16 months of age to a child who has already received three doses of OPV.*
- ***DPT booster-1:** Enquire if IM injection was given in left thigh after 16 months of age. This indicates DPT first booster if the child has already received three doses of DPT or pentavalent vaccine.*

****Rotavirus** vaccine will be given along with OPV at 6, 10 &14 weeks and will not be given if child has already started with OPV before or is older than 1 year of age.*
*** **IPV** is never started after 1 year. IPV is given IM at 14 weeks along with OPV3; however given in fractional dose (intradermal) in right arm at 6 and 14 weeks along with OPV1 and 3.*
******Pentavalent** vaccine will be administered to birth cohort (within 1 year of age) who has not started with DPT & Hepatitis-B and will replace primary series of DPT & Hepatitis-B.*
*******JE** vaccine is given at 9 -12 months (1st dose) and at 16-24 months of age (2nd dose) in selected endemic districts (list is updated every year).*

UNIT-9

Communication for behaviour change

Learning objectives

- *Recognize the importance of integrating social and behaviour change communication (BCC) in immunization services to reduce vaccine hesitancy*
- *Identify the reasons for children missing vaccinations (dropouts or left outs) and possible interventions*
- *Learn about different communication tools, channels and opportunities to reduce vaccine hesitancy.*
- *Learn to develop a simple communication plan for the PHC/CHC using communication planning tools*

Key Contents

9 Communication for reducing vaccine hesitancy and increasing demand for immunization

Role of MOs in reducing vaccine hesitancy

MOs at the block and PHCs have a critical role to play in ensuring that all children in the population under their PHCs are fully vaccinated. MOs are already working very hard to ensure that the quality of health services for mothers and children in their PHCs and SCs and are well recognized by the communities living in their areas. This also means that their first responsibility will be to ensure that RI services are not only available but that these services are also of the best quality.

Vaccine hesitancy is the behaviour of parents, caregivers, or the community in hesitating to get their children vaccinated in spite of immunization services being available and accessible to them. Inadequate immunization services due to non-availability of vaccines, absenteeism of vaccinators and long distances to vaccination centres contribute to this hesitancy. Hesitation also comes from a number of other reasons (let's call them barriers), such as low perception of the benefits of vaccines, loss of wages, social beliefs, fear of AEFIs, demotivation owing to inadequate IPC skills of HW, to sometimes geographical barriers such as inaccessible terrain.

This section looks at **low immunization coverage from the behavioural perspective,** i.e. the reasons behind vaccine hesitancy and the interventions that can be initiated by MOs to achieve the communication objectives of increasing demand for vaccination services.

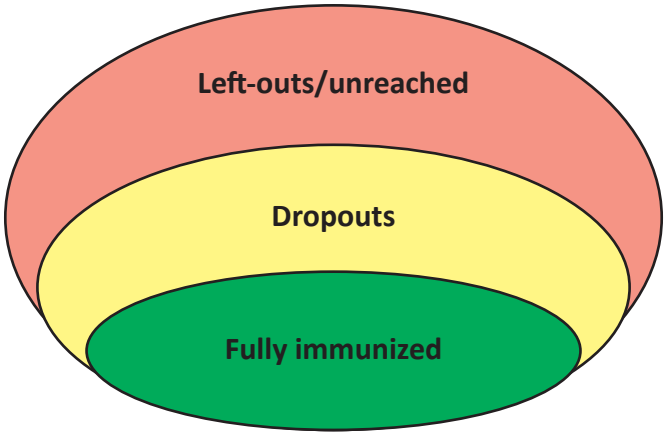
On the other hand, **vaccine confidence** is when parents, caregivers or the community understand the value of vaccination and voluntarily demand vaccination services as a right, whether these vaccinations are part of the RI schedule for their children or part of adult vaccinations such as TT for pregnant women. Vaccine confidence comes from adequate awareness about the benefits of vaccines, both to the individual and the community, and the trust in the immunization service delivery system to be able to provide quality vaccination.

Left-outs and dropouts

From a service delivery perspective:

- ***left-outs*** are those children who have never been vaccinated or reached (thus remaining unimmunized);
- ***dropouts*** are those children who started vaccination but did not complete the schedule (thus remaining partially immunized).

Fig. 9.1. Three types of behaviour groups

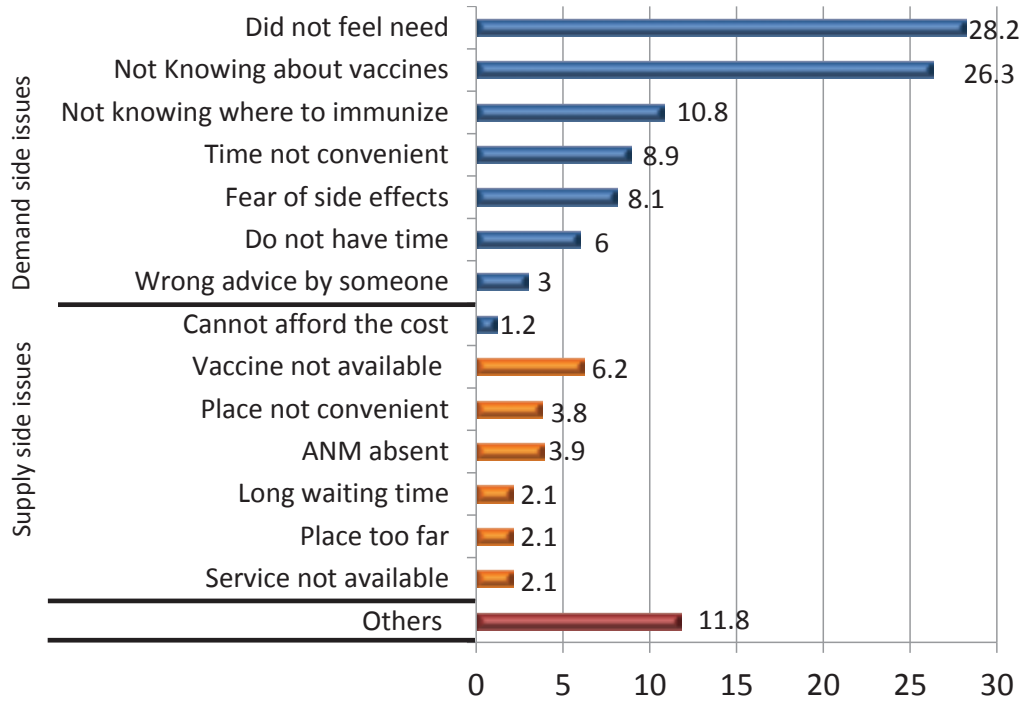


The immunization-targeted community can be divided into three groups as shown in Fig. 9.1. The aim of the health system (including MOs, HWs and mobilizers) should be to expand the inner circle to cover the entire universe of eligible children in its catchment area.

From a behavioural perspective, a large percentage of dropouts is a serious problem because it reflects the poor perception of parents/caregivers' about the benefits of vaccination or of the immunization service delivery system, or both, combined with other barriers that forces them to place immunization on a low priority.

People who "drop out" of the immunization system are the easiest to reach and be convinced to return for full immunization.

Fig. 9.2. Reasons for partial or no immunization (multiple responses) (n=10 542)

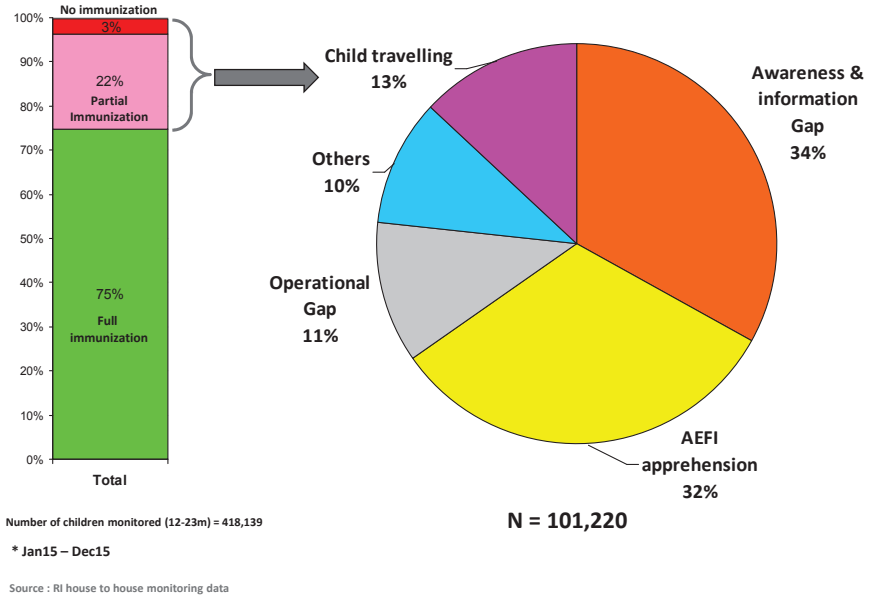


Why children do not get vaccinated: behavioural barriers

The Coverage Evaluation Survey (2009) identified the reasons for not accessing immunization services as cited by the community. A majority had demand-side issues, e.g. did not feel the need for vaccination; did not know about vaccines or where to go for vaccination; time not convenient; fear of side-effects; or did not have time.

Recent data from house-to-house RI monitoring in UP also highlighted lack of awareness and fear of AEFIs as major reasons for missed children as shown in Fig.9.3.

Fig.9.3. Reasons for missed children



The table below enlists reasons and possible interventions for tackling vaccine hesitancy. Medical officers are encouraged to review/discuss this table with staff during meetings.

Table 9.1: Reasons for missed children and possible interventions

Possible reasons	Possible interventions
Demand-side issues	
Parents not motivated to immunize children because of their poor understanding of its purpose and importance	• Engage with community leaders, school teachers, faith/religious leaders, youth networks, women's self-help groups (SHGs) and encourage them to talk to parents about the benefits of immunization. • Build capacities of HWs to counsel and effectively communicate with parents and the community on the importance of immunization. • Disseminate information on the benefits of immunization at health fairs and other events and make people aware of immunization services. • Use other communication channels such as local cable television, wall paintings and posters, mosque and temple announcements, traditional and folk media.
Cultural or religious reasons for refusal of vaccination (myths, rumours and misconceptions)	• Find out the reasons for reluctance by talking directly to communities/leaders. Try to address their misconceptions, doubts and fears by listening to them and offering support. • Involve community leaders (particularly the ones favourable to immunization) and other staff working within that particular community in order to encourage their fellow members to have their children immunized. • Arrange for an interaction between resistant groups and satisfied beneficiaries in the area to promote immunization.

Fear of side-effects or AEFI in the community discourages parents to immunize their children	• Involve religious leaders, village elders, school teachers and panchayati raj institution (PRI) members to accompany the field level workers (FLWs) during their house-to-house mobilization visits, organize folk shows to educate parents and communities on the importance of RI for children and dispel myths and misconceptions. • Remind HWs to always tell parents/caregivers about common side-effects that may occur and what to do should they occur. • Investigate any AEFI and apprise the community of the details of the case, possible causes and actions taken.
Financial or gender barriers to immunization, e.g. husbands disallowing wives to attend sessions because of time/lost labour, expense and/or fear of side-effects	• Counsel opinion leaders and influential persons about the dangers of VPDs and the benefits of immunization. • Encourage peer counselling by fathers of children who accept immunization. • Publicize that immunization services are entirely free.
Refugees/families that fear contact with government, e.g. those who lack documents/ scheduled castes or tribes/ nomadic groups/homeless families/urban slums/street children	• Determine where these populations reside. • Visit the communities and work with local mobilizers/educators/community groups/leaders to discuss reasons why they are not accessing immunization services. • Provide information on the importance of vaccination and date, time and place of the next nearest session. • Develop a list of children who have never accessed immunization services in the area and share it with HWs of the area for immunization and ensure follow-up.

Supply-side issues	
All newborns and infants not identified and listed	• Involve AWWs/ASHAs to identify and share lists of newborns and children with the HWs.
Sessions too infrequent or timings and days not convenient/not understood	• Plan sessions after consulting the community, e.g. early in the morning/late evening.
Session site too far away, e.g. border populations	• Include all the areas in the microplan. • Reorganize the catchment area so that remote sites are visited at least once every 2 or 3 months (plan at least 4 immunization sessions a year). • Work with neighbouring health facilities to coordinate services for border areas. • Improve outreach to communities through appropriate transport, additional staff and publicize outreach services.
Parents do not return because sessions are not held as planned or vaccines are unavailable	• In case of HW being on leave, deploy alternate vaccinators. • Ensure alternate delivery of vaccines to session sites. • Encourage community groups to report problems regarding HWs' attendance on session days to the PHC. • Conduct session monitoring and make real improvements; then publicize the improvements to communities. • Ensure adequate supplies of vaccines and logistics.
HWs do not clearly explain to parents what vaccines are due, when they are due and why they are needed	• Remind HWs/AWWs/ASHAs to always convey the 4 key messages to parents in a simple and understandable language. • Train HWs to provide filled-in MCP cards to all beneficiaries and to write the next due date on the card. • Ask caregivers to repeat the information given to them in order to increase the chances that they will remember when to return. Praise correct answers. • Thank the parents for bringing the child. • Publicize the immunization schedule.

HWs do not show respect towards parents or interest in the child's health, e.g. long waits, HWs shouting at mothers for forgetting the card or bringing the baby in late	• Sensitize and train HWs, ASHAs and AWWs to communicate with and treat parents with respect, warmth, friendliness and should empathize with the parents' situation. Encourage and praise the parents for bringing their children for immunization. Encourage parents to ask questions. • Guide HWs to visit dropouts before the next session to find out the reasons why they missed the session.
HWs do not know which children are due and what vaccines are due	• Organize tracking of children using RI Cards, immunization registers, counterfoils and tracking bags. • HWs can involve community teams (NGOs, community based organizations (CBOs), youth clubs, school teachers, volunteers, etc.) to identify children who are left-outs and dropouts • remind parents about the importance of full immunization; inform them about the date and time of the next session and mobilize parents for immunization sessions.
HWs do not understand/ explain to caregivers that immunization may be given to mildly ill children (false contraindication)	• Orient HWs that immunization can be safely provided to mildly ill children and that they should convince parents about this fact.
Children and mothers are not immunized when coming to the HWs for curative care (missed opportunities)	• When providing other services, always keep an eye on eligible children visiting the session with a parent or sibling. Enquire about their immunization status or refer to the list of due beneficiaries and provide services, as appropriate. • Put a reminder about immunization in the facility's waiting area.

MO as facilitator and enabler: 10 key roles

All medical officers must take a few simple steps for improving vaccine demand. The primary role of MO is to act as a facilitator and enabler for demand generation activities in order to be effective within their respective PHCs. Given below are some of the initiatives MOs must take:

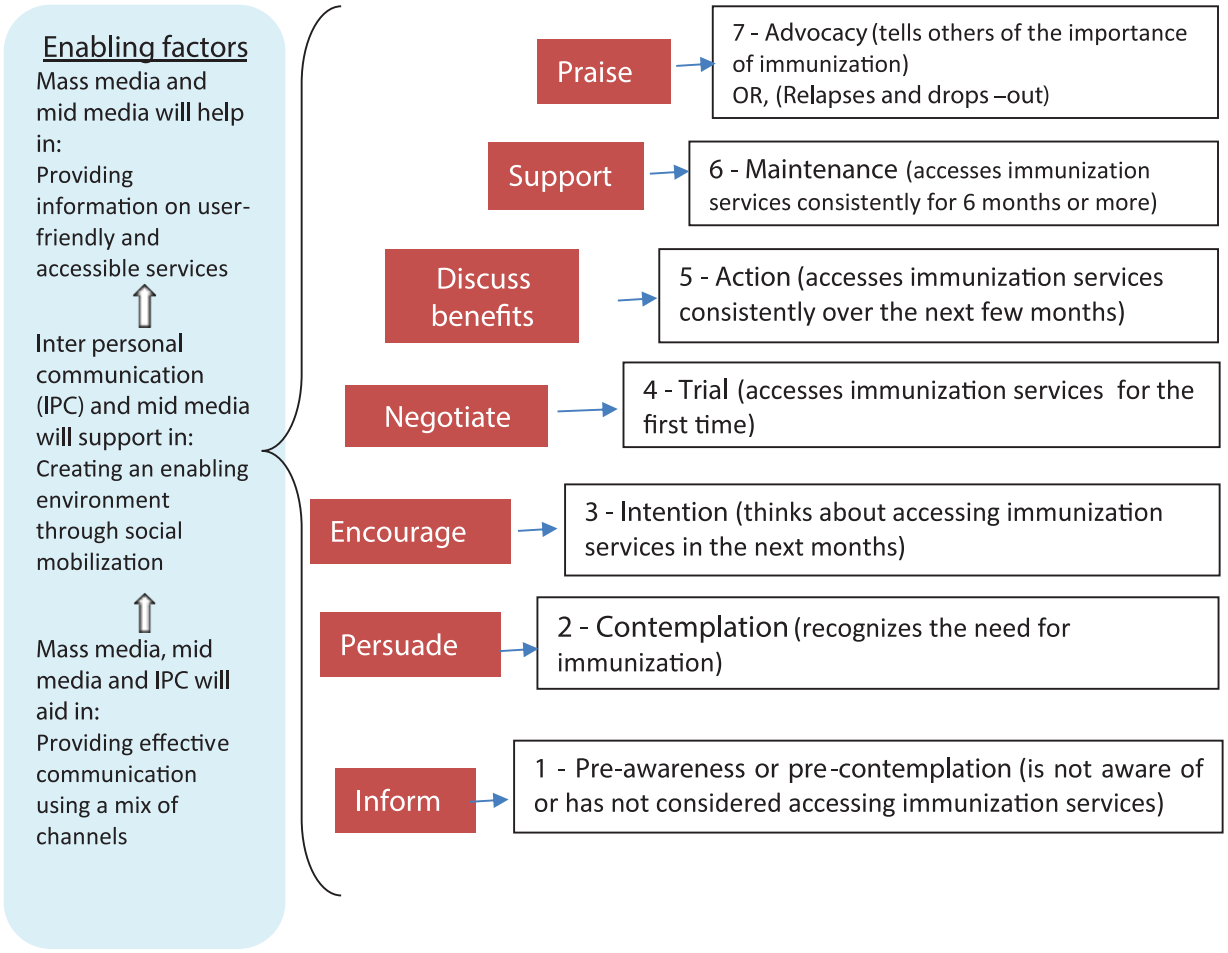
1. **Collect evidence for vaccine hesitancy/refusal**
2. **Undergo professionally-organized orientation in social and behavioural change communication (SBCC)**
3. **Ensure front-line workers and community mobilizers are well-trained in interpersonal communication skills**
4. **Strengthen or innovate supportive supervision for communication**
5. **Target populations through communication microplanning**
6. **Develop a communication plan using mapping and communication tools**
7. **Develop partnerships at local level**
8. **Generate resources for communication activities**
9. **Ensure the right communication tools (IEC) are available and used**
10. **Monitor communications interventions.**

Changing behaviour

Behaviour change is not a one-time effort but a continuous, well-planned endeavour. To mobilize parents and communities for immunization, we need to ensure that the community understands our message, taking care to keep our message simple and straight forward, avoiding too much information too fast. It is equally important that as health-care providers, we have complete information on the issue and take time to understand the community's perspective, establish and maintain credibility and also clarify misconceptions.

One of the most popular theories of behaviour change communication is called the "Stages of Change," proposed by F. Prochaska. It states that individuals are at various stages in the behaviour change cycle. Knowing at what stage of change an individual is – or a group of individuals are – will help create the appropriate change intervention (Fig. 9.4).

Fig. 9.4. Behaviour change cycle



For the RI programme to create an impact, behaviour change has to happen both at the parents/caregivers as well as service providers level. Behaviour change cannot be achieved in isolation; it is important to engage with key stakeholders in the community. This will help to create an enabling environment and motivate people to immunize their children.

For example, a mother who is aware of immunization but does not get her children routinely vaccinated could be in Step 4 of the stages of behaviour change (Trial). She might be aware of the benefits of immunization and also have accessed services, but needs to be encouraged further to continue getting her children vaccinated. The HW needs to discuss the benefits of immunization with the mother to motivate her further. Community networks and peer support groups can help in stimulating community dialogue to adopt immunization, thus helping the mother sustain this positive behaviour.

Involving the community to support immunization

Sharing responsibilities for increasing demand

Community participation is the key to increasing demand for services. An informed community has confidence in the immunization programme, ensures that provision of immunization services is tailored to the community's context (time, place and convenience) and therefore supports and demands immunization services.

