IMMUNIZATION HANDBOOK

FOR MEDICAL OFFICERS

Reprint 2017

Ministry of Health & Family Welfare
Government of India

Hkku iirki 'kekl fpo
B.P. SHARMA
Secretary

सत्यमेव जयते

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.

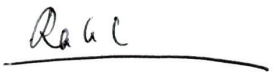
The success of the routine immunization program is also influenced by the confidence the community holds in the services. Safety of injections administered as well as safety of health staff is detailed

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

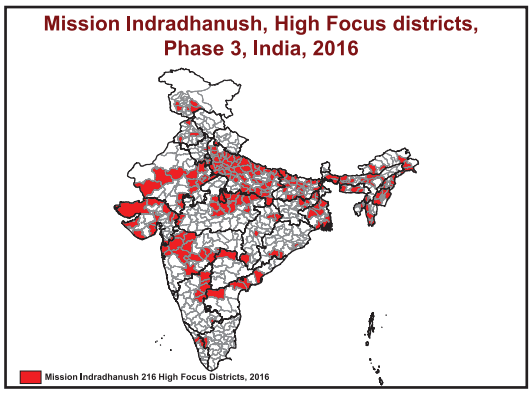
As a strategic endeavor, the Ministry of Health & Family Welfare (MoHFW), Government of India, launched Mission Indradhanush in December 2014.

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.

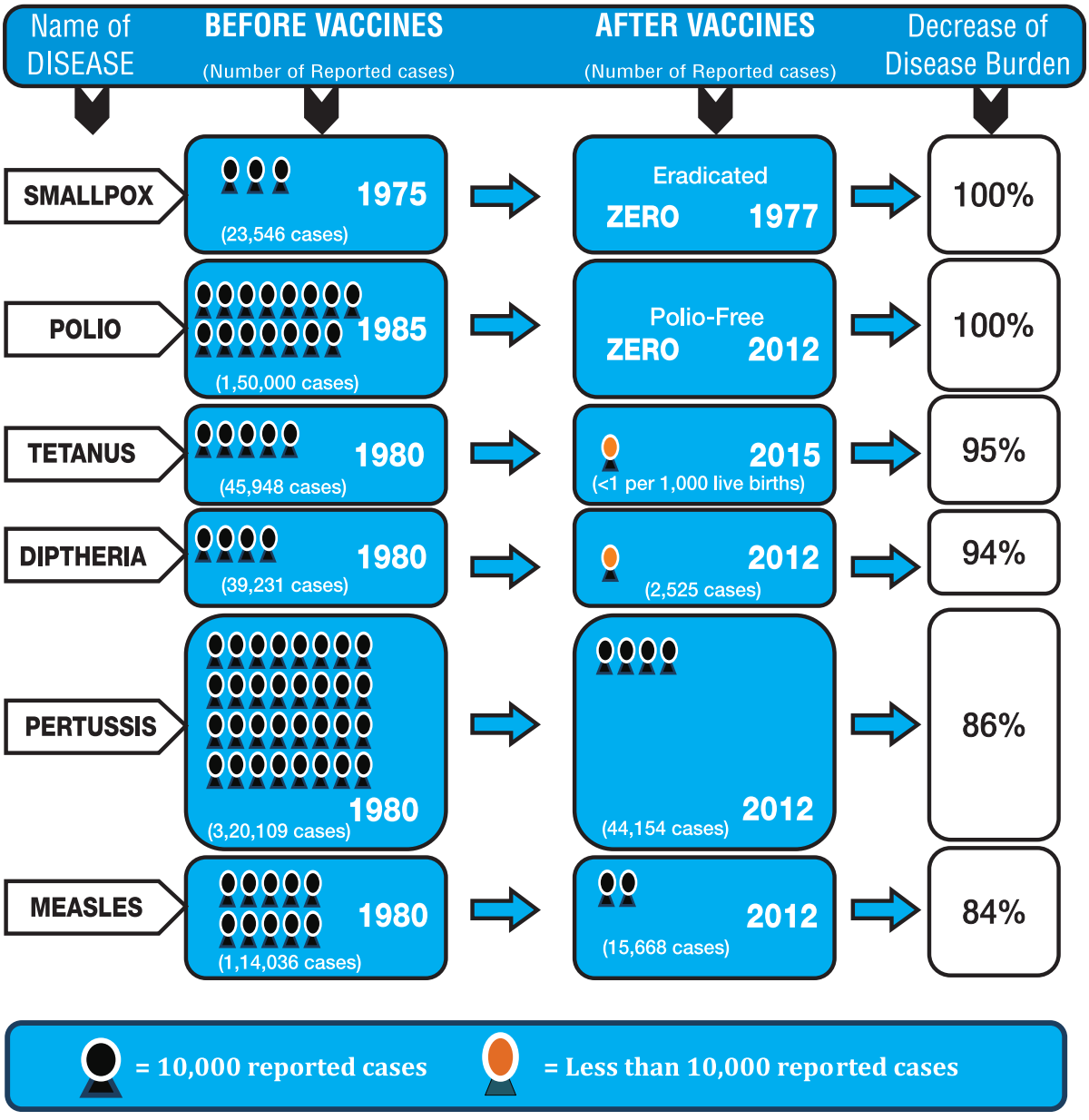
The objectives of UIP are to:

