

**DISSERTATION TITLE**

**EVALUATION OF ROUTINE IMMUNIZATION PROGRAM  
IN A DISTRICT OF MADHYA PRADESH**

A Dissertation Proposal for  
Post-Graduate Diploma in Health and Hospital Management

By

**Dr Abhishek Yadav**

Roll No. PG/10/001



**International Institute of Health Management Research**

**New Delhi**

**May, 2012**

# **EVALUATION OF ROUTINE IMMUNIZATION PROGRAM IN A DISTRICT OF MADHYA PRADESH**

**A Dissertation Submitted in Partial Fulfilment of the  
Requirements for the Award of**

**Post-Graduate Diploma in Health and Hospital Management**

**By**

**Dr Abhishek Yadav**



**International Institute of Health Management Research**

**New Delhi - 110075**

**May, 2012**

## CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Dr. Abhishek Yadav**, a graduate student of the **Post Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. He is submitting this dissertation titled **“Evaluation of Routine Immunization Program in a District of Madhya Pradesh”** in partial fulfilment of the requirements for the award of the **Post Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

*M. Gautam*  
**Faculty Member** MINAKSHI GAUTAM

IIHMR

New Delhi

Date

*U. Shakti*  
**Organizational Advisor**

ASTRON Hospital & Health Care Consultants Pvt. Ltd.

Gurgaon

Date

*22nd May 2012*



## CERTIFICATE OF APPROVAL

The following dissertation titled “**Evaluation of Routine Immunization Program in a District of Madhya Pradesh**” is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for Evaluation of Dissertation

Name

Signature

Kishor Udayar

Kishor Udayar



Astron Hospital and Healthcare Consultants Pvt. Ltd.

## Certificate of Internship

Date: 27<sup>th</sup> April 2012

### TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Abhishek Yadav** has successfully completed his internship in ASTRON Hospital and Healthcare Consultants Pvt. Ltd. from December 1, 2011 to February 29, 2012. During this period, he has worked on the project on “**Acceleration of Routine Immunization and ANC Services in Ten Underserved Districts of Madhya Pradesh**”, funded by DFID.

During his tenure with the organization, **Dr. Abhishek Yadav** was found to be hardworking, sincere, self disciplined and conscientious worker.

We wish him all the success for his future assignments.

A handwritten signature in blue ink, appearing to read 'N. Bhatia'.

Dr. Neeru Bhatia  
Executive Director

Regd. Office : 6117/3 Sector - D-6, Vasant Kunj, New Delhi - 110070, India Ph. : +91-11-42148131/32 Fax : +91-11-42148132  
E-mail: [Contact@astronhealthcare.com](mailto:Contact@astronhealthcare.com) Website : [www.astronhealthcare.com](http://www.astronhealthcare.com)

Corp. Office : L.G.F., Surya Kiran Complex, Old Mehrauli - Road (Opp. SBI Main Branch) Gurgaon, Haryana - 122 001  
Tel.: +91-124-4267551 / 52 Fax : +91-124-4546200 Extn. No. : 214

## **ABSTRACT**

Delivering effective and safe vaccines through an efficient delivery system is one of the most cost effective public health interventions. Immunization programmes aim to reduce mortality and morbidity due to vaccine preventable diseases (VPDs). Despite previous efforts made by the Indian government, rates of childhood immunization are still low.

The objective of the study is to evaluate the current immunization programme and analyse factors responsible for low immunization coverage rate. This study also takes into account the challenges and opportunities for improving the services. RI Session monitoring format was designed as tool for primary data collection from Anganwadi Centres.

Although there was lack of sufficient time for supportive supervision interventions to show their intended results, the immunization coverage in the district remains very low at 43.6%. Thus there is much wider scope for improvement in the service delivery as well as for the sensitization of the community towards immunization.

# **ACKNOWLEDGEMENT**

Any attempt at any level cannot be satisfactorily completed without the support and guidance of learned people. I owe a great debt to all the professionals at ASTRON and IIHMR for sharing generously their knowledge and time, which inspired me to do my best during my dissertation.

I would like to express my immense gratitude to Dr. Yash Paul Bhatia, Managing Director, and Dr. Neeru Bhatia, Executive Director, ASTRON Hospital and Health Care Consultants Pvt. Ltd., for providing support and guidance for my learning as well as project. It has been a privilege to work under their dynamic supervision. I also want to thank Ms. Mousumi Kundu, Principal Consultant, ASTRON Hospital and Health Care Consultants Pvt. Ltd. for her involvement and encouragement.

I am also grateful to Madhya Pradesh Technical Assistance Support Team (MPTAST) for constant support during the period of data collection.

I am glad to acknowledge Ms. Minakshi Gautam, Assistant Professor, IIHMR, New Delhi for her constant guidance during the project with time, support and the much needed enthusiasm and inspiration.

And final thanks to my family, friends for their great moral support at all times during the project. I am also grateful to all those involved in the project, directly or indirectly.

Dr. Abhishek Yadav

## TABLE OF CONTENTS

TOPIC	PAGE NO.
Abstract	1
Acknowledgement	2
List of Figures	4
List of Tables	5
Acronyms	6
Internship Report	
• Introduction to Organization	8
• Managerial Duties & Tasks Performed	9
• Reflective Learning	12
Dissertation Report	
• Introduction	13
• Review of Literature	15
• Data, Methods & Analysis	35
• Results & Findings	36
• Observations	40
• Recommendations	41
• Conclusion	42
• References	43
Annexure - RI Session Monitoring Format	46

## LIST OF FIGURES

<b>FIG. NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
1	Geographical Location of District Tikamgarh in MP	10
2	Tikamgarh Map	11
3	VVM Readings	26
4	Design of Waste Disposal Pit	33
5	Availability of BCG Vaccine	36
6	Availability of OPV Vaccine	36
7	Availability of DPT Vaccine	37
8	Availability of Hep B Vaccine	37
9	Availability of Measles Vaccine	37
10	Availability of Functional Hub-Cutter	38
11	Availability of Red/Black Disposal Bag	38
12	Percentage Target Achieved	39

## **LIST OF TABLES**

<b>TABLE NO.</b>	<b>TITLE</b>	<b>PAGE NO.</b>
1	National Immunization Schedule	16
2	Sensitivity of Vaccines for Light & Heat	24
3	Cold Chain Equipment	27
4	Preventive Maintenance of Cold Chain Equipment	29
5	Records & Reports from Sub Centre Level to State Level	34

# ACRONYMS

- ADS - Auto Disable Syringe
- AEFI - Adverse Events Following Immunization
- AFP - Acute Flaccid Paralysis
- ANC - Antenatal Care
- ANM - Auxiliary Nurse Midwife
- ASHA - Accredited Social Health Activist
- AVD - Alternate Vaccine Delivery
- AWC - Anganwadi Centre
- AWW - Anganwadi Worker
- BCG - Bacillus, Calmette, Guerin
- CDM - Community Decision Makers
- CHC - Community Health Centre
- CMHO - Chief Medical and Health Officer
- CPCB - Central Pollution Control Board
- CSSM - Child Survival and Safe Motherhood
- DC - District Consultant
- DF - Deep Freezer
- DFID - Department of International Development
- DLHS - District Level Household Survey
- DIO - District Immunization Officer
- DPM - District Program Manager
- DPT - Diphtheria, Pertussis, Tetanus
- DT - Diphtheria Tetanus
- EPI - Expanded Programme on Immunization
- FGD - Focussed Group Discussion
- FIFO - First In First Out
- GoI - Government of India
- GoMP - Government of Madhya Pradesh
- Hep B - Hepatitis B Vaccine
- Hib - Haemophilus influenzae type B vaccine
- HSS - Health Sector Strategy
- HW - Health Worker
- ICDS - Integrated Child Development Services
- IEC - Information, Education and Communication
- IFA - Iron and Folic Acid
- ILR - Ice-Lined Refrigerator
- IMR - Infant Mortality Rate

- MCH - Maternal and Child Health
- MP - Madhya Pradesh
- MPTAST - Madhya Pradesh Technical Assistance Support Team
- MPW - Multipurpose Worker
- NID - National Immunization Days
- NIS - National Immunization Schedule
- OPV - Oral Polio Vaccine
- PHC - Primary Health Centre
- PPI - Pulse Polio Immunization
- RCH - Reproductive and Child Health
- RI - Routine Immunization
- RIMS - Routine Immunization Monitoring System
- SC - Sub Centre
- SIA - Supplementary Immunization Activity
- SRS - Sample Registration System
- TOT - Training of Trainers
- TT - Tetanus Toxoid
- UIP - Universal Immunization Program
- VHND - Village Health and Nutrition Day
- VHSC - Village Health and Sanitation Committee
- VPD - Vaccine Preventable Disease
- VVM - Vaccine Vial Monitor
- WCD - Women and Child Development
- WHO - World Health Organization

# **INTERNSHIP REPORT**

## **INTRODUCTION TO ORGANIZATION**

Astron is a professionally managed consultancy organization specializing in hospital and healthcare, promoted by Dr Yash Paul Bhatia who has been at the forefront of hospital and healthcare facility management since 1981, along with a team of Healthcare and allied professionals. The combined strength of these professionals, 'Team Astron', forms the core strength of the organization. Individually, the team members have excelled in their respective fields of expertise and specialties.

**Vision** - “To facilitate quality healthcare delivery systems globally”.

**Mission** - “Astron commits to developing executing and optimizing quality health care delivery infrastructure and operating systems. It envisions a global reach for its conceptualizations enthrone local perspectives. It plans to do so through consultancy, turnkey project and systems management services, research and creating a resource pool for healthcare organizations to access operational requirements”.

Astron Hospital and Healthcare consultants are well endowed with technical expertise and experience to comprehensively assimilate projects in Hospital and Healthcare activities from conceptualization, execution, and operational management to turn key project management. Their capabilities in contemporary and visionary planning of new hospitals is equally matched in adapting existing commercial buildings (hotels and commercial complexes) into healthcare delivery facilities. Functionality remains their watchword to ensure a healing environment for the seekers and ergonomic comfort for providers within the facility.

An unmatched distinction of the 'Team Astron' is its combined experience in setting up and managing large number of hospitals. Astron Hospital and Healthcare Consultants are uniquely poised to deliver advisory services in operational management for existing healthcare facilities and offer services to take on this role. The 'Team Astron' ascribes to concept of corporate governance for taking on the challenge of astute healthcare facility management.

'Team Astron' offers expertise in health economics for strategic financial investments in commercial ventures in healthcare. Their expertise for optimization of resource deployment in existing facilities, market surveys and techno-economic feasibility studies for new projects will ensure viability and surplus generation in the units.

Astron team is fully geared up for providing consultancy services for all aspects of Public Health Programs that include program design, planning, execution and training of projects along side conduct of studies and evaluation. Astron team has developed special core competencies in all components of HIV-AIDS related to public health programs.