You may not have much time to directly interact with the various community groups and leaders. However, encourage and support HWs and supervisors in establishing strong links with the community.

The community should be involved in the immunization programme from the planning phase.

Planning

HWs should:

- consult communities about service locations and timings to ensure a convenient service, e.g. shifting vaccination hours from mornings to afternoons in areas where mothers are busy in the fields in the morning;
- involve village elders, religious leaders and village youth to motivate the community to access the immunization sessions, dispel myths and misconceptions.

Implementation

Communities can assist with:

- arranging a clean outreach site such as a school, club, panchayat bhawan, community meeting room;
- informing families initially of scheduled outreach, and again when the HW has actually arrived;
- educating the community regarding free availability of these services;
- registering patients, controlling crowds, and making waiting areas more comfortable (by providing shade and organizing space and seating);
- disseminating appropriate messages and answering questions (health education);
- identifying and referring newborns and/or infants who have recently arrived in the community and sharing the list with the HW to include in the immunization register;

- facilitate transporting vaccines and HWs in some hard to reach areas ;
- motivating fellow community members to use immunization services and helping bridge cultural or educational gaps between HWs and caregivers;
- identifying dropouts and left-outs. Making home visits when children are behind schedule to explain the importance of adherence to the immunization schedule and to motivate caregivers;
- communicating with local people and informing HWs about suspected VPDs

Evaluation

Community leaders can contribute by responding to questions about the quality of services, including counselling provided by front-line workers.

Steps for involving the community

Step 1: Identify key stakeholders in the PHC area/community and also ways to engage with them

These could be:

- governmental departments and staff (Health, ICDS, Education, District/Block Administration, PRI);
- NGOs, local organizations and youth bodies such as Nehru Yuva Kendra, National Social Service (NSS), National Cadet Corps (NCC);
- professional associations (Indian Medical Association, Indian Association of Paediatrics);
- community (parents, village health and sanitation committee(VHSC), faith-based organizations, SHGs);
- private and traditional health practitioners.

Meet the key stakeholders on a regular basis, establish a rapport with them and seek their support for the immunization programme. Encourage them to talk to parents/caregivers about the benefits of immunization; give them some IEC material such as posters and handouts with messages on immunization which can be displayed at their offices/premises or during their meetings and also be disseminated in the community. Motivate religious leaders, particularly the ones favourable to immunization, to endorse and encourage their fellow members to have their children immunized; get temple/mosque/religious places announcements made giving out details about the next immunization session and calling on parents to get their children vaccinated.

Step 2: Conduct a situation analysis

- Hold community meetings, small group discussions or discussions with opinion leaders to assess the current extent of the community's involvement with immunization services, by finding out:
  - what the community already knows about VPDs and immunization;
  - community awareness and perceptions about immunization services;
  - perceived barriers to immunization (related to quality of immunization services and the community's knowledge, attitudes and practices);
  - issues affecting physical access to services (location, frequency, schedule);
  - issues on access to services by special groups (minorities, migrants etc.);
- Identify problems and reasons for left-outs and dropouts. Jointly seek possible solutions;
- Provide information, using basic language and non-scientific terminology, on the importance of immunization, and where and when services are available. Dispel misinformation and doubts that sometimes surround immunization;
- Encourage questions so that everyone can be better informed;
- Use stories, short plays, songs and visual aids to hold the group's attention and make meetings interesting;
- Discuss possible community support.

If required, re-align Health and ICDS sector boundaries for joint planning, implementation and monitoring of immunization activities.

Step 3: Establish mechanisms for coordination

Establish a consultative mechanism at the block/PHC level, or use existing forums such as the Rogi Kalyan Samitis to ensure regular coordination between departments and to enlist community support for immunization services.

- Establish alliances with programmes such as ICDS and organizations such as NGOs with community reach;
- Involve representatives of the key stakeholder groups listed in Step 1;

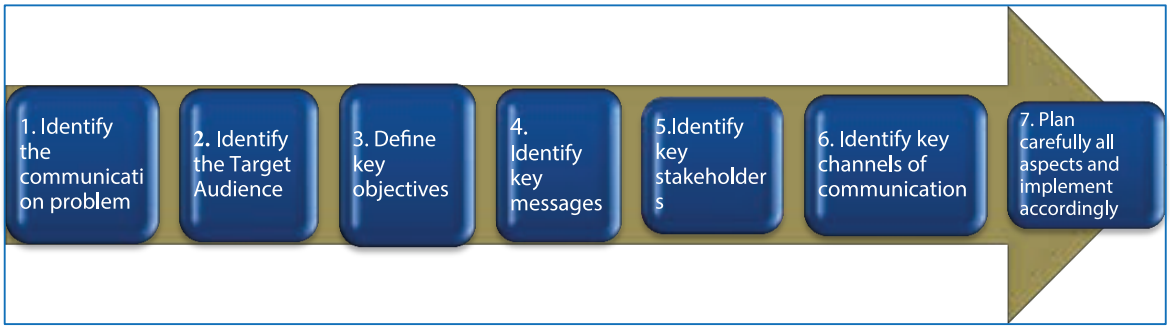
- Inform the members well in advance and prepare a clear agenda for the meeting including:
  - state and district immunization goals
  - current status of immunization in the district and block
  - key challenges and areas requiring support, with suggestions on possible interventions
  - possible roles of stakeholders
  - preparing and implementing a communication plan.

Step 4: Develop a comprehensive communication plan for community mobilization

A communication plan helps to organize actions to target our communication accurately, leading to the fulfilment of a goal. It gives a structure to determine whom we need to reach, and how. It can be longterm as well as short term, making our communication efforts more efficient, effective and lasting. This saves a great deal of time, as we know exactly what we should be doing at any point in the process. (See also Unit 3 - Forms 11 and 18)

The steps given in Fig 9.5 will help you and your team members to prepare a comprehensive communication plan for your area.

Fig. 9.5.Communication plan development



To develop a plan for communication, you need to consider some basic questions:

- Why do you want to communicate with the community? **(What is your purpose?)**
- Who do you want to communicate it to? **(Who is your target audience?)**
- What do you want to communicate? **(What is your message?)**
- How do you want to communicate it? **(What communication channels will you use?)**
- Whom should you contact and what should you do in order to use these channels? **(How are you going to disseminate your message?)**

Sample communication action plan

A sample communication action plan is outlined in Table 9.2.

Table 9.2. Developing a communication action plan

Communication objective: By…….(month and date), parents and caregivers of children under 2 years of age in village……., to be aware of the benefits of immunization and agree to get their children immunized as per schedule

Behaviour analysis	Primary target group (Individual/household level)	Secondary target group (community/service provider level)
Who is the target group?	Mothers/caregivers of children	HWs, community members
What is the current behaviour?	Parents not motivated to immunize children	ANMs may write the next due date in the immunization card, but few give mothers the four key messages or any other information, or invite questions
What is the recommended key behaviour?	Mothers/caregivers to access immunization services and get their children fully immunized	ANMs give mothers/caregivers four key messages, including when and where to go for next vaccination, what side-effects can occur and how to deal with them
What are the key barriers to the recommended behaviour?	▪ Lack of information on immunization ▪ Poor understanding of its purpose and importance ▪ Fear of AEFIs ▪ Cultural and religious reasons (myths and misconceptions) ▪ Long waiting time; days and time not convenient ▪ Time/lost labour, expense and/or fear of side-effects ▪ Lack of money	▪ ANM/AWW lack skills or focus on importance of communicating with mothers ▪ There are real or perceived social, economic, class and possibly ethnic differences between ANM/AWW and caregivers/community ▪ ANMs/AWWs lack time to give good counselling (because so many people are waiting for care)

Communication strategy	Primary target group	Secondary target group
Which barriers can be addressed through communication?	Demand side issues can be addressed through communication **(refer Table 9.1** on possible reasons for left-outs and dropouts)	
What is the key message for each target group?	Immunization is important and beneficial for your child. Get your child fully immunized	Communicate four key messages to mothers/caregivers
What are the suggested communication activities?	▪ Use posters, community meetings,radio, TV (where appropriate), and other channels to create awareness on the importance of immunization and inform parents/caregivers about the next immunization session. ▪ Orient community volunteers and school children on immunization and encourage them to discuss the benefits of immunization with parents/caregivers.	▪ Plan sessions after consulting the community (e.g. early in the morning/late evening) ▪ Visit the communities and work with local mobilizers/educators and community groups/leaders to discuss reasons for not accessing immunization services ▪ Provide information on the importance of vaccination and the date, time and place of the nearest session. ▪ Improve talks and counselling by reminding HW/AWW/ASHA to always communicate thefour key messages to the caregivers ▪ Train/orient HWs to provide filled-in immunization cards to all beneficiaries and to write the next due date on the card. Ask caregivers to repeat the information given to them in order to increase the chances of their remembering when to return ▪ Encourage ANMs/HWs to do more one-on-one counsellings.

Monitoring	Primary target group	Secondary target group
What are the monitoring indicators?	▪ Number of mothers caregivers who can tell the vaccine schedule ▪ Number of mothers who can recall the four key messages ▪ Number of ASHAs/AWWs/HWs with updated duelist	
How will you measure these?	RI monitoring data; rapid surveys; in-depth interviews Monthly HMIS reports	
Who will collect information/ data?	HWs and supervisors	

Communicating messages

The Immunization Programme uses different communication methods to reach parents and other target audiences with messages on RI such as radio, television, folk media, community meetings and interpersonal communication during sessions.

It is important to identify which communication methods or channels are the most appropriate for our target audiences, liked and used by them and can most effectively reach them with immunization messages. For example, while using mass media, it is important to know which radio stations and TV programmes are popular with the target population.

A mix of different communication channels is usually employed to reach different target groups, as each channel serves a specific purpose as outlined in **Table 9.3.**

Table 9.3: Benefits of communication channels

Mass media (radio, TV, etc.)	Mid media (reminder media)	Interpersonal Communication (IPC)
▪ Triggers thought and acts as a "hook" ▪ Reaches many people very quickly and repeatedly ▪ Reinforces messages delivered through other channels	▪ Reinforces and expands upon mass media messages ▪ Builds on messages delivered through IPC and serves as "reminders" or "message takeaways"	▪ Involves direct interaction with the audience ▪ Allows discussion and dispels myths and misconceptions ▪ Encourages, motivates and reinforces action

Thus, no single channel is the "best channel". Multiple, mutually reinforcing channels/ messages integrating all these channels together has a greater impact in stimulating behaviour change.

At the PHC level, you can effectively use the channels and tools for involving and informing the community about immunization services (Table 9.4).

Table 9.4. Channels and tools for communicating information on immunization

Communication channel or tool	Settings	Activities
Discussions between HWs and small groups of parents	Immunization sessions	Inform parents (using storyboards or flip charts) about importance of immunization, the immunization schedule and clarify individual concerns
Community mobilizers (ASHAs and AWWs)	Immunization sessions, home visits	Identify target beneficiaries and share lists with HWs. Make home visits to mobilize beneficiaries, inform about session dates and times and follow up dropouts
Local leaders such as PRI members, political/religious leaders, teachers, private medical practitioners	Work places or community events	Advocate for increasing immunization coverage and seek their support in mobilizing the community
Community groups, NGOs, CBOs, SHGs	Work places or community events	Advocate for increasing immunization coverage and seek their support in mobilizing the community
Public/street announcements	Town criers, community events	Provide basic information in support of immunization and publicize date and time of session
Drama and songs	As a precursor to discussion in community meetings	Counter rumours, misconceptions and other barriers to understanding. Provide basic information, e.g. on RI schedule
Poster, banner, tinplate and wall writing	Well-frequented places such as AWC, markets, bus stops, ration shops, schools, panchayat bhawan	Display information related to the session site, date and immunization schedule
AWW home visits with shared session due list	AWC, panchayat bhawan, school	Motivate and remind families to get their children immunized

RI form 11 for a SC communication plan is given at the end of this unit.

Increasing visibility and awareness of immunization services

Increasing the visibility and awareness of immunization and outreach health services to the general public, and particularly to beneficiaries, is the initial and perhaps the easiest step of communication. The designs for posters and hoardings on RI have been developed at the national level and the states/districts may use the prototypes to customize it according to their local needs. For example, banners and posters should preferably be in the local language. You should read the content and see the pictures of the material available to you before arranging for their placements. Make sure that what is written or shown is consistent with the guidelines of the programme. As programme managers, you will have to plan when and how to use these communication materials.

Fig. 9.6. Posters and banners used in RI

JeSaid are wellrecognized by the communities living in their areas. This also means that their first responsibility will be to ensure that RI services are not only available but that these services are also of the best quality.

Vaccine hesitancy is the behaviour of parents, caregivers, or the community in hesitating to get their children vaccinated or immunized in spite of immunization services being available and accessible to them. Inadequate immunization services such as non-availability of vaccines, absence of vaccinators and long distances between vaccination centre and home contribute to this hesitancy. Hesitation also comes from a number of other reasons (let's call them barriers), such as low perception of the benefits of vaccines, its affordability, social beliefs, fear of AEFIs, demotivation owing to HW

For example, if a poster stresses on birth dose vaccination following institutional deliveries, it should ideally be put up at institutional delivery points. If another poster encourages beneficiaries to ensure that their child completes the vaccine doses as per the immunization schedule, it could be put up at outreach sites as well as delivery points.

Strengthening interpersonal communication skills of front-line workers

ANMs/ASHAs/AWWs are a critical interpersonal link between health providers and community members. They carry out door-to-door visits and are actively involved with the community.For them to be able to effectively communicate with parents/ caregivers and mobilize them to get their children vaccinated, it is important that their interpersonal communication skills be strengthened. They also need to be equipped with appropriate knowledge about vaccines and their benefits, and how to counter prevailing myths and misconceptions on immunization with facts. Details on training of front-line workers are given in Unit 11 on training.

How and when to communicate key messages? Messages need to be appropriately timed: neither too early, lest they be forgotten nor too late for the behaviour to be practiced

Tips for effective IPC skills for communicating with caregivers

Speak clearly

- Use encouraging/helpful non-verbal communication.
- Posture – keep your head level.
- Spend enough time; do not be in a hurry.
- Use responses and gestures to show interest.
- Listen carefully and repeat what the mother says.

Greet

- Smile.Speak in a pleasant voice and tone.
- Maintain eye contact.
- Introduce yourself and your organization.

Ask

- Ask open-ended questions—What? When? Where? Why? How? Who?
    - How many children do you have?
    - Why did you not vaccinate your child?
    - How did you know about the immunization session?

Tell

- What diseases are prevented by vaccination.
- Where and when will the session be held.
- What minor side-effects can occur after vaccination and how these can be managed.

Help: Encourage the parents to come for vaccination by telling them about how to manage AEFIs.

Explain: Use **info-kits** to explain the importance of immunization and the immunization schedule.

Repeat: Use your visit to find out reasons for left-outs and dropouts.

Four key messages to be given to caregivers

- What vaccine was given and what disease it prevents
- What minor adverse events could occur and how to deal with them
- When and where to come for the next visit
- To keep the immunization card safe and to bring it along for the next visit

Holding an effective community meeting

- Identify local community representatives who would participate in the meeting;
- Hold the meeting at a convenient time and place, e.g. on market days, close to places of worship;
- Be prepared with data on the coverage and dropout rates and a map of the health areas with low coverage;
- Provide a comfortable and welcoming environment for the discussion;
- Listen to the community; find out what the community already knows about VPDs and immunization;
- Provide information, using basic language and non-scientific terminology, on the importance of immunization, the status of the immunization programme and where and when services are available. Dispel misinformation and doubts that sometimes surround immunization;
- Encourage the participants to ask questions so that everyone can be better informed;
- Use stories, short plays, songs and visual aids to hold the group's attention and make meetings interesting;
- Involve as many group members as possible in the discussion and ask them to suggest solutions to problems;
- Help mobilize resources for immunization.

Exploring new media and digital communication

The reach of digital media is expanding exponentially and you should exploit every potential communication media. The digital media, either mobile or internet-based, is inexpensive and requires minimal effort. During planning for communication, whether it is for strengthening routine RI programmes or for campaigns, remember to identify media behaviour of the population in your block/under your PHC. As MOs, you have the potential and opportunity to be innovative. There are a number of ways to achieve impactful communication using new digital technologies, as follows:

1. Social media such as Facebook, Twitter, and YouTube are becoming highly popular as preferred modes of communication among the new millennia (young, educated generation).
2. Mobile phones have not only reached every village but also almost every villager, including into women's hands. The potential of reaching the targeted stakeholders is thus enormous. SMS messaging, voiceover messages using celebrities and reminder calls are some simple, direct and affordable ways of reaching the stakeholders with messages.

3. iPads and Notebooks: Digital tools such as iPads or digital Notebooks have now become very powerful tools for IPC sessions to be conducted by front-line workers with the communities. RI counselling using multimedia formats during household visits can be made not only educative but also entertaining.
4. Digitized PHCs: Visitors to PHCs, whether they are patients or their families, can be effectively counselled and exposed to key messages on RI using these digital tools innovatively. A MO who is innovative can make their PHC a model on the use of new media and digital technologies.
5. Data collection and analysis: These digital tools can also be used for purposes of data collection and monitoring and evaluation of different communication interventions for instant results.
6. Training before using: Innovative require capacity building of health service providers to enable effective use.

Appendix: RI form 11: Communication plan for a SC (See Unit 3 for details)

Sub centre communication plan for RI Quarter- 1 / 2 / 3 / 4 **RI Form 11**

Name of Block:_____ Name of ANM:_____ Name of Subcentre:_____

Name of Village						
Nane of Session site	1-	2-	3-	4-	5-	6-
Activities						
Miking / drum beating- Name and contact number						
Mosque announcement - Contact person and number - announcement time						
Meetings (Mothers meeting,AWW meeting,etc -Contact person and number - Monthly / weekly)						
VHSC meeting - contact person and number - location - attended by ANM Monthly / weekly - enter date						
School Rallies - school name and contact person with number (once a month in villages on rotation)						
Celebrations / Special Days (eg Mothers day, health day etc) - contact person and number						
Wall paintings - locations						
Banners - identify 4 key locations - Ensure display at least one day before RI day						
Painting competition / Exihibition - (once a quarter -school name and contact person with number						
Posters - identify 5 key locations (other than Panchayat ghar, Ration store, AWWcentre, Sub centre, Bus stand) - ensure display at least 2 days before RI day						
Pamphlets / Leaflets - available with - contact person name and number - distribute before RI session day						
Counselling aids / job aids (flip books etc.,) - available with - contact person name and number						
Other						
Manpower involvement - with contact number						
Name of ASHA						
Name of AWW						
Name of Mobilizer / CMC						
Name of community influencer						
Name of PRI member						

Date:_____ Sign of ANM:_____ Sign of MO:_____

Notes:

UNIT-10

Vaccine Preventable Diseases and VPD surveillance

Learning objectives

- *Define surveillance and list its uses*
- *Describe standard case definitions of various vaccine preventable diseases*
- *Explain steps in conducting surveillance and outbreak response.*

Key Contents

Surveillance for vaccine preventable diseases

10

Surveillance is data collection for action. It is defined as the ongoing systematic collection, analysis, interpretation and dissemination of data about cases of a disease and factors influencing disease behaviour, which is used as a basis for planning, implementing and evaluating disease prevention and control activities, including immunization. Surveillance is the basic tool for understanding the epidemiology of a disease. Its key objectives are to trigger public health control measures, identify outbreaks and assess the effectiveness of prevention programmes.

Key elements of an effective surveillance system

These are:

- detection and notification of disease conditions
- investigation and confirmation (epidemiological, clinical and lab) of VPD cases
- collection, analysis and interpretation of data
- feedback and dissemination of results
- prevention and control responses.

Surveillance data on VPDs can monitor the impact of vaccination on disease incidence, identify HRAs and identify outbreaks.

Uses of VPD surveillance

Disease surveillance enables the following:

- predicting or detecting disease outbreaks for containment (**what** disease is occurring)
- identifying high-risk populations (**who** gets the disease)
- identification of HRAs requiring special attention, and where system performance is poor (**where** the disease is occurring)

- determining the frequency of occurrence of a disease in the community and magnitude of the problem (**when** the disease is occurring and **how many** get the disease)
- identifying underlying causes (or risk factors) of the disease (**why** the disease is occurring)
- guiding response activities, including immunization (**how** the disease can be prevented, controlled or eliminated).