- 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

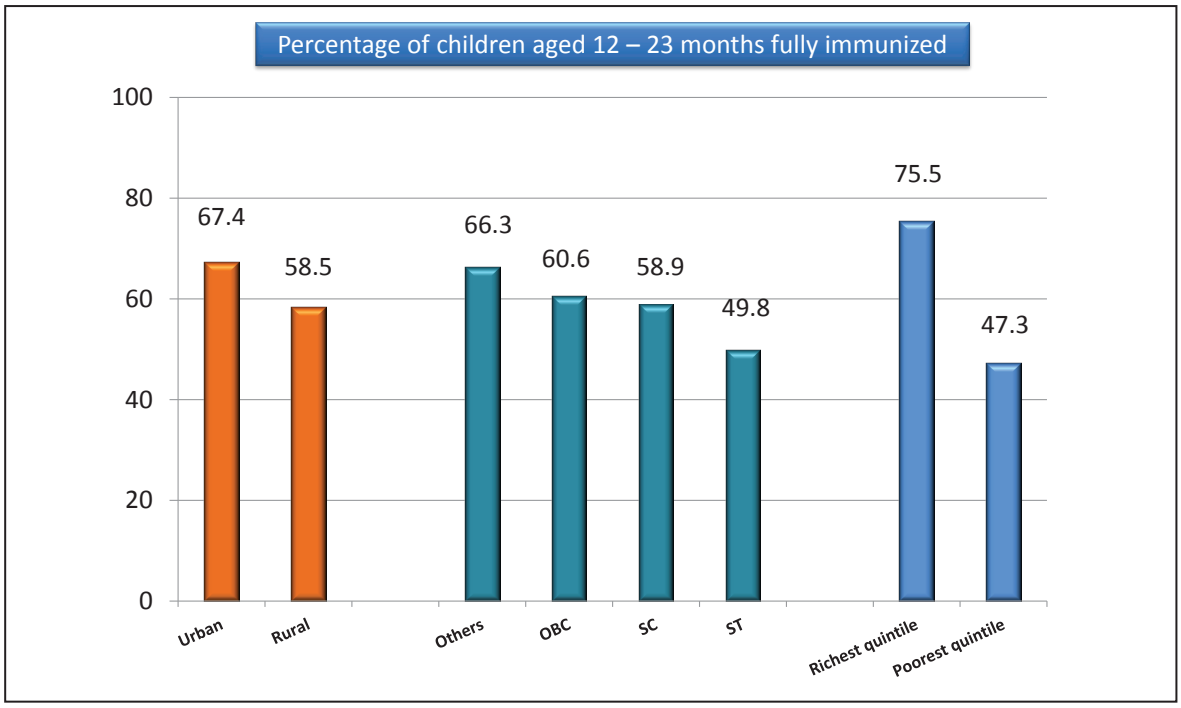
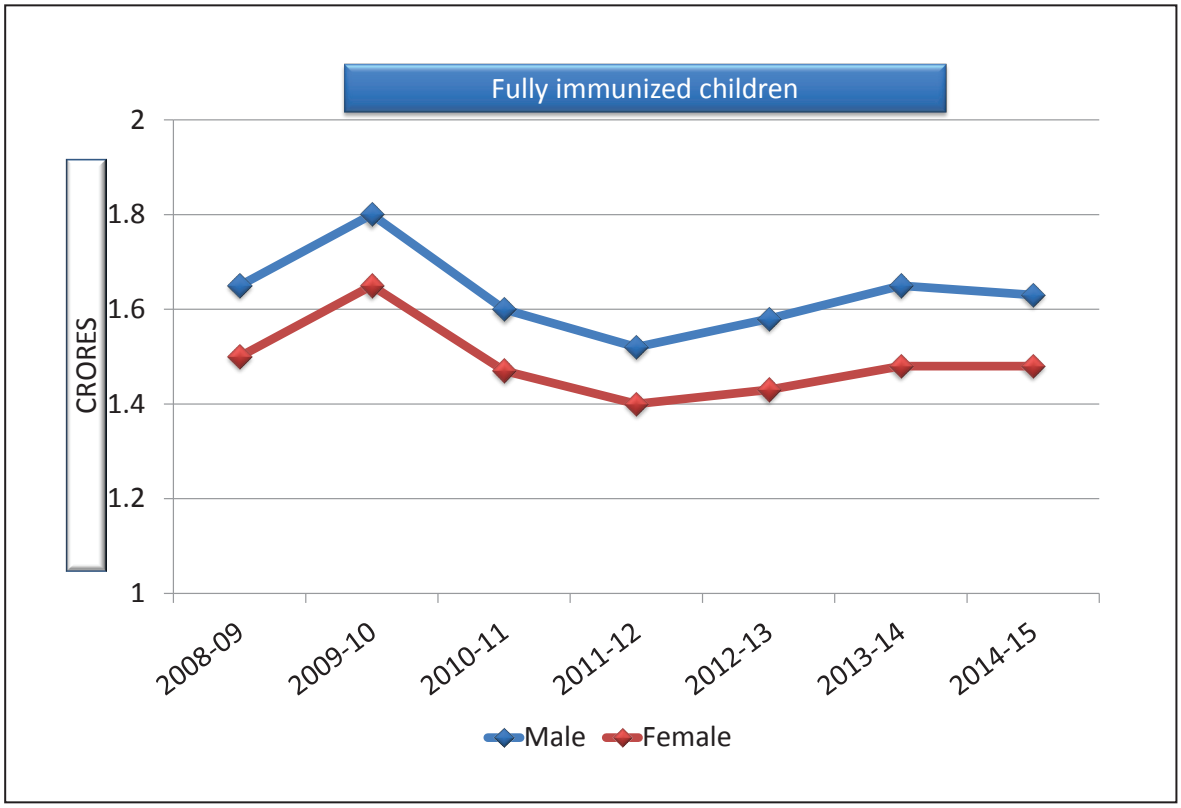


