

# Status of childhood vaccination practice in a fixed-session site of a Medical College of Eastern India

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## Abstract:

**Introduction:** Vaccination is most cost-effective munitions and National Immunization Schedule (NIS) is providing protection to under-five children against 11 diseases currently. Still gap of nearly 1/3<sup>rd</sup> unvaccinated children is remaining despite various initiatives, campaigns, and special drives.

**Objective:** To assess status of vaccination service and awareness among various stakeholders of an immunization clinic in a medical college hospital in a metropolitan city of eastern India.

**Materials and Methods:** An observational qualitative study with cross-sectional design was conducted over 4 months in an immunization clinic of a medical college. With Ministry of Health and Family Welfare (MoHFW) prescribed checklist, session site was observed with non-participant stance, two vaccinators being public health nurses were interviewed and 35 caregivers of beneficiaries were interviewed at exit point.

**Results:** Regarding session and logistics, adherence to NIS guidelines was observed mostly with few gaps in injection safety and hand washing practices. Except for one non-updated NIS schedule and one bio-medical waste management, no other IEC material could be noted at site. Only 28.6% of caregivers were found as aware of vaccines given to their children that day though importance of keeping mother-child protection card and noting of next vaccine date was among majority. AEFI knowledge was among 40% of caregivers and only 11.4% could say that “seven” visits up to 5 years of age are required for their children to get “completely immunized”.

**Conclusion:** Despite commendable commitment and support from service side childhood vaccination is at stake which requires more advocacy, in-service training and supportive supervision.

**Key words:** vaccination, caregivers, checklist, hospital.

## Introduction:

Global Burden of under-5 deaths out of vaccine-preventable diseases was estimated 7, 00, 000 in 2018 and 99% of them belonged to low and middle-income countries (LMICs).<sup>1</sup> In 1974 World Health Organization (WHO) has launched Expanded Programme on Immunization (EPI)<sup>2</sup> and Government of India propelled the country-wide drive of routine childhood vaccination through Universal Immunization Programme (UIP) since 1985.<sup>3</sup> Passing through the tunnels of hesitancy, refusal, cost-effectiveness, threats of adverse events besides golden paths of small pox eradication, reaching at vaccines against twenty starting with six only vaccine preventable diseases (VPDs), Global Vaccine Action Plan (GVAP) set its target of 90% coverage of childhood vaccination by 2020.<sup>4</sup> In midst of COVID-19 era GVAP succeeded its legacy to Immunization Agenda 2030 (IA 2030) with aim of ‘no one should

be left behind’ having a revolutionary all inclusive strategy of childhood vaccination.<sup>5</sup> Special emphasis of reduction of mortality and morbidity from VPDs is of ample importance for India being world’s largest annual birth cohort.<sup>6</sup>

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Since 2014 Ministry of Health and Family Welfare has launched Mission Indradhanush<sup>7</sup> to reach the unreached being dropped out and left out children and pregnant, and has intensified by expanding age coverage from 2 to 5 years in 2023 phase wise IMI 5.0 campaign.<sup>8</sup> These showcase government's visible commitments towards nation's health promotion and reflected by vaccination coverage of 4.45 crore children and 1.12 crore pregnant women after 2<sup>nd</sup> round of IMI 5.0 across the country.<sup>7,8</sup> National Family Health Survey-5 (NFHS-5) (2019-2021) has reported 76.4% children 12-23 months to be fully vaccinated.<sup>9</sup> Various published and unpublished literature over the world have identified hurdles at different levels like as, inadequate parental awareness, negative influences from family itself, cultural and religious factors play important demand-side obstacles.<sup>10-12</sup> From supply sides also distance of service area, long waiting time, interrupted supply of vaccines time-to-time, misbehavior and inadequate knowledge dissemination by service providers undermine vaccination coverage.<sup>11,12</sup> As supported by NFHS-5 data, Indian rural areas are better covered by primary health care services including childhood vaccination. But in urban areas especially for urban poor these are still standing at challenging point.<sup>9</sup>

The study was conducted to assess status of vaccination service and awareness among various stakeholders of an immunization clinic in a medical college hospital situated in a metropolitan city.

### Materials and Methods:

**Study type and design:** observational study with cross-sectional design

**Study setting:** the study was conducted in immunization clinic of a medical college and hospital of Kolkata. This is a PPP model medical college running since 2006 and provides educational services to medical and allied streams, curative and preventive services and conduct research activities. The immunization clinic is operational since 2009 and beneficiaries being the pregnant women and children up to 16 years of age and vaccinated following national immunization schedule (NIS). The clinic is governed by department of community medicine, have cold chain point, deliver vaccines with logistic support from Institution itself and vaccines from Kolkata Municipal Corporation borough no.12.

**Study duration:** 4 months (May-August, 2023)

**Study population:** The caregivers of the beneficiaries, as children less than 16 years of age who are vaccinated by two public health nurses posted therein were considered as study population.

**Inclusion criteria:** the caregivers of children up to 5 years of age were included for study

**Sampling design and sampling technique:** average number of beneficiaries of the clinic remains average of 60 per month as found from clinic register and among them around 80% are under-five children. Therefore in four months approximately 192 under-five attends the clinic. Following the departmental

duty roster the principal investigator visited every Monday of the week and all those found as eligible for the study were approached for data collection by convenience sampling.

**Sample size:**

1. Number of session site-1
2. Number of vaccinators-2
3. Number of beneficiary for observation of practice-37

**Study tools:** Checklist adopted from Ministry of Health and Family Welfare (MoHFW) used for monitoring of vaccination site containing two sections. In 1<sup>st</sup> one there are session details, logistic details-availability and condition, safe injection practices followed. In section 2 there is communication questionnaire with status of bridge training of vaccinators and visible display of IEC materials and questions for exit interview of the accompanying caregivers of beneficiaries.

**Study techniques:**

1. Observation of sessions being conducted
2. Interview of the vaccinators and exit interview of the caregivers

**Methods of data collection:** study was embarked upon clearance from Institutional Ethics Committee, permission from Principal of the Medical College and consent was taken from all the study participants. The investigators visited the Immunization clinic during the working hours and data were collected by observation of session following the MoHFW prescribed checklist. The vaccinators were interviewed one by one to prevent information sharing and done within their duty hours but once the peak hour was over. Exit interviews were done for clients once the day's vaccination was finished for that child.

**Data management and analysis:**

For data obtained by observation of vaccinators' practice regarding giving key messages, proper practice was given the score "1" and improper as "0". For 8 questions for exit interview, following the scoring guidelines mentioned in checklist 5 questions related to awareness, inadequacy was scored "0" and adequate as "1". If the child was brought by mother, considering chief person for child's wellbeing if there were any mobilizer and for number of visits required for full immunization upto 5 years if response was 7, for each item score was given as "1".

### Results:

#### *Section A: session including logistics details*

The session being conducted in medical college and hospital is a fixed-site session. This is a room measuring 12 ft.x14 ft., adequately ventilated, with combined natural and artificial light sources, runs 6 days a week. Here public health nurses work as vaccinators, no other mobilizer is posted herein. They also maintain registers for daily reports which are updated to corporation borough at end of daily session. They also have clinic register and vaccine stock registers. The clinic runs from 9 a.m. to 4 p.m. and as it is a cold chain point, the temperature of the Ice-lined refrigerator (ILR) and deep freezers (DF) are

monitored twice daily (10 a.m.-4 p.m.) besides following other do's and don'ts.

On direct observation taking the stance of non-participant, it was found that all newborns are given with birth doses of Hepatitis B, OPV 0 dose and BCG vaccine. Still a grey area exists being missing of Hepatitis B vaccine for babies born on days when immunization clinic remains closed for next 24 hours. Record of headcount survey is not available in this clinic as line listing is not done. Almost all the vaccines and their diluents accordingly were available at session site. One vial of PCV was found as partially used and carried forward for the current session. On checking it was found to have fulfilled all criteria for following open vial policy. None of the vials was found in session site without date and time marked on them. In session site auto disabled (AD) syringes of 0.5 ml. were available but no 0.1 ml. AD syringe was found. Total number of 5 m. syringes as used for reconstitution was more than total number of BCG+MR+JE vials. Blank mother and child protection cards were there and counterfoils though not necessary for these sessions were found intact. For biomedical waste management red and black bags were there, but there were no paracetamol tablets, vitamin A even spoon for dispensing it, ORS salt and Zinc tablets available at session site.

In direct structured observation following Goldman's complete observer stance, it was noted that two hub cutters are available and out of them one is in working condition. The vaccinators are not using any vaccine after 4 hours of reconstitution or opening the vial. As the beneficiary load is not so much sometimes reconstituted vaccines have to be discarded specially for BCG and MR as they are multi-dose vials. Regarding safe injection practice it was found that before and after each administration hand washing practice is grossly lacking though the facility was available. Vaccinators were not cutting the hub immediately and post-injection to stop bleeding caregivers were instructed to press finger is at the site. The anaphylaxis kit was available and adrenaline was found within expiry date.

#### *Section B: Communication Questionnaire*

Both the vaccinators, who are Public Health Nurses (PHN) by designation, are trained in routine immunization (RI), cold chain handlers' training, and various in-service trainings such as, MR surveillance, new vaccines in NIS, safe injection practice and so on.

Regarding the display of IEC materials in immunization clinic, a hand-written NIS poster was there which is not updated, one banner on measles-rubella vaccination campaign conducted in month of March, 2023 was there, no poster or banner on Intensified Mission Indradhanush (IMI) was seen; neither there were any wall painting on matters related to immunization. One poster of proper biomedical waste management in immunization clinic was there and aptly it was placed just above the bins for waste disposal and other poster showing 6 steps of hand washing was there just beside the wash basin.

Out of thirty-seven direct structured observation of vaccinators' practices on giving key messages, mentioning names of

vaccines and the diseases prevented by them was only 32.4%. Still explaining potential side effects like as, fever, pain, swelling and so on and how to deal with those was 75.7%. They also explained and written down in the card the date of next visit, asked caregivers to keep the card safely and to bring it in next visit in 97.3%. The vaccinators instructed to wait for 30 minutes following vaccination but it was observed that Only 13.1% followed it and rest of the people were allowed to go after 15-20 minutes.

Out of the 37 vaccination process observed, two went out in name of taking food but did not come back. So, total number of exit interviews conducted was 35. Out of them, majority was brought by mother (77.1%) and they are prime caregiver of the babies. Still it was found that only 28.6% of caregivers were aware of all vaccine(s) given to the concerned child in that visit and it was cross-checked with Mother and Child Protection (MCP) card also. For the majority (57.1%) no mobilize was there to motivate them to bring their children to this vaccination clinic, for rest of the caregivers, 10 out of 15 children were born in this medical college hospital and were asked to attend the immunization clinic after discharge. Among the caregivers 80% stated correctly the date of next visit which was corroborated from MCP card and 32 (91.4%) told that the vaccinator has asked them to carry the MCP during next visit. The caregivers who could not tell the date of next visit said that vaccinator has written down the date in the card and either has missed to tell them personally or they have forgotten it while remaining busy with the child vaccinated just then. Development of any form of discomfort (e.g. pain, fever, rash, swelling etc.) following today's or previous day's vaccination was reported by only 7 caregivers and none were major enough requiring visit to health facility. Still awareness on what to do in case of serious discomfort following vaccination, if any was among only 40% of caregivers. The caregivers were enquired regarding number of visits required for the child till 5 years to be completely immunized and the right answer being "seven" was given by only 4 (11.4%). [Table 1] [Figure 1]

#### **Discussion:**

Childhood vaccination has long been recognized as a powerful and cost-effective specific protection strategy against numerous diseases. Gaps created by drop-outs and left-outs are widened by interplay of factors from both demand as well as supply sides. This study has emphasized more on interplay of modifiable factors which have potential to strengthen the dilapidated status of childhood vaccination service delivery in present setting.

In the current setting some shortcomings could be identified which might act as bottleneck of optimum service quality. Waiting space is grossly inadequate, there is no breast feeding corner along with the immunization clinic, no proper signage is there for easy access from main gate. This is supported by Barman D et al. from the study based on DLHS data<sup>13</sup> and Sia D et al. from Barkina Faso<sup>14</sup> though their work was based on rural community. The injection safety practice gap in the present study has similarities with studies by Singh

PK et al. who also found service level gaps working behind low coverage.<sup>15</sup> It was similar to Summan A et al. but they have considered infrastructure quality index as measure of determination and that too at household level.<sup>16</sup> Rather the study Loevinsohn B et al. from Pakistan has given more emphasis on improvement of service delivery to have better outcome;<sup>17</sup> but as it was pooled data from district level survey chance of ecological bias cannot be omitted. A study based on grey literature by Favin M et al. also identified resource &/or logistics gaps behind poor coverage of childhood vaccination in their settings.<sup>18</sup> Absence of any mobilizing staff especially in urban areas might have implications regarding target immunization in current work has similar findings with Shrivastwa N et al.<sup>6</sup>

Regarding the service delivery, vaccinators play pivotal role. Their practice while vaccinating in the current study attributing the coverage in terms of both quality and quantity has been supported by some grey literatures from India, Bangladesh, and Kenya showing health workers' training, supportive supervision, exchange visits, job appraisal etc. being important determinant for service.<sup>18</sup> In contrary to these, Datar A et al. from West Bengal, India showed no significant role of supervisory visit and training driving vaccination coverage.<sup>19</sup> Bhadoria AS has emphasized on training need specially overcoming challenges in zero-dose children.<sup>7</sup>

In support to the present study benefit of caregivers from awareness campaigns, media reports, health workers have concordance to studies by Alshammari TM et al. from Saudi Arabia,<sup>20</sup> Cochrane database on low and middle income coun-

tries, study by Dixit P from India.<sup>21</sup> For flawless and quality vaccine delivery demand side factors play important roles. Awareness among the caregivers about vaccines given to their children in current study was found much lower than studies by AlGoraini Y et al.<sup>22</sup> and Alshammari TM et al.,<sup>20</sup> both from Saudi Arabia, whereas studies by Alolayan A et al.,<sup>23</sup> Francis MR et al.<sup>25</sup> had similar finding with the current study.

The study has certain limitations like as, coverage of very small number of beneficiaries who visited the vaccination centre. Nevertheless being the blame-game but more advocacies on next visits for rest of the vaccines besides telling neighbors about this service point by the existing caregivers is expected from service providers at the clinic. This study has opened the arena of further exploration of demand and service level gaps in the field practice area of the Institution and beyond.

### Conclusion:

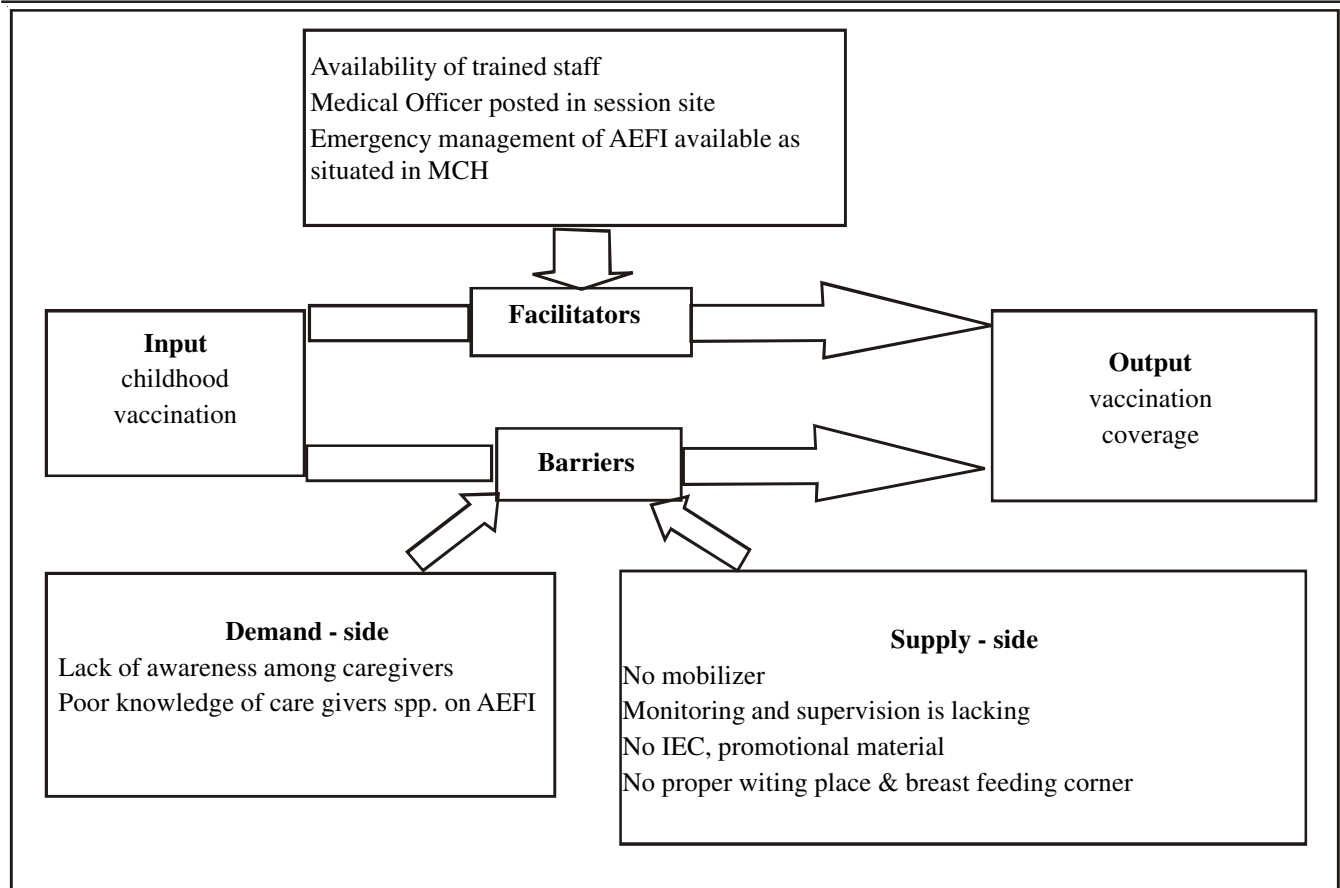
Over decades power and cost-effectiveness of vaccines in reducing public health burden out of vaccine preventable diseases has been proved. In a medical college and hospital setting despite soundness of infrastructure and expected compliance from managerial authority several supply side gaps have been identified like as, improper injection safety practices, inadequate dissemination of information related to children's vaccination to the caregivers which have impact on their knowledge level and probable futuristic output being vaccine coverage. Regular supportive supervision and in-service skill-based training of service providers are needed to abridge the gap.

Question (s)		Frequency	Percentage
Who brought the child to the session site?	Mother	27	77.1
	Others*	8	22.9
Who visited to invite for vaccination to the session site?	Health workers	15	42.9
	None	20	57.1
Whether you are aware of all vaccines given to your child this visit?	Yes	10	28.6
	No	25	71.4
Whether you know when the next visit is due for your child?	Yes	28	80.0
	No	7	20.0
Whether the vaccinators ask you to carry MCP card into next visit?	Yes	32	91.4
	No	3	8.6
Did your child develop any discomfort following previous/today's vaccination?	Yes	7	20.0
	No	28	80.0
Please state what to do in case of any discomfort following vaccination?	Stated	14	40.0
	Could not state	21	60.0
How many visits are required to get your child completely immunized upto age 5 years?	Stated as '7'	4	11.4
	Could not state '7'	31	88.6

**Table 1: Distribution of responses from caregivers in exit interviews**

\*Father, any or both grandparents, neighbors, health workers, anyone else





**Fig.1: Conceptual framework of facilitators and barriers of vaccination in session-site**

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