Identifying Barriers and Enablers in Coverage of Hepatitis B (Birth Dose) in Sirsi, Jaipur, Rajasthan

A Capstone project submitted to

IIHMR University

in partial fulfillment of the requirements for

the award of the degree of

Master of Public Health (Implementation Science)

by

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MPH (IS) 2022-23, Cohort 1

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June 2023

Acknowledgement

I would like to convey my heartfelt gratitude to **Dr. Nutan Prabha Jain**, my mentor, and my fellow colleagues for their tremendous support and assistance in the completion of my Capstone project. I would also like to thank our dean **Dr. Vinod Kumar SV**, our program coordinator **Dr. Piyusha Majumdar,** other faculties of **SD Gupta School of Public Health**, for providing me with this wonderful opportunity to work on this project named "**Identifying barriers and enablers in the coverage of Hepatitis B (birth dose) in Sirsi, Jaipur, Rajasthan**". Last but not the least, I would like to thank my family and peers for encouraging me throughout. The completion of the project would not have been possible without their help and insights.

Dr. Aditi Bakshi

Contents

Background

Immunization is necessary for the survival of a child. It protects children from eight life threatening infectious diseases. Missed Routine Immunization (RI) can cost the life of an infant, which makes immunization one of the most effective and cost-effective ways to guard the lives and futures of children. **(1)**

Government of India launched the immunization programme in 1985. It is one of the largest health programmes in the world, covering twenty-seven million children in a year. Under this programme, vaccination against eight life-threatening diseases, i.e., diphtheria, whooping cough, Haemophilus influenzae type B (Hib) causing pneumonia and meningitis, tetanus, polio, tuberculosis, measles, and hepatitis B is given to children in the entire country. Moreover, endemic districts/states have a provision of providing vaccination against Japanese Encephalitis (JE). In recent years, rotavirus vaccine (RVV) was added in RI schedule as well. **(2)** Various vaccines were added to RI in recent years such as Hepatitis B (HepB) and pentavalent**.** HepB vaccine was introduced in the UIP of 10 States of India in 2007-08 after being piloted in 2002 **(5) (11)**.

About nine million immunization sessions are conducted every year across India to deliver vaccines to the target population. Despite these efforts over the past years, immunization coverage grew at a very slow speed, i.e., around 1% each year among children aged 12-23 months (about 2 years) in the country. **(3)**

In order to address slow growth in immunization coverage, Ministry of Health & Family Welfare (MoHFW) launched massive routine immunization (RI) intensification

campaign with highest political commitment called Mission Indradhanush (MI) in December 2014 which aimed for 90% full immunization coverage (FIC) and it intended to reach children who were unvaccinated or partially vaccinated with a great emphasis on hard-to-reach and high-risk populations by 2020 **(3)**.

NFHS Rounds (4)	India			Rajasthan			Jaipur		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Round 1 (92-93)	30.9	50.7	40.8	-	-	-	-	-	-
Round 2 (98-99)	36.6	60.5	48.6	13.8	29.3	17.3	-	-	-
Round 3 (2005-06)	38.6	57.6	48.1	22.1	44.3	33.2	-	-	-
Round 4 (2015-16)	61.3	63.8	62.6	53.3	60.9	54.8	-	-	58.2
Round 5 (2019-21)	76.8	75.5	76.4	79.7	83.2	80.4	-	-	89.3

Table 1: Routine Immunization Coverage in India, Rajasthan, and Jaipur (Source: rchiips.org)

To intensify MI, Honorable Prime Minister revised timeline to reach 90% by 2018. There was an increase of 6.7 percentage points in FIC in the first two phases of MI. It was clear through analysis of coverage and trend that MI alone will be insufficient to reach the target of 90% FIC by December 2018. Thus, an Intensified Mission Indradhanush (IMI) was introduced in the in October 2017 to improve vaccination coverage and address current gaps in the programme **(2) (3).** The routine immunization schedule of the Government of Rajasthan is presented in Annex.

RI services were disrupted by Covid-19 pandemic in the 2020-21 years which led to a significant drop in the immunization coverage, with maximum fall in the first quarter of 2020 (26% fall in comparison to 2019 – according to HMIS) **(5)**. According to the operational guidelines introduced in 2021 for 4th phase of IMI, through weighted scoring mechanism Jaipur is one of the 374 prioritized districts for IMI (5). However, Rajasthan is set to achieve the missed targets and set targets for the upcoming years as well.

Program design and service delivery

IMI phased out from third into fourth phase recently, called IMI 4.0. Service delivery is sub-divided into various phases. i.e., deciding target audience and schedule for immunization, preparatory activities required for further phases- planning, organizing, recording and reporting, and, monitoring and evaluation **(5)**. Conceptual framework of program service delivery

Program design (in sequence)-

A schematic illustration of program design and service delivery process flow (as mentioned in the Guidelines for IMI latest version) are as follows-.

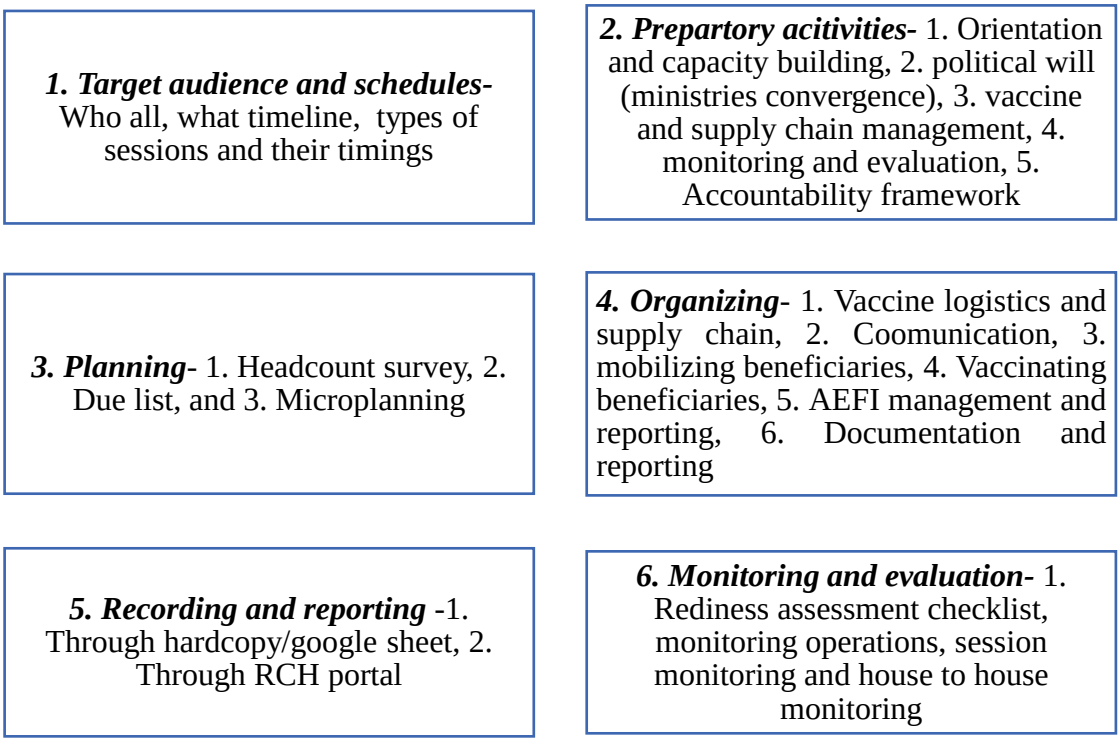
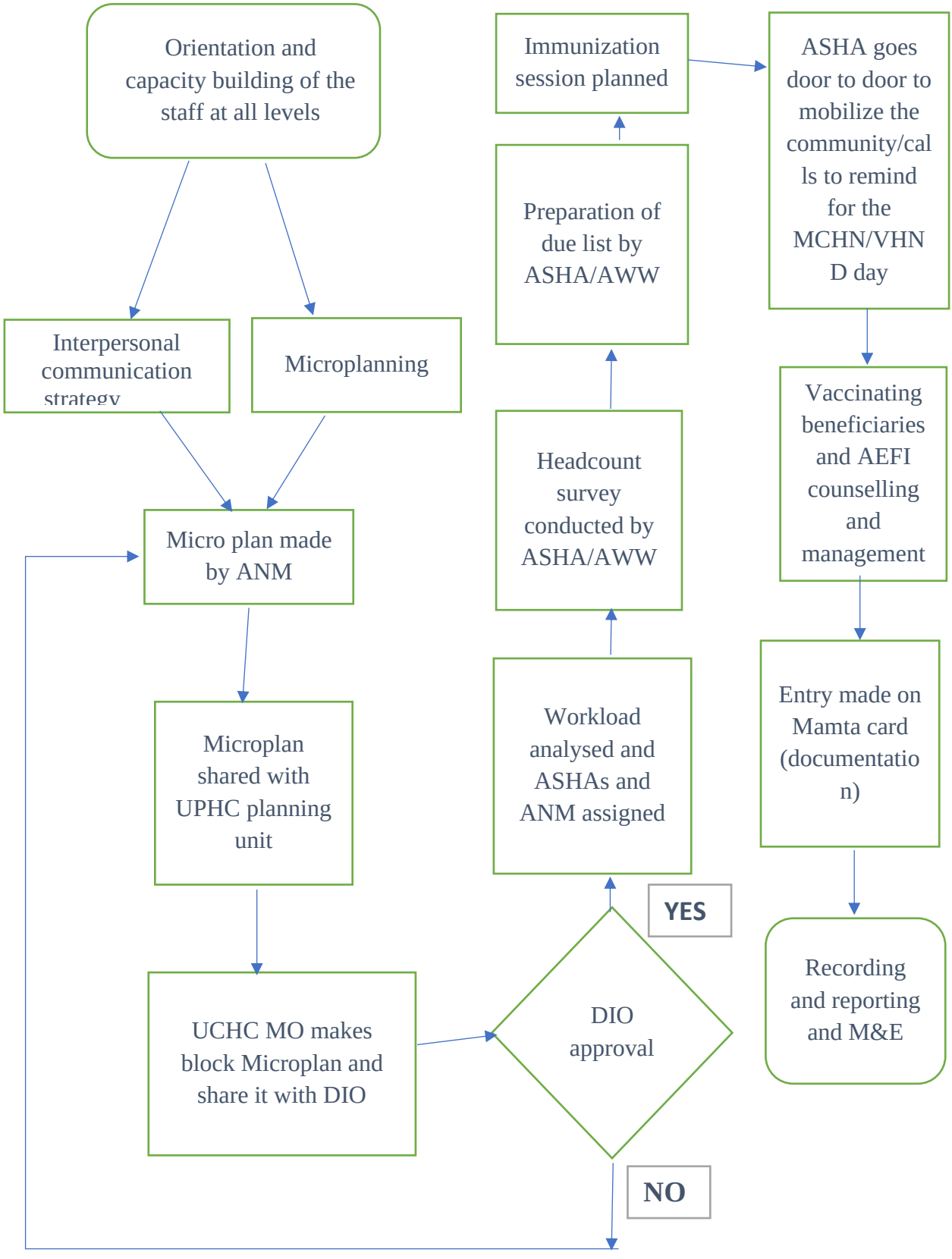


Figure 1: Program design, IMI 4.0

Process flow for service delivery



Stakeholder mapping and analysis

According to a study conducted on IMI in 2018, cross-sectoral and multistakeholder engagement can be effective in strengthening access and improving the quality vaccine services. One of the bold step taken under IMI was mobilizing communities and about 12 non-health sector ministries such as ministry of women and child development, transportation, Panchayati raj, etc., were engaged in for social mobilization through standard operating procedures **(6)**.

Stakeholder mapping and analysis has been done based on the interest and influence of the stakeholders in the programme. Here, interest means stakeholders' concerns towards the coverage (how much stakeholders are prompt in responding, proactively in providing their inputs to the context) and influence means their ability to impact the study.

The score has been given on the scale of 1 to 4, one being lowest and 4 being the highest.

Grade 1- Very low concern with the coverage / Very low impact on coverage

Grade 2- Low concern with the coverage / /Minimal impact on coverage

Grade 3- High concern with the coverage / High impact on the coverage

Grade 4- Very High concern with the coverage/ Very High impact on the coverage

Since the area of focus is the coverage of HepB vaccine (birth dose), stakeholders who have an impact on coverage are listed as key stakeholders and mapped below-

Stakeholders	Interest	Influence	Key stakeholders
1. Healthcare providers- Medical officer	4	4	✓
2. ANMs and GNMs	4	4	✓
3. ASHAs	4	4	✓
4. AWWs	2	4	
5. District Immunization Officer	4	4	✓
6. Government of Rajasthan-Local leaders and MLAs	2	4	
7. Beneficiaries (infants and children, mothers, and families)	3	4	✓
8. Vans carrying vaccinations	1	4	
9. Local Voluntary organizations (VOs)	3	3	
10. Development organizations like UNDP, WHO, UNICEF, USAID,	4	4	✓
11. Non-health ministries (Panchayati raj, Ministry of Women and Child Development, etc.)	4	4	✓
12. Space lending agents (schools, anganwadis)	2	3	

Table 2: Stakeholder Analysis

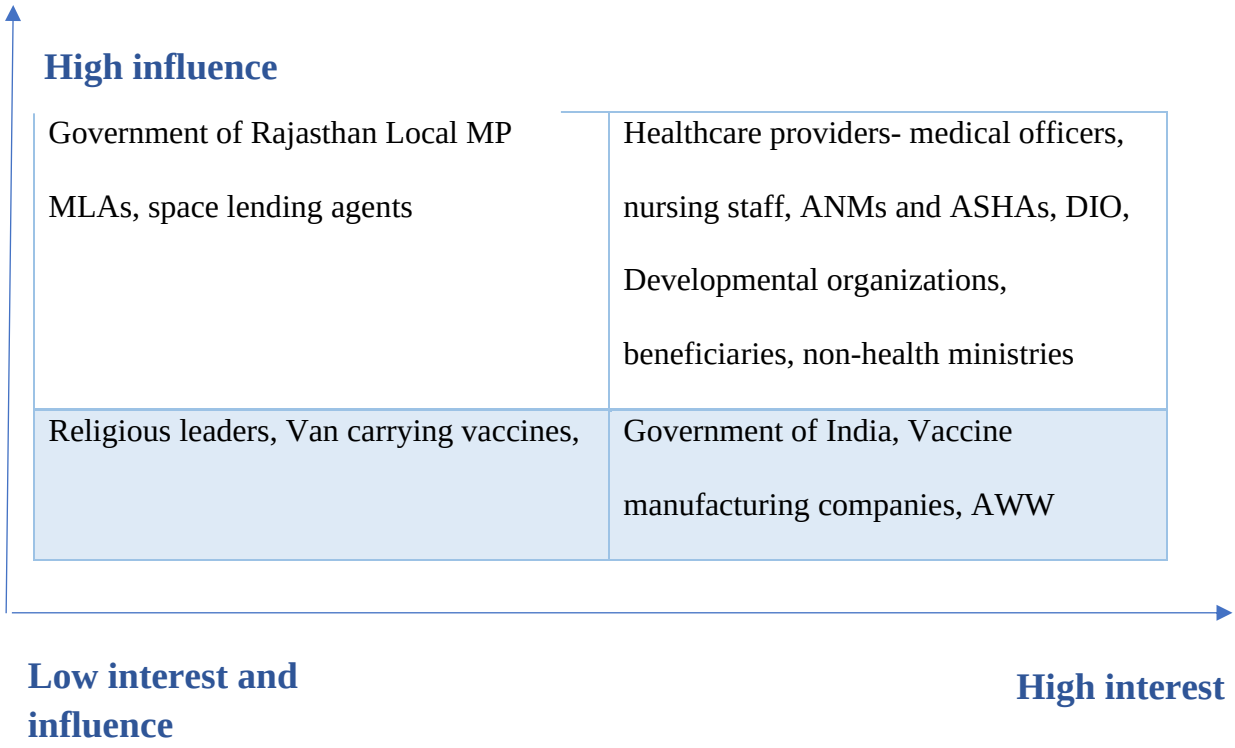


Figure 2: Stakeholder mapping

Statement of the Problem and Objectives

In India, viral hepatitis is progressively being identified as a public health challenge, with Hepatitis B virus (HBV) infection a major public health burden. Based on HepB surface antigen (HBsAg), areas of endemicity are categorized as high (more than 8%), intermediate (2-7%) and low. According to the categories mentioned, India has intermediate endemicity with an average of 4 per cent **(7)**. Moreover, India has second largest number of cases of chronic HBV infections. In 2015, About 197,640 perinatal HBV infections occurred in South East Asian Region (SEAR) with major contribution from India (62%). **(9)** HBV infections morbidity and mortality pattern is very relative to the endemicity of HIV/AIDS. **(8)**

According to WHO, with over 40 million HBV carriers, HBsAg prevalence is 3-4.2%, whereas in Rajasthan, it is 1.83%. **(12)** However in Jaipur, prevalence of HBV infection varies in urban as well as rural settings. In a recent study conducted in 2020, HepB was found out to be prevalent in rural Jaipur, whereas no cases of Hep B were discovered in urban Jaipur.

Hepatitis is very preventable through vaccination if given during early childhood **(7).** Various countries instituted the intervention of providing HepB birth dose in their immunization schedules. After piloting in 2002, India also introduced it in UIP of 10 States of India in 2007-08 and then scaled up to entire nation in 2012 **(5) (10)**.

In India, coverage for hepatitis B birth dose during 2015 and 2016 was 45 and 60 per cent respectively **(7)**. In Rajasthan, National Family and Health Survey (NFHS) Rajasthan 2019-21 results show that percentage of children aged 12-23 months who received

hepatitis B (birth) dose at any time was 82.4%, against 90% coverage according to the roadmap, 2019. Coverage of hepatitis B birth dose in India is sub optimal. **(14)**.

Hence, this capstone targets to discuss barriers and enablers in the coverage of birth dose of hepatitis B in Sirsi, Jaipur, Rajasthan.

Context Analysis

Field visit documentation

Day 1- Overview of the UCHC (observation):

Activities conducted included a small tour of the UCHC, understanding the assigned roles and of each department, and one-on-one interaction with the service providers (general introduction). A thorough overview was taken of the posters and IEC material related to vaccination displayed and available in the UCHC. The organogram of the UCHC and a brief introduction about the program, beneficiaries and activities conducted under the program were informed by the medical officer. A detailed overview of the cold chain was given by the ANM. Furthermore, working of ILR and deep freezer and the entire process of vaccinating beneficiaries, starting from indenting vaccines to conditioning ice box and carrying vaccines to subcenters on MCHN day was briefed by the ANM. The process of manual recording and reporting was also explained by the ANM.

Day 2- Interviewing service providers:

During the second visit, a detailed discussion with medical officer and ANM was conducted. Questions related to program, providers' role, and implementation of activities were asked in a structured manner. Implementation challenges and how those are addressed at different service providers level was discussed. Every information shared by the service providers was recorded. Post lunch, an in-depth interview was conducted with ASHA and her duties in the program and her understanding of the program were also recorded.

Day 3- Observation of Implementation of MCHN Day at UCHC Sirsi:

Third visit was planned with the intent to understand (by observing and interviewing the beneficiaries) how MCHN day is conducted at the facility. MCHN was conducted on a Friday (31st March 2023), delayed by a day (Thursday) due to a public holiday (Ramnavami) between 9 AM-2 PM. All the beneficiaries were informed during the last MCHN day for the due vaccination and a reminder through calls was also given by ASHA. Process of vaccinating the children and pregnant women and counselling about adverse events of the vaccines was observed. There were two ANMs present- one was vaccinating, the other was making entries in Mamta cards. According to the due list prepared by the ASHA (but was not available at the facility), vaccines were brought by ANMs in vaccine carriers with conditioned icepacks and syringes were preloaded with vaccines to avoid delays and inconvenience to the families. Vaccine Vial Monitoring was also noted by the observation team for each vaccine. According to ANMs, beneficiaries that arrived were more than the number which was expected. Post-vaccination, ANMs explained the beneficiaries about AEFI and how to manage them, what all to give and when to come next. The beneficiaries that were interviewed were the ones who came for missed doses for their children. The most common cause of dropouts/delays were due to forgetfulness of parents and mothers visiting their maternal homes. Poor biomedical waste management was observed in terms of improper use of respective bins. Further, interviews of various beneficiaries were conducted, and important points were noted and discussed with the beneficiaries. Their understanding of the program and its benefits were understood as well.

Day 4- Understanding the HMIS of Rajasthan:

On the fourth day of the visit, quantitative data was collected using PCTS (Government of Rajasthan software pregnancy and child tracking system). The work of the website was

discussed and understood. The process of online data entry system was also observed, majorly related to vaccination and immunization. Data entry is made in this portal, fortnightly. Information such as ANM roasters are used for planning.

SWOT and PESTLE

Based on the understanding of the UCHC, following SWOT and PESTLE Analysis was done to understand the key factors (both external and internal) that may impact (positively and negatively) the of coverage and to understand what is in control and what is not-

Strengths	Weakness
1. Free of charge services 2. Availability of Vaccines, cold chain, etc., 3. Work managed by limited human resources, but beneficiaries are getting services 4. Allows beneficiaries who are beyond the due list (coming from outside the catchment areas, dropouts, delayed, etc.)	1. Inadequate human resources (2 ANMs for 14 subcenters, ANM is also taking care of cold chain as well) (standard is two ANMs-one permanent and one contractual is each subcenter) 2. Lack of complete service statistics for all the years (2019-2020 report was not available) 3. Vaccine wise target beneficiaries not listed, 4. Lack of transparency in sharing information 5. Lack of supervision 6. Inadequate knowledge of vaccine preventable diseases among ANMs. 7. Data quality (incomplete, over-reporting and under-reporting, denominator vs numerator)
Opportunity	**Threats**
1. Political commitment (allocated budget, Mission mode) 2. Routine audits/checks by international agencies (INGOs commitment) 3. Community awareness (beneficiaries aware about the benefits of vaccination)	1. Nomadic population (always on the move, difficult to track) 2. Stock outs during outbreaks 3. Communities' resistance, 4. Missed/delayed doses

Table 3: SWOT Analysis

Political	Economical	Social	Technological	Environmental	Legal
Political commitment for the improvement of coverage and effective program is in place	A budget of 39,000 crores is allocated to vaccination in India (6)	Cultural barriers like hesitancy amongst Muslim community, people from neighboring villages also coming to Sirsi for vaccination	Rajasthan has its own HMIS for maternal and child health called PCTS	Natural calamities may affect MCHN day (rare) Biomedical waste management policy in place and is done at UCHC Sirsi	Strengthening of surveillance for AEFI is encouraged to protect the health of the future generations

Table 4: PESTLE Analysis

Findings

Barriers

Barriers detected through analysis of primary data collected through interviewing frontline health workers and beneficiaries of the program, reflected issues typically with both service delivery, beneficiaries, and recording and reporting.

The challenges were classified into following perspectives:

A) Based on providers perspective

B) Based on beneficiaries' perspective

C) Based on facility's condition and circumstances

Based on the perspective of providers:

Evidence suggests that poor recording and reporting, incompleteness of data (no. vaccine specific target population) and absence of due list at UCHC were other issues and due to incompleteness or data and lack of information, a proxy indicator of target population was created at 97 per cent based on NFHS data, assuming this number of institutional deliveries must have occurred. There are gaps in the data due to misinformation or poor recording or reporting as well as the difference is quite significant. Other factors such as poor supportive supervision and overworked staff were also reflected in the survey.

Based on Facility perspective:

According to the SWOT analysis done of the UCHC, it was found out that there is no provision for delivery in that UCHC (no labor room). This reduces the possibility of the child to be vaccinated in this facility, since HepB vaccine (birth dose) is to be given

withing 24 hours of birth. Moreover, other CHCs in Sirsi could also be another factor. This could lead to patients attending another facility for vaccination.

Based on beneficiaries' perspective

From beneficiaries' perspective, lack of awareness regarding HepB vaccine (birth dose) was also noticed when questions regarding Hepatitis B vaccine birth dose were raised during the interview.

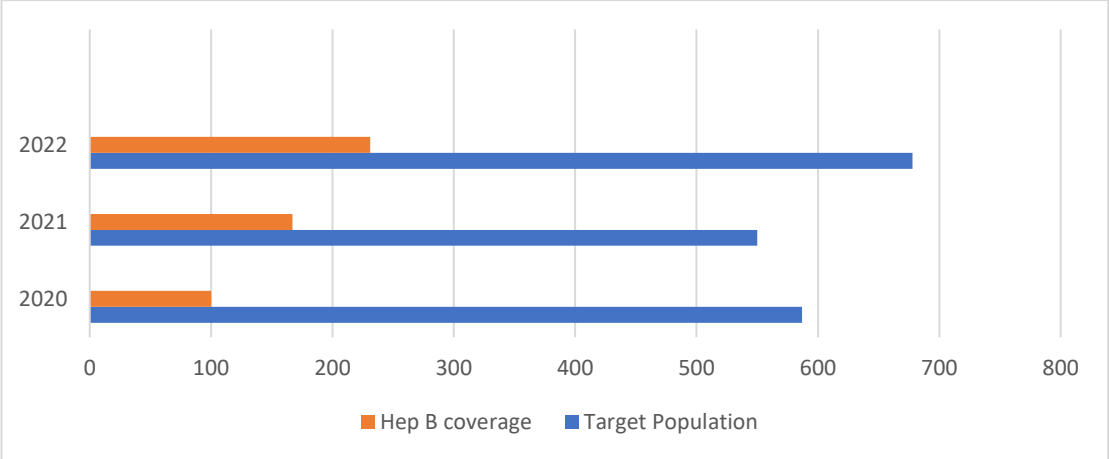


Figure 1: No. of children given Hep B vaccine (birth dose) out of target population in Sirsi, 2023

Enablers

On the other hand, **enablers** of HepB (birth dose) vaccine coverage were understood through PESTLE analysis conducted for the facility. It includes sufficient vaccine available at the facility (no stockouts in last three months), resilient and committed workforce of the program, political will for the program implementation and free of cost services. Moreover, awareness among beneficiaries regarding the importance of the vaccination in general also facilitates vaccination. In terms of HepB vaccine, it follows open vial policy, that is, one vaccine vial contains 10 doses of 0.5ML each and can be

used multiple times until it loses its viability. Monovalent HepB vaccine is heat stable, making it suitable for storage outside cold chain at 37 °C for 1 month (15).

Challenges
1. No provision of institutional delivery (no labor room or maternity ward)
2. Potential beneficiaries do not restrict to one health facility
3. Lack of supportive supervision
4. Lack of awareness in beneficiaries regarding HepB vaccine
5. Data quality
Enablers
1. Sufficient vaccine logistics available at the facility
2. Resilient and committed frontline health workers
3. Political will for the program implementation (sustained funding and support)
4. Increased community awareness about importance for immunization but lack of awareness of vaccinations
5. Free of charge services

Table 5: Challenges and enablers

Based on the magnitude of the problem, following challenges were identified as of top priority-

1. 1. Poor data quality
2. Lack of awareness about HepB vaccine among beneficiaries
3. Lack of supportive supervision

Table 6: Prioritized challenges

Suggestive actions for each challenge are given in the table below and these solutions are further classified based on feasibility and priority:

Problem	Suggestive Action	Feasibility	Priority
1. Poor data quality	• Conduct regular review (at least monthly) • Partner with experts for audits (collaborate with third party) • Training of staff for data quality • Weekly checks for registers by MO (more frequent) • Cross checking protocol (weekly) in the field (checking Mamta cards with mothers' testimony, etc.) • Adapting Khushi baby	Difficult	
2. Lack of awareness about HepB vaccine among beneficiaries	• Outreach awareness activities • Counseling mothers and family and educate them regarding Hepatitis B • Allocate more women from the community to conduct "baithaks" to talk about vaccines • Putting more IEC posters	Challenging	
3. Lack of supportive supervision	• Training of MO on public health leadership • Build a feedback mechanism	Swift	

Table 7: Suggestive actions for each challenge

Based on primary and secondary data, shortlisted enablers are listed below-

1. Sufficient vaccine logistics
2. Resilient and committed service providers (ASHAs and ANMs)
3. Sustained funding and political will for program implementation
4. Free of cost services

Table 8: Prioritized enablers

The best practices in the program that constitute as enablers are listed below with the suggestive actions to sustain it:

Best practices	Supporting actions required to sustain best practices
1. Sufficient vaccine logistics	• Determining the need before time and timely procurement of vaccine logistics to avoid stock-outs with a buffer stock of at least a month, • Time-to-time checking VVM to understand the need for discarding and procurement, • Cross-examine the quality of not only vaccines but also syringes, and other logistics
2. Resilient and committed service providers (ASHAs and ANMs)	• Even workload distribution • Performance based incentivization scheme for ANMs • Regular training and capacity building to be done
3. Sustained funding and political will for program implementation	• Yearly budget allocation particularly for immunization, • Targeting transparency to make politics work, • Optimally utilizing allocated budget and resources
4. Free of cost services	• Optimal utilization of resources and funds and minimizing waste • Sufficient budget allocation for program implementation • Advocacy for free-of-cost services

Table 12: Actions to sustain best practices

Conclusion

This report put light upon various challenges and enablers of HepB (birth dose) vaccine coverage in UCHC, Sirsi. Data quality was identified as the biggest challenge, followed by poor supportive supervision and lack of awareness among beneficiaries regarding HepB vaccine. Prompt and corrective actions are given, and their feasibility and priority are detailed in the results.

Despite the gaps, there are various enablers that facilitates improvement in coverage of Hepatitis B vaccine. From descriptive survey conducted with service providers, it was noted that sufficient vaccine logistics is one of the best practices in this facility. In addition, resilient and hardworking service providers including ASHAs and ANMs are also considered as enablers of the program. There is political commitment along with a separate budget for the immunization program allocated by the state of Rajasthan as well. Moreover, all the immunization services are free of charge, and completely funded by central government of India.

The report also highlights the need for addressing these challenges to improve coverage of HepB vaccine and sustain the best practices for smooth implementation of program and getting desired outcome. However, due to the small sample size and limited information, this report is not representative of the true picture.

Recommendations

With the National Viral Hepatitis Control Programme (NVHCP) being rolled out in India along with IMI, targeting to increase HepB birth-dose vaccination to >90%, it is of utmost importance to address all the challenges and encourage all best practices to improve the coverage of HepB vaccine.

The following are recommendations to address the issues and encourage best practices-

1. It was observed during the study that there is a gap in supportive supervision. Regular monitoring and training and capacity building for public health leadership should be conducted.
2. Due to incompleteness of the data, data reliability became questionable for analysis, thus proxy indicator was created based on secondary review. Timely recording and reporting and training for the same should be conducted to avoid such foreseen barriers.
3. Lack of awareness was noted in beneficiaries during the survey conducted. Beneficiaries were not able to differentiate between all three birth doses. Thus, including a conversation regarding awareness during ANC services could be considered as it is the need of the hour.
4. Innovative interventions can be considered to improve coverage, such as incentivization (rations, money, etc.), Khushi baby, and providing other health benefits, etc.

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Annexure

Vaccine	When to give	Dose	Routine	Site
For pregnant women				
TT- 1	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
TT-2	4 weeks after TT-1*	0.5 ml	Intra-muscular Upper Arm	Upper Arm
TT- Booster	If received 2 TT doses in a pregnancy within the last 3 years*	0.5 ml	Intra-muscular	Upper Arm
For infants				
BCG	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
Hepatitis B – Birth dose	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV-0	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
OPV 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks (OPV can be given till 5 years of age)	2 drops	Oral	Oral
Pentavalent 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Rotavirus#	# At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	5 drops	Oral	Oral
IPV	Two fractional doses at 6 and 14 weeks of age	0.1 ml	Intra dermal two	Intra-dermal:

				fractional doses	Right upper arm
Measles /MR		1st Dose 9 completed months-12 months. (Can be given till 5 years of age)		0.5 ml	Sub-cutaneous	Right upper Arm
JE – 1**		9 completed months-12 months. 0.5 ml Sub-cutaneous Left upper Arm		0.5 ml	Sub-cutaneous	Left upper Arm
Vitamin A (1st dose)		At 9 completed months with MR		1 ml (1 lakh IU)	Oral	Oral
For children						
DPT booster-1		16-24 months		0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles/ MR 2nd dose		16-24 months		0.5 ml	Sub-cutaneous	Right upper Arm
OPV Booster		16-24 months		2 drops	Oral	Oral
JE-2		16-24 months		0.5 ml	Sub-cutaneous	Left Upper Arm
Vitamin A*** (2nd to 9th dose)		16-18 months. Then one dose every 6 months up to the age of 5 years.		2 ml (2 lakh IU)	Oral	Oral
DPT Booster-2		5-6 years		0.5 ml	Intra-muscular	Upper Arm
TT	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 labor if she has not previously received TT.**

****JE Vaccine is introduced in select endemic districts after the campaign.**

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

#Phased introduction, at present in Andhra Pradesh, Haryana, Himachal Pradesh, and Orissa from 2016 & expanded in Madhya Pradesh, Assam, Rajasthan, and Tripura in February 2017 and planned in Tamil Nadu & Uttar Pradesh in 2017.

#Phased introduction, at present in five states namely Karnataka, Tamil Nadu, Goa, Lakshadweep, and Puducherry. (As of February 2017)

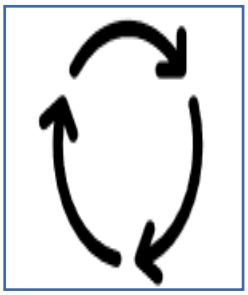
Table 1: Current immunization schedule of India **(23)**

Input

1. No of service providers- ANM (2 for 14 village) (trained/untrained for vaccination)
2. No. of service delivery points (14 anganwadi under CHC Sirsi)
3. Logistics and supply chain for vaccines
4. No. of cold chain units (1 ILR, 2 DF)
5. Equipments (vaccine carriers, icepacks, syringes, needles sterelizer
6. Funding (political commitment from the CM of Rajasthan)
7. Distribution from sirsi to sub centres.
8. Mamta cards
9. IEC materials

Process

1. Preparing a due list of children/pregnant mothers (to be done by ASHA)
2.. Planning for immunization sessions (to be done by MO head and ANM).
3. Notifying benficies according to the due list
3. Conducting immunization sessions (once a week in both subcentres and CHC).
4. Providing vaccines
5. Recording and reporting (to be done by ASHA at subcentre level and ANM at CHC)
6. Counselling about effects of vaccines and how to tackle them
7. Handling drugs for fever or rashes
8. Disposing according to BMW management



Output

High coverage rate - 90% (state and district wise desired output is not clear.

Figure 1: Conceptual framework for UCHC, Sirsi

Service Statistics

	2020	2021	2022	2023	Remarks
Target population of beneficiaries		605	567	699	No denominator vaccine/age specific number of target population of beneficiaries was available only yearly target.
I. CHILD Immunization (0-9 Months)					
Number of infants 0-11 months who received					
a. BCG		216	308	259	* Data for the year of 2019-20 was not available due to no reporting/poor reporting
b. OPV 0 (Birth Dose)		120	204	213	
c. Hepatitis B 0 (Birth Dose)		100	167	231	
d. DPT1/Pentavalent 1		467	541	383	
e. DPT3/Pentavalent 3		445	519	395	
f. Rotavirus – 1		467	569	391	
g. Rotavirus – 3		445	528	398	
II. CHILD Immunization (9-11 Months)					
a. Measles and Rubella (MR) – First Dose		494	406	354	
b. Number of children aged between 9-11 months fully immunized (BCG+DPT123/pentavalent 123+OPV123+Measles /MR) – Male		219	180	182	

c. Number of children aged between 9-11 months fully immunized (BCG+DPT123/pentavalent 123+OPV123+Measles /MR) – Female		275	226	172	
III. CHILD Immunization (after 12 Months)					
Number of infants more than 12 months who received					
a. Measles and Rubella (MR) – First Dose		494	406	354	
b. Measles and Rubella (MR) – Second Dose		478	438	293	
IV. Number of Immunization Sessions					
a. Immunization Sessions Planned		7	8	16	Number of sessions planned vs held in year 2022-2023 is only fifty%
b. Immunization Sessions Held		7	8	8	
c. Number of Immunization Sessions where ASHAs were present		7	6	7	ASHAs were present in all the sessions.
V. Adverse Event Following Immunization (AEFI)					
a. Number of cases of AEFI – Abscess		0	0	0	ASHAs and ANM give brief about reactions of vaccines and how to manage them at home.

Table 2(A): Service Statistics-Vaccination

A	Programme Management	Consult Facility In charge and Records	Remarks
1	*Contents of RI Microplan (for dependent sub-centres) available*	Yes ☑ No ☐	
	a. Map of Catchment Area (Indicating SCs and distances from vaccine storage point)	Yes ☐ No ☑	
	b. Estimation of beneficiaries (village / area wise) for current year	Yes ☐ No ☑	
	c. Estimation of Logistics – Vaccines, syringes, Immunization Cards etc. (are wise)	Yes ☑ No ☐	
	d. ANM Roster / Immunization Calendar	Yes ☑ No ☐	ANM roaster on PCTS
	e. Day wise plan for supervisor Visits	Yes ☐ No ☑	Absent
2	*ANM Roster / Immunization Calendar displayed at Facility*	Yes ☐ No ☑	
3	*Coverage Monitoring Chart / Drop out Chart (BCG-Measles or DPT 1-3) displayed at facility*	Yes ☑ No ☐	
4	*Supervisory visits by District Level Govt Health Officials in the last calendar month*	Yes ☐ No ☑	Only once fortnightly
B	*COLD CHAIN (Observe)*	Consult SN/ MO and Records	
1	*ILR and Deep Freezers*		
	a. Placed on wooden blocks and at least 10 cm away from walls and surrounding equipment	Yes ☑ No ☐	
	b. Dedicated Voltage Stabilizer for each equipment	Yes ☐ No ☑	Not available for DF
	c. Functional Thermometer inside every ILR and DF	Yes ☑ No ☐	
	d. No frost or Frost less than 5 mm inside walls of every ILR	Yes ☑ No ☐	
	Temperature and Logbooks		
	a. Twice daily monitoring of temperature in respective logbooks	Yes ☑ No ☐	
	b. Periodic checks of logbooks by facility in charge (Signatures)	Yes ☑ No ☐	
3	*ILRs*		
	a. Cabinet Temperature between +2 - +8^{o}C	Yes ☑ No ☐	

	b. All Vaccine vials stored correctly inside cartons (Expiry date, batch)	Yes ☑ No ☐	
	c. No T – series or Hepatitis vaccines are kept in the bottom of ILR	Yes ☑ No ☐	
4	*DF*		
	a. Cabinet Temperature between +2 - +8°C	Yes ☑ No ☐	
	b. Correct placement of ice packs inside the DF (in cress cross manner, while freezing)	Yes ☐ No ☑	
	c. No RI vaccines stored inside DF (including reconstituted vaccines)	Yes ☑ No ☐	
C	*Strategic BCC content*		
	a. Mid media	Yes ☐ No ☑	
	b. Advocacy	Yes ☑ No ☐	Done by ASHA and ANM
	c. Mass media	Yes ☐ No ☑	
	d. Interpersonal communication	Yes ☑ No ☐	Done by ASHA and ANM

Table 2(B): Service Statistics- Program management

D. Supply and Stocks			Consult SN/ MO and Records
BCG/OPV/DPT/DT/ TT/ Hep B (Check for any one vaccine)	Available Yes ☑ No ☐	Current Stock 570	Supply Issues / Stockouts in Past (Ask) Yes ☐ No ☑
All sessions in last month issued at least one vial of each vaccine	Available Yes ☑ No ☐	Current Stock 57 vials	Supply Issues / Stockouts in Past (Ask) Yes ☐ No ☑
Doses administered (Cumulative for last three months)	**(24)** DPT1 383	(ii) DPT3 395	Dropout rate = DPT 1 – DPT 3 /DPT 1 x 100 3.13%
Any AEFI Reported in last 3 months	Yes ☐ No ☑		If Yes Details _____

Any VPD in last 3 calendar months	Yes ☐ No ☑		If Yes Details _____ _____

Table 2 (-C): Service Statistics- Supply and stocks

Providers Interaction- Medical Officer

24. Demographics

1. Age: 57 Yrs.
2. Gender: Male

3. Current affiliation and designation:

   SMO In charge

4. What kind of responsibilities you have under the RI program

   Supervising, Managing, and monitoring for RI. Check for availability of vaccines, cold chain maintenance, monitoring for AEFI.

5. Tell me a little about RI

   Cold chain, DF, AEFI, about AEFI kits, how to refer, where to refer, who will monitor, pros and cons of vaccines, knowledge about vaccine transportation, understanding context.

6. Have you undergone any specific training related to RI, under the program? If yes, when was it and what was the duration?

   Yes, the last was 3 years ago, duration 2 days.

7. What do you know about Hepatitis B vaccination? When was it introduced in the RI in your state?

   Hepatitis B vaccine protect children from HBV disease, which is a viral disease, which leads to cirrhosis of liver if not treated. It was introduced 8 years ago in Rajasthan (2015). A total of 4 doses are given as birth dose (within 24 hours) and as pentavalent at 6,10,14 weeks to children.

II Context and Challenges

1. Were there any major factors (political, social, economic, technical, legal) that affected the implementation of RI?

   Political: Complete support from government, financially and advocacy wise as well.

   Social: Muslim community was resistant to the idea of immunization; BCC was provided to improve coverage.

   Economic: Never ran out of funds

   Technical: Procuring PCV is a challenge, there is always shortage, no other challenge faced

   Geographical: There is no difficulty to reach areas here, therefore, no issues.

   Any Other: Massive population is a challenge, this CHC provide vaccination than targeted since lots of the beneficiaries are not in the due list and they come from neighboring villages. This leads to a shortage of medicines at times; thus, order size is always larger.

2. How did these changes hinder implementation? Did you use any strategies to address the challenge?

For shortfall of vaccines, taken from neighboring CHC or demand is discussed and raised to the RCHO, and vaccine is brought by sending someone (a van goes from here to the center)
When more beneficiaries come for the services, we increase the time-of-delivery time (usual time is 9-2PM) to 3-3:30 PM.

3. Were there any health system factors that affected implementation of RI? For example, changes to service delivery, health workforce shortages, heavy Workload? How did these factors affect implementation? Did you use any strategies to address the challenge?

   There is always shortfall of workforce, e.g., only 2 ANM for 14 villages (1 for 7 anganwadis)
   This leads to a high workload on ANM. To address this challenge, ANM from neighboring countries are called. Sometimes a few children are missed due to their late arrival or shortfall in vaccines, they are scheduled for next time.

4. Were there any Operational challenges that affected implementation of RI Program? For example? Logistical challenge? Did you use any strategies to address the challenge?

   Logistical challenges such as stock outs for vaccine happens occasionally in conditions such as outbreaks or when more beneficiaries come to the facility. In such cases cars/vans suitable for vaccine transportation is sent to the center.

5. Were there any challenges related to the process of Program Implementation that affected implementation of RI?

   Planning: No

Execution: Mostly, execution is not hindered. However, challenges like natural calamity (rainfall) and national holidays pre- or postpone the MCHN day.

Engaging: No, only Muslim communities was not convinced at one point, but they also counselled.

Reflecting & Evaluating: No (but the ANM said there is no regular debriefing or discussion since MO has low inclination/ commitment to work) (no data before 2020 was found on PCTS as well)

Providers Interaction- ASHA

I. Demographics

1. Age: 24 Yrs.

2. Current affiliation and designation: ASHA, (community mobilizer) 12th graduate

3. आप राष्ट्रीय टीकाकरण कार्यक्रम के अंतर्गत क्या कार्य कर रहे है? / What work are you doing under the National Immunization Program?

   I go home to home to find out which lady is pregnant or has children in my village and prepare a due list for beneficiaries with their contact information. I also call them to come to attend the MCHN day as a form of reminder. Along with it, I counsel beneficiaries regarding the benefits of the vaccination and how it protects their child from 8 types of diseases.

4. इस कार्यक्रम के बारे में आप क्या जानती हैं? कुछ बताएं।/ What do you know about this program? Tell me something.

This program provides vaccine against eight vaccine preventable diseases to children. It reduces infant mortality as well. A total of 8 types of vaccines are given to children and one type to pregnant women.

5. इस कार्यक्रम के अंतर्गत क्या सहयोग प्रदान करतीं हैं? (MCHN/VHND गतिविधियाँ, ड्यू लिस्ट, टीकाकरण के प्रति जागरूकता आदि पर चर्चा करें।)/ What support do you provide under this program? (Discuss MCHN/VHND activities, due list, immunization awareness, etc.)

   Same as mentioned in answer 3. Due list is with ASHA, kept at anganwadi, instead of CHC.

6. आप का इस कार्यक्रम में और क्या योगदान रहता है? / What is your contribution to this program?

   I bring beneficiaries to anganwadi for vaccination on MCHN day. I prepare due list. My contribution is important for the coverage of the program.

7. इस कार्यक्रम के कार्य में आपको कभी कोई कठिनाई महसूस होती है? अगर हाँ तो ज्यादा विस्तार में बताएं।/ Do you ever find any difficulty in working with this program? If yes, then discuss in more detail.

   Poor coordination is there. Money is less, sometimes I feel there is lack of motivation, but I give my best because I understand the value of the program and it is for the betterment of the nation.

8. इस कार्यक्रम को और बेहतर करने के लिए आप क्या सुझाव देंगे? / What suggestions would you give to improve this program?

   PCV should be procured more
   JE should be included
   More coordination and support from the MO
   More incentivization

II. Demographics

1. Age: 48 Yrs.

2. Current affiliation and designation: ANM, Jaipur nursing council

3. आप राष्ट्रीय टीकाकरण कार्यक्रम के अंतर्गत क्या कार्य कर रहे है? / What work are you doing under the National Immunization Program?

   Cold chain management, vaccination (ordering, procurement, and service delivery) and family planning. Last training, November for cold chain.

4. इस कार्यक्रम के बारे में आप क्या जानती हैं? कुछ बताएं।/ What do you know about this program? Tell me something.

   Provides vaccine for 8 vaccine preventable diseases, beneficiaries are women and children of 0-5 years of age. In this UCHC, vaccination is provided every Thursday, in anganwadi, every Monday. MCHN is also Monday. Vaccination prevents mortality and is beneficial for the longevity of life of children. It provides immunity against infectious diseases that cause major deaths in children.

5. इस कार्यक्रम के अंतर्गत क्या सहयोग प्रदान करतीं हैं? (MCHN/VHND गतिविधियाँ, ड्यू लिस्ट, टीकाकरण के प्रति जागरूकता आदि पर चर्चा करें।)/ What support do you provide under this program? (Discuss MCHN/VHND activities, due list, immunization awareness, etc.)

   We conduct MCHN day both at anganwadi and in the UCHC as well. We alternate our duties, for two weeks I am here and for two weeks I go to anganwadi to provide vaccines to the beneficiaries according to the due list. Besides this, we provide advocacy and BCC to the beneficiaries. A list of 4 messages is given to them, what vaccine, what are the bad effects, when to come and to bring Mamta card.

On VHND day, we prepare a due list, other ANM/ASHA makes an entry in the card, we prepare vaccine syringes according to the due list. We provide vaccination as well as advice and hand them over paracetamol for managing fever. We also advise them the next date for successive vaccine.

Same on MCHN day, we prepare the vaccine carriers, vaccines, and syringes according to the due list. Ice box is conditioned, and vaccines are put in the polyethene before carrying. We always carry more than what is anticipated, especially the vaccines that do not follow the open vial policy. Same as VHND, vaccine advocacy, ill effects and how to manage them, this type of counseling is advised.

6. आप का इस कार्यक्रम में और क्या योगदान रहता है? / What is your contribution to this program?

Mentioned in answer 5.

I understand my duties in the immunization program and how it helps the community and prevents mortality amongst children.

7. इस कार्यक्रम के कार्य में आपको कभी कोई कठिनाई महसूस होती है? अगर हाँ तो ज्यादा विस्तार में बताएं।/ Do you ever find any difficulty in working with this program? If yes, then tell me in more detail.

No meetings regarding vaccination are held by the MO, we barely discuss our targets, MO also do not come for field visits as suggested. We also face difficulties while traveling to the distant villages since we must do it on our own salary. If the distance is more than 8 km then only money is provided that is also very nominal (75rs), it barely covers travel. Workload is too much. I am the sole caretaker for cold chain as well as conducting MCHN in 7 anganwadis and in this UCHC as well.

8. इस कार्यक्रम को और बेहतर करने के लिए आप क्या सुझाव देंगे? / What suggestions would you give to improve this program?

More workforces should be there, allowance for transportation or at least means of transportation should be provided for MCHC day to anganwadis. Incentivization should be there/increment in the salary should be there. MO should be more focused and dedicated to work for the betterment of UCHC.

Community Interaction

	1	2	3
Age of child (Months)	5 months	2.5months	2.5 months
Gender	M ☑ F ☐	M ☑ F ☐	M ☑ F ☐
क्या आपके बच्चे को अब तक के सभी टीके लगे हैं?/ Is your child immunized with Hepatitis B birth dose vaccines up to date?	My child got three vaccines at birth, 1 oral and 2 injections, do not know whether it was HepB or not	I think yes, but do not know by the name	I do not know, see my card must be written (yes)
आपका घर यहाँ से कितना दूर पड़ता है? / How far is your house from here?	5km	Within a km	5-6km
आपके विचार में टीकों को लगाने के क्या फायदे है?/ What are the benefits of getting vaccinated in your opinion?	So that children do not get sick easily (no knowledge about HepB)	It protects my child from deadly disease I get my child vaccinated out of fear	It gives protection and helps in building immunity
क्या टीकाकरण के फायदों के बारे में आपको किसी ने समझाया? यदि हां तो किस तरह? जरा विस्तार में बताये।/	People at my paternal home told me that it is necessary for child' protection these days	Benefits were conveyed by doctors and nurses	ASHAs and ANMs told me and encouraged my husband also

Did anyone explain to you about the benefits of vaccination? If yes how? Please tell in detail.			
आपको अपने इलाज में जाँच या दवा में कोई दिक्कत हुई?/ Have you had a problem with your test or medicine?	हाँ ☐ नहीं ☑	हाँ ☐ नहीं ☑	हाँ ☐ नहीं ☑
आपको बच्चे के टीकाकरण में कभी कोई समस्या महसूस हुई ? यदि हाँ तो थोड़ा विस्तार से बताएं।/ Have you ever experienced any problem with vaccination of your child? If yes, then explain in detail.	No	No	no
आपके अनुसार अस्पताल की सुविधा और क्या सुधार होना चाहिए?/ What else should be improved in the hospital facility according to you?	Crowd and time management Pediatric doctors should be there More workforce to minimize delay	No issues	Crowd management and no other issues

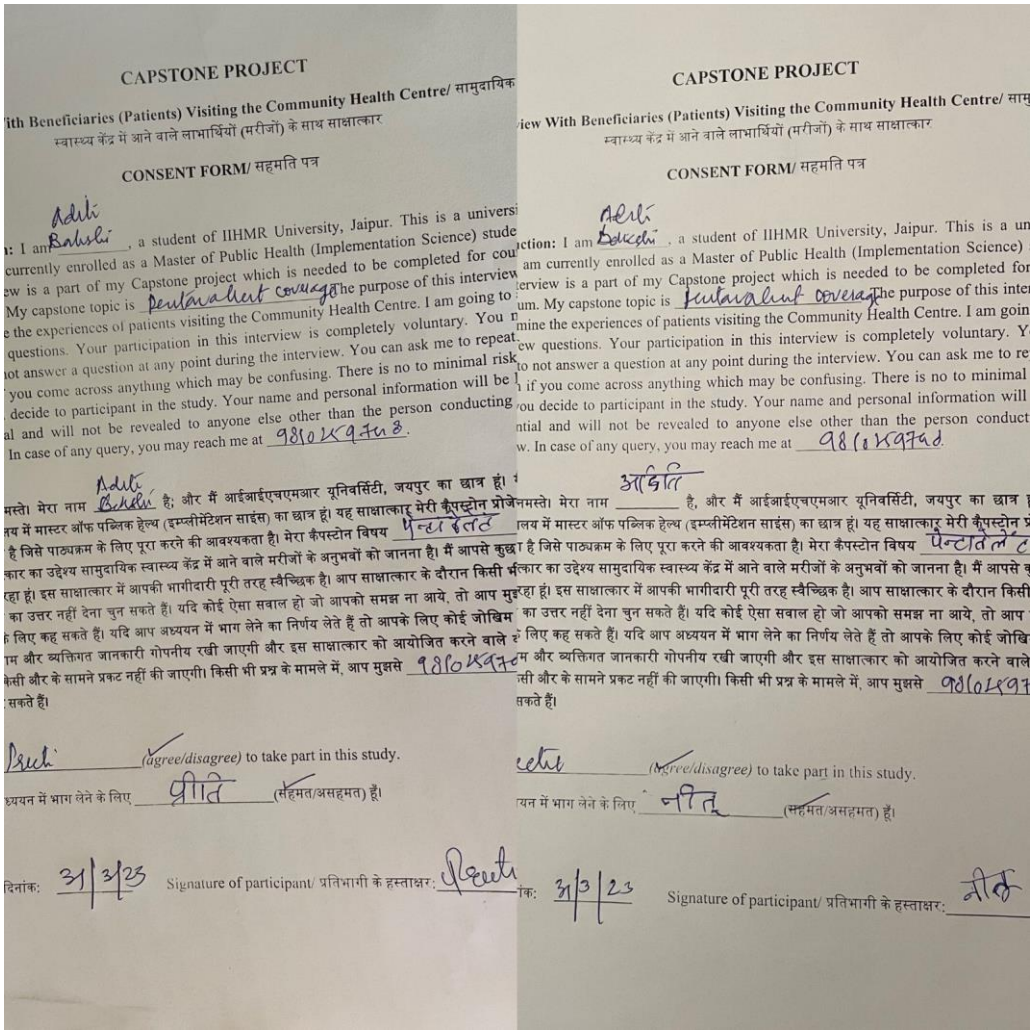
Pictures from the field

Picture 1: Outlook

Picture 2: Cold chain

Picture 3: Providers interaction

Picture 4: MCHN Day



CAPSTONE PROJECT

ith Beneficiaries (Patients) Visiting the Community Health Centre/ सामुदायिक
स्वास्थ्य केंद्र में आने वाले लाभार्थियों (मरीजों) के साथ साक्षात्कार

CONSENT FORM/ सहमति पत्र

n: I am Aditi Bahuli, a student of IIHMR University, Jaipur. This is a universi
currently enrolled as a Master of Public Health (Implementation Science) stude
ew is a part of my Capstone project which is needed to be completed for cou
My capstone topic is Postnatal coverage. The purpose of this interview
e the experiences of patients visiting the Community Health Centre. I am going to
questions. Your participation in this interview is completely voluntary. You
ot answer a question at any point during the interview. You can ask me to repeat
you come across anything which may be confusing. There is no to minimal risk
decide to participant in the study. Your name and personal information will be
al and will not be revealed to anyone else other than the person conducting
In case of any query, you may reach me at 9810459743.

मस्ते। मेरा नाम Aditi Bahuli है; और मैं आईआईएचएमआर यूनिवर्सिटी, जयपुर का छात्र हूं।
तय में मास्टर ऑफ पब्लिक हेल्थ (इम्प्लीमेंटेशन साइंस) का छात्र हूं। यह साक्षात्कार मेरी कैपस्टोन प्रोजे
है जिसे पाठ्यक्रम के लिए पूरा करने की आवश्यकता है। मेरा कैपस्टोन विषय प्रसवोत्तर कवरेज
कार का उद्देश्य सामुदायिक स्वास्थ्य केंद्र में आने वाले मरीजों के अनुभवों को जानना है। मैं आपसे कुछ
रहा हूं। इस साक्षात्कार में आपकी भागीदारी पूरी तरह स्वैच्छिक है। आप साक्षात्कार के दौरान किसी भी
का उत्तर नहीं देना चुन सकते हैं। यदि कोई ऐसा सवाल हो जो आपको समझ ना आये, तो आप मुझ
के लिए कह सकते हैं। यदि आप अध्ययन में भाग लेने का निर्णय लेते हैं तो आपके लिए कोई जोखिम
ाम और व्यक्तिगत जानकारी गोपनीय रखी जाएगी और इस साक्षात्कार को आयोजित करने वाले
केसी और के सामने प्रकट नहीं की जाएगी। किसी भी प्रश्न के मामले में, आप मुझसे 9810459743
सकते हैं।

Prachi (agree/disagree) to take part in this study.

ध्ययन में भाग लेने के लिए प्रीति (सहमत/असहमत) हूँ।

दिनांक: 31/3/23 Signature of participant/ प्रतिभागी के हस्ताक्षर: Preeti

CAPSTONE PROJECT

iew With Beneficiaries (Patients) Visiting the Community Health Centre/ सामु
स्वास्थ्य केंद्र में आने वाले लाभार्थियों (मरीजों) के साथ साक्षात्कार

CONSENT FORM/ सहमति पत्र

ction: I am Aditi Bahuli, a student of IIHMR University, Jaipur. This is a un
am currently enrolled as a Master of Public Health (Implementation Science)
terview is a part of my Capstone project which is needed to be completed for
um. My capstone topic is Postnatal coverage. The purpose of this inte
mine the experiences of patients visiting the Community Health Centre. I am goin
ew questions. Your participation in this interview is completely voluntary. Y
to not answer a question at any point during the interview. You can ask me to re
if you come across anything which may be confusing. There is no to minimal
ou decide to participant in the study. Your name and personal information will
ntial and will not be revealed to anyone else other than the person conduct
w. In case of any query, you may reach me at 9810459743.

आदिति
नमस्ते। मेरा नाम _____ है, और मैं आईआईएचएमआर यूनिवर्सिटी, जयपुर का छात्र
लय में मास्टर ऑफ पब्लिक हेल्थ (इम्प्लीमेंटेशन साइंस) का छात्र हूं। यह साक्षात्कार मेरी कैपस्टोन प्र
है जिसे पाठ्यक्रम के लिए पूरा करने की आवश्यकता है। मेरा कैपस्टोन विषय पैन्टार्तल
कार का उद्देश्य सामुदायिक स्वास्थ्य केंद्र में आने वाले मरीजों के अनुभवों को जानना है। मैं आपसे
हा हूं। इस साक्षात्कार में आपकी भागीदारी पूरी तरह स्वैच्छिक है। आप साक्षात्कार के दौरान किसी
का उत्तर नहीं देना चुन सकते हैं। यदि कोई ऐसा सवाल हो जो आपको समझ ना आये, तो आप
लिए कह सकते हैं। यदि आप अध्ययन में भाग लेने का निर्णय लेते हैं तो आपके लिए कोई जोखि
म और व्यक्तिगत जानकारी गोपनीय रखी जाएगी और इस साक्षात्कार को आयोजित करने वाले
सी और के सामने प्रकट नहीं की जाएगी। किसी भी प्रश्न के मामले में, आप मुझसे 9810459
सकते हैं।

Preeti (agree/disagree) to take part in this study.

यन में भाग लेने के लिए प्रीति (सहमत/असहमत) हूँ।

क: 31/3/23 Signature of participant/ प्रतिभागी के हस्ताक्षर: प्रीति

Picture 5: Consent forms