Prerequisites for effective surveillance

- Standard case definitions (to ensure uniformity in reporting)
- Recording and reporting system (to ensure regularity in reporting)
- List of all the reporting units (to ensure completeness in reporting)

The quality of surveillance data depends upon correct diagnostic criteria, timeliness and completeness of reports.

Case definitions of VPDs

The case definitions of VPDs are as follows:

- ***Polio:*** Acute flaccid paralysis (AFP) is defined as sudden onset of weakness and floppiness in any part of the body in a child < 15 years of age, or paralysis in a person of any age in whom polio is suspected. **(WHO)**
- ***Measles:*** Any person in whom a clinician suspects measles infection,

  or

  Any person with fever **and** maculopapular rash, i.e. non-vesicular

  and

  cough, coryza (runny nose), or conjunctivitis (red eyes). **(WHO)**
- ***Diphtheria:*** A suspected case of diphtheria is defined as an illness of the upper respiratory tract characterized by the following:
  - laryngitis or pharyngitis or tonsillitis,

    and

  - adherent membranes of tonsils, pharynx and/or nose. **(WHO)**
- ***Pertussis:*** A suspected case of pertussis is defined as a person with a cough lasting for at least 2 weeks, with at least one of the following:
  - paroxysms (fits of coughing)
  - inspiratory whooping
  - post-tussive vomiting (vomiting immediately after coughing)
  - without other apparent causes. **(WHO)**

- ***Neonatal tetanus:*** Any neonate with a normal ability to suck and cry during the first 2 days of life, and who thereafter cannot suck normally between 3 and 28 days of age and becomes stiff or has convulsions/spasms (jerking of the muscles), or both. **(WHO)**
- ***Tuberculosis:*** A child with fever and/or cough for more than 2 weeks, with loss of weight/no weight gain and history of contact with a suspected or diagnosed case of active TB disease within the last 2 years. **(WHO)**
- ***Bacterial meningitis:*** Any person with sudden onset of fever (> 38.5 °C rectal or 38.0 °C axillary)

  and

  one of the following signs: neck stiffness, altered consciousness or other meningeal sign **(IDSP).**
- ***Hepatitis B:*** An acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue and right upper quadrant tenderness.
  - Biological signs include increased urine urobilinogen and >2.5 times the upper limit of serum alanine aminotransferase.

  Note: Most infections occur during early childhood. A variable proportion of adult infections are asymptomatic. **(IDSP)**
- ***Japanese Encephalitis:*** A person of any age, at any time of the year with acute onset of fever and change in mental status (including symptoms such as confusion, disorientation, coma or inability to talk)

  and/or

  new onset of seizures (excluding simple febrile seizures).

  Other early clinical findings may include an increase in irritability, somnolence or abnormal behaviour greater than that seen with usual febrile illness. **(IDSP)**

Reporting network: the backbone of a surveillance system

Efficient and reliable reporting network and notification systems are vital for any disease surveillance. In many developing countries, the number of cases that are reported into the system is an underestimation of the actual disease burden, for the following main reasons:

- ***Community level:*** Not all cases seek healthcare at the designated reporting sites (this is called under ascertainment).
- ***Health facility level:*** Failure of the reporting site to adequately report suspected cases that have sought medical advice (under-reporting). The common reasons for under-reporting include lack of knowledge of case definitions , lack of appreciation of the importance of reporting , lack of motivation, competing priorities and complexity of the reporting procedure.

- All ***health-care delivery sectors not included in the reporting network*** (e.g. private sector not involved, ISM practitioners not involved, etc.)

It is difficult to address under-ascertainment. However, under-reporting can be addressed by diligently selecting the reporting sites, creating awareness of the importance of case reporting and regular monitoring to verify the quality and completeness of reporting. The health facility selected for VPD surveillance should:

- be adequately motivated to participate in the surveillance with the understanding of its importance
- serve the population of interest
- have medical staff sufficiently specialised to diagnose, treat and report cases of the diseases under surveillance.

Various types of surveillance systems functioning in India

Surveillance system for polio and other VPDs

The country has established an efficient surveillance system for polio with technical, operational and monitoring support from WHO-NPSP. This support for countrywide AFP surveillance is made through its strong field presence and a well-distributed network of reporting sites.

The reporting network for AFP involves both public and private sector health facilities and has established mechanisms for case investigation, reporting and data management. AFP surveillance has proved to be one of the best surveillance systems globally and functions beyond the globally accepted quality standards. Details of operational protocols are available in the AFP surveillance field guide, also popularly known as Red Book.

Utilizing the AFP surveillance system for surveillance of other VPDs

To capitalize on the existing infrastructure and investments already made in the Polio Eradication Initiative, the platform of the AFP surveillance system is being modified to generate valuable epidemiological information for other VPDs. A laboratory-supported surveillance system for VPDs has been designed to capture epidemiological data on measles, rubella, diphtheria, pertussis and neonatal tetanus.

A measles-rubella surveillance system has been established across the country with 14 laboratories in the network. National Institute of Virology, Pune and King Institute of Preventive Medicine (KIPM), Chennai are designated as reference laboratories. The operational protocols for measles-rubella surveillance are available in the “Measles Surveillance and Outbreak Investigation– Field Guide”.

A laboratory network for surveillance of other VPDs is being established. The Christian Medical College at Vellore has been designated to serve as the reference laboratory for the VPD surveillance laboratory network and state-specific laboratories functioning under the supervision of the reference laboratory are expected to test the samples collected from suspect cases. Technical and operational details of the laboratory-supported case-based VPD surveillance system are available in "Surveillance for Vaccine Preventable Diseases – Field Guide" developed by WHO in coordination with the GoI.

Integrated Disease Surveillance Project

IDSP is a surveillance system wherein data generation, compilation, analysis and feedback to actions take place at district level and flow upwards to the state surveillance unit (SSU) and central surveillance unit (CSU). IDSP has an administrative mechanism in the form of surveillance committees and surveillance units at district and state levels headed by a surveillance officer and supported by an epidemiologist, microbiologist, data entry operator and data managers. Implementation is intended to uncover the burden of infectious diseases and detect early warning signals for outbreaks based on syndromic reporting right from the population level. Gaps exist in capturing of data from the private sector.

Laboratory confirmation of cases and outbreaks is another important component of IDSP that feeds into Form L at the district level. In addition, a reference laboratory network has been established in nine states by utilizing the existing functional laboratories in the medical colleges and other facilities which provide diagnostic services.

Central Bureau of Health Intelligence (CBHI)

CBHI, under the Directorate General of Health Services (DGHS), is an agency involved in collection, compilation, analysis and dissemination of information on a broad range of indicators related to health status and health services in the country. It is the national nodal institution for health intelligence. CBHI has a web-based data entry portal for collation of data at the national level. It regularly brings outs an annual publication in the form of National Health Profile based on the health data collected from all health directorates of states and union territories.

A sensitive and reliable VPD surveillance system can become an important tool for generating valuable epidemiological data which provides guidance to national policy-makers to identify specific national challenges and formulate evidence-based recommendations on immunization.

Awareness and skills of health staff are major factors for high sensitivity and quality of a surveillance system. All these systems are dependent on the district and sub-district level health staff. The states have to ensure capacity building of the health-care providers/ surveillance staff, monitoring and evaluation of the key components of surveillance, data analysis and providing feedback.

Outbreak investigation, response and control

An **outbreak** is defined as the occurrence of an illness in a community, clearly in excess of the expected numbers. Usually, an outbreak is limited to a small focal area. When an outbreak covers a larger geographic area and has more than one focal point, it is termed as an epidemic.

Outbreaks are defined differently for different VPDs. For diphtheria, polio, neonatal tetanus or JE, even a single case is defined as an outbreak, whereas for measles and pertussis, a sudden increase in the number of cases is considered to be an outbreak.

Steps in outbreak investigation

Prompt and timely action during an outbreak is critical for minimizing the damage and maintaining public trust in health and immunization services. The emphasis should be on saving lives. Do not wait for confirmation of a suspected outbreak, immediately provide logistic support to the field teams. Once the cause of the outbreak is confirmed, do not further waste laboratory support for diagnosing every case, since standard case management for epidemiologically-linked cases does not require laboratory confirmation.

Step 1: Confirm the outbreak

Confirmation of an outbreak is done through two related steps. Firstly, you have to visit the area concerned and confirm the diagnosis of as many reported cases as possible. Next, you should ascertain its geographical spread through a preliminary search.

- **Confirm the diagnosis** by:
  - ***Clinical criteria:*** According to the standard case definition using information obtained by history and examination.

- ***Epidemiological association:*** If an outbreak has been confirmed, and similar cases in the same area in the same period of time are reported by HWs but not investigated individually, they may be confirmed by epidemiologically-linked association with confirmed cases.
- ***Laboratory tests:*** For VPDs subject to eradication or elimination, collect laboratory specimens from every suspect case (e.g. stool sample from each AFP case). For VPDs subject to control, collect specimens from a sufficient number of cases (e.g. five blood samples in case of a measles outbreak) to confirm the outbreak. However, no laboratory specimens are required for neonatal tetanus.

- **Ascertain the geographical extent** of the outbreak to the surrounding villages/ blocks. The search for additional cases must include visits to:

  Health facilities: Talk to the doctors and nurses to see if they are seeing suspected cases of the VPD. Visit hospital wards and outpatient departments and search all patient registers for cases that fit the standard case definition.

  The community: Visit the area from where cases have been identified. Talk to volunteers and other influential persons in the community. If feasible, organize a rapid house-to-house search of the affected area(s) to search for similar cases. Identify key informants in each village/ward for prompt information about any cases.

Step 2: Conduct house-to-house searches to find additional cases and provide case management

Train and assign HWs to conduct house-to-house searches to find the cases in the designated area. Ensure all are aware of the case definitions and ensure monitoring of this activity.

Step 3: Line list and notify the cases

Enlisting all cases is important as it collates all relevant information.

Step 4: Describe the outbreak

Describe the outbreak in terms of time, place and person.

Step 5: Analyze the data to:

- Confirm the outbreak:
  - Are the number of cases reported greater than the number expected for this period (e.g. threshold)?
  - What proportion of cases fulfill the case definition?

- Define the extent of the outbreak (time, place and person).
- Measure the severity of the outbreak (what proportion of confirmed cases were hospitalized, suffered complications or died).

Step 6: Use the data for action

Use data on the various components of the immunization system such as coverage, status of the cold chain, training and availability of personnel to determine the probable causes of the outbreak.

Step 7: Write the report

After conducting the outbreak investigation, prepare a short comprehensive report.

Step 8: Give feedback

Provide feedback to all levels (community/SC/PHC/CHC/district) on the outcomes of the VPD outbreak investigation, in order to ensure that all stake holders are aware of the reasons for the outbreak, the actions initiated and the plan to prevent future outbreaks.

Step 9: Initiate action

In all VPD outbreaks, effective case management and followup of cases is a priority. Thereafter, conduct activities for strengthening and raising awareness of RI.

For further details refer to operational manuals / guidelines of VPD surveillance, measles and AFP.

UNIT-11

Capacity building of health functionaries in immunization

Learning objectives

- *Describe the importance of capacity building of health functionaries and the target groups*
- *Enlist different mechanisms for conducting immunization training*
- *Describe the guidelines, curricula and steps for conducting intensified immunization training of frontline workers.*

Key Contents

Capacity building of health functionaries in immunization

11

Regular capacity building of health functionaries at the village and SC level is essential to ensure sustained utilization of quality immunization services by the community. As an MO, it is your duty to ensure that all the health functionaries in your PHC have adequate knowledge and skills to provide quality immunization services, including social mobilization functions.

The following health functionaries need to be regularly trained in immunization at the block/PHC level:

- HWs or vaccinators
- HSs
- Social mobilizers such as ASHAs and AWWs
- Vaccine and Cold-chain handlers
- Data handlers.

Training mechanisms

Different mechanisms which can be used to train the health functionaries are as follows:

- Half day training of front-line workers at PHC/block level once every 6 months
- Review meeting at the block/PHC held every fortnight/month/quarter
- Supervisory visits to the health centres, session sites and the community.

These are in addition to the regular training courses imparted by the district or state. Overview of the regular training courses available under the immunization programme is given in Table 11.1.

Table 11.1.Overview of regular training courses available under the immunization programme

Category	Duration	Venue	Training materials
MOs – Immunization	3 days	District/regional/state training centre	Immunization Handbook for MOs, Facilitators' Guide and Training kit
MOs –RI microplanning	2 days	State level TOT followed by cascaded training at district and sub-district level	Material shared during state-level workshops
HWs	2 days	District training centre/ ANMTC	Immunization Handbook for HWs and Facilitators' Guide
Frontline Workers – Immunization	Half day	Block/PHC level	Info-kits for HWs and ASHAs/ AWWs,Facilitators Guide for Intensified Immunization Training of Frontline Workers
Cold-chain handlers	2 days	District training centre/ ANM Training Centre	Handbook for Vaccine and Cold-chain Handlers

Intensified immunization training of frontline workers: an overview

This training course was provided by GoI with WHO-India (NPSP) support to the frontline workers in nine priority states during 2013. It is recommended that MOs of all blocks/ PHCs should use these guidelines, curricula and methodologies to regularly train frontline workers, i.e. ANMs, LHVs, HSs, ASHAs, AWWs,HWs (male), urban HWs, link persons, etc. An overview of the training is at Table 11.2.

Table 11.2 .Overview of immunization training for ANMs and LHVs

Participants	Block level facilitators (MO/BMC)	ANMs, LHVs, health supervisors	ASHAs, AWWs and others*
Venue of training	District level	Block level	Block level
Duration	One day TOT	4 hours	3 hours
Batch size	20–25	25–30	30–40 (ASHAs and AWWs under the same SC area should be called together along with the concerned ANM)
Facilitators	DIO, SMO (WHO), other partners, RRT members	Block level MO (2 per batch)	Block level (2 per batch) MO/LHV/ BMC
Contents of training	Role of facilitator and types of training, immunization schedule and FAQs, social mobilization and IPC, planning and managing immunization sessions, injection safety, AEFIs, records and reports	Immunization schedule and FAQs, social mobilization and IPC, planning and managing immunization session, injection safety, AEFIs, records and reports	Immunization schedule and FAQs, role and responsibilities, improving reach of immunization services and IPC skills required
Training material	Facilitators' guide	Info-kit for HWs	Info-kit for ASHAs, AWWs
Training methods	Discussions, roleplays, group exercises, films on immunization and IPC		

**** Others include HW (male), urban HW, link person, etc.***

TOT – training of trainers; RRT – rapid response team; FAQ – frequently asked questions

Roles and responsibilities of MOIC block/PHC as immunization manager

- Assess training load and prepare a training calendar for the year, marking the dates of the meetings and other opportunities that can be used for training.
- Select topics from the training material which are relevant for the health functionaries based on assessments through data analysis of routine reports and RI monitoring/ supervision.
- Prepare an agenda and allocate sessions to the facilitators at PHC/block level.
- Inform the participants in advance so that they can come prepared with their questions.
- Arrange for all equipment and supplies required during the training.
- Organize the venue and logistics.
- Conduct training as per the calendar.
- Submit a report of the training conducted with muster roll to DIO.
- Plan and conduct catch-up training for absentees.
- Continue to provide follow-up and on the job training to front-line workers during supervisory visits and review meetings.

Role and responsibilities of MO as the facilitator

- Positive attitude is required at all times to effectively carry out your roles.
- Encourage participants to ask questions and make comments.
- Use examples from your own experience and ask participants for examples from their experience.
- Model good communication skills, speak clearly and vary the pitch and speed of your voice.
- Use interactive training methods for training such as demonstration and hands-on practice, brainstorming, group discussions, role plays, films on immunization and IPC, question and answer technique, posters and presentations and flip charts or black/ white board.
- Praise/compliment each participant for comments, participation and contributions.
- Always summarize, or ask a participant to summarize what was discussed in the session.
- Keep the group on track.
- Encourage participants to explore how the skills they are learning can help them to improve immunization coverage.

Note: Various planning (annxure 1) and reporting formats (annxure 2) used for this training are annexed in this unit.

Training programme for immunization training of ANMs and LHVs

Learning objectives

At the end of the training, the participants should be able to:

- explain National Immunization Schedule and the frequently asked questions (FAQs);
- list the reasons and solutions for left-outs and dropouts, and key IPC messages;
- plan and conduct immunization sessions using injection safety measures;
- use recording and reporting forms correctly.

The agenda for this training is given in Table 11.3.

Table 11.3. Agenda for immunization training of HWs (ANMs and LHVs)

Session No.	Time	Session
1.	10:00–10:15	• Welcome, introduction of participants and pre-test • Sharing of RI issues from the RI monitoring reports
2.	10:15–10:45	• National Immunization schedule • Frequently asked questions
3.	10:45–11:30	Social mobilization and IPC: • Tracking left-outs and dropouts with emphasis on HRAs • Key IPC messages
4.	11:30–12:30	Planning and managing immunization sessions: • Planning and preparing for immunization session • Arranging immunization session • Conducting immunization session • Injection safety • AEFIs - including the use of Adrenaline in AEFI
5.	12:30 -13:20	Records and reports (10 minutes each): • MCP card,counterfoils and tracking bag • MCH/Immunization/MCTS register • Name-based list of due beneficiaries and Tally Sheet • Monthly Progress Report (HMIS report)
6.	13:20–13:40	Film on RI
7.	13:40–14:00	Open discussion, post-test, feedback and wrap-up

List of items required for the training

- Info-kit for HWs and stationary for all participants
- White board with marker pens/flip charts with tripod stand
- TV, DVD player/LCD projector and screen
- Vaccine carrier with 4 conditioned ice packs and vaccine vials in the zipper polythene pack
- AD disposable syringes – 0.1 ml and 0.5 ml
- Functional hub cutters – 4
- Waste baskets with Red Plastic Bag – at least 1
- Waste basket with Black Plastic Bag- at least 1
- MCP/RI cards – filled
- Tracking bag
- RCH/Immunization/MCTS registers –filled
- Due list cum tally sheets –filled
- HMIS reporting format for SC–filled.
- Use of adrenaline in AEFI

Detailed guidelines for conducting HW training

Session 1: Welcome, introduction and sharing of key RI issues

Time: 10:00–10:15	**Registration:** • Register all participants by asking them to sign in Muster roll (Annex2). • Give info-kit and other stationary to each participant. • Make a note of the number of expected participants who did not attend. • Plan to train them during catch-up sessions. **Introduction and pre-test:** • Ask each participant to introduce herself/himself briefly by giving her/his name, place of work and years of experience. Also, one personal detail such as a hobby or interest they have outside of work. • Ask pre-test questions. **Sharing of RI issues from monitoring reports:** • Share key RI issues identified during monitoring visits. Ensure that these issues are addressed during the training.
Method: Interaction and discussion	

Session 2: National Immunization Schedule and frequently asked questions

Time: 10:15–10:45 **Method:** Discussion	**Steps:** • Discuss the National Immunization Schedule by asking participants and later ask them to check from info-kit. • Discuss FAQs by asking each participant to read one question and answer by taking turns. • Explain to clarify their doubts.

Session 3: Social mobilization and interpersonal communication

Time: 10:45 – 11:30 **Method:** Group discussion and role plays	**Steps:** • Discuss definition of dropouts and left-outs (5 mins). • Ask participants about the common reasons and solutions for dropouts and left-outs based on their experience. List them on the flip chart (15 mins). • Divide the participants into two groups to discuss the following (20 mins): ▪ Ask Group 1 to move to the far corner of the room to represent that they are living in a remote hamlet without any SC in their village. Outreach sessions are rarely held in their village. Explain that their children are one type of "left-outs", i.e. they are hard to reach geographically and have difficult access to services. Ask them to discuss the reasons why their children do not get vaccinated and also suggest some possible solutions. ▪ Now turn to Group 2 and explain that their children started the vaccination schedule but have not completed it and no longer go to the session. Explain that their children are "dropouts." Ask them to discuss the reasons why their children dropped out and to also suggest some possible solutions. • Ask each group to present/role play in the plenary (15 mins). • Summarize the session by reminding participants of the 4 key IPC messages (5 mins).

Session 4: Planning and managing an immunization session

Time: 11:30–12:30	**Steps:** • Discuss components of the Microplan by asking participants (5 mins). • Discuss what all preparations are required before an immunization session (5 mins). • Ask for volunteers to play the role of ANM and caregiver with beneficiary. • Ask them to present a roleplay on conducting an immunization session (by using the session site equipment and logistics) (10 mins). • Ask all participants to observe the role play and check from the info-kit whether all steps are being followed. Make a note of missed steps to be discussed after the roleplay (15 mins). • Demonstrate the use of AD syringe, hubcutter and waste disposal guidelines (10 mins). • Discuss definition of AEFIs and their types; common programme errors and how to prevent them; how to manage and report AEFIs (15 mins) and ensure entry in the block AEFI register.
Method: Discussion, role plays, demonstration of injection safety equipment	

Session 5: Records and reports

Time: 12:30–13:20	**Steps:** • Ask participants what are the various records and reports related to the immunization programme (5 mins). • To each group of 4–5 participants, distribute filled in: o MCP card o RCH/Immunization/MCTS register o Due list and Tally sheet o Monthly Progress Report (HMIS report). • Ask them to identify the gaps and discuss any issues faced. • Demonstrate use of tracking bag for keeping counterfoils.
Method: Brain storming, group work, discussion, demonstration	

Session 6: Film on Routine Immunization

Time: 13:20–13:40	**Steps:** • Ask participants to note key messages from the film for improving quality of immunization services. • Show the film.
Method: Film	

Session 7: Open discussion, post-test, feedback and wrap-up

Time: 13:40–14:00	**Steps:** • Ask post-test (same as pre-test) and feedback questions from the participants. • Ask participants to enumerate key actions they would take to improve coverage and quality of services after training. • Clarify any doubts of the participants and close the session.
Method: DIscussion	

Training programme for immunization training of ASHAs and AWWs

Learning objectives:

At the end of the training, the participants should be able to:

- Describe the importance of immunization and the role of ASHA and AWW in the immunization programme
- List the vaccines available under National Immunization Schedule
- List the reasons for left-outs and dropouts and how to deal with them
- Keyinterpersonal messages and skills to communicate with the caregivers.

Agenda for this training is given in Table 11.4.

Table 11.4. Agenda for immunization training for ASHAs and AWWs

S No	Time	Session
1.	10:00–10:15	Welcome,introduction of participants and pre-test
2.	10:15–10:30	Importance of immunization and National Immunization Schedule
3.	10:30–10:45	Role of ASHA/AWW in immunization programme
4.	10:45–12:00	**Social mobilization and IPC:** • What and why are dropouts and left-outs? How to reach them? • IPC skills required • Preparing/updating due lists • Tracking left-outs and 0dropouts • Key IPC messages during o house-to-house visits o immunization sessions
5.	12:00 –12:20	Film on IPC in RI
6.	12:20–12:40	FAQs regarding immunization
7.	12:40–13:00	Open discussion, post-test, feedback and wrap-up

List of items required for the training

- Info-kit for ASHA/AWW and stationary for all participants
- White board with marker pens/flip charts with tripod stand
- TV, DVD player/LCD projector and screen
- Due-list cum tally sheet – filled.

Detailed guidelines for conducting ASHAs and AWWs training

Session 1: Welcome and introduction of participants

Time: 10:00–10:15	**Registration:** • Register all participants by asking them to sign in Muster roll (Annex2). • Give info-kit and other stationary to each participant. • Make a note of the number of expected participants who did not attend • Plan to train them during catch-up sessions. **Introduction and pre-test:** • Welcome and ask each participant to introduce herself briefly by giving her name, place of work and years of experience. Ask pre-test questions.
Method: Interaction and discussion.	

Session 2: Importance of immunization and National Immunization Schedule

Time: 10:15–10:30	**Steps:**
Method: Discussion	• Explain the importance of immunization and the VPDs prevented. • Discuss the National Immunization Schedule by asking participants and later ask them to check from info-kit.

Session 3: Role of ASHAs/AWWs in the immunization programme

Time: 10:30–10:45	**Steps:**
Method: Brainstorming	• Ask each participant to tell one responsibility of an ASHA/AWW in immunization and write their responses on a flip chart. • Group them into groups for enumerating their responsibilities before, during and after immunization session and check from info-kit for any missed points.

Session 4: Social mobilization and interpersonal communication

Time: 10:45–12:00	**Steps:**
Method: Brainstorming, discussion, roleplays, exercises	• Discuss the definition of dropouts and left-outs (5 mins). • Ask participants about the common reasons for dropouts and left-outs based on their experience. **List them on the flip chart** (15 mins). • Check from info-kit to see if any reason is missed. • For each reason, ask and discuss the solutions and cross check from info-kit (15 mins). • Discuss IPC skills required for the social mobilizers by referring to the info-kit (5 mins). • For roleplays, ask for 8–10 volunteers, 4–5 to act as caregivers and other 4–5 to act as ASHAs/AWWs. • Ask other participants to observe the IPC skills used during roleplays and comment on the same after the role plays. • Call a pair of one caregiver and one ASHA/AWW to the front. Ask them to enact the IPC related to RI issue/s (dropouts and left-outs) during house-to-house visits and at session sites. • Then ask other pairs to come one by one and discuss different issues not covered by earlier groups (25 mins). • Summarize the session by revising the key IPC messages. • Discuss tools for tracking left-outs and dropouts. • Give an exercise on filling due lists and Tally sheet (10 mins).

Session 5: Film on interpersonal communication in routine immunization

Time: 12:00–12:20	**Steps:** • Ask participants to note key messages from the film for improving coverage. • Show the film.
Method: Film	

Session 6: Frequently asked questions on immunization

Time: 12:20–12:40	**Steps:** • Ask participants to read the FAQs and answers one by one. • Explain and clarify their doubts.
Method: Discussion	

Session 7: Open discussion, post-test, feedback and wrap-up

Time: 12:40–13:00	**Steps:** • Ask post-test (same as pre-test) and feedback questions from the participants. • Ask participants to enumerate key actions they would take to improve coverage and quality of services after training. • Clarify any doubts of the participants and close the session.
Method: Discussion	

Pre and Post test questions

For HWs:

1. Name the VPDs under the UIP.
2. What all vaccines should be given to a child for full immunization by 1 year of age and by 2 years of age?
3. What tools are available for tracking dropouts and left-outs?
4. What are the four key IPC messages that should be given to the caregivers?
5. What are minor AEFIs and how to manage them?

For ASHAs and AWWs:

1. Name the VPDs under the UIP.
2. What all vaccines should be given to a child for full immunization by 1 year of age and by 2 years of age?
3. What tools are available for tracking dropouts and left-outs?
4. What are the four key IPC messages that should be given to the caregivers?

Role of ASHA, AWW and social mobilizers in the immunization programme

Planning for immunization

- Enumerate all the pregnant women and children and their immunization status.
- Help the ANM to identify hard to reach areas and underserved populations.
- Help in planning the site, day and time of the session in the village.
- Share the list of newborns in the area with the ANM every month.
- Help in preparing the due list of beneficiaries for your area/village.
- Visit households to inform the due beneficiaries of the vaccination date, time and site.

During the immunization session

- Ensure that all due beneficiaries are brought to the session site for immunization.
- Assist the ANM in conducting the immunization session(control the crowd, assist in recording, etc.).
- Deliver the four key messages about immunization to the caregivers.
- Ask the beneficiaries to wait for 30 minutes at the session site after immunization.
- Prepare the due list for the next session.

After the immunization session

- Report any case of high fever, any allergic reaction or convulsions after immunization to the ANM and ensure the treatment.
- Visit the houses of dropouts and left-outs to counsel the mothers to immunize their children.

"How to conduct a roleplay" with a sample illustration

- Select a group of six volunteers and take them out of the hall.
- Share with them the story plot given below.
- Instruct them to prepare a roleplay based on the situation.
- Give them 10 minutes to present the roleplay.
- Before the roleplay begins, ensure the following:
    - o Participants are seated and attentive;
    - o Ask everyone to observe the roleplay closely so that it could be discussed later;
    - o Take note of the HW's role.
- Ask them to enact out the roleplay.

A sample role play is given below (please note that in the case study below, the example of a female child has been deliberately given to reinforce the point that a female chid is equally important and needs equal care as a male child).

Rani is a HW. She goes to Phalguni's house. She wants to remind the family about the immunization session the next day and the visit of the ANM. Also, she has to explain the importance of vaccinating a child and the benefits of immunization. Phalguni's 5-month-old daughter is suffering from diarrhoea and fever. The entire family is under great stress. Rani is trying to draw their attention. She fails and the discussion could not start.

Rani: (Knock knock – she is knocking at the door of Phalguni's house). Phalguni's sister Phoolwati opens the door.

Rani: (Comes in through the door.) "Phoolwati, listen, the ANM behenji is coming to the village tomorrow and she will give vaccines to the children. I want to talk to you all about this".

Phoolwati: "Dekho Rani, we all are very tense and busy now".

There is loud crying from inside. Phalguni is crying. The others in the house are trying to pacify her. Rekha, her sister-in-law, is running around to get a clean cloth to wipe the baby. Someone else is running to fetch a wiping mop.

Rani: "Listen, I have come to tell you something very important. The ANM will vaccinate children of the village tomorrow. You have so many little children in the house. You all must definitely come."

Nobody is listening to Rani. She is looking around at all of them.

Rekha: "Bhabhi, don't cry. Munni will be alright. Bhaiyya,why don't you run and get the nurse behenji".

Rani: "Phoolwati, if you don't want to listen it is really your headache. How does it matter to me? I will tell the Pradhanji, and I have to visit other houses too. Had you taken the advice of nurse behenji seriously your child would not have been so sick in the first place."

The father of the child is running out and Rani leaves.

Some questions after the role play:

- What did you see?
- What mistakes did Rani make?
- What should she have done?

Discuss and brief the HWs on the various attributes and skills a communicator should possess and use when dealing with families and the community at large. Now ask them to enact the same role play (with a changed scenario).

Rani: (Knock knock – she is knocking at the door of Phalguni's house). Phalguni's sister Phoolwati opens the door.

Rani: (Comes in through the door.) "Phoolwati, listen, the ANM behenji is coming to the village tomorrow and she will give vaccines to the children. I want to talk to you all about this".

Phoolwati: "Dekho Rani, we all are very tense and busy now".

There is loud crying from inside. Phalguni is crying. The others in the house are trying to pacify her. Rekha, her sister-in-law, is running around to get a clean cloth to wipe the baby. Someone else is running for fetching a wiping mop.

Rani: "Oh! What happened? Why is the baby crying? Is everything all right?"

Phoolwati: "Rani, Phalguni's baby is very sick. She has been having watery stools for the last 3 days and also has fever. We all are very worried for her".

Rani: "Don't worry, she will be fine. May I have a look at her?"

Phoolwati: "Surely.She is in the room. Phalguni has been crying, we have tried everything….don't know what to do. Come in".

Rani: (Goes into the room, and consoles and comforts Phalguni) "Don't worry, she will be fine. Have you given her ORS?"

Phalguni: "No Rani, she has become so weak. She is not even taking my milk".

Rani: "ORS is very safe. Please give it to her. It will help her recover fast". (Rani takes out an ORS sachet from her bag and gives it to Phalguni. She tells her how to prepare the ORS solution and how to feed the baby). "Also continue to breastfeed the baby, there is no substitute for mother's milk. But you should get her vaccinated tomorrow. The fever is mild and vaccination will not harm her; rather, it will protect her from life-threatening diseases. Bhaiyya, please come along with me. We need to call in the doctor immediately".

Both of them leave to call the doctor.

Some questions after the role play:

- What did you see?
- What did Rani do differently this time?
- What do we learn from this?

Annexures –Planning and reporting formats

Annexure 1

Format for planning and scheduling the immunization training of front-line health workers

State: ____________________________ **District:** ________________________ **Block / Urban Planning Unit:** ____________________________

Sr. No.	Category of training* (Encircle)	Date of training session	Venue of training	Time of training session	Number of participants expected to attend						Name of trainer	Designation and contact details of trainer
					LHV / HS	ANM	ASHA	AWW	Others[#]	Total		
	1 / 2											
	1 / 2											
	1 / 2											
	1 / 2											
	1 / 2											
	1 / 2											
	1 / 2											
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	1 / 2											
	1 / 2											
	1 / 2											
	1 / 2											
Total												

* 1=LHV/ HS/ ANM; 2=ASHA/ AWW/ Others[#]

[#] Others includes HW(Male), Urban health worker, Link person etc.

Submitted by: ______________________________**(signature with seal)**

Name: ____

Designation: ______________________________________

Annexure 2

Muster roll for the intensified immunization training of front-line health workers

State: ______________________ **District:** __________________________

Block / Urban Planning Unit: ____

Sr. No.	Name of participant	Designation # (Encircle)	Contact number	Signature
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
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		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		
		LHV / HS / ANM / ASHA / AWW / Others		

Others includes HW(Male), Urban health worker, Link person etc.

Submitted by: ______________________________**(signature with seal)**

Name: ____

Designation: _____________________________________

Annexure 3

Block reporting format for immunization training of front-line health workers

(To be submitted weekly by the BMO to the DIO)

Reporting Week: From: ________________ **To:** ________________

State:________________________ **District:** ______________________ **Block/ Urban Planning Unit:** ___________________________

Sr. No.	Category of Training* (Encircle)	Date of training session	Number of participants										Name of facilitator	Facilitator trained in TOT (Encircle)	Info-kits distributed (Encircle)
			LHV/ HS		ANM		ASHA		AWW		Others#				
			Expected	Attended	Expected	Attended	Expected	Attended	Expected	Attended	Expected	Attended			
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
	1 / 2													Yes / No	Yes / No
Total															

* 1=LHV/HS/ ANM; 2=ASHA/ AWW/ Others

Others includes HW(Male), Urban health worker, Link person etc.

Attach copies of Muster Roll (List of participants with designation, place of work, contact numbers and signatures)

Submitted by: ________________________________**(signature with seal)**

Name: ______________________________________

Designation: ________________________________

UNIT-12

High risk populations and Urban areas

Learning objectives

- *List steps to include high risk areas and populations in the RI microplans*
- *Explain the challenges and steps to provide RI services in urban areas*

Key Contents

High-risk areas and urban services

12

High risk areas/populations

HRAs are special sites/areas which may be one or more of the following types of areas:

- Hard-to-reach areas
- Unserved or underserved areas or areas with shortage of health workers
- Urban areas, especially slums
- Migratory populations including temporary harvesters, brick kiln workers and construction labourers in large construction sites
- Security compromised areas.

The polio programme has identified population groups/areas that often miss routine and supplementary immunization and pose a risk for polio and other VPDs. HRAs are categorized as migratory and non-migratory (settled). (Other high risk populations could include those living in prisons, brothels and redlight areas)

Migratory HRAs

Migratory HRAs have been characterized as follows:

- ***Slums with migration:*** These are settlements in urban/periurban areas, or slums situated close to industrial areas including mining/stone-crushing sites or agricultural fields. These slums are typically found listed as such with urban development or district authorities. These areas are densely populated with substandard housing, which may be pucca or kaccha (jhuggies) and invariably have poor sanitation. Some of these areas are unauthorized and/or are not recognized by urban development authorities. The socioeconomic status of the residents in these areas is low.
- ***Nomads:*** Populations such as Mangteys, Kanjars, Fakirs, Natts, Banjaras, Shahs, Shahbalis, Albis, GadhiaLuhars, Ghumantus, etc. often move from place to place for livelihood, usually setting up “dera” wherever they stop. They are normally found in between or at the end of big colonies, railway stations, along the rail tracks, open fields, market places and in urban/periurban slums.

- ***Brick kilns:*** Migrant labour camping in brick kilns and the "pather" fields where raw bricks are prepared.
- ***Construction sites:*** Migrant families live in jhuggies or brick sheds in and around the under-construction buildings. The number of families and children present in these sites varies according to the size of the construction site.
- ***Others:*** These are fishermen villages, riverine areas with shifting populations, etc.

Non-migratory HRAs

These are areas with settled population with no migration and poor immunization coverage. These include hard-to-reach areas and misinformed communities that refuse vaccination due to misplaced beliefs.

Hard to reach areas

Accessibility compromised areas i.e. due to geographical / topographical reasons and in areas where security is a concern poses a different challenge to delivering RI or any other services.

Provision of services

Despite these challenges frontline workers and health staff are committed to providing services even in such areas. Therefore it is important for RI microplanning to be flexible and respond specifically to local situations and needs.

As MO you can review situations and in consultation with the district be innovative to overcome some of these obstacles.

For areas with multiple pockets of nomads or construction sites:

- Ensure identification of each area or pocket
- Identify a key person in each
- Explore use of mobile session for such areas

For hilly regions:

- Due to the vertical spread and terrain microplanning including maps should be made to reflect the ground realities
- Mobilization of beneficiaries will benefit from innovation. E.g. using available telecommunication /sending messages through school children returning home or through other agencies
- The use of alternate vaccine delivery options which may include pack animals or other modes of transport

- ANMs / health workers may have to stay overnight is some areas this will require extra vaccine carriers with extra ice packs to ensure maintenance of cold chain
- Immunization waste management – all waste will have to return to the centre for further management.

Steps to be followed by block/urban area MOs

1. Update the available list of all HRAs in the block/urban area every 3 months.
2. HRAs that are not included in the microplan should be immediately added, with appropriate revisions.
3. Review monitoring and coverage reports to identify issues in provision of immunization services with special emphasis on HRAs to include:
    a. Planned sessions not held
    b. Areas with low coverage
    c. Sessions with poor mobilization
    d. Status of due-list updating, especially for migrants and newborns
4. Revise session sites and timings, wherever required, in consultation with the ANM, ASHA, LW,AWW and community members.
5. Followup the progress regularly.

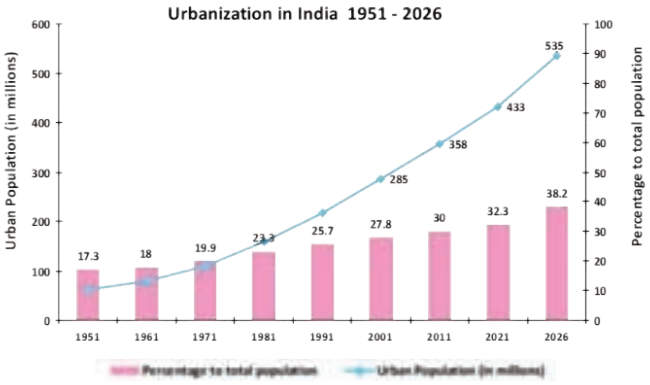
Steps to be followed by DIO

1. Review the maps and microplans from each block to check that all the HRAs are included in the ANM work-plan;
2. Review monitoring reports to identify issues;
3. Prioritize block/s with large number of HRAs;
4. Facilitate block level review and revision in priority blocks.

Any area with a risk for disease transmission or outbreak can be included as an HRA by MO.

Urban services

Virtually all population growth over the next 30 years will be in urban areas. By 2030, six out of every 10 people will be city dwellers, rising to seven out of 10 people by 2050. The trend for the past 50 years is for cities to grow horizontally in the form of urban sprawls, whether as suburbs or as peri-urban expansion.



India has been urbanizing rapidly in recent decades. It is estimated that the urban population will nearly double to reach 534 million by 2026.

Urbanization and its health impacts are not just an issue for with over 10 million residents. In fact, much of the urban population growth will occur in small and mid-sized cities. While large cities of developing countries will account for 20% of the increase in the world's population between 2000 and 2015, small and mid-size cities (less than 5 million) will account for 45% of this increase.

India is on the brink of an urban revolution with nearly 30% (about 300 million people) of the total population living in towns and cities. As per the United Nations projections, if urbanization continues at the present rate, 46% (about 500 million people) of the total population will be concentrated in urban regions of India by 2030. Migration is a major driving force for this rise in urban population. This exponential growth in urban population is leading to many problems such as increasing slums, decrease in standard of living in urban areas and contributes to environmental damage.

The definition of urban area as per the 2011 Census is as follows:

(a) All statutory places with a municipality, corporation, cantonment board or notified town area committee, etc.

(b) A place satisfying the following three criteria simultaneously:

i) a minimum population of 5000;

ii) at least 75% of the male working population engaged in non-agricultural pursuits;

iii) a density of population of at least 400 per sq km (1000 per sq mile).

An urban agglomeration is a continuous urban spread constituting of a town and its adjoining urban outgrowths, or two or more physically contiguous towns together and any adjoining urban outgrowths of such towns.