The strategic initiative domain of Astron includes bringing together bio-medical equipment manufacturers and importers and healthcare service providers. Astron facilitates conceptualizing and establishing product lines based on current market demands and formulating road maps looking into the future needs and trends in healthcare. It offers services to healthcare providers in selecting the appropriate equipment at the right price and facilitating uptime management of bio-medical equipment for optimal utilization.

Astron is organized as an agglomeration of divisions. These divisions work in an integrated manner while maintaining work distinction and responsibility in their specialized activities and niche foci. All projects are subject to scrutiny by the various divisions as required. This metrical organizational framework enables Astron to comprehensively assimilate projects imparting professional flavour to the various facets of its projects be it on the structural, process or outcome parameters. This distinct advantage offered by Astron is unmatched by any other hospital and healthcare consultancy in the region.

Keeping in view, the needs of the hospital and healthcare facilities, Astron has developed the following divisions:

- Division of Public Health
- Division of Facility Planning and Design
- Division of Quality and Accreditation
- Division of Equipment Management
- Division of Corporate Governance and System Optimization
- Division of Healthcare Human Resources

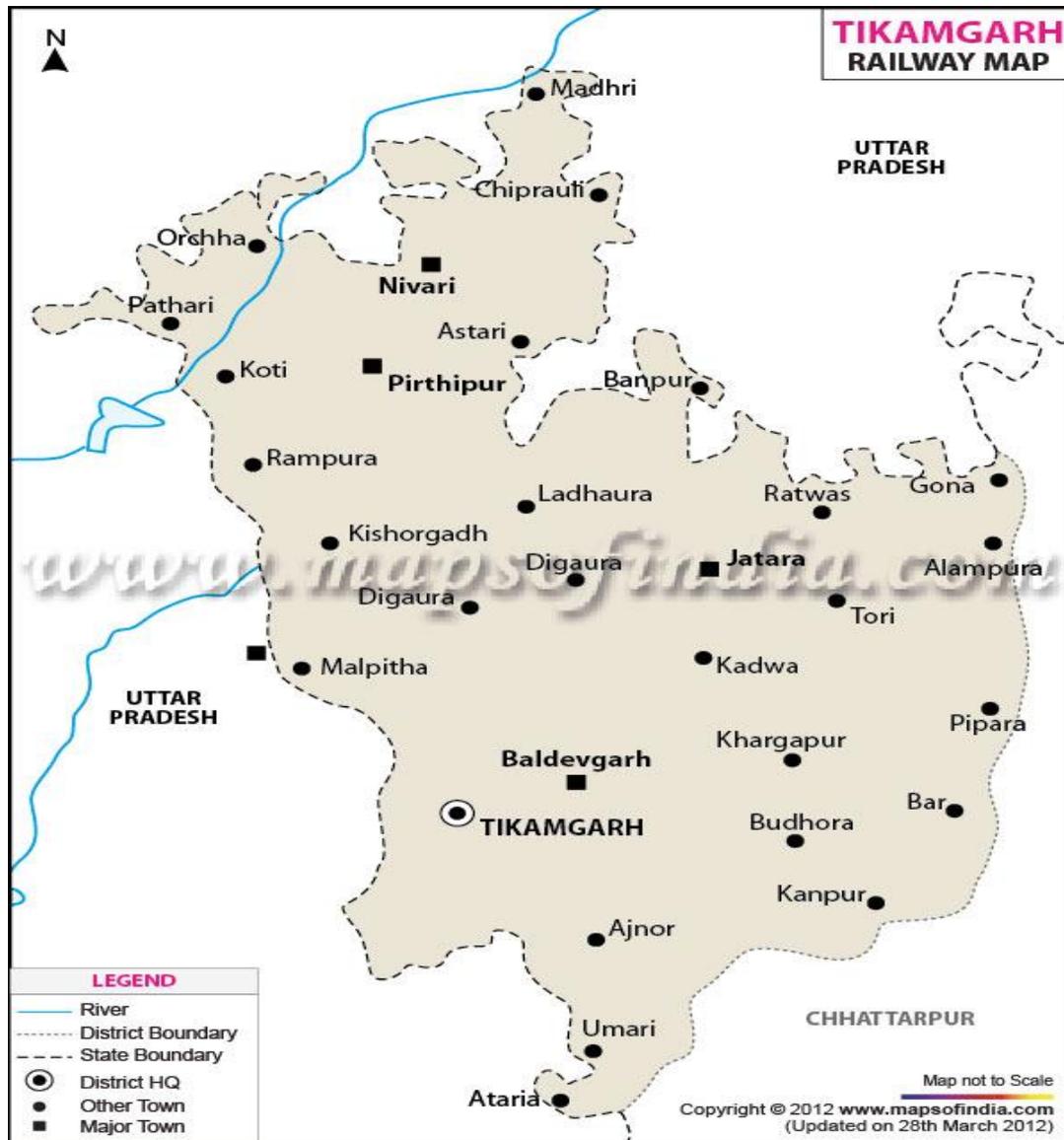
## **MANAGERIAL DUTIES AND TASKS PERFORMED**

During my internship period I was appointed as the District Consultant for RI (Routine Immunisation) in Tikamgarh District, Madhya Pradesh. I worked for the “Project on Acceleration of Routine Immunisation & ANC Services in Ten Underserved Districts of Madhya Pradesh” (Tikamgarh being one of the districts), initiated by Astron and MPTAST for supporting the MP Government. Following were the duties assigned to me:

- Technical and managerial support to the districts for capacity building in terms of immunization and ANC services.
- Developing and reviewing the micro plans for immunization
- Strengthen the micro planning at the block level and integration of micro plans at village, block and district health plans by building capacity of the immunization officers at district and block levels.
- Strengthening the monitoring and supervision capacity of district and block level officials in terms of routine immunization and ANC.
- Identifying key factors and strategies that are instrumental in effective functioning of immunization and ANC services.



FIGURE 2: TIKAMGARH MAP



## **REFLECTIVE LEARNING**

The internship period was definitely a great learning experience for me. It gave me hands-on experience in the field of public health. I got to know the various aspects of immunisation including:

- Basic understanding of Universal Immunization Program (UIP) which includes, current immunization schedule, current vaccines and their doses, routes of vaccine administration, common side effects, Adverse Events Following Immunization (AEFI) and general precautions to be taken at the time of vaccination.
- Planning of immunization services: Basic understanding of the steps involved in a bottom-up approach of developing an appropriate micro plan from sub-centre to district level, alternate vaccine delivery, role of supervision and monitoring in achieving high immunization coverage and understanding the concept of supportive supervision.
- Cold chain management, including the importance of maintaining cold chain, understanding of basic equipments at block and district level, importance of preventive maintenance, vaccine management and storage practices at various levels.
- Injection safety and waste disposal including immunization waste management and current practices observed in the field.
- Documentation: Understanding of various records such as vaccine stock and distribution registers at block level.
- Organizing and managing field visits and meetings with district and block level officials.
- I also conducted trainings, which improved my technical and practical knowledge about immunization and also helped me to develop my communication skills. I also learnt to speak and understand “Bundelkhandi”.

# **DISSERTATION ON “EVALUATION OF ROUTINE IMMUNIZATION PROGRAM IN A DISTRICT OF MADHYA PRADESH”**

## **INTRODUCTION**

Immunization is one of the most successful and cost effective public health interventions. Thanks to modern vaccines, crippling childhood diseases have been brought under control and some like smallpox have been eradicated and others like poliomyelitis are nearing eradication, saving the lives of millions.<sup>1</sup> Immunization is the key to the achievement of Millennium Development Goal 4 on reducing under 5 mortality by two thirds by 2015. Many of these deaths occur from the diseases that can be prevented with vaccines. Vaccines are also one of the most cost-effective health investments available, with health economic studies demonstrating direct net health savings as well as benefits to wider society. As a consequence, immunisation is not only an important public health tools, but can also promote economic development.<sup>2</sup>

Vaccine coverage has grown substantially since the introduction of WHO's Expanded Programme on Immunisation in 1974. Routine vaccination against measles, polio, diphtheria, tetanus, pertussis and tuberculosis (BCG) is available in all developing countries. About 80% of world's children are routinely vaccinated.<sup>3</sup>

While many vaccines are traditionally given to infants and young children (such as those against tuberculosis, polio, diphtheria, tetanus, pertussis, hepatitis B and measles), it is important to recognize that immunisation has a role to play throughout life. Booster doses of some vaccines are needed for protection throughout the life cycle.

Immunisation forms the major focus of child survival programmes throughout the world. Roughly 3 million children die each year of vaccine preventable diseases (VPDs) with disproportionate number of these children residing in developing countries. Government of India (GoI) launched the Expanded Programme on Immunisation in 1978 to protect children against diphtheria, pertussis, tetanus, and typhoid. Vaccination against polio through oral polio vaccine (OPV) was added to the programme in 1979-80 and BCG vaccination against tuberculosis was added in 1981-82. Vaccination against measles was included in 1985-86 and Hepatitis-B vaccine was added to UIP in 2006.<sup>4, 5, 6</sup>

In 1985, the Universal Immunisation Programme (UIP) was launched to protect all infants (0 through 12 months) against 6 serious but preventable diseases, namely, tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis and measles. The objective of the program was to fully vaccinate at least 85% of all infants of the age of 1 year. In subsequent years, the goal of UIP was raised to ensure 100% coverage of all eligible children with one dose of BCG, three

doses of DPT and OPV, and one dose of measles vaccine. This programme was integrated with the Child Health (RCH) Programme in 1997. In addition to ongoing routine immunisation programme, the Pulse Polio Immunization (PPI) campaign was initiated in 1995 to eradicate poliomyelitis from the country.<sup>7</sup>

The Government of India has declared 2012 as Immunization Year. Immunization against common childhood diseases has been an integral component of mother and child health services in India since adoption of the primary health care approach in 1978. However, vaccination coverage in India is far from complete and Madhya Pradesh is amongst the lowest performing states in terms of immunization. Despite the constant focus of the government on immunisation, parents sometimes fail to have their children fully vaccinated due to misinformation and unfounded rumours about possible adverse events. Failure to protect children through vaccination far outweighs any likelihood of adverse events following immunisation.<sup>8</sup>

## **PROBLEM STATEMENT**

Madhya Pradesh is among lowest five states in the country for the children aged 12-23 months who have received DPT vaccine (3 doses), polio vaccine (3 doses), measles vaccine and one dose of vitamin A supplement. As per DLHS-III, full vaccination coverage rate for Madhya Pradesh is 36.2%.<sup>9</sup> There are around 17 districts in Madhya Pradesh which are underserved, and have around 2 million children who are eligible for immunization against common vaccine preventable diseases of childhood.<sup>10</sup> The issues which need to be addressed include stagnating routine immunization coverage rates, high drop-out rates and declining trend in the underserved districts, underperforming pockets within districts. There is little capacity in the system to assess where unimmunized children are and as a result which areas to prioritize for targeted attention.

## **OBJECTIVE OF THE DISSERTATION**

- To evaluate routine immunization program in the district at end user perspective.

### **SPECIFIC OBJECTIVES:**

- To assess the supply of vaccines and logistics regarding immunization in the district.
- To understand the challenges and opportunities for improving the immunization coverage.
- To identify the constraints from service provider side for better immunization performance and facilitate corrective actions through the programme steering committee (district steering committee)
- To strengthen the capacity of district and block level officials for better monitoring and supervision of routine immunization program at district level.

# **REVIEW OF LITERATURE**

## **IMMUNIZATION**

Immunization is the process by which an individual's immune system becomes fortified against an agent (known as the immunogen). When this system is exposed to molecules that are foreign to the body (non-self), it will orchestrate an immune response, and it will also develop the ability to quickly respond to a subsequent encounter (through immunological memory). This is a function of the adaptive immune system. Therefore, by exposing an animal to an immunogen in a controlled way, its body can learn to protect itself: this is called active immunization. The most important elements of the immune system that are improved by immunization are the B cells (and the antibodies they produce) and T cells. Memory B cell and memory T cells are responsible for a swift response to a second encounter with a foreign molecule. Passive immunization is when these elements are introduced directly into the body, instead of when the body itself has to make these elements.<sup>11, 12</sup>

Immunization is done through various techniques, most commonly vaccination. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease.

Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year. It is one of the most cost-effective health investments, with proven strategies that make it accessible to even the most hard-to-reach and vulnerable populations. It has clearly defined target groups; it can be delivered effectively through outreach activities; and vaccination does not require any major lifestyle change.<sup>13</sup>

## **ROUTINE IMMUNIZATION IN INDIA**

Delivering effective and safe vaccines through an efficient delivery system is one of the most cost effective public health interventions. Immunization programmes aim to reduce mortality and morbidity due to vaccine preventable diseases (VPDs). Following the successful global eradication of smallpox in 1975 through effective vaccination programmes and strengthened surveillance, the Expanded Programme on Immunization (EPI) was launched in India in 1978 to control other VPDs. Initially, six diseases were selected: diphtheria, pertussis, tetanus, poliomyelitis, typhoid and childhood tuberculosis. The aim was to cover 80% of all infants. Subsequently, the programme was universalized and renamed as Universal Immunization Programme (UIP) in 1985.<sup>14</sup> Measles vaccine was included in the programme and typhoid vaccine was discontinued. The UIP was introduced in a phased manner from 1985 to cover all districts in the country by 1990, targeting all infants with the primary immunization schedule and all pregnant women with Tetanus Toxoid immunization.<sup>15</sup>

**TABLE 1**

**National Immunization Schedule (NIS) for Infants, Children and Pregnant Women**

Vaccine	When to give	Dose	Route	Site
<b>For Pregnant Women</b>				
<b>TT-1</b>	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
<b>TT-2</b>	4 weeks after TT-1*	0.5 ml	Intra-muscular	Upper Arm
<b>TT- Booster</b>	If received 2 TT doses in a pregnancy within the last 3 yrs*	0.5 ml	Intra-muscular	Upper Arm
<b>For Infants</b>				
<b>BCG</b>	At birth or as early as possible till one year of age	0.1ml (0.05ml until 1 month age)	Intra-dermal	Left Upper Arm
<b>Hepatitis B****</b>	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
<b>OPV-0</b>	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
<b>OPV 1,2 &amp; 3</b>	At 6 weeks, 10 weeks & 14 weeks	2 drops	Oral	Oral
<b>DPT1,2 &amp; 3</b>	At 6 weeks, 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of mid thigh
<b>Hepatitis B 1, 2 &amp; 3****</b>	At 6 weeks, 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
<b>Measles</b>	9 completed months-12 months. (give up to 5 years if not received at 9-12 months age)	0.5 ml	Sub-cutaneous	Right upper Arm
<b>Vitamin A (1stdose)</b>	At 9 months with measles	1 ml (1 lakh IU)	Oral	Oral
<b>For Children</b>				
<b>DPT booster</b>	16-24 months	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
<b>OPV Booster</b>	16-24 months	2 drops	Oral	Oral
<b>Japanese Encephalitis**</b>	16-24 months with DPT/OPV booster	0.5 ml	Sub-cutaneous	Left Upper Arm
<b>Vitamin A*** (2nd to 9th dose)</b>	16 months with DPT/OPV booster Then, one dose every 6 months up to the age of 5 years.	2 ml (2 lakh IU)	Oral	Oral
<b>DPT Booster</b>	5-6 years	0.5 ml.	Intra-muscular	Upper Arm
<b>TT</b>	10 years & 16 years	0.5 ml	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.

\*\* SA 14-14-2 Vaccine, in select endemic districts after the campaign.

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

\*\*\*\* In select states, districts and cities.

***Proposed Changes in the National Immunization Schedule: 2009-10***

- In select well-performing states, MR to be given with DPT Booster at 16-24 months (Dose: 0.5 ml; Route: Sub-cutaneous; Site: Right Upper Arm)
- DPT and HepB vaccines at 6, 10 and 14 weeks to be replaced by DPT-HepB-Hib (Pentavalent) vaccine.

The UIP envisages achieving and sustaining universal immunization coverage in infants with three doses of DPT, Hep B and OPV and one dose each of measles vaccine and BCG, and, in pregnant women, with two primary doses or one booster dose of TT. The UIP also requires a reliable cold chain system for storing and transporting vaccines, and attaining self-sufficiency in the production of all required vaccines.<sup>16</sup>

In 1992, the UIP became a part of the Child Survival and Safe Motherhood Programme (CSSM), and in 1997, it became an important component of the Reproductive and Child Health Programme (RCH). The Cold-chain system was strengthened and training programmes were launched extensively throughout the country. Intensified polio eradication activities were started in 1995-96 under the Polio Eradication programme, beginning with National Immunization Days (NIDs) and active surveillance for acute flaccid paralysis (AFP). The Polio Eradication Programme was set up with the assistance of the National Polio Surveillance Project.<sup>17</sup>

India's Immunization Program is one of the largest in the world in terms of quantities of vaccines used, numbers of beneficiaries, and the numbers of immunization sessions organized, the geographical spread and diversity of areas covered. Under the immunization program, six vaccines are used to protect children and pregnant mothers against Tuberculosis, Diphtheria, Pertussis, Polio, Measles and Tetanus.<sup>18</sup> Hepatitis B vaccine is the seventh vaccine added in UIP.

According to SRS, December 2011, the infant mortality rate of India was 47 per 1000 live births and that of Madhya Pradesh was 62 per 1000 live births (highest IMR amongst all states). In Madhya Pradesh, more than 63 percent of children under 12-23 months are not fully immunized. Almost 9 percent children (12-23 months old) in MP do not receive any vaccination. This represents one of the lowest levels of coverage in the country.<sup>19, 20</sup>

Specifically, MP is among lowest five states (out of 32 states and UTs) in the country for children 12-23 months who have received: three doses of DPT vaccine (47.4 percent) three doses of polio vaccine (55.1 percent); measles vaccine (57.7 percent); and children (9 months and above) who have received at least one dose of vitamin A supplement (39.5 percent).

Immunization performance varies considerably from district to district. The data shows that despite some overall progress from DLHS (District Level Household Survey) II to DLHS-III, 17 districts have extremely low rates of full vaccination coverage. As per DLHS-III, full vaccination coverage rate for Madhya Pradesh is 36.2 %. This is much lower for some of the underserved districts which are predominantly inhabited by tribal population.<sup>21</sup> Primarily, there are around 17 districts which are underserved, and have around 2 million children who are eligible for immunization against common vaccine preventable diseases of childhood, as per our National Immunization Schedule.<sup>22</sup>

## **PLANNING IMMUNIZATION SERVICES**

Immunization planning is a continuous process. The first step in planning for immunization services is the formation of standard micro plan with the help of micro planning tool suggested by the government of India.

### **Micro Plan at Sub Centre Level:**

Sub Centre (SC) is the basic unit for the preparation of micro plan, which includes name of villages, ANM, ASHA, estimation of beneficiaries, estimation of other logistics and vaccines, place and time for sessions. Compilation of these micro plans and inclusion of an area map, alternate delivery plan, and cold chain points, supervisory plan make micro plan of a block. District's micro plan is the compilation of blocks' micro plan.

It is observed that many SCs do not review their micro plan on regular basis (micro plan with old census) which may result in higher numbers of left outs. It is also possible that sometime higher birth rate is used for micro plan preparation which sets hard to achieve goals. It is our understanding that good communication among ANMs, AWWs and ASHAs may help in continuous review and revision of micro plan at SC level. A very good micro planning tool has been adopted by the government of India. This micro planning tool has 13 components. At 5 places we need to enter information in a systematic manner then micro planning tool generates remaining 8 components. Surprisingly, it is very easy to make block level micro plan with this tool, but because of many different field level issues few blocks do not have standard RI micro plan or even if they have, it is not in use. Many blocks have prepared micro plan according to the name of ASHA. It seems simple (ease of use) but it does not distribute work equally to all ANMS and at all the sessions sites for one ANM. Sometimes ANMs do have very few beneficiaries and sometimes they have too many beneficiaries. Therefore it can be concluded that absence of appropriate RI micro plan affects RI services severely and continuously.

These are the several components of micro plan:

- An estimation of beneficiaries
- An estimation of vaccines, logistics
- A work plan, including:
  - Who will provide the services

- Who will assist in provision of services;
  - ASHA, AWW, Social Mobilizers, Gram Panchayat members, NGOs, etc.
- Selection of site
- Planning of sessions
- Area map:
  - Villages, hamlets, hard to reach areas, etc. at sub centre level.
- For the block level:
  - The map includes SC boundaries
  - Alternate vaccine delivery routes
  - Vaccine storage point
- At the PHC and District level:
  - Make a plan for supervision
  - Prepare a budget that includes:
    - The cost of transport, meetings, social mobilization and other activities
    - IEC and training plans

### **Alternate Vaccine Delivery (AVD):**

The purpose behind AVD is to ensure presence of ANMs at sessions sites for required period of time. It had chiefly two benefits; first presence of ANMs could be ensured and regular presence of ANMs increase bondage and trust between community members and health department. Strong community participation is the key source of success for any public health program. AVD is the very essential part of micro plan, therefore it must be made according to micro plan and it must be approved from respective medical officers of PHCs.

These are the few steps involved in AVD plan:

- A. List out session site and plan route from cold chain storage point to session site
- B. Plan in terms of methods of delivery and routes based on the distance of session sites
- C. To ensure that the sessions are held according to the plan and on time.

### **Supportive Supervision and Monitoring:**

Supportive Supervision and Monitoring play a significant role in strengthening RI activities. It is carried out with a focus on using supervisory visits as an opportunity to improve knowledge and skills of health staff.

It focuses on **monitoring** performance towards goals, and **using data** for decision-making, and depends upon regular follow-up with staff to ensure that new tasks are being implemented correctly.

Supportive Supervision is a process of helping health staff to improve their own work performance;

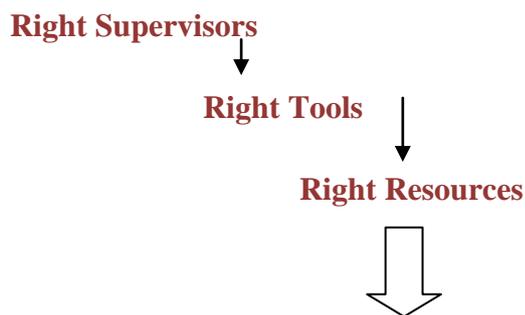
- A. It should be carried out in a respectful way and not like a dictator
- B. It encourages communication:
  - a. Open
  - b. Two-way
  - c. Builds team approach to solve the problems

There are two approaches in supervision, control and supportive approach; and among these two, supportive approach is effective and efficient. These are the chief characteristics of supportive supervision;

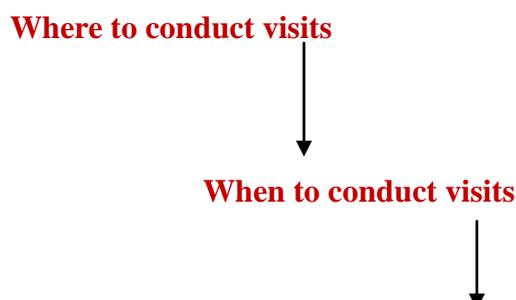
- A. Focus will be on improving performance not on fault finding
- B. Builds relationship
- C. Regularly follow up with positive attitude
- D. Using local data to monitor performance and accordingly solving the problems

There are steps for conducting Supportive Supervision:

### Step 1: Set Up a Supportive Supervision System



### Step 2: Plan Regular Supervisory Visits



## What to do during visits



### Step 3: Conduct Supportive Supervision Visits

Collect information



Problem-solve and provide feedback



Provide on the job training



Record results of supervision



### Step 4: Follow - up

Follow up on agreed actions



Analyze data regularly



Provide feedback to all stakeholders



Conduct follow up visits

There are three main aspects in Supportive Supervision System for its effectiveness

- A. Right Supervisors: she/he should be;
  - a. Well trained on supportive supervision techniques
  - b. Updated with information of immunization
  - c. Skilled on immunization issues
- B. Right Tools:
  - a. Availability of supervisory checklists and forms
  - b. Training materials
- C. Right Resources:

- a. Sufficient mobility
- b. Sufficient time for supervision and follow up

In Planning the Regular Supportive Supervision Visits; following aspects taken into consideration:

A. Where to conduct visits:

- a. Prioritize the areas by noticing:
  - i. High number of unimmunized
  - ii. High dropouts
  - iii. Low coverage rate
  - iv. Poor reports from previous visits

B. When to conduct visits:

- a. Plan visits on immunization session days
- b. Supervise fixed as well as outreach sessions
- c. Inform the HW about the scheduled visit
- d. Prepare plan taking into account distance, transportation, weather.etc.
- e. Schedule enough time to visit

C. What to do during visits:

- a. Review data of the site
- b. Previous supervision report

**Conduct During Supportive Supervision Visits:**

A. Collect information:

- a. Observe the health facility environment
- b. Review the records
- c. Talk with parents and community members

B. Problem solve and provide feedback:

- a. Describe the problem and its impact
- b. Discuss the causes of the problem with health staff
- c. Implement solutions and monitor regularly
- d. Provide feedback to the health staff concerned

C. Provide on the job training

- a. Explain the skill or activity to be learned
- b. Demonstrate the skill

- D. Record results of supervision; after each supervisory visit prepare a supervisory report

**Follow up:** it includes;

- A. Follow up on agreed actions by supervisors and supervised staff
- B. Analyze data regularly:
  - a. To notice the recommendations are being implemented
- C. Provide feedback to all stakeholders about:
  - a. Equipment supply and delivery problem
- D. Conduct follow up visits

**Monitoring:** As it mentioned in Immunization Handbook for Medical Officers “*Monitoring is the systematic and continuous process of examining data, procedures and practices. It is a process to gather all the significant information and used to measure progress, identify problems, develop solutions, guide policies and interventions*”. Monitoring is an important tool and helps to improve the quality of the immunization programme by ensuring:

- A. All infants and pregnant women are immunized
- B. Vaccines and safe injection equipment are delivered in correct quantities and on time
- C. Staff are well trained and adequately supervised
- D. Information on disease incidence and AEFI are collected and analyzed
- E. The community has confidence in the vaccine delivered and the immunization service they receive

There are five major components to be monitored in immunization system as per WHO guideline:

- A. Service delivery
- B. Vaccine supply, quality and logistics
- C. Surveillance and monitoring
- D. Advocacy and communication
- E. Programme management

## **Cold Chain and Logistic Management:**

“Cold Chain is a system of storing and transporting vaccines at recommended temperatures from the point of manufacture to the point of use”. The key elements of the cold chain are:

- A. Personnel: to manage vaccine storage and distribution
- B. Equipment: to store and transport vaccine and to monitor temperature
- C. Procedures: to ensure that vaccines are stored and transported at appropriate temperature

Cold chain seems like a big issue at district and block levels because of interrupted power supply, too busy cold chain handlers. False beliefs of cold chain handlers about the practices in cold chain; like more number of icepacks can be frozen if icepacks arrange in a manner so they can stick with the wall cause harm to the deep freezers. Although it may freeze icepacks little faster than recommended criss-cross manner, it increases load on compressors of DF and thus decreases their life span. The ILRs can keep vaccine safe with as little as 8 hours continuous electricity supply in a 24-hour period.

**TABLE 2: SENSITIVITY OF VACCINES FOR LIGHT AND HEAT**

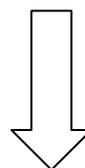
Vaccine	Exposure to heat/light	Exposure to cold	Recommended Temp
<b>▪ Heat/Light sensitive vaccines</b>			
<b>1. BCG</b>	Sensitive to light	Not damaged by freezing	<b>+2°C to +8°C</b>
<b>2. OPV</b>	Sensitive to heat	Not damaged by freezing	<b>+2°C to +8°C</b>
<b>3. Measles</b>	Sensitive to heat and light	Not damaged by freezing	<b>+2°C to +8°C</b>
<b>▪ Freeze sensitive vaccines</b>			
<b>1. DPT</b>		Freezes at -3°C	<b>+2°C to +8°C</b>

	(Should not be frozen)	
<b>2. HEP B</b>	Freezes at -0.5°C (Should not be frozen)	<b>+2°C to +8°C</b>
<b>3. TT</b>	Freezes at -3°C (Should not be frozen)	<b>+2°C to +8°C</b>

**Vaccine sensitivity to heat:**

1. BCG(after reconstitution)
2. OPV
3. Measles
4. DPT
5. BCG(before reconstitution)
6. TT, HEP B, JE

Most Heat Sensitive



Least Heat Sensitive

**Vaccine sensitivity to freezing:**

1. HEP B
2. DPT
3. TT

Most Freeze Sensitive



Least Freeze Sensitive

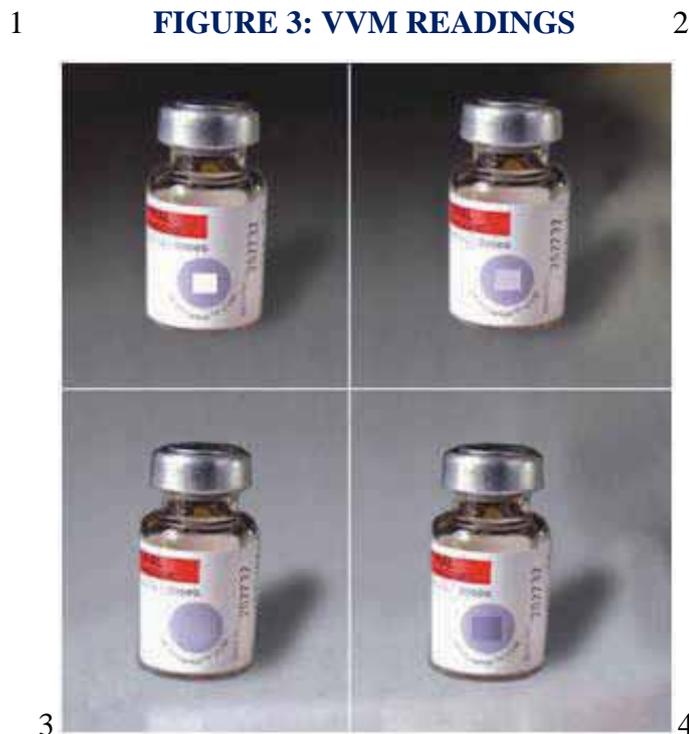
**Heat Damage:**

1. All vaccines damage- If temperature is more than 8° C
2. Reconstituted BCG, Measles, JE vaccines are more sensitive to heat and light
3. Reconstituted BCG and Measles should be used within 4 hours of reconstitution
4. JE vaccine should be used within 2 hours of reconstitution

**The Vaccine Vial Monitor (VVM):**

A VVM is a label on vaccine vials containing a heat sensitive material and it indicate cumulative exposure to heat over time.

- BCG and Measles-VVM placed at top of the cap of vial
- T series vaccine-VVM placed on label of vial
- Before opening a vial check the status of the VVM
- The cumulative effect of temperature and time cause the inner square of VVM to darken gradually and irreversibly
- The VVM does not directly measure the vaccine potency but it gives idea about the heath exposure, one of few main factors which affect the potency of vaccine.
- Readings



1. The inner square is lighter than the outer circle, then use the vaccine (Vaccine is usable)
2. The inner square is lighter than the outer circle, then use the vaccine
3. The colour of inner square and outer circle is same, then don't use the vaccine called as Discard Point
4. The colour of inner square is darker than the outer circle, then do not use the vaccine, called beyond the vaccine point

#### **Freeze Damage:**

- Always store T series vaccines (DPT, TT) and Hep B vaccine between 2°C to 8°C
- DPT, TT, Hep B vaccines lose their potency if frozen
- **Discard the vials , if vials are found to be frozen (this is specific for DPT, TT, DT, Hep B)**
- If you have doubt that the vials are frozen then conduct the “shake test”

**Light Damage:**

BCG and Measles are kept in amber coloured vials because they are light sensitive.

**Cold chain equipments:**

1. Electrical
2. Non-electrical

They are used for storing and transporting vaccines at recommended temperature

**TABLE 1: COLD CHAIN EQUIPMENT**

Electrical Equipment	Temperature	Storage Capacity
<b>DF(Large)</b>	-15°C to -25°C	200 ice packs or OPV stock for 3 month(1,20,000-1,80,000 doses)
<b>DF(small)</b>	-15°C to -25°C	100 ice packs
<b>ILR(large)</b>	+2°C to +8°C	Vaccine stock for 3 month(60,000 doses)
<b>ILR(small)</b>	+2°C to +8°C	Vaccine stock for 1 month(25,000 doses)
<b>Non electrical Equipment</b>		
<b>Cold Box(Large)</b>	+2°C to +8°C	6000 doses of mixed antigen with 50 icepacks Or 72-96 icepacks
<b>Cold Box(small)</b>	+2°C to +8°C	1500 doses of mixed antigen with 24 icepacks Or

		36 icepacks
<b>Vaccine Carrier</b>	+2°C to +8°C	Carried for 12 hours(4 ice packs and 16-20 vials)

### **Conditioning of Icepacks:**

When icepacks are removed from freezers at -15°C to 25°C, they should be kept at room temp for a while to increase their temperature till 0°C, otherwise it can cause freeze damage to T series vaccines. Sole purpose of conditioning of ice packs is to elevate the core temperature of icepacks till 0°C to prevent freeze damage to vaccines.

Characteristics-

- Beads of water cover the surface of icepack (precipitation of water)
- Sound of water is heard while shaking

**Domestic Refrigerator:** Although domestic refrigerators are not recommended for vaccine store, it can be used if it meets the following criteria;

- Temperature range should be 2°C to 8° C
- They are recommended for government facilities because their holdover time is only 4 hours
- Many urban dispensaries and private practitioners use domestic refrigerators

### **Vaccine Vans:**

- Insulated vans used for transporting the vaccines in bulk
- 6 lakh to 10 lakh mixed antigen can be transported at a time
- Vaccine should be transported in cold boxes with adequate number of conditioned ice packs

### **Cold Boxes:**

- These are insulated boxes, used for transportation and emergency storage of vaccines and icepacks
- Place conditioned icepacks at bottom and side of the cold box then keep vaccines in polythene bags
- Always keep thermometer inside the cold box for temperature monitoring.

- Don't keep T series vaccines in direct contact with conditioned icepacks to prevent freeze damage.

**Vaccine carriers:**

- It is an air tight small box which contains 4 conditioned ice packs with 16-20 vials
- Maintains temperature between 2 °C to 8 °C for 12 hours
- Keep vials in polythene bag
- Sitting on vaccine carrier can cause harm to it, hence it must be avoided
- Vaccines must be collected on the same day of distribution because its hold over time is only 12 hours.

**Ice pack:**

- It is a plastic containers filled with water
- Deep freezers are used to freeze them
- These are used in vaccine carriers and cold boxes (non electrical cold chain equipments) to increase the holdover time of vaccines

**TABLE 4: PREVENTIVE MAINTENANCE OF COLD CHAIN EQUIPMENT**

ILRs/DFs	Cold Boxes and Vaccine Carriers
Check Daily ✓ Temperature (twice daily) ✓ Door condition	After every use ✓ Keep latches open and free from load and tension ✓ Clean with detergent and dry ✓ Examine inside and outside surface for cracks ✓ Check that the rubber seal around the lid is not broken (if so, replace immediately) ✓ Hinges and locks are lubricated with machine oil.
Check Weekly ✓ Frost –( less than 0.5 cm thick) if more than 0.5 cm, then defrost	
Check Monthly ✓ Equipment for deforestation and Cleanness	

**Adverse Events Following Immunizations (AEFI):** “a medical incident that takes place after an immunization causes concerns and is believed to be caused by immunization” as it is described in *Immunization Handbook for Medical Officers*. AEFI cause serious concern to

routine immunization activities because it (AEFI) not only plays critical role in increasing gap between left outs and dropouts but also decreases trust between health workers and beneficiaries. Following are the common side effects of vaccination,

- Pain at the site of injection
- Swelling
- Redness
- Sometimes vomiting, diarrhea, malaise
- High grade fever and shock

Fortunately, majority of AEFIs can be prevented if proper maintenance of cold chain is ensured and safe injection practices are delivered by the skilled health professional at session sites. Frequent and/or the same type of AEFIs also indicates training issues in the area. AEFI may occur in same time period, with vaccine of same batch number, of with the same person. Contrary to the belief of community members, many AEFIs do not occur due to vaccine reactions but due to the variety of programmatic errors. Following events are considered as AEFI;

- High grade fever after DPT vaccine administration because of inherent quality of DPT Vaccine
- Abscess at injection site due to unsterile injection or unclean injection site
- Pneumonia after oral polio vaccine administration due to temporal association but not caused by vaccine
- Fainting spell: due to anxiety or pain from injection

*Program error: any error occurs during preparation, handling, transportation and administration of vaccine.*

### **Injection Safety and Waste Disposal:**

#### **Safe Injection:**

A safe injection does no harm to the beneficiaries. However, when safety control practices do compromise for any reason, severe complication may results. Unsafe injection practices cause risk of blood borne disease like Hepatitis B, Hepatitis C and HIV, and few other diseases due to unhygienic practices or unclean injection sites.

#### **Common reasons for unsafe injection practices:**

- A. Low supply of Hub cutters, AD syringes, Red and Black bags, Cotton swabs

- B. Untrained HWs
- C. Lack of awareness about the safe practices
- D. Ignorance of health workers and parents

**Possible solutions to address the issues of unsafe injection practices:**

- A. Ensure injection safety through a continuous supply of equipments:
  - a. AD syringes
  - b. Reconstitution syringes
  - c. Hub cutters
  - d. Waste disposal bags (Red and Black bags for waste segregation at the site of waste generation)
- B. Provide continuous education on injection safety to HWs.
- C. Parental education; so they help health workers to maintain hygiene at injection site
- D. Correct use of AD syringes
  - a. Use correct syringe for vaccine administration, (“adopted from the Immunization handbook for medical officers”):
    - i. *BCG – 0.1 ml*
    - ii. *All others are 0.5 ml*
  - b. *Check the packaging*
  - c. *Tear the package from plunger side and remove the syringe by holding barrel*
  - d. *Invert the vial and insert needle into the vial through the rubber cap*
  - e. *Do not touch the needle or the rubber cap of the vial*
  - f. *Do not draw air into the syringe*
  - g. *Clean the injection site with water swab and administer the vaccine*
- B. *Correct use of Hub- cutters:*
  - a. *Keep the hub cutter within arm’s reach during the session*
  - b. *Carefully insert the hub of syringe into insertion hole*
  - c. *Cut the hub completely by firmly holding the syringe*
  - d. *The cut needle , hub will drop into container*
  - e. *Put broken vials and ampoules on paper and drop into the container*
- C. *How to improve injection safety:*
  - a. *Keep hands clean before giving injections*
  - b. *Use sterile injection equipment*
  - c. *Prevent the contamination of vaccine and injection equipment*

*d. Consider all used equipments as contaminated*

*e. Practice safe disposal of all sharps*

### **Safe disposal of immunization waste:**

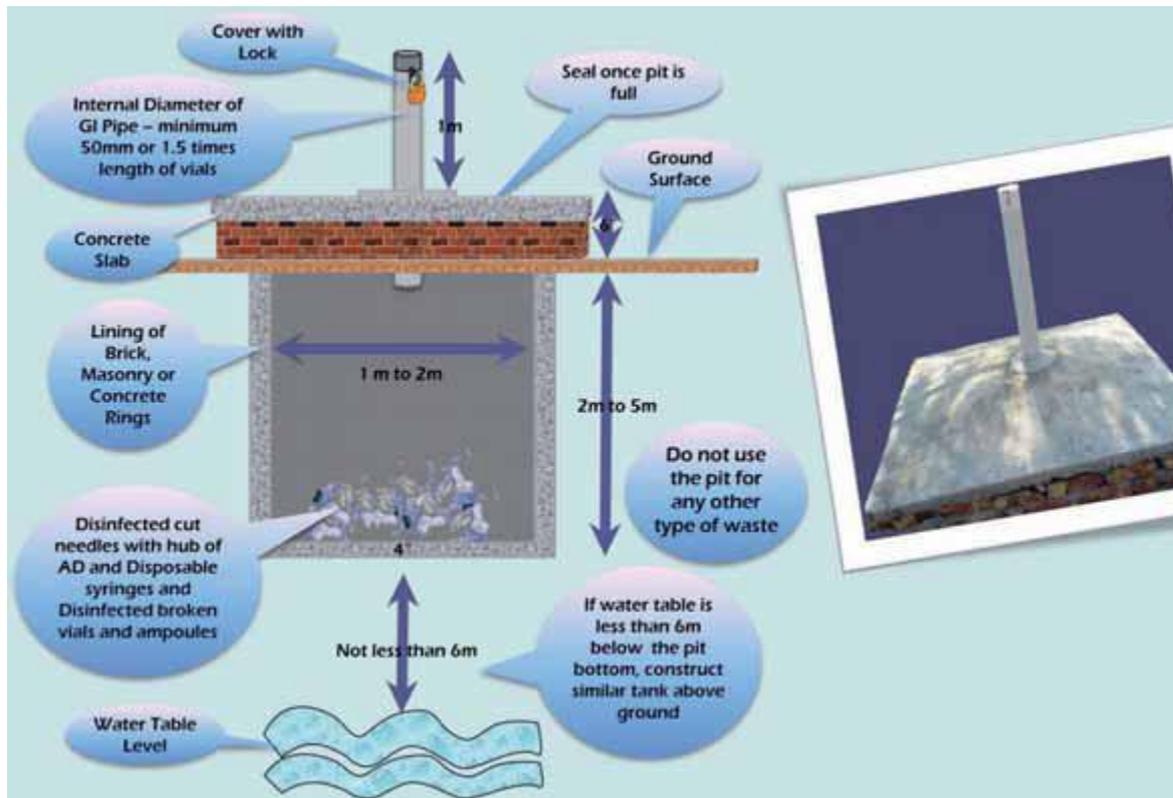
Safe waste disposal is one of the critical issues of routine immunization activities. It is very hard to find proper waste disposal. Few places have waste disposal pit as per the guidelines of Central Pollution Control Board (CPCB). But, many cold chain handlers dispose every kind of immunization waste including, syringes, unbroken vials and rappers, therefore these pits fill in a short period of time. It is not only the deviation from CPCB guidelines but also the wastage of our resources. Bleaching powder is easily available but chemical disinfection is still not in practice. Unsafe disposal of immunization waste can cause;

- **Dangers to health:** Throwing used needles in open pits can put the community at risk of acquiring infection. Usually children, rag pickers and animals are the unfortunate victims of needle-stick injury from unsafe disposal of needles and other sharps.
- **Dangers to the environment:** Due to the significant environmental risks posed by the unsafe disposal of immunization waste, CPCB disallows:
  - Throwing used needles and syringes in the open
  - Burying used needles and sharps
  - Burning immunization waste.

### **Disposal of bio-medical waste generated at Outreach Points/PHCs/ CHCs/ District Hospitals etc.**

- A. At the session site, cut the needle of the AD syringe immediately after administering the injection, using the hub cutter
- B. Store the plastic portion of the cut syringes and unbroken (but discarded) vials in the red bag or container.
- C. Dispose the needles and broken vials in a safety pit
- D. Send the syringes and unbroken vials for recycling
- E. Wash the containers properly for reuse
- F. Maintain a proper record of generation, treatment and disposal of waste at the District Hospitals/CHC/PHC/etc.

**FIGURE 4: DESIGN OF THE SHARP WASTE DISPOSAL PIT/TANK SUGGESTED BY CPCB**



Current practices observed in the field:

- A. Many health workers are aware about the disposal of immunization waste at session site but due to unavailability of hub cutters, and red and black bags, immunization waste segregation and collection is not being done at many places.
- B. It also been observed that few HWs dispose waste at session sites or throw it in open
- C. Sometimes disposable syringes are used instead of AD syringes due to unavailability of later one.
- D. Even at health facility level, proper waste disposal is not in practice. Few CHCs/PHCs do not have even waste disposal pit and because of that they have no choice, either they have to burn it or throw it in open area.<sup>23, 24</sup>

**Records and Reports:**

In Routine Immunization programs records are meant to collect: and they includes;

- Details of beneficiaries,
- Vaccination status, visit dates
- Number of cases of VPDs and AEFIs.

Reports are based on records and are submitted to higher levels of program management.<sup>25</sup>

Following are the records and reports related to immunization:

**TABLE 5: RECORDS AND REPORT FROM SC LEVEL TO STATE LEVEL**

<b>Level</b>	<b>Records</b>	<b>Reports</b>
<ul style="list-style-type: none"> <li>▪ Session site</li> <li>▪ SC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Immunization Card</li> <li>▪ Counterfoil</li> <li>▪ MCH/Immunization register</li> <li>▪ List of beneficiaries</li> <li>▪ Tally sheet</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly UIP Report</li> <li>▪ Weekly AFP, Measles Report</li> <li>▪ Immediate serious AEFI report</li> <li>▪ Outbreak Reports</li> </ul>
<ul style="list-style-type: none"> <li>▪ PHC</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temperature Monitoring Charts /Logbook</li> <li>▪ Stock and Issue Register</li> <li>▪ Micro plan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly UIP Report</li> <li>▪ Weekly AFP, Measles Report</li> <li>▪ Immediate serious AEFI report</li> <li>▪ Outbreak Reports</li> </ul>
<ul style="list-style-type: none"> <li>▪ District</li> </ul>	<ul style="list-style-type: none"> <li>▪ RIMS upload of Monthly UIP Report in computer</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly UIP Report</li> <li>▪ Weekly AFP, Measles Report</li> <li>▪ Immediate serious AEFI report</li> <li>▪ Outbreak Reports</li> </ul>
<ul style="list-style-type: none"> <li>▪ State</li> </ul>	<ul style="list-style-type: none"> <li>▪ RIMS upload of Monthly UIP Report in computer</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly UIP Report</li> <li>▪ Weekly AFP, Measles Report</li> <li>▪ Immediate serious AEFI report</li> <li>▪ Outbreak Reports</li> </ul>

# **DATA, METHODS AND ANALYSIS**

## **STUDY DESIGN**

The study design adopted for the study was cross-sectional.

## **STUDY AREA AND DURATION**

The study was conducted in selected Anganwadi Centres of all the 6 blocks of Tikamgarh District. The AWCs were selected randomly to cover all the blocks. The study was done for the duration of 3 months (from 1<sup>st</sup> December 2011 till 29<sup>th</sup> February 2012).

## **DATA COLLECTION TECHNIQUE**

Data was collected through a RI session monitoring format approved by the state government authorities. It covered following indicators:

- Availability of vaccines at session sites
- Availability of logistics at session sites
- Number of beneficiaries to be immunized
- Number of beneficiaries immunized

## **DATA ANALYSIS**

Analysis of the data was done using Microsoft Excel. Descriptive statistics were obtained to meet the objectives of the study.

## **QUALITY ASSURANCE**

Data thus entered in MS Excel has been randomly checked for quality assurance.

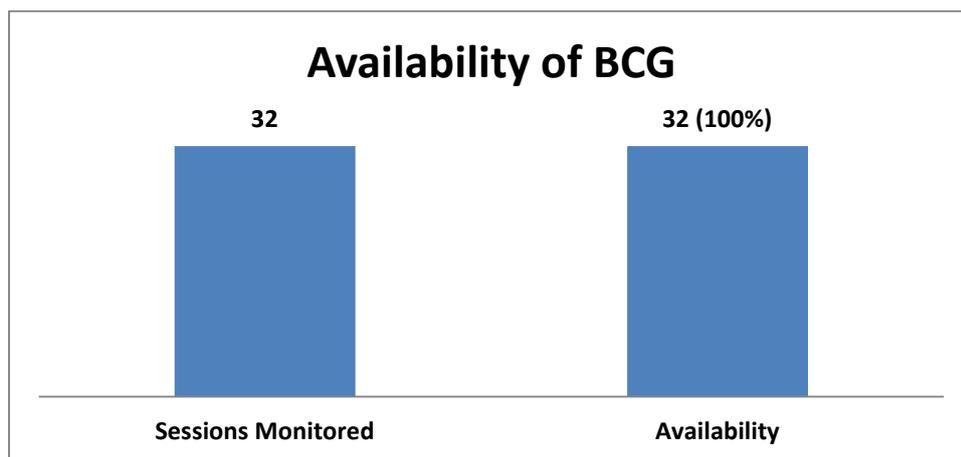
## **LIMITATIONS**

- The study is limited to few AWCs, so cannot be generalized to whole state.
- Cold chain points are not included in the study, which is a major factor in immunization coverage.

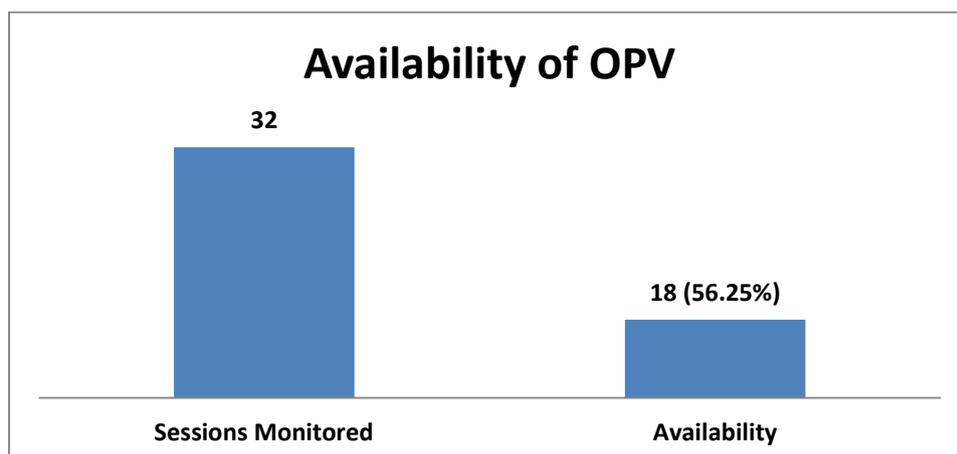
## **RESULTS AND FINDINGS**

### **Availability of Vaccines**

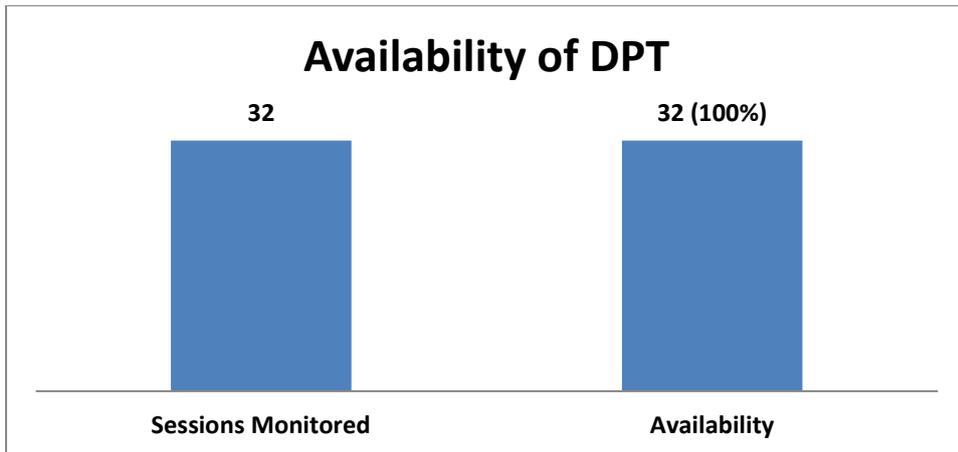
**FIGURE 5: AVAILABILITY OF BCG VACCINE**



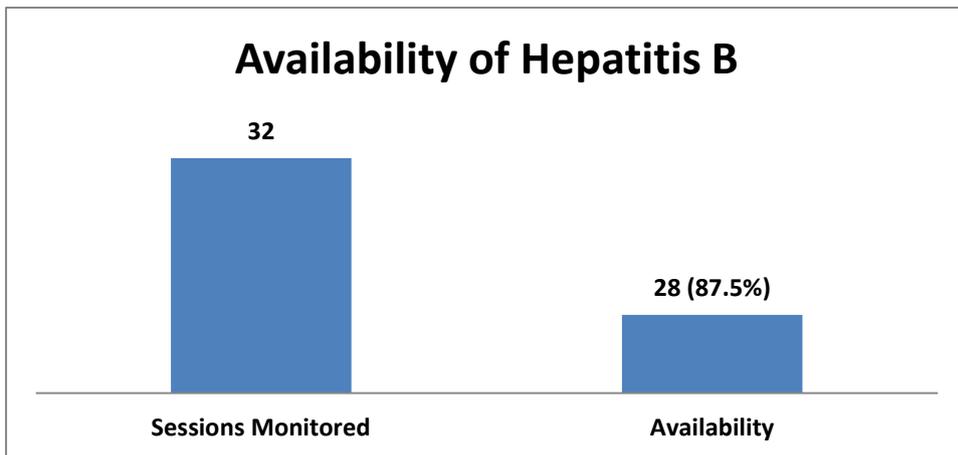
**FIGURE 6: AVAILABILITY OF OPV VACCINE**



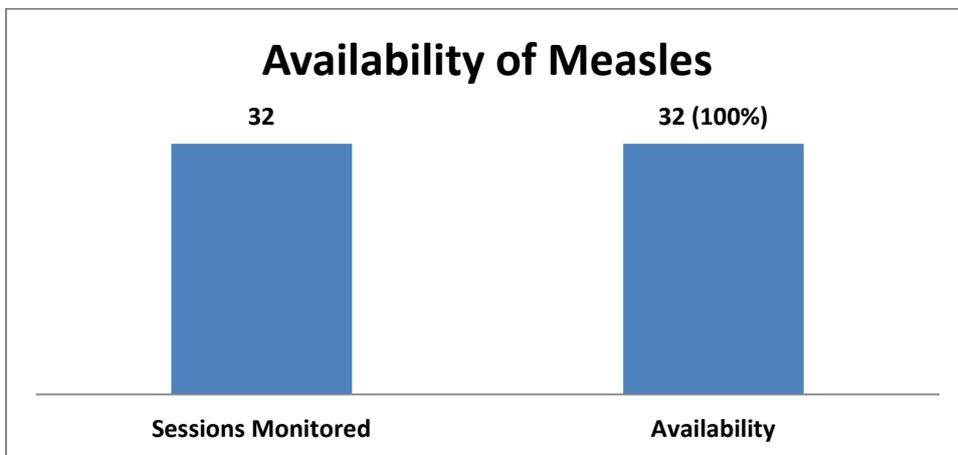
**FIGURE 7: AVAILABILITY OF DPT VACCINE**



**FIGURE 8: AVAILABILITY OF HEPATITIS B VACCINE**

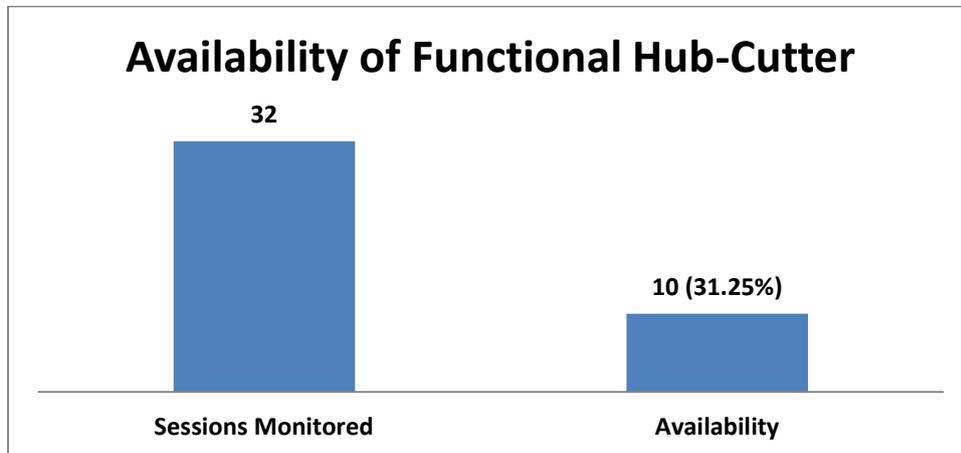


**FIGURE 9: AVAILABILITY OF MEASLES VACCINE**

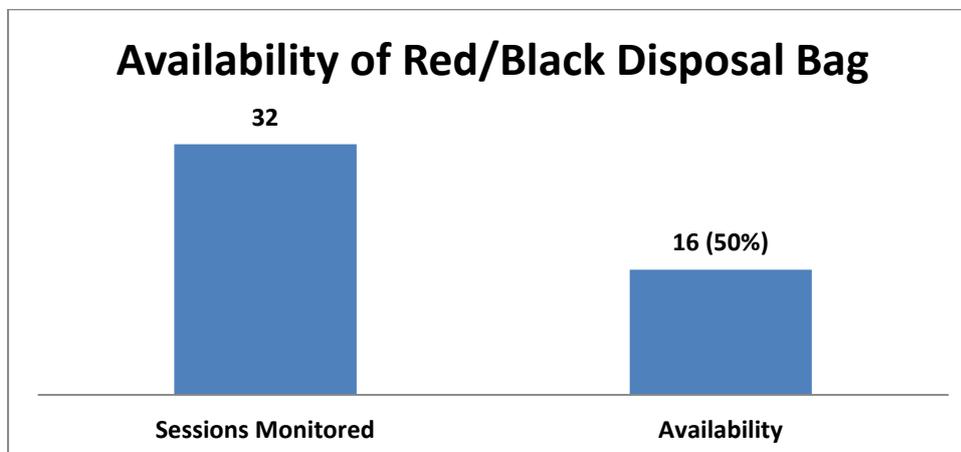


# Availability of Logistics

**FIGURE 10: AVAILABILITY OF FUNCTIONAL HUB-CUTTER**

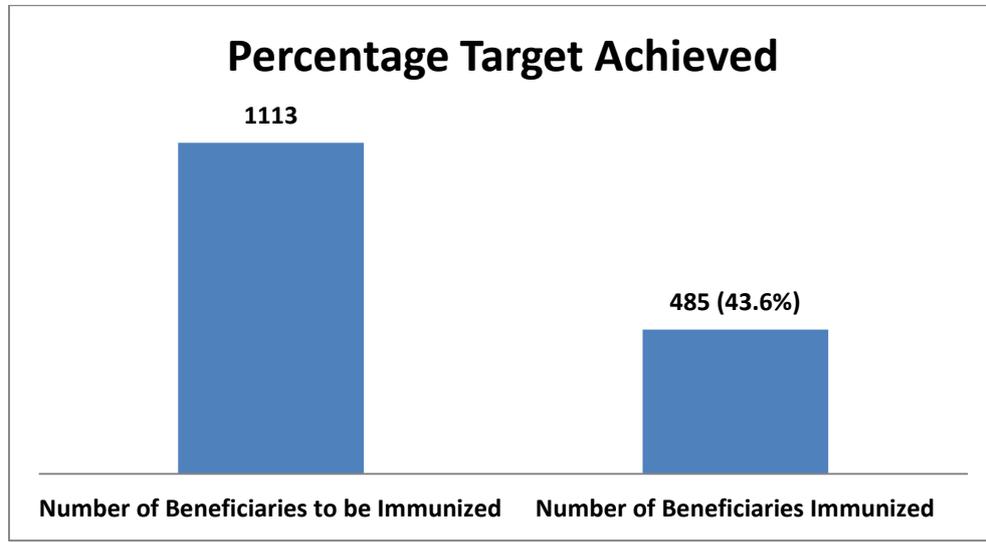


**FIGURE 11: AVAILABILITY OF RED/BLACK DISPOSAL BAG**



# Number of Beneficiaries Immunized

**FIGURE 12: PERCENTAGE TARGET ACHIEVED**



## **OBSERVATIONS**

Non-availability of vaccines is a major issue in the district. It was observed that BCG, DPT and Measles vaccine were available in all the sessions but OPV was available only in 56.25% of sessions and Hep B vaccine was available in 87.5% of sessions monitored.

Availability of logistics, including functional hub-cutter and disposal bag is also an issue of concern. Whereas only 32.25% sessions had functional hub-cutter, red/black disposal bag was found in 50% of the sessions monitored.

Out of 1113 beneficiaries to be immunized, 485 (43.6%) were immunized.

The constraints and roadblocks for uptake of immunization services are illiteracy and low awareness levels, low socio-economic status, lack of family support, migration, long distance coupled with inadequate availability of transport facilities, difficult geographical terrain, poorly accessible and remote geographical areas, infrastructural issues and prevailing myths & misconceptions. Additionally these issues were voiced cumulatively by the beneficiaries, providers and community decision makers which highlight the pressing need of these issues to be addressed immediately.

Other reasons for poor performance included the lack of knowledge about time and place of vaccinations, lack of awareness about the programme, fear of getting a disease and fear of side effects.

## **RECOMMENDATIONS**

- Ensuring timing and continuity of services to increase immunization coverage - Supply related factors of supply side such as suitability of timing of immunization, waiting time and motivation for subsequent immunization highly influence the attendance of immunization. The beneficiaries also need to have clear information about the subsequent immunization schedule and its importance. So health workers need to be trained on communication skills; how to provide clear information and motivate mothers to come for subsequent immunization and simultaneously educate them about the importance of immunization.
- Improving components of organizational quality - Organizational quality is related to training, use of micro planning, availability of supportive supervision, and the use of local area monitoring. Behavioural training and capacity building should be organized for health workers and supervisors from block to district level. Provide in-service continuous training to ANMs, medical officers, and cold chain handlers to improve the quality of services.
- Increasing the number of staff - Providing sufficient number of staff in order to reduce ANM's workload is necessary for better performance of EPI programme. Multiplicity of role as per the defined scope of work, pressures of achieving targets of all allocated programs, large geographical limits to be covered in the absence of adequate transport facilities affect ANM's working.
- Increasing the number of Anganwadi Centres - Geographical barrier is one of the main barriers to immunization programme. Currently, there are many AWCs which are built on main roads traversing through the village which is inaccessible to the population living in the interior part of village, away from the main road. To improve the accessibility, the government should conduct a detailed assessment to select the site for building new anganwadis.
- Increasing outreach services and knowledge related to EPI to increase utilization - District officials should provide budget for outreach services as it is an efficient strategy to increase immunization coverage. IEC activities can be expanded using local Haat bazaars, local TV and radio.
- Improving injection safety and cold chain system in order to improve technical quality - Besides increasing coverage of immunization, improving quality of services is also a crucial aspect to be improved because children have to be immunized with potent vaccines and appropriate injections. Supportive supervision should be provided to motivate the staff to follow the guidelines. Shortage of logistics (like hub-cutters, black disposal bag) needs to be addressed.
- District officials should routinely conduct vaccine monitoring to prevent vaccine stock out.
- Increasing inter-sectoral meetings and co-ordination to improve social accountability.

## **CONCLUSION**

The following issues still remain a matter of concern which needs to be resolved with a sustained and combined effort of the district and block level authorities.

- Administrative formalities and processes resulting in delay in implementation of activities, hence impacting the uptake of services, for e.g. delayed supply of logistics and vaccines from state to district and from district to block, time taken for the issuance of order on AVD and implementation of guidelines after completion of the required formalities at the district and block level.
- Unequal distribution of focal points across the district vis a vis the number of sessions planned in the block, adversely impacting the needs of the block and compromising cold chain maintenance by transportation of vaccine in far flung villages.
- Though there was no AEFI case reported, technical qualities including cold chain system and injection safety were practically poor in the district. It was observed that although the staff had the knowledge on the importance of cold chain system including daily temperature monitoring, they did not apply their knowledge due to lack of motivation and willingness. Injection safety is another issue of technical qualities such as syringe recapping and improper disposal. Shortage of functional hub-cutters adds to this problem.
- Inadequate convergence between Health and ICDS department resulting in inadequate coordination between the ANM, ASHA and AWW, posing as a major challenge. Poor coordination among district and block level officials is also observed.
- Inappropriate implementation of micro plan - Though a structured micro plan is available in the district but a co-ordinated implementation of the same at the block level still remains an issue to be addressed.

Inappropriate documentation featuring as a disparity in the number of targets in the village population, for e.g. outdated census data i.e. the family has left farming and moved out of village in search for other means of livelihood but they are still listed in the census list of the village. Also there are particular castes that have completely shifted from village to city but still remain in the village list.

As the success of any program implementation is dependent upon the synergistic activities of several partners i.e. stakeholders, service providers and beneficiaries, there needs to be a mutually supportive, innovative, practical and time bound action plan which will go a long way in achieving long term improvement in uptake of Mother and Child Health services & immunization among beneficiaries.

## **REFERENCES**

1. *Field Guide: Measles Surveillance, & Outbreak Investigation*, New Delhi, Government of India, 2006, (<http://www.npsuindia.org/download/Measles%20Guide.pdf>)
2. *Field Guide: Surveillance of Acute Flaccid Paralysis*, New Delhi, Government of India, 2005, (<http://www.npsindia.org/download/Redbook.pdf>)
3. *Guidelines for Disposal of Bio-medical Waste Generated during Universal Immunization Programme*, Delhi, Central Pollution Control Board, 2004, (<http://www.solutionexchange-un.net.in/environment/cr/res21040602.doc>)
4. *Guidelines for Reporting & Management of Adverse Events Following Immunization: India*, New Delhi, Government of India, 2005, ([http://www.whoindia.org/LinkFiles/Routine\\_Immunization\\_AEFIguidelines\\_for\\_reporting.pdf](http://www.whoindia.org/LinkFiles/Routine_Immunization_AEFIguidelines_for_reporting.pdf))
5. *Guidelines for Surveillance of Acute Encephalitis Syndrome*, New Delhi, Government of India, 2006, (<http://nvbdcp.gov.in/Doc/AES%20guidelines.pdf>)
6. *Immunization Essentials: A Practical Field Guide*, Washington, D.C., United States Agency for International Development, 2003, ([http://www.dec.org/pdf\\_docs/PNACU960.pdf](http://www.dec.org/pdf_docs/PNACU960.pdf))
7. *Immunization Handbook for Health Workers*, New Delhi, Government of India, 2006, ([http://www.whoindia.org/LinkFiles/Routine\\_Immunization\\_Immunization\\_Handbook\\_for\\_Health\\_Workers\\_2006.zip](http://www.whoindia.org/LinkFiles/Routine_Immunization_Immunization_Handbook_for_Health_Workers_2006.zip)),
8. *Immunization In Practice: A Practical Resource Guide for Health Workers*, Geneva, World Health Organization, 2004, (WHO/IVB/04.06),

(<http://www.who.int/vaccines-documents/DoxTrng/h4iip.htm>)

**9. *India National Universal Immunization Programme Review***, New Delhi, United Nations Children's Fund- World Health Organization , 2004,

([http://www.whoindia.org/LinkFiles/Routine\\_Immunization\\_Acknowledgements\\_contents.pdf](http://www.whoindia.org/LinkFiles/Routine_Immunization_Acknowledgements_contents.pdf))

**10. *Integrated Disease Surveillance Project: , Training Manual for State & District Surveillance Officers, Module 5***, New Delhi, Government of India, 2005,

([http://nicd.nic.in/IDSP\\_docs/TRAINING%20MANUAL/District%20Surveillance%20Team%20Training%20Manual/Module5.pdf](http://nicd.nic.in/IDSP_docs/TRAINING%20MANUAL/District%20Surveillance%20Team%20Training%20Manual/Module5.pdf))

**11. *Measles Mortality Reduction: India Strategic Plan 2005-2010***, New Delhi,

Government of India, 2005, ([http://www.whoindia.org/LinkFiles/Measles\\_Measlespdf.pdf](http://www.whoindia.org/LinkFiles/Measles_Measlespdf.pdf))

**12. *Multi Year Strategic Plan 2005-2010: Universal Immunization Programme***, New Delhi, Government of India, 2005,

([http://www.whoindia.org/LinkFiles/Routine\\_Immunization\\_MYP\\_PDF\\_\(o5\\_July\\_05\)\\_\\_Final.pdf](http://www.whoindia.org/LinkFiles/Routine_Immunization_MYP_PDF_(o5_July_05)__Final.pdf))

**13. *National Child Survival and Safe Motherhood Programme: Surveillance***, New Delhi, Government of India, 1994

**14. *National Family Health Survey (NFHS-3), 2005-06: India***, Mumbai, International Institute of Population Sciences and Macro International, 2007,

([http://nfhsindia.org/nfhs3\\_national\\_report.html](http://nfhsindia.org/nfhs3_national_report.html))

**15. *National Immunization Programme: Conduct Disease Surveillance***, New Delhi, Government of India, 1989

**16. *Outbreaks Investigation and Control***, New Delhi, National Institute of

Communicable Diseases, Government of India, 1998, (2-313 DGHS/98)

**17.** *Reproductive and Child Health Programme, Immunization Strengthening Project:*

*Training Module for Mid-level Managers*, New Delhi, Government of India, 2001

**18.** *Standard Operating Procedures for Investigation of Adverse Events Following*

*Immunization*, New Delhi, Government of India, 2005,

([http://www.whoindia.org/LinkFiles/Routine\\_Immunization\\_standard\\_operating\\_procedures.pdf](http://www.whoindia.org/LinkFiles/Routine_Immunization_standard_operating_procedures.pdf))

**19.** *Surveillance of Epidemic-Prone Diseases*, New Delhi, National Institute of

Communicable Diseases, Government of India, 1998, (2-312 DGHS/98)

**20.** *Training for Mid level Managers Modules (MLM)*, Geneva, World Health

Organization, 2008

([http://www.who.int/immunization\\_delivery/systems\\_policy/training/en/index1.html](http://www.who.int/immunization_delivery/systems_policy/training/en/index1.html))

**21.** *Vaccine Stock Management: Guidelines on Stock Records for Immunization*

*Programme and Vaccine Store Managers*, Geneva, World Health Organization,

2006, (WHO/IVB/06.12),

(<http://www.who.int/vaccines-documents/DocsPDF07/826.pdf>)

**22.** *Text book of Public Health & Community Medicine*, Department of Community Medicine, AFMC, Pune, 2009

**23.** <http://www.who.int/topics/immunization/en/> Accessed on April 30, 2012

**24.** <http://pib.nic.in/newsite/erelease.aspx?relid=79602> Accessed on April 30, 2012

Name of District: \_\_\_\_\_ Name of Block: \_\_\_\_\_ Name of CHC/PHC: \_\_\_\_\_

Name of Subcentre: \_\_\_\_\_ Name of ANM: \_\_\_\_\_ Date of Visit: \_\_\_\_\_

Name of Session site: \_\_\_\_\_ Population Catered: \_\_\_\_\_ No. of Beneficiaries (1 year \_\_\_\_\_): \_\_\_\_\_

Time of Visit: \_\_\_\_\_ Name & Designation of monitor: \_\_\_\_\_

### SESSION MONITORING FORMAT FOR ROUTINE IMMUNIZATION

Session Site	Sub center <input type="checkbox"/> Anganwadi Center <input type="checkbox"/> Others <input type="checkbox"/>		
<u>1</u> Present at Site (tick all that apply)	ANM <input type="checkbox"/> AWW <input type="checkbox"/> ASHA/Link Worker <input type="checkbox"/> Mobilizer <input type="checkbox"/> Other <input type="checkbox"/>		
<u>2</u> Availability of ANM as per micro plan	Yes <input type="checkbox"/> No <input type="checkbox"/>		
<u>3</u> Name of ANM			
<u>4</u> Type of immunization –related IEC material is displayed at site? (tick all that apply)	Banner <input type="checkbox"/> Wall writing <input type="checkbox"/> Tinplate <input type="checkbox"/> Poster <input type="checkbox"/> Other <input type="checkbox"/>		
<u>5</u> Is vaccine carrier with 4 ice packs available/With conditional icepacks?	Yes <input type="checkbox"/> No <input type="checkbox"/>		
<u>6</u> Are all vaccine & diluents placed in plastic zipper bag in vaccine carrier?	Yes <input type="checkbox"/> No <input type="checkbox"/>		
<u>7</u> Availability of MCH registers with ANM?	Yes <input type="checkbox"/> No <input type="checkbox"/>		
<u>8</u> Availability of vaccines (according to duelist) and logistics D-Distributed / B – Balance <i>(Enter the no. of vaccines distributed &amp; Balance remained)</i>			
	D	B	
BCG			Measles Diluent
BCG Diluent			Tally Sheet
tOPV			Vitamin A
DPT			Tracking bags
Hep B			Plastic Spoon
			0.1ml AD Syringes
			TT
			0.5ml AD Syringes
			Disposable Syringes
			Blank RI Cards
			Hub Cutter
			Available/NA
			Functional/Non-Functional
			Red/Black Disposal Bags
<u>9</u> Is the VVM of all antigens is in usable stage (Stage 1 or 2)/any frozen (T) series antigen available?	Stage 1		Yes <input type="checkbox"/> No <input type="checkbox"/>
	Stage 2		Yes <input type="checkbox"/> No <input type="checkbox"/>
	Frozen t series		Yes <input type="checkbox"/> No <input type="checkbox"/>
<u>10</u> Is the time of reconstitution	BCG		Yes <input type="checkbox"/> No <input type="checkbox"/>

	mentioned on both BCG & Measles vial(s)?	Measles	Yes <input type="checkbox"/>	No <input type="checkbox"/>											
<u>11</u>	Does ANM/AWW/ASHA/Link Worker have a due list of beneficiaries for this day?	Yes <input type="checkbox"/>	No <input type="checkbox"/>												
<u>12</u>	Is the DPT vaccine administered on outer mid-thigh (antero-lateral aspect)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>											
<u>13</u>	Is the ANM giving the 4 key messages to the mother/care-giver?	Yes <input type="checkbox"/>	No <input type="checkbox"/>												
<u>14</u>	Is Blank /new immunization cards provided to beneficiaries?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>											
<u>15</u>	Is after injection / immunization, ANM is asking parents to wait for half an hour?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>											
<u>16</u>	Vaccine carrier brought by....?	Hired Person <input type="checkbox"/>	Supervisor <input type="checkbox"/>	ANM <input type="checkbox"/>	Other <input type="checkbox"/>										
<u>17</u>	What is the type of waste disposal system?	Burial <input type="checkbox"/>	Incineration <input type="checkbox"/>	Outsource <input type="checkbox"/>	Others <input type="checkbox"/>										
<u>18</u>	Whether unused vaccine vials and syringes returned back to PHC or not?	Yes <input type="checkbox"/>	No <input type="checkbox"/>												
<u>19</u>		BCG	OPV-1	Hep B-1	DPT-1	OPV-2	Hep B-2	DPT-2	OPV-3	Hep B-3	DPT-3	Measles	DPT Booster	OPV Booster	
	No. of beneficiaries to be immunized (As per micro plan target)														
	No. of beneficiaries Immunized														
<u>20</u>	Reason for Drop out	Not Knowing about vaccines <input type="checkbox"/>		Time not Convenient <input type="checkbox"/>		Feel no need <input type="checkbox"/>		Do not have time <input type="checkbox"/>		Others .....					
<u>21</u>	Any AEFI case reported during last 3 months														
<u>22</u>	Corrective action taken in case of AEFI	Information to BMO <input type="checkbox"/>		Information to DIO <input type="checkbox"/>		Visit to Household <input type="checkbox"/>		Child Referred to Hospital <input type="checkbox"/>		Whether Treated or Not <input type="checkbox"/>		Follow Up <input type="checkbox"/>		Other .....	
<u>23</u>	Type of maternal tracking system.	No. of Beneficiary Mother block	No. of forms Filled	No. of forms entered											
<u>24</u>	Type of child immunization tracking system.	No. of Beneficiary Children	No. of forms Filled	No. of forms entered at block	List of Left Out Children										