Figure 1.5- Gender differences in vaccine coverage – HMIS



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

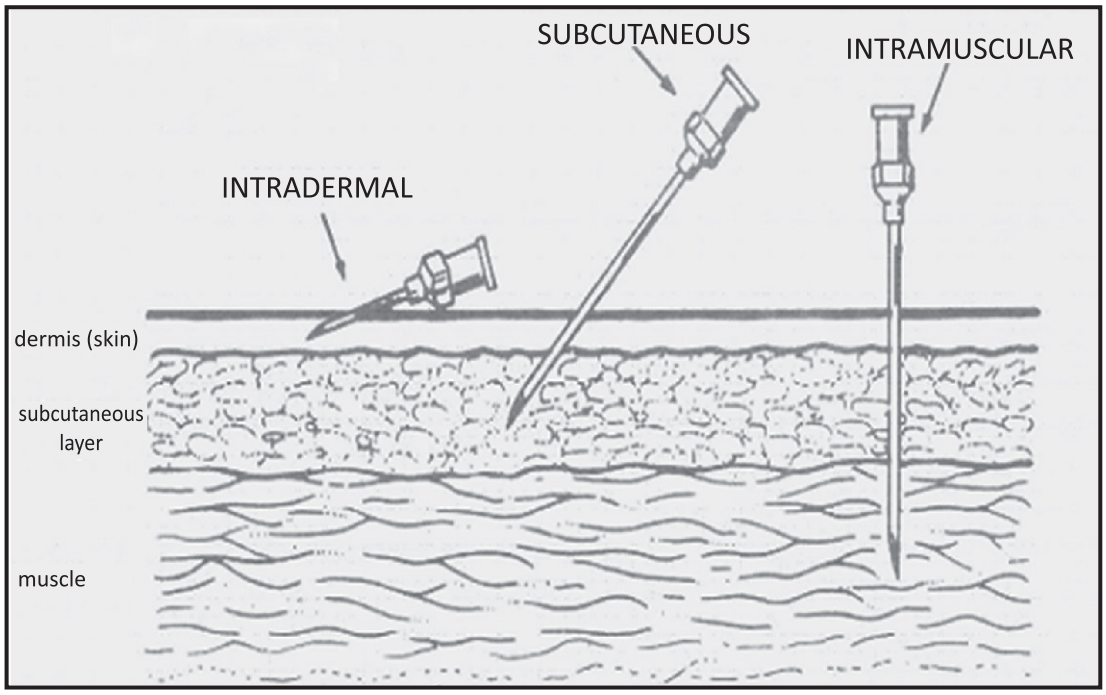


Fig. 2.1. Different needle positions for vaccine administration

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

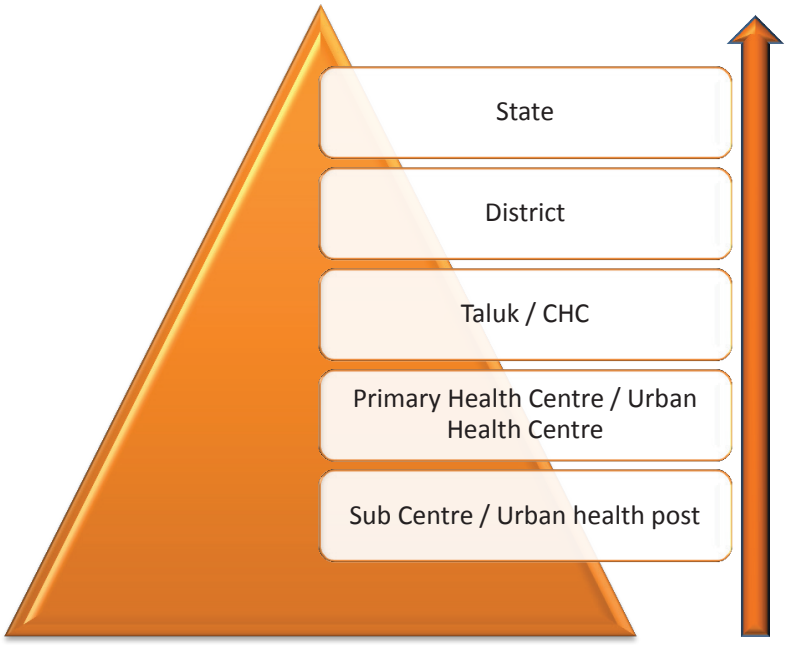


Fig. 3.2. RI microplanning from SC to district

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

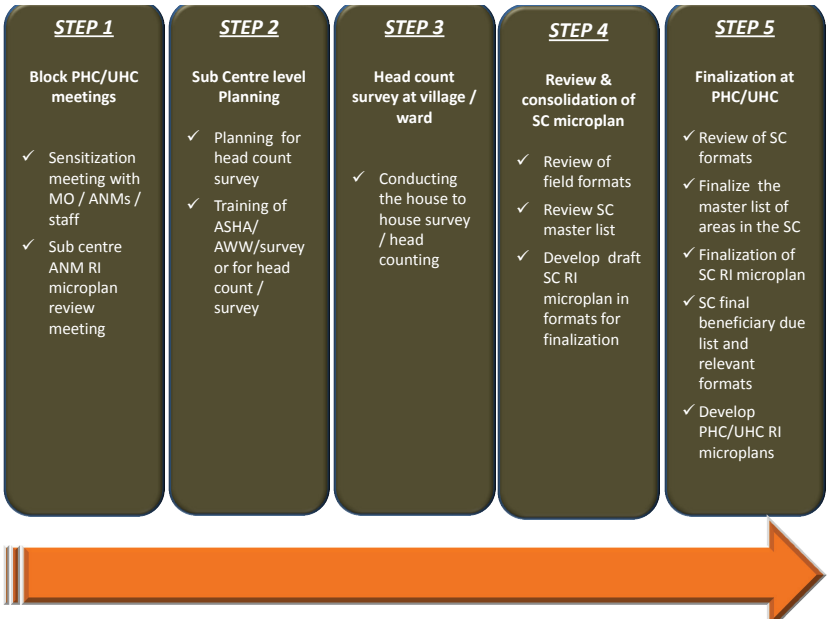


Fig 3.4. Overview of major activities in RI microplan development process