Characteristics of urban areas

- Ever expanding borders and peri-urban areas
- HRAs - higher number of construction and nomadic sites
- Manpower shortages.
- Large volume of transit / migrant population
- Unrecognized slums

Challenges to providing immunization in urban areas

Providing immunization services in urban areas have the following challenges:

1. Area demarcation
2. Accessibility
3. Inadequate infrastructure to support RI sessions
4. Multiple agencies / bodies for coordination

1. Area demarcation

Most of the urban areas in cities and towns are defined clearly with local urban bodies and infrastructure. However, the demarcation of areas among health workers is a challenge due to either overlapping administrative areas or expanding areas.

Area demarcation in urban areas is an investment that will be beneficial to all and is worth the effort. Except for the periphery or peri-urban parts, for the rest of the area it will be a onetime activity to develop maps and demarcate areas.

Source of maps in urban areas:

- Local urban bodies such as municipality / corporation / Dept. of urban development (see Unit 3, Fig 3.7)
- Simple hand drawn maps made by health workers (see Unit 3 Fig 3.8)
- Using google maps (Fig 12.3 and 12.4)
- Upgrading existing maps to clearly demarcate (Fig 12.2)

To clear up issues of area demarcation:

- Have copies of maps of each urban SC area prepared / copies made if already available
- Call for an ANM meeting and/or coordinated meeting with ICDS (if available)
- Bring out discussion on areas of confusion
- Clarify and if needed take decisions based on ease of access / rationality and finalize
- Plan for field verifications where boundaries are not well defined.

If there is an existing AWW/ASHA/link worker network, areas can be demarcated on the same lines. This makes it simpler to identify areas. Once this is done, ANM areas can be superimposed on the maps.

Fig 12.2 Urban PHC area polio map showing landmarks and upgraded to include migrant population mapping

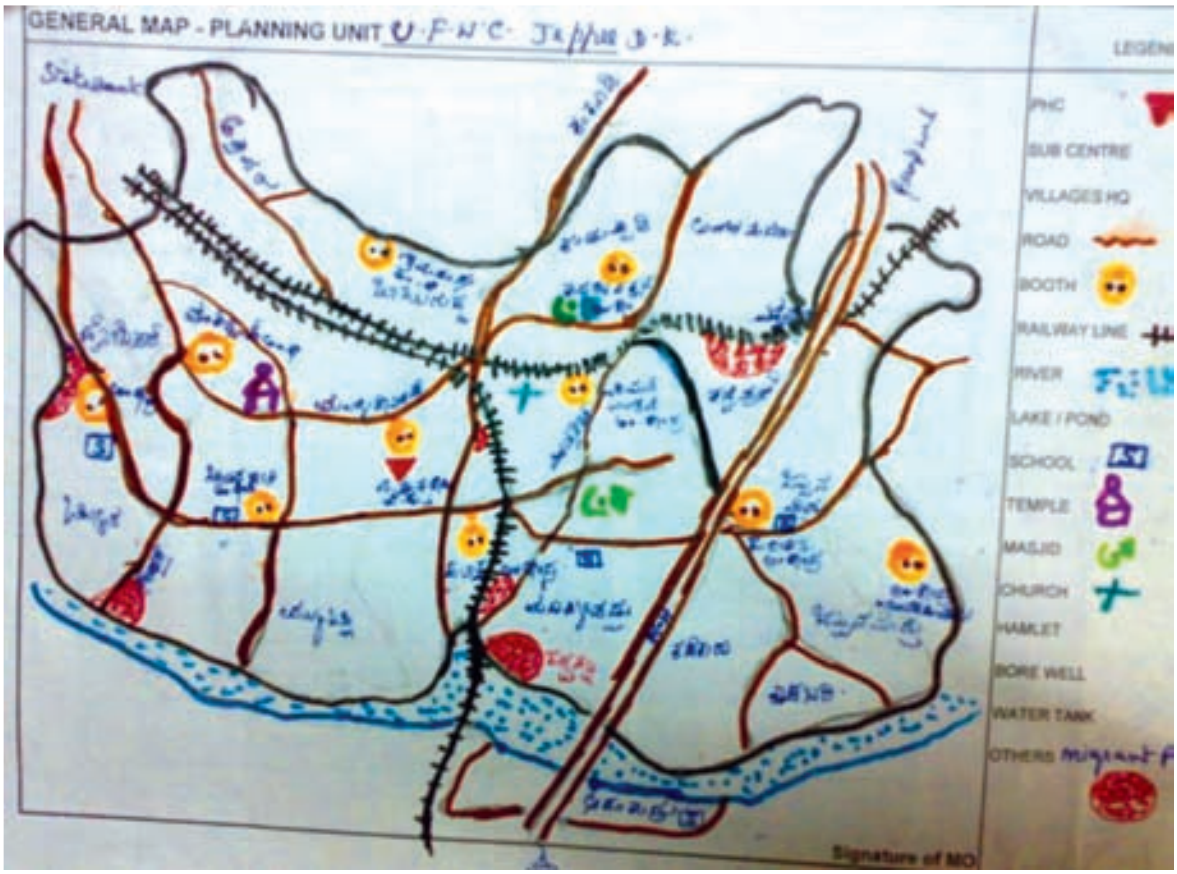
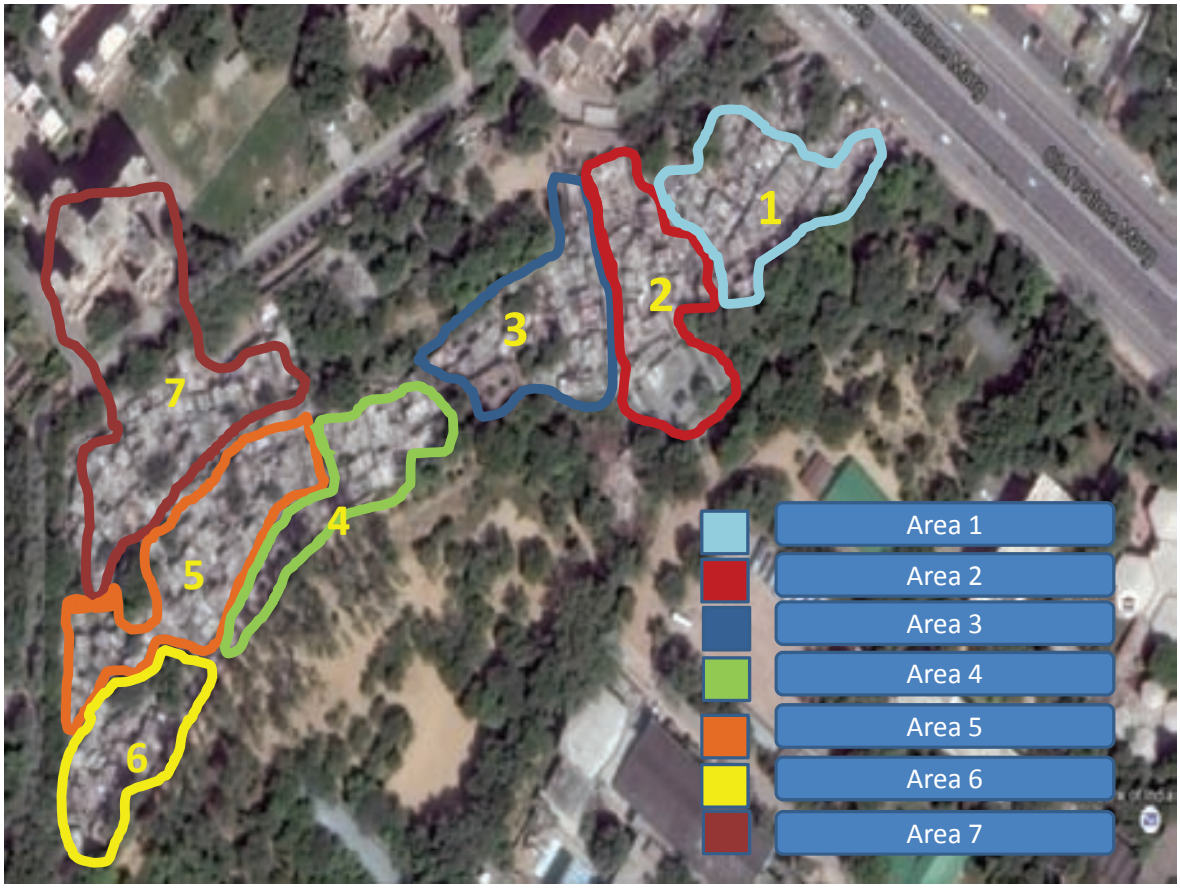


Fig 12.3 Urban PHC area map – screen grab from google maps

Fig 12.4 Urban SC area map – screen grab from google maps – with areas demarcated for ASHA/LW



Steps to use google maps

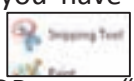
Using google maps may seem to be very complicated but for the purpose of getting a birds eye view of your area it is as simple as viewing a photograph on your computer.

Step 1 – go to www.googlemaps.com (generally the map identifies your IP address and shows the area you are located automatically)

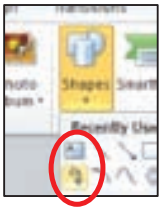
Step 2 – at the bottom left of the screen click on the "earth"  square so this will show you a satellite image rather than line map.

Step 3 –at the top left of the screen in the  "search google maps"enter the name of your area.

Step 4 – using the scroll button  on the mouse or the + and – icons  on the map zoom into any area on the map.

Step 5 – once you have identified the area you wish to use as a map, either use the "snipping tool"  from "ACCESSORIES folder" from Windows Menu to cut out the area you need OR press "PrtScn"  to get an screen image of the map. (For Mac computers use Command-control-shift-3)

Step 6 – paste the image on a PowerPoint slide or in a word document.



Step 7 – using the "insert shapes" option you can draw around an area using the "scribble" option (see Fig 12.4) OR take a print out and draw directly on the print out to demarcate areas.

Step 8 – save the file with area name and take a print out of the final map.

2. Accessibility

One of the challenges facing urban HWs is the large number of high-rise buildings, industrial areas and apartment complexes. Other challenges include narrow lanes, distance from local public transportation, high density and also access to flats and families living in them. The local solutions to providing services include:

- Using three or two wheelers to access narrow lanes;
- Involvement of industries – individually or through their organizations;
- Involvement of the apartment associations in planning and support to the HWs during visits;
- Involvement of local municipalities or corporations to issue instructions to all apartments or other associations in an area;
- Seeking support from local key influencers and community leaders;
- Support from local civil service organizations – Rotary, Lions, professional bodies, etc.

The MO with support from the local workers can discuss and develop locally specific solutions in such areas.

3. Infrastructure for providing RI services

Urban immunization services to be operationalized in the following way:

1. **"Same day, Same site, Same time" provision of services:** This should include:
    - All sites including Anganwadi centres, dispensaries, clinics and maternity homes in the public sector;
    - All NGOs engaged in providing health care in urban areas;
    - Any private institution /practitioner willing to support RI services.

2. **Urban outreach:** Expand the network of urban service provision points from the health facility:
    - Estimate size of population and frequency of sessions (same as with rural areas);
    - Set up a site in every urban slum, with one or two trained vaccinators, to provide immunization services on a regular (weekly or monthly) basis;
    - Use the same principles for creating a session plan and work plan (described in Unit 3) for the expanded network of urban outreach;
    - Plan location of sites, frequency and timing of service to suit the local population;
    - Establish contact with the local leader and obtain support;
    - Communicate time and dates of sessions to the community (using existing channels in the community like loudspeakers, religious or mothers' groups, etc.);
    - Ensure a regular uninterrupted service to gain the trust and cooperation of the community
3. **Communication:** Communication through ICDS workers, LWs,HWs, NGOs active in the area, print media, television and radio about the following:
    - The timing of local immunization services;
    - Local service delivery points;
    - The vaccines and schedule of immunization;
    - The benefits of immunization.

4. Multiple agencies / bodies for coordination

In addition to the Municipalities and Corporations there are many other departments that can be approached for support. E.g. Department of Telecommunications can be approached for help to send SMSs through government mobile network or from private sector under Corporate Social Responsibility / local FM radio stations to be involved or conduct special programs for immunization or Department of Transport can be approached to display banners or posters on government vehicles or to facilitate support from private transport companies.

Urban areas have the advantage of many non-governmental organisations working in the peripheries or in slums. These organizations can be approached for support or for active involvement in some areas where they have a strong presence.

Educational institutions can be approached directly or through the Department of Education for support. Nursing colleges can be approached for support during campaigns or in areas where there are vacancies in the urban health infrastructure. Involving multiple organisations requires careful planning and inter-sectoral coordination, consult with CMO/ DHO and DIO for guidance and support.

Refer to frame work for implementation of National Urban Health Mission for urban specific guidelines.

Notes:

UNIT-13

Financial planning in Immunization

Learning objectives

- *Understanding the process flow in Programme Implementation Plan (PIP) preparation under National Health Mission*
- *Overview of the Financial Management Report (FMR) codes and budget utility in immunization*

Key Contents

Financial planning in immunization

13

Financial management is an essential part of organizational management and comprises of more than just keeping accounting records. Financial management involves planning, organizing, controlling and monitoring financial resources in order to achieve organizational objectives.This unit will give you an overview of sources of funding and focuses on the detials of the program implementation plan and its norms.

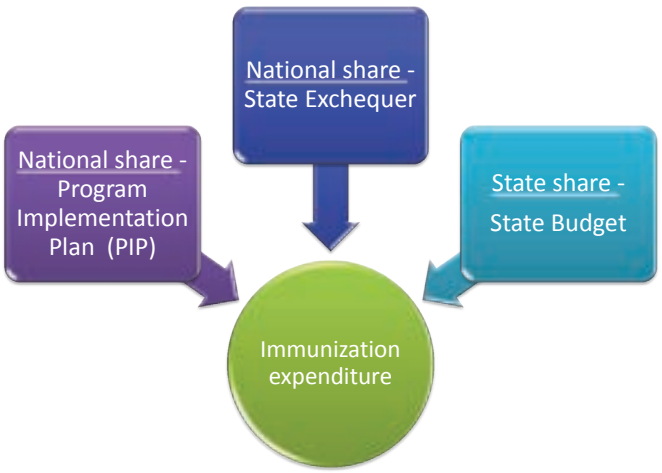
Sources of funding:

The state financial resource for health is made up from three sources:

- State Budget
- State Exchequer
- Program Implementation Plan (PIP)

The state budget is the finances allocated by the state in its annual budget and reflects the state's contribution. The state exchequer source refers to funds received by the state from the centre through the Ministry of Finance. These are amounts disbursed for regular activities and represent the centres contribution. The PIP source refers to the flexible funds proposed by the states as per the states PIP reflecting the states proposed needs for funds from the centre in addition to those committed. These funds are committed to the state by the centre through the Recording of Proceedings (ROP).

Fig. 13.1. Source of funds



State Programme Implementation Plans (PIPs) are a proposal of the overall annual activities and budgetary requirements based on which the state health system will function (Including immunization expenditure).

PIPs are made up of five parts, namely: PART I: NRHM plus RMNCH+A (including immunization), PART II: NUHM; PART III: Disease Control Programmes; PART IV: Non-communicable diseases including injury and trauma; and PART V: Infrastructure Maintenance. The MoHFW supports the states immunization programme through the National Health Mission under Part I as mentioned above.

Process of PIP:

The purpose of the PIPs is to make budgetary proposals for both regular as well as need based activities.

The block medical officer with support from the Block Program Management Unit provides inputs for the DHAP in consultation with the District Program Management Unit and district health officials. The DHAPs are a complete action plan which includes budgeting of all health programs including immunization. The DPMU will review the district action plan before submitting it to the District Health Society which under the chairmanship of the District Magistrate will review and finalize it for submission to the state.

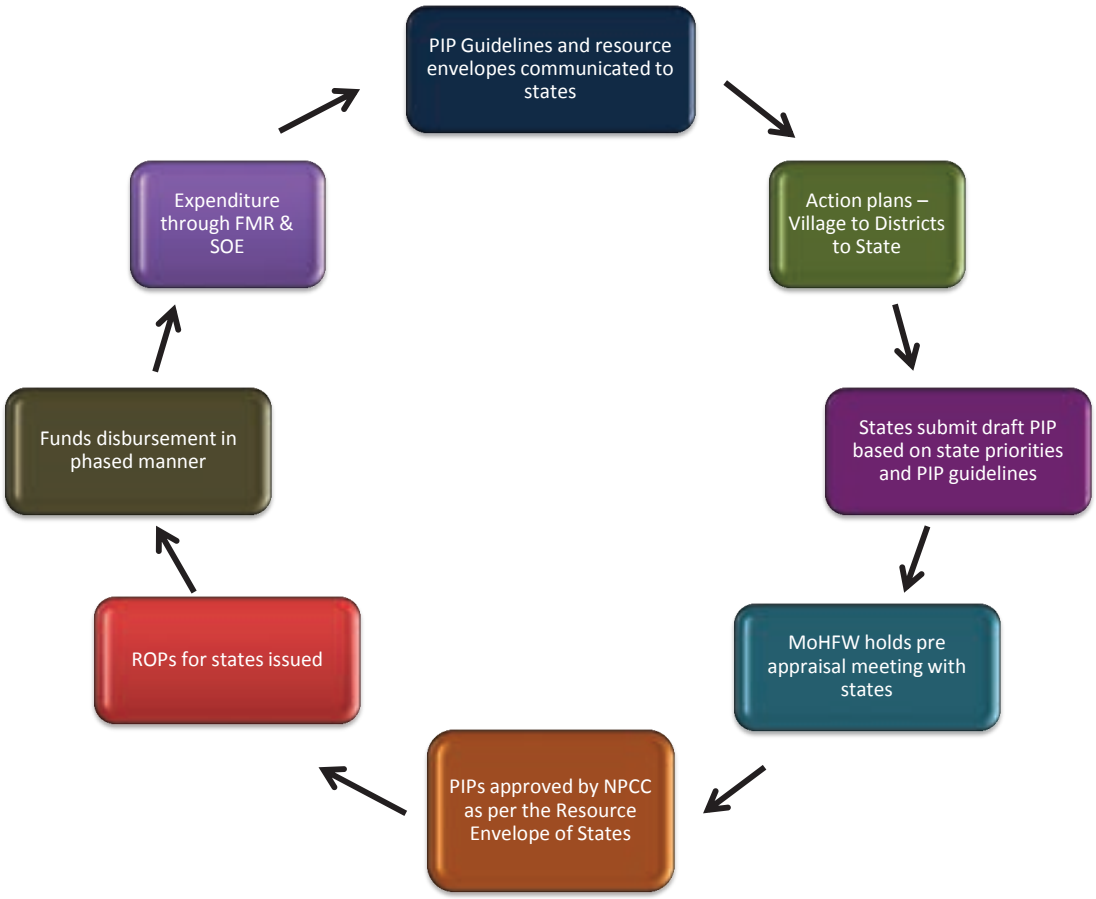
The State Program Management Unit (SPMU) with officials from the Directorate and Mission Director review the action plans which are then sent to the State Health Society where, under the chairmanship of the Principal Secretary they are finalized. The Executive Committee (EC) of the State Health Society can examine this plan and make appropriate modifications based on the states priorities and resource envelope. The State's PIP is consolidated from DHAPs.

The states submit their draft PIPs to the centre where the MoHFW conducts pre-appraisal meetings with the states. The PIP is then appraised by the National Programme Coordination Committee (NPCC), chaired by the Mission Director with officials from various program divisions in MOHFW and with state participation.

Once approved the states are issued with a Record of Proceedings (ROP). Funds from the centre are disdursed to the states in a phased manner.

The State Health Society implements the approved plan, with governance and oversight exercised by the Governing Board and the State Health Mission, in association with District Health Society (DHS). All expenditures should be made using FMR codes and followed by issuance of SOE. See fig. 13.2 for proccess flow of PIP.

Fig. 13.2. Process flow of PIP



The role of the Medical Officer is crucial for the preparation of village & block health action plans, which form the basis for making DHAPs which are finally merged into the state PIPs.

Programme Implementation Plan - Immunization

(Part C, Financial Management Report (FMR) C.1 to C.6)

Under the National Health Mission (NHM), financial support for various components of immunization is given to all states at all levels to strengthen the Immunization Programme under part C. These are further budgeted under FMR C.1 to C.6 of the PIP.

C.1 Routine Immunization strengthening project (Review meetings, mobility support, printing, outreach services, innovations, etc.)

C.2 Salary of contractual staff

C.3 Training under Immunization

C.4 Cold chain maintenance

C.5 ASHA incentive for full immunization

C.6 Pulse polio operational cost

Most of the activities are covered under C.1 component, which is further sub classified into FMR c.1.a to c.1.v.

There are certain activities which may not fit into part C like additional human resources or budget for IEC/ BCC etc. These can be budgeted under part A/ part B of PIP.

Others (Part A and B) – support for HR and IEC/BCC:

- For other HR related to immunization (technical staff), e.g. refrigerator mechanics
- For IEC/BCC activities related to immunization.

New Activity

The State should provide a brief description, rationale, data/ background information required to appraise the proposal and budget break-up for each new activity

Innovation

Up to a maximum of 10 % of the health systems strengthening budget (Mission Flexi pool and NUHM) may be proposed for innovations which is a part of the overall budget envelope.

Budget Envelope:

As per 2016-17 guidelines, the NHM funding between the Centre and States would be in the ratio of 60:40 (for all states except NE and 3 Himalayan States), 60 from Central government and 40 from State.

States are requested to estimate the resource envelope accordingly. However, FMG communicates the resource envelope separately.

Note:

Budgetary : this refers to norms to be used as guidance for preparing PIP.

Expenditure : this refers to norms to be used while spending as per GoI norms.

Details of PIP Norms

FMR Code	Activities	Purpose	Norms *	Level
C.1				
c.1.a	Mobility Support for supervision for district level officers.	**Budgetary:** Mobility budget for the entire year is provided to the districts for undertaking monitoring and supervision of Routine immunization programme in the district. The mobility support is provided only for the district level officers.	Rs.2,50,000/ Year / district level officers.	District
c.1.b	Mobility support for supervision at state level	**Budgetary:** Mobility budget for the entire year is provided for undertaking monitoring and supervision of Routine immunization programme in State Level.	Rs. 1, 50,000 per year.	State
c.1.c	Printing and dissemination of Immunization cards, tally sheets, monitoring forms etc.	**Budgetary:** The funds allocated under this head are for printing and dissemination of Immunization cards, etc.	Rs. 10 / beneficiary	State/ district
c.1.d	Support for Quarterly State level review meetings of district officer	**Budgetary:** Funds allocated for conducting quarterly State level review meetings of district officer for maximum of 3 persons per meeting	Rs. 1250/ per participant/day for 3 persons (CMO/ DIO/Dist. Cold Chain Officer)	District

FMR Code	Activities	Purpose	Norms *	Level
c.1.e	Quarterly review meetings exclusive for RI at district level with one Block MOs, CDPO, and other stake holders	**Budgetary:** Funds allocated for conducting quarterly review meetings at district level for maximum of 5 persons per meeting	Rs. 100/per participant for meeting expenses for 5 persons (lunch, Organization expenses)	Block
c.1.f	Quarterly review meetings exclusive for RI at block level	**Budgetary:** Funds allocated for conducting quarterly review meetings at block level wherein honorarium is paid to ASHA	Rs. 50/ per person as honorarium for ASHA (Travel) and Rs. 25/person at the disposal of MO-IC for meeting expenses (refreshment, stationary and misc. expenses)	Block
c.1.g	Focus on slum & underserved areas in urban areas/alternative vaccinator for slums	**Expenditure:** In case the ANM is not available or appointed, an alternate vaccinator can be hired for these session sites.	Hiring of ANM@ Rs 450/session for four session/month/ slum of 10000 population and Rs. 300/- per month as contingency per slum i.e. Rs. 2100/- per month per slum of 10000 population	District/ Block
c.1.h	Mobilization of children through ASHA or other mobilizers	**Expenditure:** Funds @ 150/- per session for mobilization of Pregnant Women and targeted children for immunization as per the micro-plan are to be paid preferably to ASHA.	Rs. 150 per session	District/ Block

c.1.i	Alternative vaccine delivery in hard to reach areas	**Expenditure:** Rs. 150 per session for Hilly terrains and geographically hard to reach areas	Rs. 150 per session	District/ Block
c.1.j	Alternative Vaccine Delivery in other areas	**Budgetary:** Rs. 75 per session for RI session in other areas	Rs. 75 per session	District/ Block
c.1.k	To develop micro plan at sub-centre level	**Budgetary:** Rs. 100/- paid per subcentre to familiarize the health managers with the steps in developing a comprehensive and equitable micro plan	@ Rs 100/- per subcentre	Block
c.1.l	For consolidation of micro plans at block level	**Budgetary:** Rs.2000/- for each district and Rs.1000/- for each block or PHC for the purpose of consolidation of micro plans	Rs. 1000 per block/ PHC and Rs. 2000 per district	District/ Block
c.1.m	POL for vaccine delivery from State to district and from district to PHC/CHCs	**Budgetary:** The POL is provided for transport and distribution of vaccine from State to district and then from district to PHC/CHCs	Rs1,50,000/ district/ year	State/ District
c.1.n	Consumables for computer including provision for internet access for RIMs	**Budgetary:** The funds is earmarked for petty consumable items for each district	@ 400/ - month/ district	District

FMR Code	Activities	Purpose	Norms *	Level
c.1.o	Red/Black plastic bags etc.	**Budgetary:** Fund allocated for procurement of red and black plastic bags for containment of medical waste after post RI immunization session	Rs. 3/bags/session	District/ Block
c.1.p	Hub Cutter/ Bleach/Hypochlorite solution/ Twin bucket	**Budgetary:** For cutting the AD syringe at the hub immediately after administering the injection at the session site. Similarly other items are required for disinfecting medical/bio waste	Rs. 1200 per PHC/ CHC per year	District/ Block
c.1.q	Safety Pits	**Budgetary:** Funds allocated for the disposal of used needles and syringes that are loose	Rs. 5250/pit	District/ Block
c.1.r	State specific requirement	**Expenditure:** This head is for any innovation under Immunization. Normally it should not exceed 10% of the total resource envelope under Part C.		At all levels
c.1.s	Teeka Express Operational Cost	**Expenditure:** Funds allocated for providing operational cost for Teeka Express.		State (as a pilot in only 5 states)
c.1.t	Measles SIA operational Cost	**Expenditure:** Funds allocated for providing operational cost for Measles SIA		Allocat-ed by GOI

c.1.u	JE Campaign Operational Cost	**Expenditure:** Funds allocated for providing operational cost for JE SIA		Allocated by GOI
c.1.v	Others	**Expenditure:** This head is basically for any other Immunization activity which could not be covered under any other head. Alternatively, this head can also be used for innovation in the field of Immunization		At all levels
C.1-Sub Total				
C.2		**Expenditure:**		
C.2.1	Computer Assistants support for State level	Funds allocated for payment of salary to Computer Assistant at State level		State
C.2.2	Computer Assistants support for District level	Funds allocated for payment of salaries to Computer Assistants at District level		District
C.2.3	Others(service delivery staff)	Funds allocated for payment of salaries to service delivery staff , if any		At any level
C.2-Sub Total				

FMR Code	Activities	Purpose	Norms *	Level
C.3				
C.3.1	District level Orientation training including Hep B, Measles & JE(wherever required) for 2 days ANM, Multi-Purpose Health Worker (Male), LHV, Health Assistant (Male/Female), Nurse Midwives, BEEs & other staff	**Expenditure:** Fund allocated for conducting 2 days training for ANM, Multi-Purpose Health Worker (Male), LHV, Health Assistant (Male/ Female), Nurse Midwives, BEEs & other staff	As per revised norms for trainings under RCH** (See page 286)	
C.3.2	Three day training including Hep B, Measles & JE(wherever required) of Medical Officers of RI using revised MO training module)	**Expenditure:** Fund allocated for conducting 3 days training for Medical Officers of RI		
C.3.3	One day refresher training of district Computer assistants on HIMS and immunization formats	**Expenditure:** Fund allocated for conducting 1 day refresher training of Computer assistants on RIMS/HIMS and immunization formats		
C.3.4	Two days cold chain handlers training for block level cold chain handlers by State and district cold chain officers	**Expenditure:** Fund allocated for conducting 2 days training of cold chain handlers at block level and district level		

C.3.5	One day training of block level data handlers by DIOs and District cold chain officer	**Expenditure:** Fund allocated for conducting 1 day training of block level data handlers by DIOs and District cold chain officer		
C.3.6	Others	**Expenditure:** Head reserved for any other training to be conducted under Immunization which could not be covered under the above mentioned training heads		At all levels
C.3-Sub Total				

C.4				
C.4	Cold chain maintenance	**Budgetary:** Funds are allocated for cold chain maintenance at District Level, PHC and CHC	Rs.750/PHC/CHCs per year District Rs.15000/year	State/ district
C.5				
C.5	ASHA incentive for full Immunization	**Expenditure:** The ASHAs will receive performance-based incentives for full Immunization of Rs.150/- which is paid in two years.	Rs 100 per child for full immunization in first year	District/ block
			Rs 50 per child for ensuring complete immunization up to 2nd year of age	
Total ROUTINE IMMUNIZATION				

FMR Code	Activities	Purpose	Norms *	Level
C.6	Pulse Polio Operational Cost (Tentative)	**Expenditure:** Funds allocated for providing operational cost for Pulse Polio Immunization Programme	Allocated by GOI	National level
Total				
A.8	Human Resources	**Expenditure:** Funds allocated for payment of salary to technical staff e.g. refrigerator mechanics	Any new or ongoing positions	State/ district
A.10	Program Management	**Expenditure:** Funds allocated for payment of salary to other staff related to Immunization	Any new or ongoing positions	State/ district
B.10	IEC-BCC NHM	**Expenditure:** Funds allocated for IEC / BCC activities related to Immunization		State / district

Other incentives for ASHAs under NHM

c.1.r/ c.1.v	ASHA incentive for due list preparation	**Expenditure:** For monthly updating of due list of beneficiaries under immunization	Rs 100/month	District
	ASHA incentive for house to house survey	**Expenditure:** For conducting house to house survey bi-annually	Rs 100 twice in a year	District

Please note that under Immunization most of the activities are normatic, and is to be budgeted as the multiplication factor of the mentioned norm. However, there is flexibility provided to the state under innovations head (c.1.r & c.1.v). States should also refer to the conditionality mentioned in the ROP. These conditionalities are provided for C.4 under cold chain maintenance funds, wherein the state may propose for re-appropriation of funds within part C from MoHFW, in case the funds are exhausted as per the actual expenditure. Also, the norms for alternate vaccine delivery are for budgetary purpose only and need based support should be provided for vaccine delivery as per local situation.

** Revised training norms under RCH (as per GOI letter D.O.No. A-11033/101/07- Trg, dated 28th Jan, 2015)

S No.	Budget Head	Final Proposed Norms
1.	DA to Group A equivalent Participants	Rs 700/- per day
2.	DA to Group B, C & D or equivalent participants	Rs 400/- per day
3.	Honorarium/ per diem to Group A & B equivalent participants	Rs 500/-
4.	Honorarium/ per diem to Group C & D or equivalent participants	Rs 300/-
5.	TA to Group A,B,C & D or equivalent participants	TA rules of Central/ State Govt. (whichever applicable)
6.	Hiring of Vehicle by Trainer	State norms of hiring of vehicle will apply
7.	Honorarium to Guest faculty at District and sub-district, State/Regional/National level (Experts/Specialists of area, faculty of medical college, centre of excellence, program officer dealing with program)	Rs 600 (district) Rs 1000 (State) & 1500 (National Level) per day^
8.	Honorarium to professional/ Faculty/ Trainers from Medical Colleges^^^ for monitoring of trainings in field as Observer • Checklist • Handholding the training • Action taken decision	District to Block- Rs 500/-, State to District/Block 1000/- and National to State/ District/ Block level – 1500/- (one training in a day with complete observer report) Report to be copied to respective concern division, State headquarters/ SIHFW and in Ministry (MOHFW)
9.	Food to participants (breakfast, working tea & lunch & Dinner for residential trainings)	Rs 250/- participants/day at district level and 350 at State and 400 at National level (subject to actual)
10.	Accommodation for Trainers where residential facility is not available	Up to Rs 3000 (district level) Rs 4000 (at state level), & 5000 (National Level) per day (subject to actual). Above are the maximum limits and subject to receipt.

11.	Accommodation for participants where hostel facility is not available	Up to Rs 1000 (district level) Rs 2000 (at state level), & 3500 (National Level) per day (subject to actual). Above are the maximum limits and subject to receipt.
12.	Incidental expenses (Photocopy, job aids, flip charts etc)	Rs 300/- participants/day (subject to actual)^^
13.	Venue hiring (in absence of training institute)	Rs 5000/- per day at district/block level per day Rs 10,000 per day at State level per day and Rs 20,000 per day at National level per day^^
14.	Institutional overhead for the use of institutional facilities	15% of total training expense

^ Subject to two lectures/Guest faculty/per day

^^Subject to keeping it minimum

^^^In principle, honorarium to impart training/taking sessions is not to be paid to any type of in-house faculty from NIHFW/SIHFW/ DTC/ HFWTC/ ANMTC/ DTT/ HTT or similar institute of training since training is their defined job.

The Medical Officer may refer to the link http://nhm.gov.in/nrhm-in-state/state-program-implementation-plans-pips.html, for updated guidelines and ROPs of all states/ UTs at MoHFW National Health Mission website.

Medical Officer's role	Activity	How
Providing inputs during preparation of the block & district health action plans.	1. Ensuring all activities related to routine immunization are included in BHAP (Block Health Action Plans) of PIPs. 2. MOIC can share his ideas with the District Immunization Officer (DIO) during preparation of District Health Action Plans for adding any need based innovation.	During preparation of BHAP for PIPs, interact with BPMs (Block Programme Manager), NHM & DPMs (District Programme Manager)
Utilization of Budget provided to the state as per ROP	1. A Medical officer can view activities under state ROP which has been approved for his state in a particular financial year and accordingly incur expenditure on various activities. 2. The utilization is to be shared with the district regularly.	ROP can be viewed at NHM website of GOI or can be taken from SPMU/ DPMU.
Any additional requirement can be projected in the Supplementary PIP.	Are all activities covered under ROP? If not, you may propose a new activity within your budget envelope, explaining in a short write-up, why you need this and may propose under supplementary PIP.	Any time after the issue of final ROP.

Notes:

Further reading and links

This unit contains a list of links to some of the information that supports this module. Some of the links provided are technical information which may not have been mentioned in this manual but will be useful if you wish to read further on some topics or if you need a broader perspective. Happy reading!!

Unit 1 – Introduction

- Comprehensive Multiyear Plan 2013–2017

  https://www.itsu.org.in/Comprehensive-Multi-year-Plan

- Understanding global evolution of EPI

  http://www.who.int/immunization/programmes_systems/en/

- Information on global immunization policies and strategies

  http://www.who.int/immunization/programmes_systems/policies_strategies/en/

- Global Vaccine Action Plan

  http://www.who.int/immunization/global_vaccine_action_plan/GVAP_foreword.pdf?ua=1

- Sampling methods in estimating immunization coverage
  - http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index1.html
  - http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/index2.html

Unit 2 – National Immunization Schedule

- How vaccines are introduced in India – National Vaccine Policy

  http://mohfw.nic.in/showfile.php?lid=900

- Detailed technical information on vaccines – WHO: Vaccine Position Papers

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

- For National Technical Advisory Group on immunization recommendations

  visit www.mohfw.nic.in. Use search function on webpage; key in NTAGI. Meeting minutes and recommendations are available.

Unit 4 – Cold chain and logistics management

- National effective vaccine management assessment 2013
  http://unicef.in/Uploads/Publications/Resources/pub_doc86.pdf
- Article on best practices in intradermal, subcutaneous and intramuscular injections –http://www.who.int/bulletin/volumes/81/7/Hutin0703.pdf?ua=1
- Validation of the shake test for detecting freeze damage to adsorbed vaccines
  http://www.who.int/bulletin/volumes/88/8/08-056879/en/

Unit 5 – Safe injections and waste disposal

- Central Pollution Control Board for details on BMW rules
  http://www.cpcb.nic.in/Bio_medical.php
- Biomedical Waste Management and Handling Draft Rules 2015 amendments
  http://www.moef.nic.in/sites/default/files/Final_vetted_BMW%20Rules%202015.pdf
- Injection safety information
  http://www.who.int/injection_safety/en/

Unit 6 – Adverse events following immunization

- Information sheets on reaction rates of selected vaccines
  www.who.int/vaccine_safety/initiative/tools/vaccinfosheets/en/

Unit 7 – Sources and use of data

- Immunization coverage estimation
  http://www.who.int/immunization/monitoring_surveillance/routine/coverage/en/
- Using data to improve immunization – global learning
  http://www.who.int/management/UsingDataToImproveServiceDeliveryImmunization.pdf

Unit 8 – Supervision and monitoring

- NIHFW module on supervision and monitoring
  http://www.nihfw.org/pdf/nchrc-publications/module%20-%204.pdf

Unit 9 – Communication for behaviour change

- Information on vaccine hesitancy
  http://www.who.int/mediacentre/news/releases/2015/vaccine-hesitancy/en/

Unit 10 – Vaccine Preventable Diseases and VPD surveillance

- Epidemiology and Prevention of Vaccine-Preventable Diseases; The Pink Book: Course Textbook– 13th Edition (2015) available at:

  http://www.cdc.gov/vaccines/pubs/pinkbook/index.html

- WHO – recommended standards for surveillance of selected vaccine-preventable diseases available at:

  http://apps.who.int/iris/bitstream/10665/68334/1/WHO_V-B_03.01_eng.pdf?ua=1

- Field guide for AFP surveillance

  http://www.searo.who.int/entity/india/topics/poliomyelitis/Field_guide_for_Surveillance_of_Acute_Flaccid_Paralysis_3rd_edition.pdf

- Measles outbreak investigation field guide

  http://www.searo.who.int/india/topics/measles/Measles_surveillance_and_outbreak_investigation_field_guide_2005.pdf

Unit 11 – Capacity building of health functionaries in immunization

- Module on ASHA guidelines including roles and responsibilities

  http://nrhm.gov.in/images/pdf/communitisation/asha/Orders-Guidelines/Guidelines_for_Community_Processes_2014_English.pdf

Unit 12

- National Framework for NUHM implementation

  http://www.nrhm.gov.in/images/pdf/NUHM/Implementation_Framework_NUHM.pdf

- PIP guidelines for NUHM

  http://www.nrhm.gov.in/images/pdf/NUHM/NUHM_PIP_Guidelines_2013-14.pdf

Unit 13– Budgeting and finance

- E-Training Module on “PIP/Budget preparation”

  http://mohfw.nic.in/WriteReadData/l892s/8514370340PIP-%20Budget%20%20Module.pdf

Notes:

FAQ Contents

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Frequently asked questions

General queries on immunization

What is immunization?

Immunization is the process of administering vaccines for the development of the body's protective response.

How do vaccines work?

Vaccines contain either weakened or killed versions of viruses or bacteria. These are also called "antigens". Once introduced, they stimulate the immune system in the body to produce "antibodies" against the disease causing organisms. Each vaccine provides immunity against a particular disease; therefore, a number of vaccines are administered to children and women to protect them from many vaccine-preventable diseases.

Vaccines also vary in **efficacy,** according to the age at which the vaccine is administered and the number of doses given. Presence of maternal antibodies in early infancy interferes with the antibody production. For example, measles vaccine is 85% effective at the age of 9 months and 95% at 1 year.

What are the different types of vaccines?

There are four main types of vaccines:

Live attenuated vaccines (LAV), inactivated or killedvaccines, Subunit or Recombinant and Toxoid (Inactivated toxins).

Live attenuated vaccines are derived from disease-causing viruses or bacteria that have been weakened under laboratory conditions. They replicate in a vaccinated individual, but because they are weak, they cause either no disease or only a mild form of the disease. Examples of live vaccines are BCG, measles, Rotavirus, JE and oral polio vaccine.

Inactivated or killed vaccines are produced by viruses or bacteria which are inactivated with heat or chemicals. They cannot grow in a vaccinated individual and so cannot cause the disease. They may not always induce an immune response, requiring multiple doses for full protection as well as booster doses to maintain immunity. Use of adjuvants enhances response to non-live vaccines. Examples are whole-cell (pertussis), fractional polysaccharide-based conjugate (Haemophilusinfluenzae type b or Hib) and IPV.

Subunit or Recombinant vaccines are produced by inserting genetic material from a disease-causing organism into a harmless cell, which replicates the proteins of the disease-causing organism. The proteins are then purified and used as vaccine. Example is hepatitis B vaccine.

Toxoid vaccines are made from a toxin that has been made harmless but which elicits an immune response against the toxin. Toxoid vaccines are safe because they cannot cause the disease they prevent and there is no possibility of reversion to virulence. The vaccine antigens are not actively multiplying and do not spread to unimmunized individuals. Examples are Tetanus toxoid and diphtheria toxoid.

What is Herd immunity or population immunity?

A population with a high number of members with immunity to a particular disease or pathogen may give protection from that infection to the small number of its non-immune members. This is as a result of there being too few susceptible persons in the "herd" for the infection to circulate. This is known as "herd immunity or population immunity."

Immunization of children can go well beyond saving individual lives. It can also help in preventing large-scale outbreaks of diseases as well as keeping a disease under control (or sometimes even eliminated or eradicated e.g. polio) in the area. You should always strive to achieve the highest percentage of coveragepossible for all doses of the vaccines for disease control to be effective.

How are vaccines introduced in UIP and how are immunization schedules decided?

The decision on inclusion of vaccines and the schedules is taken by the National Technical Advisory Group on Immunization (NTAGI). It is based on recommendations of the Strategic Advisory Group of Experts (SAGE)as well as WHO-recommended schedules and vaccine position papers.

Why are vaccines administered at specific sites?

Vaccines are administered at specific sites to maintain uniformity and for helping surveyors in verifying the receipt of the vaccine. e.g BCG on left upper arm.

Why should there be a minimum gap of 4 weeks between two doses of a vaccine?

There should be a minimum of 4 weeks gap between two doses because decreasing the interval between doses may not achieve optimal antibody production required for protection.

How long can a bottle of Vitamin A be used, once opened?

A Vitamin A bottle, once opened, should be used within 8 weeks. Write the date of opening on the bottle. It must be kept away from direct sunlight.

What is the dose of Zinc to be used along with ORS in the treatment of diarrhea?

The dose of zinc for infants aged 2–6 months is 10 mg of dispersible tablet in expressed breast milk for 14 days. For children 6 months to 5 years of age, it is 20 mg of dispersible tablet for 14 days.

Queries on immunization schedule

If a child is brought late for a subsequent dose, should one re-start with the first dose of a vaccine?

No, do not restart the schedule again; pick up where the schedule was left off. For example, If a child who has received BCG, penta1 and OPV1 at 5 months of age returns at 11 months of age, then vaccinate the child with penta2, OPV2 , measles, Rotavirus vaccine (where applicable) and JE (where applicable).

If a child who has never been vaccinated is brought in at 9 completed months but before 12 completed months of age, then, can all the due vaccines be given to a child on the same day?

Yes, all the due vaccines can be given during the same session but at recommended injection sites, using separate AD syringes. It is safe and effective to give BCG, penta, OPV,IPV, measles ,RVV (where applicable), JE (where applicable) vaccines and Vitamin A at the same time to a 9-month-old child who has never been vaccinated.

If more than one injection has to be given in one limb then ensure that the distance between the two injection sites is at least 1 inch apart.

If a child who has never been vaccinated is brought in immediately after completing 12 months of age, (beyond one year) what vaccines would you give?

As per the national immunization schedule this child need not be given – BCG, Hepatitis B, Rotavirus, Penta and IPV.

This child should be administered DPT 1, OPV 1, Measles 1, JE 1(if applicable) and also Vitamin A solution.

The subsequent doses of DPT and OPV should be given at an interval of 4 weeks. Administer Measles 2, JE 2 (If applicable), Vitamin A and a booster dose of DPT at recommended age as per national immunization schedule.

Which vaccines can be given to a child between 1 and 5 years of age who has never been vaccinated?

Such a child will not receive BCG, Hepatitis B, Rotavirus, Penta and IPV.

Give DPT1, OPV1, measles 1, JE 1 (where applicable) and 2ml of Vitamin A solution.

Then follow with the second and third doses of DPT and OPV at 1 month intervals. Give measles 2 as per the schedule/1 month later*. Give booster dose of OPV/DPT at a minimum of 6 months after administering OPV 3/DPT 3. Also give Vit A at 6 months interval till 5 years of age.

***Note:** In an unvaccinated child more than **16 months** of age remember the interval between Measles 1 and Measles 2 is 4 weeks and for JE 1 and JE 2 (where applicable) the interval is **3 months.**

Which vaccines can be given to a child between 5 and 7 years of age who has never been vaccinated?

Give of DPT 1, 2 and 3 at 1 month intervals. Give booster dose of DPT at a minimum of 6 months after administering DPT 3 up to the age of 7 years.

Why are the DPT, HepB (birth dose), IPV and pentavalent vaccines given in the anterolateral mid-thigh and not the gluteal region (buttocks)?

This is done to prevent damage to the sciatic nerve. Moreover, vaccine deposited in the fat of the gluteal region does not invoke the appropriate immune response.

Vaccine-specific FAQs

BCG

Why is BCG given only up to 1 year of age?

Most children acquire natural clinical/sub-clinical tuberculosis infection by the age of 1 year. This protects against severe forms of childhood tuberculosis, e.g. TB meningitis and miliary disease.

If no scar appears after administering BCG, should one re-vaccinate the child?

There is no need to re-vaccinate the child even if there is no scar.

Why do we give 0.05 ml dose of BCG to new borns (below 1 month of age)?

This is because the skin of newborns is thin and an intra-dermal injection of 0.1 ml may break the skin or penetrate into the deeper tissue and cause local abscess and enlarged axillary lymph nodes. Dose of 0.05 ml is sufficient to elicit adequate protection.

Hepatitis B

What is hepatitis?

Hepatitis is an inflammation of the liver, most commonly caused by a viral infection. There are five main hepatitis viruses, referred to as types A, B, C, D and E. These five types are of the greatest concern because of the burden of illness and death they cause and the potential for spread of outbreaks and epidemics. In particular, types B and C lead to chronic disease in hundreds of millions of people and, together, are the most common cause of liver cirrhosis and liver cancer.

Hepatitis A and E are typically caused by ingestion of contaminated food or water. Hepatitis B, C and D usually occur as a result of parenteral contact with infected body fluids. Common modes of transmission for these viruses include receipt of contaminated blood or blood products and using contaminated equipment in invasive medical procedures. For hepatitis B, the causes are transmission from mother to baby at birth, from family member to child and also by sexual contact.

Acute infection may occur with limited or no symptoms, or may include symptoms such as jaundice (yellowing of the skin and eyes), dark urine, extreme fatigue, nausea, vomiting and abdominal pain.

What is the "birth dose" of hepatitis B?

This refers to the dose given within 24 hours of birth. A child vaccinated with Hep B after more than 24 hours of birth is not considered to have received the birth dose.

Why is the birth dose of hepatitis B vaccine given only within 24 hours of birth?

The birth dose of hepatitis B vaccine is effective in preventing peri-natal transmission of hepatitis B only if given within the first 24 hours.

Why is hepatitis B vaccine given only till 1 year of age?

Hepatitis B vaccine is given till 1 year of age because infections during first year of age have a 90% chance of becoming chronic as compared to 30% during 1–5 years and 6% after 5 years. Persons with chronic infection have 15–25% risk of dying prematurely due to HBV-related liver cirrhosis and cancer.

Pentavalent Vaccine

What is pentavalent vaccine?

Pentavalent vaccine is a vaccine that contains five antigens (diphtheria + pertussis + tetanus+ hepatitis B + Haemophilusinfluenzae type b).

How is pentavalent vaccine more advantageous?

- The addition of Hib vaccine provides protection against Haemophilus Influenzae Type b related diseases (bacterial meningitis, pneumonia and others)
- The number of injections administered under UIP during the first year of life reduces from ten to seven (not including IPV).
- It does not require reconstitution.

What is the schedule for pentavalent vaccine?

As per the National Immunization Schedule, three doses of pentavalent vaccine are to be administered. The first dose is given only after a child is 6 weeks old. The second and third doses are given at 10 and 14 weeks of age, respectively. There is no booster dose recommended under UIP

Note: Pentavalent vaccine should be started for any child aged more than 6 weeks and can be started upto 1 year of age.

For what reasons should a child not be given pentavalent vaccine?

- Age – a child below 6 weeks of age should not be given pentavalent vaccine.
- Vaccination history – a child whose vaccination schedule has been initiated with DPT/hepatitis B vaccine will continue to receive subsequent doses of DPT/hepatitis B and not pentavalent vaccine.
- Severe allergic reactions – although serious side effects have not been reported, a child who has had a severe reaction to pentavalent vaccine earlier should not be given another dose.
- Children with moderate or severe acute illness should not be administered pentavalent vaccine until their condition improves. Minor illnesses, however, such as upper respiratory infections (URI) are not a contraindication to vaccination.

What vaccine will be given to a child who has received at least one dose of pentavalent vaccine before his/her first birthday?

If a child has received at least one dose of pentavalent vaccine before his/her first birthday, the child should be administered the due pentavalent doses at a minimum interval of 4 weeks, at the earliest available opportunity.

What are the common side-effects of pentavalent vaccine?

Pentavalent vaccine has not been associated with any serious side-effects. However, redness, swelling and pain may occur at the site where the injection was given. These symptoms may appear the day after the injection is given and last from 1 to 3 days. Less commonly, children may develop fever for a short time after immunization.

After introduction of pentavalent vaccine, will DPT and Hep B be required?

Yes, Hep B birth dose (within 24 hours) for institutional deliveries and DPT boosters at 16–24 months and 5–7 years will continue as before.– Introduced

Rotavirus vaccine – Introduced in Feb 2016 - in phases

What is Rotavirus?

Rotavirus is a highly contagious virus. It is the most common organism that causes diarrhea among children which may lead to hospitalization and death.

What are the clinical features of Rotavirus diarrhea?

Rotavirus diarrhea has an incubation period 1-3 days. It presents usually with sudden onset of watery stools, often accompanied by fever and vomiting. Sometimes accompanied with abdominal pain. The diarrhea and associated symptoms may last for 3-7 days.

How effective is the Rotavirus vaccine?

The available Rotavirus Vaccines are observed to be effective in preventing severe rotavirus diarrhea by 54-60%. The protective effect of Rotavirus vaccine lasts through 2nd year of life.

Is Rotavirus vaccine being used in any other country in the world?

Rotavirus vaccine is being used in national immunization program more than 80 countries. Rotavirus vaccine has also been in use by private practitioners in India for several years.

Will vaccination with Rotavirus vaccine prevent all diarrheas?

No it does not prevent all diarrheas. Diarrhea is caused by many organismsof which Rotavirus is one of the leading causes for diarrheain children. Rotavirus vaccine is effective in preventing diarrhea due to Rotavirus only. So the child may still get diarrhea due to other germs and causes even after receiving Rotavirus vaccine.

How and when is the Rotavirus vaccine given?

Rotavirus vaccine is an oral vaccine. The dose of Rotavirus vaccine varies from manufacturer to manufacturer.

The dose and route for Rotavirus vaccine currently being supplied under UIP is 5 drops to be administered to all infants at 6, 10 and 14 weeks along with other vaccines in routine immunization .

What is the maximum age limit for giving the first dose of Rotavirus vaccine?

The upper age limit for the first dose of Rotavirus vaccine is one year of age. If a child has received only the first dose of Rotavirus vaccine by 12 months of age, two more doses of the vaccine should be given at an interval of 4 weeks between the two doses to complete the course.

Is a booster dose required for Rotavirus vaccine?

No booster dose of Rotavirus vaccine is recommended. Only three doses at 6, 10 and 14 weeks are required to complete the schedule of vaccination for a child.

Should Rotavirus vaccine be given to children who have already received first dose of OPV and Pentavalent vaccine?

No, during the initial period of Rotavirus vaccine introduction, only the infants coming for the first dose of OPV and pentavalent vaccine will be administered Rotavirus vaccine. These children will be given 2nd and 3rd doses in subsequent visits as per the schedule.

Infants who are coming for their second or third dose of OPV and pentavalent vaccine, will complete the schedule with OPV and pentavalent vaccine only. Rotavirus vaccine is not to be started with second or third dose of OPV and Pentavalent vaccine.

What should be done if a child has received one or two doses of Rotavirus vaccine in a private facility?

If the parents want to vaccinate their child from the public sector after receiving one or two doses of Rotavirus vaccine in a private facility, a new course of Rotavirus vaccine must be started with all three doses at one month intervals provided the child is less than one year old.

Inactivated Poliovirus Vaccine

What is IPV?

IPV refers to Inactivated Poliovirus Vaccine administered by injection. Evidence suggests that this vaccine, when used along with OPV, increases the protection to the individual as well as the community. IPV together with OPV prevents re-emergence and reinfection of wild poliovirus (WPV).

Will IPV (injection) replace OPV (drops)?

No, IPV (injection) will not replace OPV (polio drops), since IPV is recommended to be administered in addition to OPV.

Is IPV a new vaccine?

No, IPV is not a new vaccine. It is being used in many countries. IPV was licensed in 1955 for use in United States, Canada, and Western Europe.

IPV was licensed for use in India in 2006. Based on recommendations of the Indian Academy of Paediatrics (IAP), IPV is being used in the private sector in addition to OPV schedules since 2007.

What is the benefit of IPV?

IPV provides much needed additional protection against polio and protects a child as well as other children in our community. Evidence shows that when IPV is used along with OPV, it builds better mucosal (intestinal) immunity than when OPV is used alone; it thereby increases both the protection to the individual and the community. To maximize childhood immunity and move towards global polio eradication, it is recommended that both vaccines be used together.

Is IPV safe?

Yes, IPV is considered very safe, whether given alone or in combination with other vaccines.

Are there any contraindications for use of IPV?

IPV should not be administered to children with a documented or known allergy to streptomycin, neomycin or polymyxin B, or with a history of a previous allergic reaction after IPV injection.

Is it safe to give IPV and OPV together?

Yes, it is absolutely safe to give IPV and OPV together. It is also important – and best – for a child to receive both IPV and OPV. Together, these two vaccines provide safe and strong protection against polio. If a child only receives one of the vaccines they will not be as well protected as the child that has received both the vaccines. Primary doses of OPV (OPV1, OPV2 and OPV 3) should be completed as per schedule.

How and when is IPV to be administered?

IPV is to be given as a fractional dose (0.1 ml) intradermally in the Right arm of the child.

Fractional IPV is given in two doses at 6 and 14 weeks along with OPV 1 and OPV 3

Measles / Rubella

What are Measles / Rubella diseases?

Measles is a highly infectious disease causing illness and death due to complications in the form of diarrhea, pneumonia or brain infection mostly among the children less than five years of age. Rubella is a mild disease but when infection occurs in early pregnancy, it has the potential to cause spontaneous abortions, fetal deaths, still births and serious congenital defects in the child causing lifelong disabilities.

What is CRS?

CRS, (Congenital Rubella syndrome) is a set of serious congenital defects a child may be born with when a pregnant women gets Rubella infection in early pregnancy , causing blindness, deafness, heart defects, mental retardation, liver disorders and other hematological disorder, incompatible with normal living.

Why is Measles-Rubella vaccine given?

This Measles –Rubella vaccine is given for preventing both measles and rubella disease in the child, as these diseases can be only prevented by vaccination.

What is the efficacy of Measles-Rubella vaccine?

The efficacy of measles component in the vaccine is 85% when given below 12 months of age in a child and >95% efficacy when given above 12 months of age. While the efficacy of the Rubella component in the vaccine is more than 95% below 12 months and > 99% if given above 12 months of age.

Does a child need to be vaccinated if she or he has history of any fever-rash illness including measles or rubella disease?

Yes, every child must be vaccinated with two doses, as per the national immunization schedule with MR vaccine at the recommended ages, irrespective of any past fever-rash illness or measles/rubella disease.

If a child has received the Measles Rubella vaccine before 9 months of age, is it necessary to repeat the vaccine later?

Yes, the Measles Rubella vaccine needs to be administered, according to the National Immunization Schedule, after the completion of 9 months until 12 months of age as 1st dose and at 16-24 months as 2nd dose in RI.

If a child comes after 2 years for the first dose, then can he/she get the second dose?

All efforts should be made to immunize all children at the right age i.e. first dose at completed 9 months to 12 months and second dose at 16-24 months. However if a child comes late (beyond 2 years),then two doses of the vaccine can be given at one month interval until 5 years of age under UIP.

If a child has received all vaccines as per the national immunization schedule, dose she or he need to be vaccinated during supplementary MR campaigns?

Yes, in addition to the recommended national immunization schedule the child (if eligible as per age group targeted) must be vaccinated with supplementary MR vaccines during campaigns.

As measles and JE vaccine doses are recommended for the same age group, can they be given together?

Yes, two live injectable vaccines can be administered simultaneously at different sites, otherwise at a minimum interval of 28 days.

Japanese Encephalitis

What is Japanese encephalitis and what is acute encephalitis syndrome (AES)?

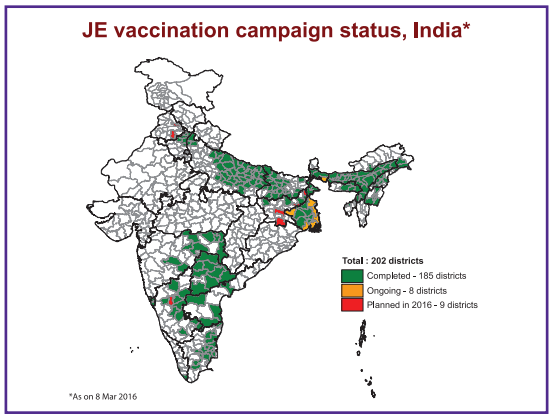
Japanese encephalitis (JE) is a severe, disabling viral disease spread by infected mosquitoes, primarily in the agricultural regions of Asia. The disease affects the central nervous system and can cause severe complications, seizures, and even death.

Clinically, a case of acute encephalitis syndrome (AES) is defined as a person of any age, at any time of the year with acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma, or inability to talk) and/or new onset of seizures (excluding simple febrile seizures). Other early clinical findings may include an increase in irritability, somnolence or abnormal behaviour greater than that seen with usual febrile illness (WHO).

AES including JE is a group of clinically similar neurological manifestations caused by several different viruses, bacteria, fungus, parasites, spirochetes, chemical/toxins, etc. Some other causes of AES could be tuberculosis, meningitis, viral encephalitis, cerebral malaria, etc.

How common is JE?

JE is the leading cause of viral encephalitis in Asia. Though 30,000 to 50,000 cases and 15,000 deaths are reported each year, a lack of diagnostic capability and reliable data suggest that the actual number of cases is much higher.



Where is JE endemic in India?

JE is endemic in 202 districts in 12 states across the country. JE vaccination campaigns have been completed in 193 districts and with the remaining nine scheduled to be completed in 2016.

Who is at risk for JE?

People living in rural rice-growing and pig-farming regions face increased risk. Cases are also found in the peri-urban parts of cities. In areas where JE has been present for many years, the disease is most frequently seen in children between the ages of 1 and 15 years; however, it can affect adults also.

Which vaccine is used in JE?

Live attenuated SA-14-14-2 JE vaccine manufactured by Chengdu Institute of Biological Products, China is used by the GoI.

What is the schedule of JE vaccine in the UIP?

Two doses of JE vaccine are administered in UIP in all JE endemic districts of the country. The first dose of JE vaccine is given to infants aged 9–12months along with the first dose of measles vaccine and the second dose is given along with DPT booster dose and measles vaccine second dose.

What is the side-effect of SA 14-14-2 JE vaccine?

JE vaccine is as safe as any other immunization vaccines given in India. Rare serious adverse events may be reported, such as transient fever amongst 5–10% vaccine recipients and local reactions such as injection site tenderness, rash or irritability in 1–3% of cases.

What if someone misses receiving JE vaccine during catch-up campaigns?

Those children aged 1–15 years who have missed receiving JE vaccine during the catch-up campaigns can receive it at the nearest PHC/CHC or district hospital.

If a child more than 9 months but less than 24 months who has never received any JE vaccine comes for immunization, how should JE vaccine be administered?

The first dose should be given at first contact and the second dose should be given with an interval of 3 months following the first dose.

Pneumococcal

What is pneumococcal disease?

- Pneumococcal disease is a group of diseases caused by a bacterium Streptococcus pneumoniae (also known as pneumococcus).
- The most serious of these diseases are pneumonia, meningitis, and blood stream infections.
- Streptococcus pneumoniae is the leading cause of bacterial pneumonia in children under 5 years of age.

How common is pneumococcal disease?

- Pneumococcal disease constitutes a major public health problem.
- In India, pneumococcal pneumonia was estimated to have caused 105,000 deaths in 2010.
- Beyond the pneumonia cases there are other serious pneumococcal cases and deaths from blood stream infections (sepsis) and meningitis.

How is pneumococcal disease spread?

- Pneumococcus spreads from person to person (coughing, sneezing or close contact). Many people have pneumococcus in their nasopharynx for days or weeks at a time. In most cases the pneumococcus disappears from the nasopharynx without causing any symptoms, but sometimes disease develops.

What diseases does pneumococcus cause?

Diseases that are often caused by pneumococci include:

- Pneumonia,
- Bacteraemia, sepsis: bloodstream infection,
- Bacterial meningitis: infection of the membranes and fluid that covers and protects the spinal cord and brain
- Middle ear infection (otitis media)
- Sinusitis, Bronchitis

Who is at increased risk of pneumococcal disease?

- Young children and elderly individuals are most at risk.
- The children most at risk of pneumococcal disease are:
  - Children under 5 years of age, especially those under 2 years of age
  - Immunocompromised children
  - Those with influenza or other respiratory virus infections can get a second infection with pneumococcus.
  - Malnutrition, lack of breastfeeding, exposure to indoor smoke and crowded living conditions.
  - Poor and marginalized populations with poor access to health care.

What is the vaccination schedule for PCV?

PCV is to be administered in three doses (2 primary doses and 1 booster) at 6 weeks, 14 weeks and 9 months of age.

Age	PCV schedule	Other scheduled vaccines to be given along with PCV
6 weeks	**PCV-1***	**OPV-1, Pentavalent-1, Rota-1*, fIPV-1**
14 weeks	**PCV-2***	**OPV-3, Pentavalent-3, Rota-3*, fIPV-2**
9 months	**PCV booster dose***	**Measles-1/MR-1, JE-1***

* Where applicable

Microplanning

RI microplans already exist in my PHC/UHC. Do I need to review them?

Yes, RI microplans require to be reviewed every quarter. This ensures that all areas and all beneficiaries are included in the RI session due lists.

Why should we do the house-to-house survey?

The house-to-house survey is the most important activity in RI microplanning. It gives the exact count of pregnant women and eligible children, and is the basis for calculation of injection loads. This injection load estimation determines the number of sessions to be conducted in an area.

Why is head counting important for microplanning?

- Head counting identifies all beneficiaries (children and pregnant women) for immunization;
- When done correctly, it makes sure that no beneficiary is missed;
- It provides an opportunity to build community confidence in the programme;
- Due list preparation is based on head count;
- The head count is important for estimation of injection loads ,vaccines and logistics.

What should an ANM do if there is no ASHA in her area?

- After discussing with the sector MO or MOIC, she should plan for an ASHA from nearby to cover this area.
- With support from the ICDS supervisor, an AWW can also be deputed to help with the head counting.

OR

- After discussion with the MOIC, a local person who is involved with the polio programme, or who supports mobilization, can be called in to conduct the head counting after receiving training from the MO.

Is there any incentive for ASHAs under NHM for conducting house to house survey?

Yes, an ASHA is to receive Rs 100 twice in a year for conducting the house-to-house survey. (refer Unit 12)

Who is expected to conduct immunization at vacant sub-centres?

Any ANMof the adjoining area / SC with more than one ANM/ who has no planned sessions on the day should be delegated to conduct RI sessions in vacant sub-centres. In some cases, ANMs from other blocks can be deployed by block/district officials to conduct sessions for such vacant areas.

First line Management of Anaphylaxis in Field Settings

SOP for administration of one dose of Intra-muscular Adrenaline by ANM

Q 1. What is Anaphylaxis? How does it manifest?

Anaphylaxis is an extreme and severe allergic reaction, that is potentially life threatening. The whole body is affected, often within minutes of exposure to the allergen (substance causing the allergic reaction), but sometimes after hours. It occurs because the immune system overreacts to an allergen, and causes secretion of chemical substances that cause swelling of blood vessels. Common allergens include foods such as peanuts, dairy products, eggs etc. and non-foods such as wasp or bee sting, medications, vaccines, latex etc. The symptoms of an anaphylactic reaction include generalized flushing of the skin, nettle rash (hives) anywhere on the body, swelling of throat and mouth, difficulty in swallowing or speaking, alterations in heart rate, severe asthma, abdominal pain, nausea and vomiting, sudden feeling of weakness (drop in blood pressure), collapse and unconsciousness.

Q2. How will you suspect a case of anaphylaxis?

In anaphylaxis, there is sudden onset of symptoms which rapidly worsens. Individual may complain of difficulty in breathing and/or giddiness/loss of consciousness, hypotension, skin changes such as generalized rashes, swelling of the lips and tongue (angioedema), hives (urticaria) and flushing.The person may have had a severe allergic reaction or anaphylaxis in the past. However, this may be the first time. Sudden onset and rapid progression of ≥ 1 signs and symptoms of any of the two systems (respiratory, cardiovascular and dermatological/ mucosal) should be suspected as a case of anaphylaxis.

Recognition of anaphylaxis case in field setting

Usually respiratory, dermatological and cardiovascular systems are involved in anaphylaxis. In most cases of anaphylaxis, skin and mucous membrane are affected. The case of anaphylaxis is suspected if the following criteria are met:

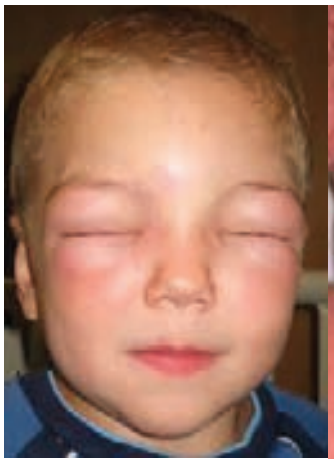
Rapid onset and progression of ≥ 1 signs and symptoms of any of the two systems (respiratory, cardiovascular and dermatological/mucosal) as illustrated in Figure 3 (clinical features).

In addition to the signs and symptoms given in Table 1, following features could also be observed: anxiety, diarrhea, abdominal cramps, nausea, vomiting and sneezing or rhinorrhea.

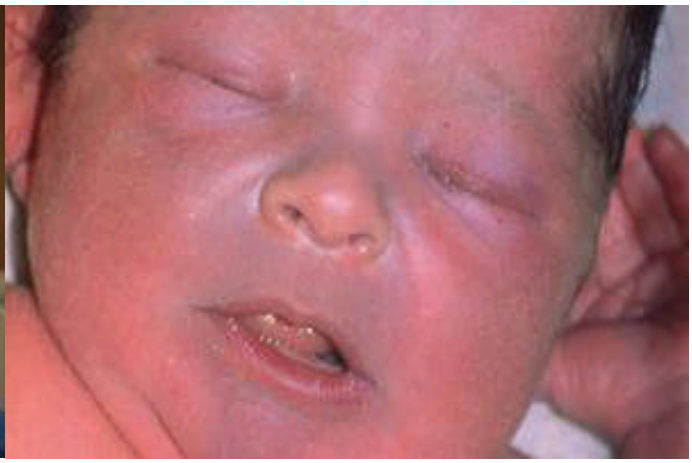
Table 1: Signs and symptoms of Anaphylaxis

System	Sign and Symptom
Respiratory	• Swelling in tongue, lip, throat, uvula or larynx • Difficulty in breathing • Stridor (Harsh vibrating sounds during breathing) • Wheezing (breath with whistling or rattling sound in the chest) • Cyanosis (bluish discoloration of arms and legs, tongue, ears, lips etc.) • Grunting (noisy breathing)
Cardiovascular	• Decreased level /loss of consciousness (fainting, dizziness) • Low blood pressure (measured hypotension) • Tachycardia (increased heart rate, palpitation)
Dermatological or mucosal	• Generalized urticaria (raised red skin lesion, rash with itching) • Generalized erythema (redness of skin) • Local or generalized Angioedema- itchy/ painful swelling of subcutaneous tissues such as upper eyelids, lips, tongue, face etc. • Generalized pruritus (itching) with skin rash

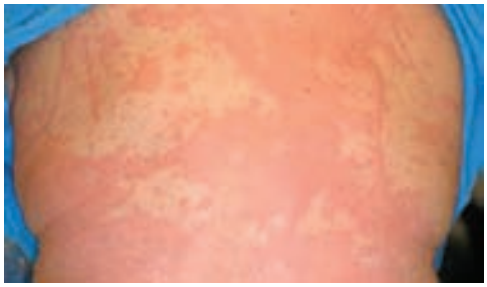
Figure 3: Clinical features



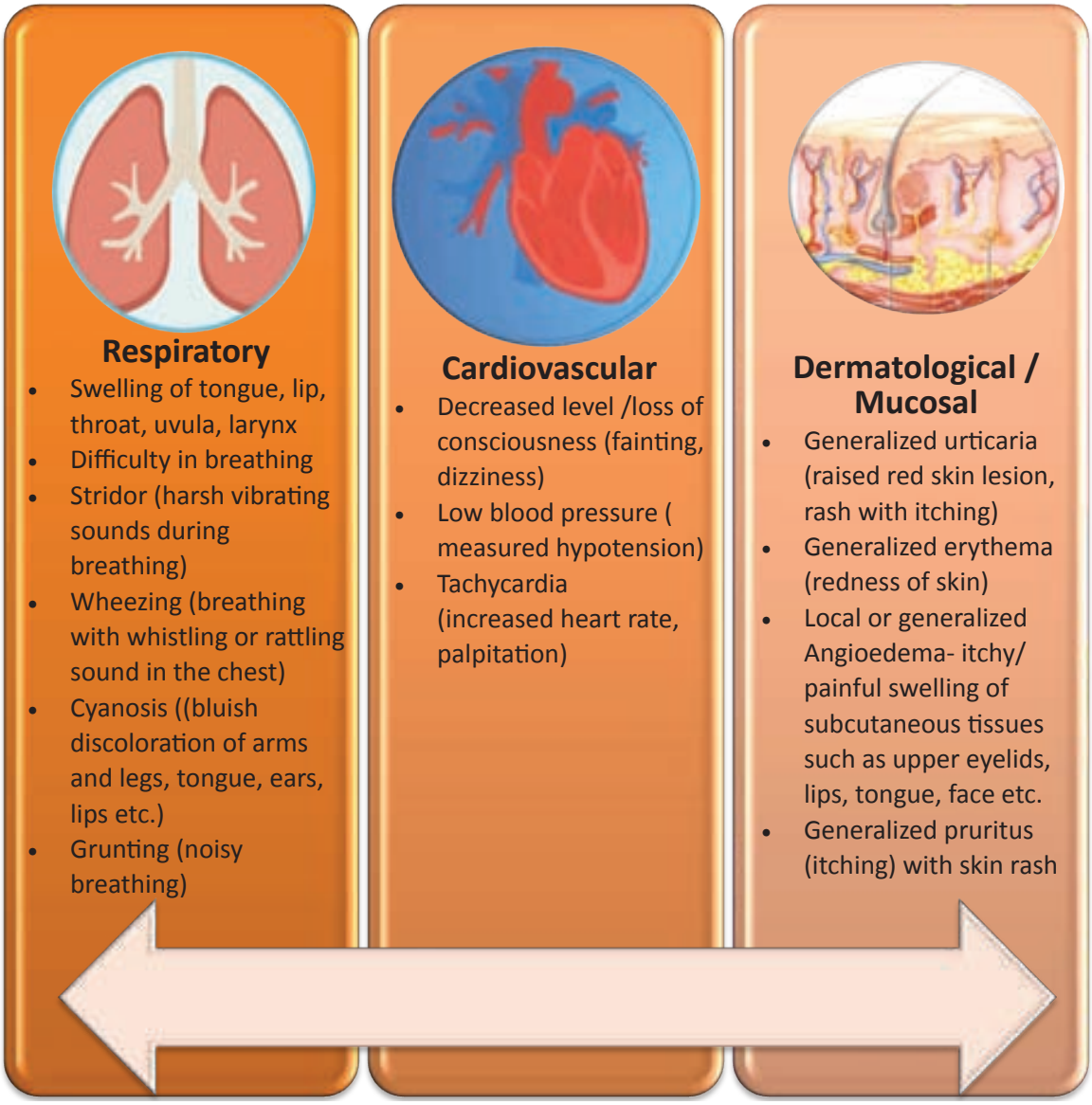
Picture 1: Angioedema



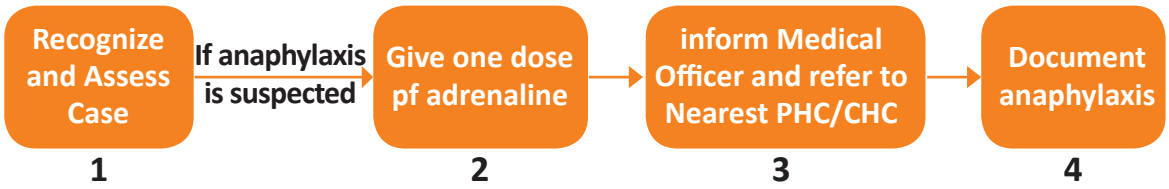
Picture 2: Cyanosis



Picture 3: Urticaria



The ANM should follow four steps for initial management of anaphylaxis cases.



Suspect Anaphylaxis in a case with following symptoms and signs

Assess Case

Rapid onset & progression of >= 1 signs & symptoms of any of the two systems (Respiratory, cardiovascular and dermatological / mucosal)

Respiratory:

- Swelling of tongue, lip, throat, uvula, larynx
- Difficulty in breathing
- Stridor (harsh vibrating sounds during breathing)
- Wheezing (breathing with whistling or rattling sound in the chest)
- Cyanosis ((bluish discoloration of arms and legs, tongue, ears, lips etc.)
- Grunting (noisy breathing)

Cardiovascular:

- Decreased level /loss of consciousness (fainting, dizziness)
- Low blood pressure (measured hypotension)
- Tachycardia (increased heart rate, palpitation)

Dermatological or mucosal:

- Generalized urticaria (raised red skin lesion, rash with itching)
- Generalized erythema (redness of skin)
- Local or generalized Angioedema- itchy/ painful swelling of subcutaneous tissues such as upper eyelids, lips, tongue, face etc.
- Generalized pruritus (itching) with skin rash

Manage anaphylaxis

Give one dose of adrenaline deep IM

- **Reassure** patient, parents/ relatives
- **Immediately administer** one dose of injection Adrenaline by deep IM route
- **Seek help to immediately arrange for ambulance** to transport the patient to the nearest health facility (PHC/CHC/District Hospital/Civil Hospital)
- **Do not leave patient alone**
- If patient is **conscious,** he/she should be kept in **supine position with lower limbs raised** higher than head
- If patient is **unconscious,** he/she should be kept in **left lateral position**

Referrals

Refer to higher center

- **Call for ambulance**
- **Inform MO** about the case for timely management

Document suspected anaphylaxis

Document suspected anaphylaxis on immunization card in block letters against vaccines administered

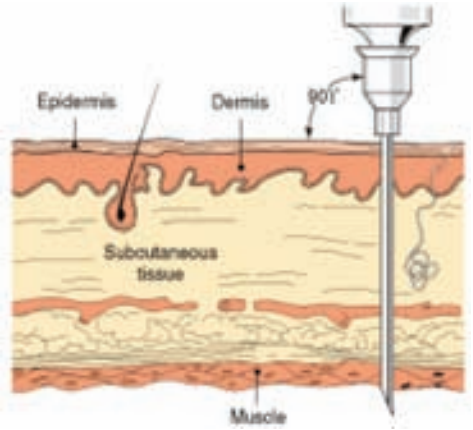
Steps for administration of injection Adrenaline by ANM

- Take one ampoule of adrenaline (1:1000) solution from the **Anaphylaxis Kit** and check name, dilution and expiry date on **label of vial** (not from kit label).
- Take a 1 ml syringe and 24/25 G needle of length 1 inch and load the required dose of adrenaline as per the age of the patient. [Table 2]
- Adrenaline ampoules are also labelled as Epinephrine. Epinephrine is another name for adrenaline.

Table 2: Age specific dosing chart of adrenaline (1:1000) for management of anaphylaxis

Age group (in years)	One inch needle gauge	Dosage (in mL) using 1 mL tuberculin syringe	Dosage (in units) using 40 units insulin syringe
0-1	24G/ 25G	0.05	2
1-6		0.1	4
6-12		0.2	8
12-18		0.3	12
Adults		0.5	20

- Use alcohol swab to clean the middle 1/3rd of anterolateral aspect of the thigh of the opposite limb to that in which vaccine is given.
- Hold the muscle mass on the anterolateral aspect of thigh with hands, stretch the skin (do not bunch) with fingers.
- Give deep intramuscular injection at 90 degree angle to skin in middle 1/3rd of anterolateral aspect of thigh.

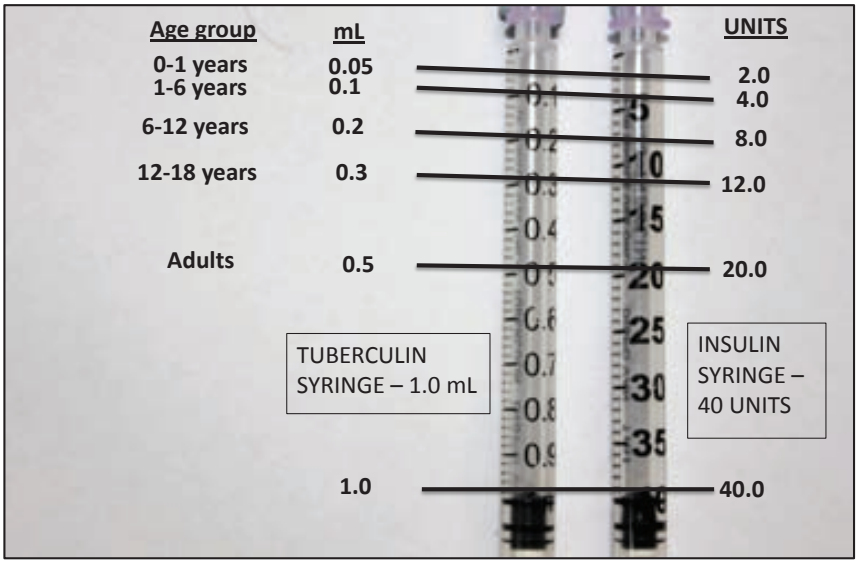


Source: Smith et al., 2000, p. 394

Ensure appropriate syringes and Needle availability at sub centre

- States/districts should procure and supply anaphylaxis kits with the following syringes and needles:
  Tuberculin syringe (1 ml) OR
  Insulin syringe (40 units) (without attached needle) – 3 nos./ANM

* 1ml tuberculin syringe comes with a detachable 0.5 inch needle. Procure 1 inch 24/25G needles separately and supply in anaphylaxis kit.



Anaphylaxis kit for ANM

Anaphylaxis Kit – Each kit should contain the following items:

- Annexure 2 of these guidelines to be taped to the inside of the box lid – 1 no.
- 1 mL ampoule of adrenaline (1:1000 aqueous solution) – 3 nos.
- 1 mL syringes – 3 nos.
- 24/25 G needles of 1 inch length – 3 nos.
- Alcohol swabs – 3 nos.
- Up to date contact information for the DIO and Medical Officer(s) of PHC/CHC and local ambulance services.

The kits can be stored in an air tight container. Ensure the drugs are not exposed to light which can cause deterioration. Ensure the contents of Anaphylaxis kits are verified in advance of every session so as to replace drugs before the expiry date.

Adrenaline Administration record

Name of Patient: _____ Age: _____

Date:_____

Adrenaline (1:1000 dilution) dose administered:

dose Amount: _____ mL

(if given)Time:_____ Site:_____

Anaphylaxis Kit

ANM should administer only one dose of adrenaline and refer the patient to referral center. Record of the administration of Adrenaline should be entered in the card above, which must be provided with the patient when he/she referred to medical officer. These details must also be recorded in immunization session summary and available with the ANM after transferring the patient.

About Adrenaline Injection

Adrenaline ampoules should not be exposed to temperature above 25 degree Celsius.

Key features of adrenaline are as follows:

- Description of drug: Adrenaline is a naturally occurring catecholamine.
- Dosage: 0.01ml/Kg body weight
- Route of administration: Intramuscular
- Site of injection: middle 1/3rd of anterolateral aspect of thigh in children and deltoid region of arm in case of adults.
- Preparation: injection adrenaline is available in 1 mg/ml preparation.
- Storage: Store in airtight containers, protected from light.
- Shelf life: 1 year

Developed for Ministry of Health & Family Welfare by WHO Country Office for India