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VACCINE HESITANCY-MEASURING THE MAGNITUDE AND PROVIDING POSSIBLE SOLUTIONS TO ADDRESS THE ISSUE IN MEWAT DISTRICT OF THE NORTHERN INDIAN STATE HARYANA

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Keywords:

Vaccine hesitancy, Child immunization, Gender disparity, Mewat district, Cultural sensitivity Healthcare interventions

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ABSTRACT: Objective: To understand the magnitude of vaccine hesitancy, its proximal determinants, and recommend specific interventions to address it in Mewat district (also known as Nuh), Haryana. **Design:** A mixed-method study design was adopted which involved: Household survey (479 households) and key informant interviews with healthcare providers (10 service providers). **Setting:** Four blocks namely, Nuh, Ferozepur-Jhirka, Punahana, and Taoru of Mewat district, Haryana. **Results:** In Mewat, age-appropriate vaccination was observed in 48.8% of the children, whereas 31.6% were partially vaccinated and 19.6% were unvaccinated. Fear of side effects of vaccination (35.0%) was one of the main reasons for partial and no immunization. About 22.1% of households in Mewat were either hesitant or refused to vaccinate their children. Out of all four blocks, Punahana block had 33.3%, the highest proportion of vaccine hesitant or refusal households. A strong patriarchal society with low women empowerment was observed in the community while interacting with beneficiaries and front-line-workers. Further, there existed a misconception that vaccines cause infertility, which leads to gender disparity in immunization of children and could potentially be the reason for outright rejection of vaccines. **Conclusion:** Multi-dimensional, gender and culturally sensitive approaches are required to address the issue of vaccine hesitancy in the area. Involvement of other line departments like Department of Women and Child Development (DWCD), Panchayati Raj Institutions (PRI), Public Relations etc will help in catalyzing the adopted strategies and sustain the achievements in the long run.

INTRODUCTION: While India has witnessed significant gain in vaccines uptake, we are far behind to achieve the goal of 90% full immunization coverage [1].

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India's recent history witnessed the achievement of critical milestones, which included receiving polio-free certification in 2014 by World Health Organization [2], the successful elimination of maternal and neonatal tetanus in 2015 [3] and the introduction of new vaccines under the Universal Immunization Programme (UIP) [4]. Despite high childhood mortality rates due to vaccine preventable diseases, 38% of Indian children missed the benefits of full immunization according to national family health survey, 2015-16 (NFHS-

4) [5]. A large proportion of children are still missing their vaccine doses due to demand-side issues. Almost 35 percent of parents are not aware of immunization benefits, 26 percent do not vaccinate due to fear of side effects or adverse events following immunization (AEFI) and another 13 percent are "missed" because children were unavailable to receive the services [6]. The reasons vary across states and districts and include both supply and demand-side issues. However, looking at the improvement done on the delivery-side, it could be attributable to vaccine hesitancy - the delay of acceptance or refusal of vaccination despite the availability of vaccines [7]. It has surfaced in WHO's list of top 10 global health threats in 2019 and has drawn significant concerns across the world due to the increase and resurgence of vaccine preventable diseases (VPD) [8].

Creating vaccine is only the half effort in battle towards eliminating VPD and the other half is ensuring that all the eligible children get vaccinated. In general, the public already approaches vaccines with uncertainty. The last few years have seen growth in the anti-vaccine (anti-vax) movement, which is strongly associated with conspiracy theories, misinformation, and the desire to protect individual freedoms. Vaccine refusal arises from underestimated risk of disease or overestimated risk of vaccine-induced adverse effects [9]. Vaccine hesitancy and refusal are prominent in geographical and socioeconomic or religious cluster [10]. This suggests that an important feature of vaccine- related behaviours is their propagation at the community level.

A Behavioural Approach of Vaccine Hesitancy: The behaviours responsible for vaccine hesitancy can be related to confidence (do not trust a vaccine or a provider), convenience (access) and complacency (do not perceive a need for a vaccine or do not value the vaccine) [11]. The causes of vaccine hesitancy can be described by the epidemiological triad **Fig. 1** *i.e.* the complex interaction of environmental- (*i.e.* external- religious beliefs, influential leaders, communication and media, geographic barriers, politics/policies, parent-provider relationship, school immunization requirements), agent- (*i.e.* vaccine- risk of AEFI, design of the vaccination programme, lack of knowledge about vaccination among health professionals/their role, reliability of the vaccine supply, costs, vaccination schedule, vaccine efficacy perception, disease susceptibility perception) and host (or parent- risk perceptions, trust in the health system, lack of knowledge, past experience, belief, attitude about health and preventions, income, race/ethnicity, educational level) specific factors [8, 12].

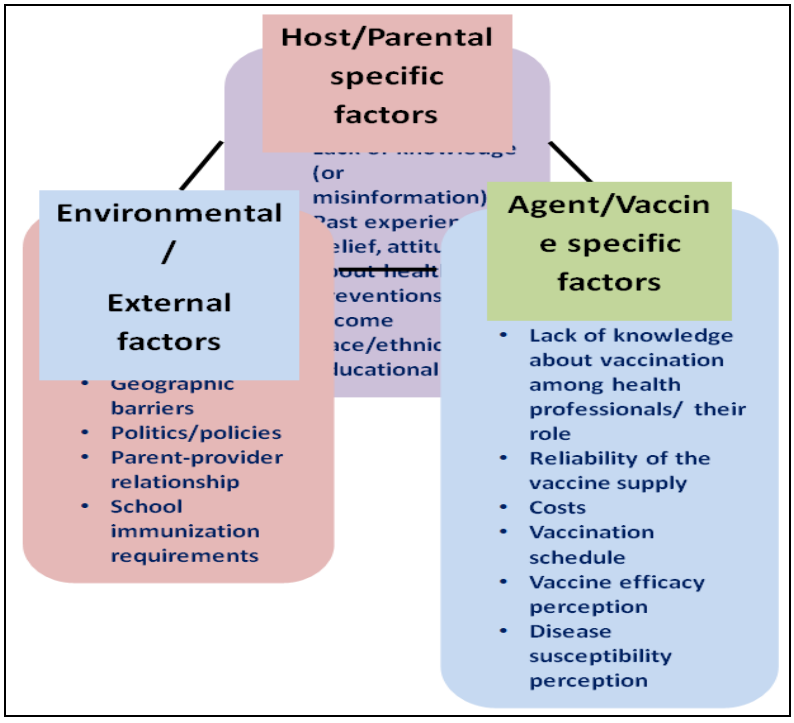

FIG. 1: EPIDEMIOLOGICAL TRIAD OF VACCINE HESITANCY

There are several pockets in the country with historically low vaccination coverage. Mewat district in Haryana falls in the lowest decile, as far as immunization is concerned. FIC data from NFHS-4 shows poor vaccination coverage of 13.1% in the district [5]. The recent WHO concurrent monitoring data also re-verified the inadequate coverage of less than 50% in most blocks of Mewat region and frequent outbreaks of measles and diphtheria have also been reported. The coverage of MR campaign was less than the state average; (Haryana: 99% & Mewat: 65.5%, October 2018) and is also designated as Aspirational District for transformation by NITI Aayog [13].

In this context, the State Health Systems Resource Centre-Haryana requested Immunization Technical Support Unit (ITSU), Ministry of Health and Family Welfare (MoHFW), Government of India (GoI) to conduct a study to understand the factors associated with vaccine hesitancy in Mewat, Haryana. The study will play a very important role in understanding how and why people gets hesitate to the vaccine will be essential in guiding policies and campaigns working to increase vaccine uptake.

Objectives of the Research: To understand the magnitude of vaccine hesitancy, its proximal determinants, and recommend specific interventions to address it in Mewat district (also known as Nuh), Haryana.

METHODS: The study was conducted in all four blocks (Nuh, Ferozepur Jhirka, Punahana, and Taoru) of district Nuh (Mewat) in June 2019. A mixed-method design was adopted for the assessment which involved: 1) Household survey and 2) Key informant interviews with healthcare providers.

Minimum number of households for the study was calculated to be 491 considering 59% of partial and unimmunized children in the area from latest available information IMI-CES, 2018 [14], 10% non-response rate and 1.2 design effect [15].

Total sample was distributed across four blocks using Probability Proportional to Size (PPS). Further, the sample within the sub-districts was distributed as per rural and urban populations. Villages were primary sampling units in rural areas and wards in urban areas. A two-stage sample selection was adopted. At first stage, villages and wards were selected randomly within each block. In the second stage, in each selected village or ward, a systematic random selection of household was done using the existing house list with FLWs.

Information regarding only one child was recorded from each household. The respondent was the mother or the primary care giver of the child. In case of more than one child in the age group of 0-23 months, information pertaining to the youngest child was recorded to minimize the recall bias. Quantitative data collection was carried out on Computer Assisted Personal Interviewing (CAPI) tool for real-time data entry. A customized data collection tool was prepared in the open data kit (ODK) - open software, which was piloted before the survey. During the survey, data was collected from 479 households.

Qualitative data was collected in the form of key informant interviews (KIIs) with 10 service providers (ANM, ASHA, mobilizers and AWW).

To analyze the factors related to vaccine hesitancy, four key groups were formulated based on their knowledge, attitude and practice regarding vaccination. The four groups were defined as

Active users: Respondents who have ensured that their children have received vaccines as per the recommended immunization schedule.

Passive users: Respondents with children who have

A. Completed vaccination but not as per the age.

B. Partially vaccinated due to supply side or demand side issues.

C. Not vaccinated due to supply side issue but willing to vaccinate in future

Vaccine Hesitant: Respondents whose children have not received and refused few vaccines irrespective of supply side issues.

Vaccine Refusal: Respondents who always refused vaccines and do not consider it as important due to demand side issues. An empirical research approach for data analysis was used to draw conclusions. A set of predefined indicators was

analyzed in Excel and STATA13. To know the status of immunization, vaccination card was used as the primary source of information. Recall method was used to capture information, where vaccination card was not available.

Ethics Approval: This study was conducted on request of State Health Systems Resource Centre-Haryana. Written and verbal informed consent in local language was obtained from all respondents during the survey and qualitative interviews. Any information related to the background of the respondent was not captured during the interview. Full anonymity and confidentiality were maintained. It was ensured that the data were accessible only to the authorized members of the research team.

RESULTS:

Quantitative Findings: In the study sample, around 60% of the children were in the age group of 0-11 months and the rest were in the age group of 12-23 months. Notably, one-fifth (19.6%) of the children did not receive any vaccination and only 17.8% of children were found to be age appropriately immunized.

Immunization was delayed in 31.1% of children and 31.5% were partially immunized. Fear of side effects of vaccines was found to be the common reason for no immunization (35.0%), followed by the child's illness (21.0%), child travelling (19.0%), awareness gap (13.0%) and operational reasons (8.0%) **Fig. 2.**

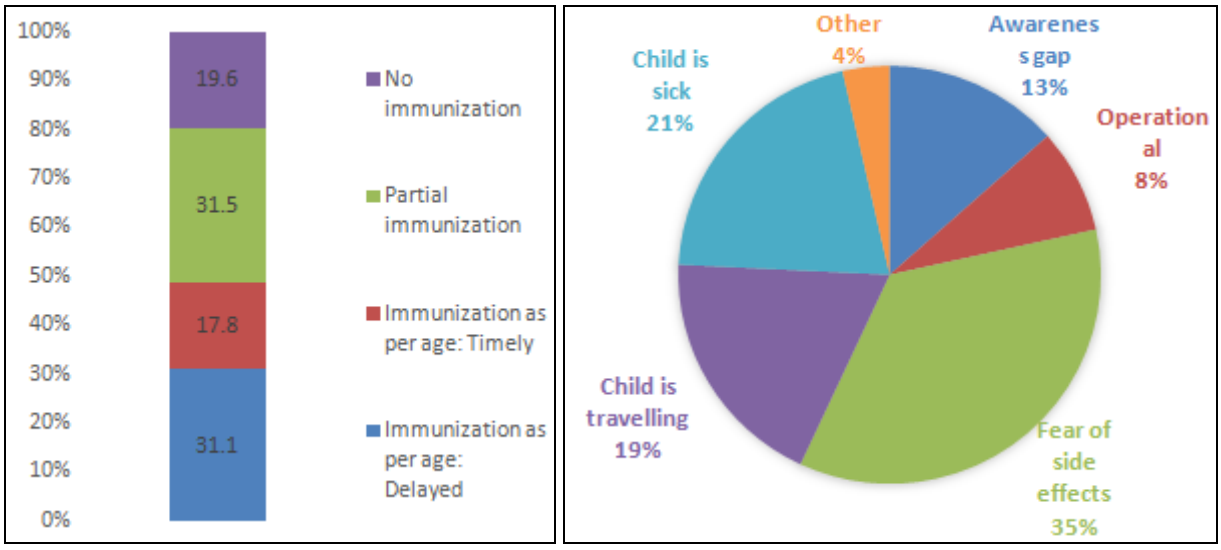

FIG. 2: VACCINATION STATUS AND REASONS FOR PARTIAL AND NO IMMUNIZATION AMONG CHILDREN AGED 0-23 MONTHS

TABLE 1: BLOCK WISE TYPE OF VACCINE USERS

District	Active	Passive	Vaccine hesitant	Refusal
Nuh	27.3	57.8	13.3	1.6
Taoru	25.0	54.2	13.9	6.9
Firozpur Jhirka	23.6	57.6	14.6	4.2
Punahana	17.8	48.9	21.5	11.9
Mewat	23.2	54.7	16.1	6.0

Factors affecting Vaccine Hesitancy:

Host or Parental Factors: The study explored the knowledge, perception and attitude of mothers or caregivers regarding the immunization of their children and vaccine preventable diseases. The study also assesses the decision-making attitudes of parents/care givers towards child's health. Both the active and passive groups unanimously agreed that the vaccination was important for their child whereas, more than half in the hesitant group surprisingly also felt the same. About 32.2% of respondents revealed that if situation arises, they were willing to pay for vaccination. A majority of respondents considered vaccines were safe (83.9%) and only few did not know about the safety aspects of vaccines (7.9%). Interestingly, this proportion was high among both the active and passive groups (more than 90%). Whereas, about one third of the

vaccine hesitant or refusal group did feel vaccines are safe. The finding highlights that vaccine safety issue is an underlying concern among vaccine hesitant and refusal group which needs to be addressed. Findings also revealed that overall awareness for next due date was among 42.9% of primary caregivers. About half of respondents in the active and passive group and 10.4% in hesitant or refusal group were aware of the next due date of vaccination. This clearly shows the lack of attention towards child's vaccination and the information provided by the service providers on immunization schedules by the hesitant and refusal group. Knowledge on Vaccine Preventable Diseases (VPDs) strengthens the faith of people on vaccination and motivates them to make sincere efforts to get their children immunized. About 24.4% in active group, 30.2% in passive group and 59.4% in hesitant or refusal group had no knowledge about any VPDs. Further, only 64.7% of respondents had knowledge about at least one VPD. In the active group, 63.1% respondents had knowledge of at least two VPDs, which was 59.2% in the passive group and only 28.3% in hesitant or refusal group. Overall, knowledge of at least two VPDs was among 53.2% of respondents. This brings to light the need to generate awareness regarding Vaccine Preventable Diseases (VPDs) in the community to generate demand and improve acceptance of vaccination. Results on the decision making regarding the health of the child showed that only 8.7% of primary caregivers took decision themselves. This proportion varied across the active, passive and hesitant group (5.2%, 10.4% and 8.4% respectively), depicting lesser say on the decision making for child's health issues by primary caregiver. It was also observed that in majority of the cases, decisions were taken either jointly with husband or with the family. It was further noted that active users mostly took decision either with family (50.5%) or husband (44.3%). Whereas, majority of passive and hesitant users took decisions with husbands (52.8% and 68.4% respectively) and not with family (36.8% and 23.2% respectively). This shows that influence of husbands in decisions-making regarding child health among the passive and hesitant families are more **Table 2.**

TABLE 2: KNOWLEDGE, PERCEPTION AND ATTITUDE TOWARDS VACCINATION

Indicators	Total (%) N=479	Active (%) N=111	Passive (%) N=262	Hesitant/Refusal (%) N=106
Thinks vaccination is important				
Yes	88.5	100.0	95.8	58.5
No	11.5	0.0	4.2	41.5
Willingness to pay for vaccines				
Yes	32.2	31.5	36.6	21.7
No	67.8	68.5	63.4	78.3
Feels vaccination safe				
Yes	83.9	93.6	93.5	50.0
No	8.2	0.9	1.9	31.1
Don't know	7.9	5.5	4.6	18.9
Knowledge on next vaccination due date				
Yes	42.9	47.7	49.2	10.4
No	57.1	52.3	50.8	89.6
Knowledge of VPD				
No knowledge on any VPD	35.3	24.4	30.2	59.4
Knowledge on one or more VPD	64.7	75.6	69.8	40.6
Knowledge of at least two VPDs				
Yes	53.2	63.1	59.2	28.3
No	46.8	36.9	40.8	71.7
Decision-maker for child health				
Primary caregiver	8.7	5.2	10.4	8.4
Jointly with husband	54.4	44.3	52.8	68.4
Jointly with family	36.9	50.5	36.8	23.2
Decision-maker for child vaccination				
Primary caregiver	19.9	19.6	20.3	18.9
Jointly with husband	44.2	36.1	42.4	56.8
Jointly with family	35.9	44.3	37.3	24.3

Agent/Vaccine Specific Factors: A total of 81.2% of the children experienced side effects of vaccination either in the form of fever or swelling. Around 2.1% of the respondents did not know if their children had experienced any such side effects after vaccination. Experience of side effects was more among passive and hesitant group (84.3% and 84.1%) as compared to active group (73.6%). Follow-up visit after reported vaccines' side effect cases is a mandatory activity of FLWs. It was found that the follow-up visit by ASHA was done in around 68.4% of the cases who experienced side effects of vaccination. However, no visits were made by ASHA in 31.6% of the cases. Follow-up visit by ASHA reported was more among passive (73.3%) and hesitant households (75.5%) in comparison with active households (53.1%).

This also shows the efforts made by ASHA in dealing with problems faced by passive and hesitant groups in the community. Subsequent to the experience of side effects of vaccination, about 71.3% of respondents took their child for next vaccination which was observed highest among passive users (83.4%) followed by active (70.4%) and then hesitant (31.4%). ASHA, AWW, and mobilizers are the key health activists in the community who are also responsible for generating awareness on health issues. Around 83.1% of the respondents reported that the mobilizers visited their household to discuss about immunization. These visits were reported more from passive and hesitant households (85.1% and 82.1% respectively) as compared to active households (79.3%) **Table 3.**

An ideal session site should be accessible, identifiable (IEC materials displayed), having adequate space to accommodate beneficiaries before (waiting area), during and after vaccination (observation area) with space for registration and recording. About 97.9% of the respondents felt that the immunization site was convenient. More than 99% of the respondents from the active and passive groups and 92.2% from the hesitant or refusal group reported that the site was convenient for their child's vaccination. Out of the total respondents, who visited the immunization session for any vaccination, only 53.9% received any of the four key messages. Around 40.9% did not receive any of the messages and only 5.2% received all four key messages. In the active group, 33.3% of the respondents did not receive any message, 61.3% reported to have received few messages and only 5.4% received all the key messages. Similarly, only 7.3% of the respondents in the passive group reported receiving all the four key messages, whereas, 58% received any message and 34.7% did not receive any message. No one in the hesitant or refusal group reported receiving all the four messages. Around 64.2% did not receive any of the messages and 35.8% received any message in the hesitant or refusal group. This shows the need for reemphasis on the way of delivering four key messages to all the people in the community **Table 3.**

TABLE 3: EXPERIENCE OF SIDE EFFECTS, PERCEPTION TOWARDS SERVICES AND RECEPTION OF FOUR KEY MESSAGES RELATED TO IMMUNIZATION

	Total (%) N=479	Active (%) N=111	Passive (%) N=262	Hesitant/ Refusal (%) N=106
Experienced side effects				
Yes	81.2	73.6	84.3	84.1
No	16.7	25.5	13.8	11.1
Don't know	2.1	0.9	1.9	4.8
Follow-up visit by ASHA after side effects				
Yes	68.4	53.1	73.3	75.5
No	31.6	46.9	26.7	24.5
After side effect, took the child for next vaccination				
Yes	71.3	70.4	83.4	31.4
No	28.7	29.6	16.6	68.6
ASHA/AWW/Mobilizer pay a visit to the household to discuss immunization				
Yes	83.1	79.3	85.1	82.1
No	16.9	20.7	14.9	17.9
Feels immunization site is convenient				
Yes	97.9	99.1	99.1	92.2
No	2.1	0.9	0.9	7.8

Feels immunization timing is convenient				
Yes	99.5	99.1	100.0	98.4
No	0.5	0.9	0.0	1.6
Received Four key messages				
No message received	40.9	33.3	34.7	64.2
Any message received	53.9	61.3	58.0	35.8
All four messages received	5.2	5.4	7.3	0.0

Environmental/ External Factors: Positive interaction is the keystone in maintaining confidence regarding vaccination. The personal attitude of health care providers, along with their knowledge determines how effectively they will recommend a vaccine to their patients. In the study area, only 21.1% ofthe primary caregivers have attended mothers meeting on immunization organized by the FLWs and 37.1% were still not aware of any such meetings. In the vaccine-hesitant group the attendance rate was lowest *i.e.*, only 10.4% in comparison to active and passive groups (24%). Services like distribution of ORS/Zinc packets, Vitamin A and Poshahar (Supplementary Nutrition) on immunization day can be a motivating factor for the beneficiaries to attend immunization session. Therefore, information on these was also collected in the study. It was reported that only 27.4% of the households received ORS and Zinc supplements; 18.2% of the households have received Vitamin A supplement and 43.8% of the households have received Poshahar (Supplementary Nutrition) on the immunization day. It was also reported by FLWs during informal interaction that attendance on the day of immunization increases if supplementary items are distributed on the immunization day. With growing recognition of the utility of mobile technology to improve health communication, interventions related to mobile phones might be useful to improve vaccine coverage. In the study area, 94.4% of the households had mobile phones. However, only about 15.2% primarycaregivers had their personal mobile phones and 30.7% reported sharing accessibility to phones with family members. The presence of television was not much; only 33% of households had television **Table 4.**

Incentives can effectively turn an inconvenient task into a worthwhile activity, dramatically increasing uptake of a service. In our study area, more than half (51.6%) of the households said that they would be motivated if rewards or recognition were given on achieving FIC. It was reported highest among the active group (60.4%) followed by passive (56.5%) and hesitant group (30.2%). Whereas more than half of the hesitant group were unsure if they will get motivated to vaccinate their child through rewards or recognition. Only 8.4% households reported knowing any person who had received recognition on FIC. This shows non-financial incentives can have effect mostly on passive group **Table 4.**

TABLE 4: EXPERIENCE OF SIDE EFFECTS, PERCEPTION TOWARDS SERVICES AND RECEPTION OF FOUR KEY MESSAGES RELATED TO IMMUNIZATION

	Total (%) N=479	Active (%) N=111	Passive (%) N=262	Hesitant/ Refusal (%) N=106
Attended Mother's Meeting on immunization				
Yes	21.1	24.3	24.1	10.4
No	41.8	49.6	39.3	39.6
Don't Know	37.1	26.1	36.6	50.0
Services received apart from immunization-on-immunization day				
ORS/Zinc	27.4	28.8	34.4	8.5
Vitamin A	18.2	12.6	26.0	4.7
Poshahar	43.8	44.6	46.2	37.0
Presence of Computer				
Yes	6.9	10.8	6.9	2.8
No	93.1	89.2	93.1	97.2
Presence of Mobile Phone				
Yes	94.4	98.2	93.9	91.5
No	5.6	1.8	6.1	8.5
Presence of Television				

Yes	33.0	40.5	37.8	13.2
No	67.0	59.5	62.2	86.8
Presence of Radio				
Yes	12.3	11.7	14.1	8.5
No	87.7	88.3	85.9	91.5
Mobile Phone Users				
No Mobile Phone	5.6	1.8	6.1	8.5
Primary Caregiver	15.3	13.6	17.9	10.3
Other Family Member	48.4	43.2	48.5	53.8
Both	30.7	41.4	27.5	27.4
Will be motivated if received recognition on FIC				
Yes	51.6	60.4	56.5	30.2
No	12.8	9.9	11.6	18.9
Don't Know	35.6	29.7	31.9	50.9
Knows any person who has received recognition on FIC				
Yes	8.4	8.1	10.0	4.7
No	91.6	91.9	90.0	95.3

Qualitative Findings:

Host/Parental Specific Factors: Preference for a male child resulted in large family size, high dropouts among girls, poor nutrition and limited decision-making rights among women and girls was observed.

"If the political leaders talk to the males (fathers, grandfathers), mobilization will take a better shape which in turn might encourage and support their wives & daughters-in-law to immunize their children." DIPRO, Mewat.

"There is need for greater engagement of men from the community and sensitization of fathers, husbands on the rights of women and children (including immunization and health) as a key determinant to support coverage interventions in the district" SMO, WHO. While respondents informed that joint decisions were taken if the child was ill, however, decision making for day-to-day affairs such as household decisions, education, mobility and preferred medium of health care for deliveries were taken by men and elder family members.

Agent or Vaccine Specific Factors: The fear of discomfort, fever, inflammation and subsequent suffering related to the vaccination was cited as a critical reason for dropouts or unimmunized children. There was widespread belief that administration of multiple vaccines at the same time may lead to severe side effects. "There is difficulty in mobilizing the community due to fear of vaccines. There is resistance in the community because of the fear that vaccines will make their child infertile. Involvement of fathers or other male members of the family in immunization activities is minimal. Religious leaders do not encourage the community to go for and support immunization." AWW, Mewat.

Environmental/External Factors: Community engagement interventions such as street plays (nukkadnataks) were discouraged due to their cultural beliefs. Community and religious leaders were not involved in propagation of information regarding immunization and healthcare.

"IPC activities like mothers' meetings and household visits can have a better influence." - ASHA, Mewat

DISCUSSION: This study was carried out in Mewat with a mixed method approach to understand the determinants of vaccine hesitancy in the community. Results of the quantitative findings showed that around one-fifth (19.6%) of the children had not received any vaccination and the most common reason for no immunization was found to be the fear of side effects of vaccine (35%). Further, the households were divided into four vaccine user type categories depending upon their attitude related to vaccination. Overall, 54.7% of the households were passive vaccine users, 23.2% were active vaccine users, 16.1% were vaccine-hesitant and 6% were in vaccine refusal category. Further, qualitative findings showed that religious beliefs of parents or caregivers also encourage not immunizing their children. Furthermore, households who have refused immunization altogether cited fear of side effects

such as high fever and infertility as the main reasons. A spectrum of approaches was proposed to address the above-mentioned challenges. The proposed strategies were multidimensional and tailored according to different sections of the community to address the issues related to vaccine hesitancy.

Recommendation: Based on the study findings and the discussion from the nexus meeting, recommended domain specific strategies for intervention are as follows:

Host or Parental Factors:

Increase Knowledge on Vaccine Preventable Diseases: This can be done through permanent wall paintings on immunization and conducting meetings in the community for positive experience sharing of parents who have fully immunized their children.

Building Trust in Health Care Providers: This can be done by creating small groups within the community and train them for the purpose of community empowerment. Increase participation of parents in mothers meetings can also help to build trust in the health system.

Awareness Generation on Immunization and its Benefits: To generate awareness, IEC activities can be conducted at places where community gathering is higher. Use of social-media platforms such as Facebook and WhatsApp also has to be used to disseminate information and remove misconceptions.

Sensitization of Males of the Community and Increase their Involvement in Health Seeking Behaviours: Mosques can be used as a platform to sensitize and advocate the males on immunization and family planning post Friday Prayer (Namaaz). Village elected leaders & Panchayati Raj Institutions (PRI) Gram Sabha can also be used to disseminate information on immunization sessions targeting males.

Agent or Vaccine Specific Factors:

Increase Knowledge and Skill of FLWs: Refresher trainings for FLWs on how to address the cases reporting side effects and make them efficient for proper use of IEC and BCC materials is required.

Adequate Response to Side Effects of Vaccination: Ensuring follow up visits and provision of adequate treatments to the household reporting side effect by the community health workers and volunteers will improve the acceptance and utilization of immunization services.

Environmental or External Factors:

Involvement of Influencers: Involvement of religious and political leaders, for immunization promotional activities will be helpful for improving immunization coverage.

Vaccination Promoting Activities: Mid-media and social-media activities can be utilized as a platform for vaccination promotion. Experience sharing videos of parents who have lost their child due to VPD and educational videos can be prepared and circulated in the community for awareness generation.

Increase Inter departmental Activity Integration: Roles and responsibilities of departments -WCD, Health, Education and Panchayati Raj- should be outlined for the immunization activities.

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CONFLICT OF INTEREST: Nothing to declare.

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