

Enablers and barriers towards ensuring routine immunization services during the COVID-19 pandemic: findings from a qualitative study across five different states in India

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Background: The coronavirus disease 2019 (COVID-19) pandemic has led to disruption in delivering routine healthcare services including routine immunization (RI) worldwide. Understanding the enablers and barriers for RI services during a pandemic is critically important to develop context-appropriate strategies to ensure uninterrupted routine services.

Methods: A community-based, cross-sectional descriptive study was conducted in five different states of India, nested within an ongoing multicentric study on RI. