

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.*

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Introduction including role of medical officers in immunization

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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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Hepatitis B universalized and Haemophilus influenza type b introduced as pentavalent in 2 states Open Vial Policy for vaccines in UIP
2013	<ul style="list-style-type: none"> Pentavalent expanded to 9 states Second dose of JE vaccine
2014	India and South East Asia Region certified POLIO- FREE
2015	<ul style="list-style-type: none"> India validated for Maternal and Neonatal Tetanus elimination Pentavalent expanded to all states IPV Introduced
2016	<ul style="list-style-type: none"> Rotavirus vaccine introduced in 4 states in Phase 1 tOPV to bOPV Switch Switch to fractional IPV (Phased) Rotavirus vaccine introduced (Phased launch)
2017	<ul style="list-style-type: none"> 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.

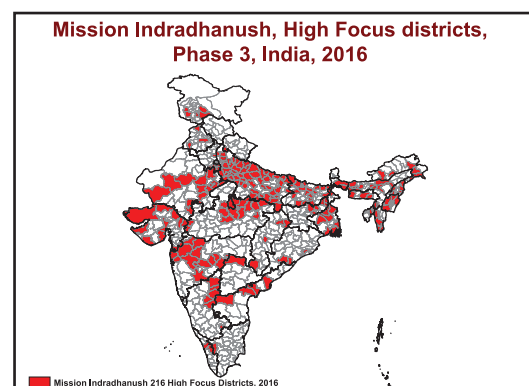
Four states – Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh – account for 82 of the 201 high-focus districts and nearly 25% of the unvaccinated or partially vaccinated children.

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.

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.



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



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:
 - o Fixed sites PHC/CHC/Govt Hospital – 37%
 - o Sub center- 19%,
 - o Outreach session held at Anganwadi center–26%
 - o 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:

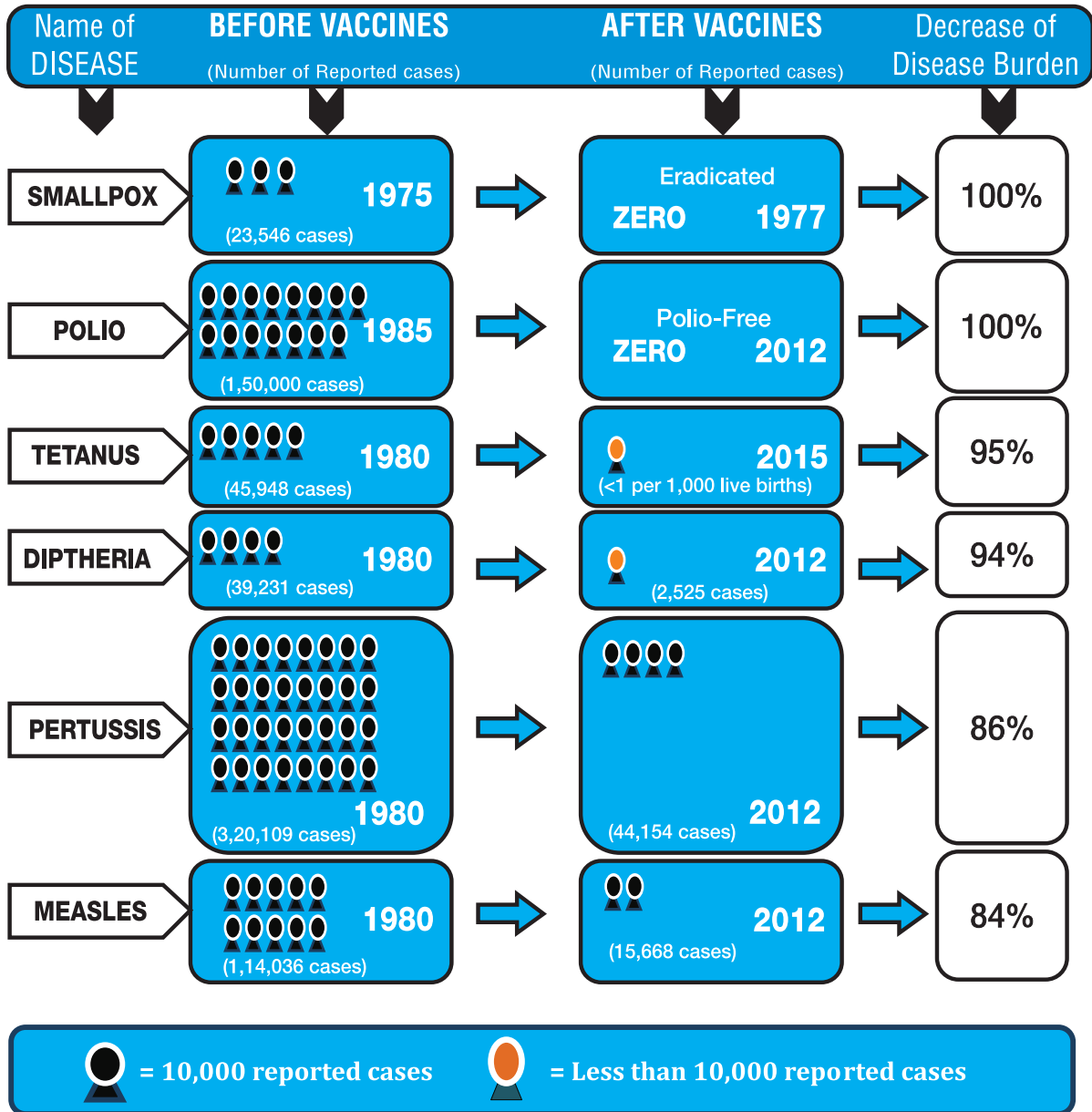
- rapidly increase immunization coverage
- improve the quality of services
- establish a reliable cold chain system up to the health facility level
- introduce a district-wise system for monitoring of performance
- achieve self-sufficiency in vaccine production

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 Preventable 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

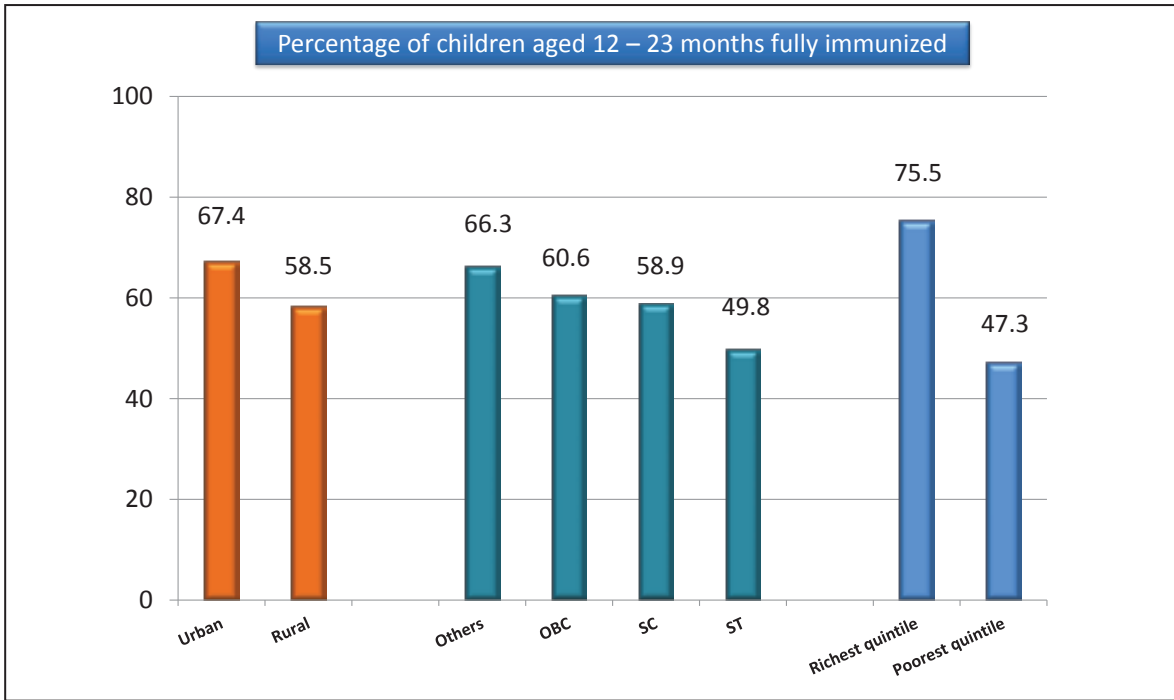
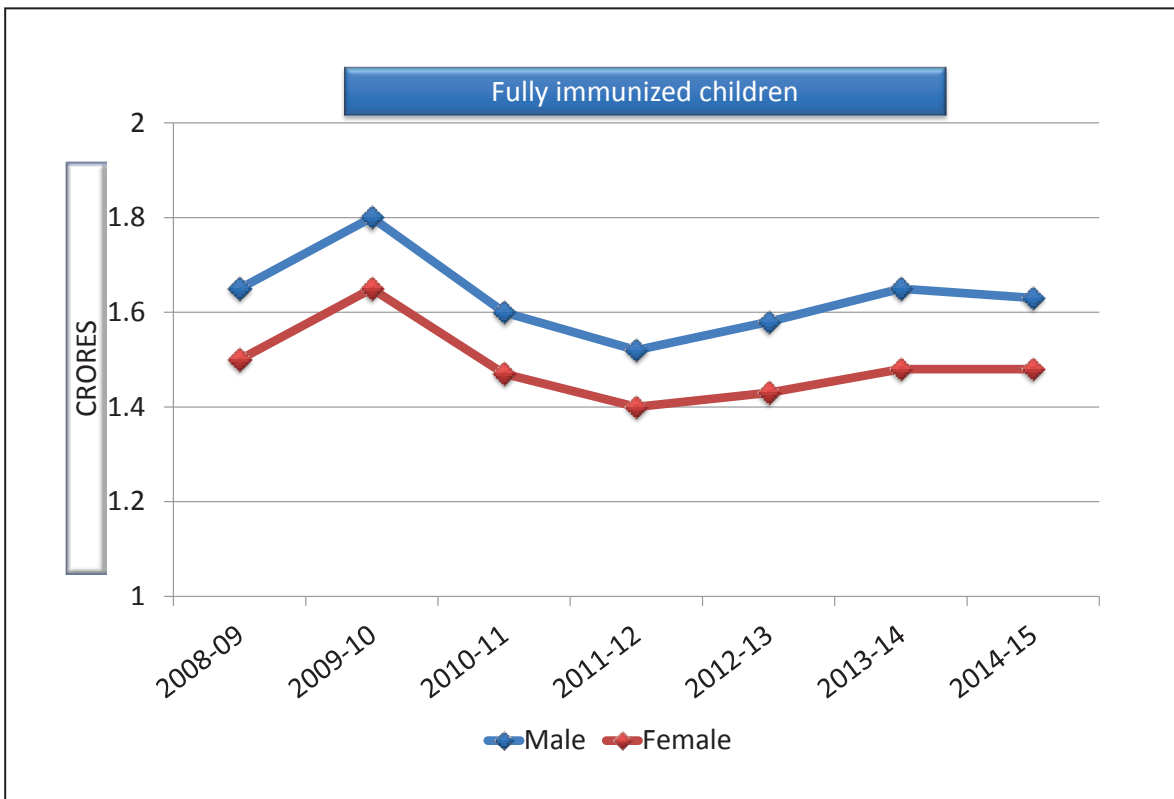


Figure 1.5- Gender differences in vaccine coverage – HMIS



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 involvement and 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: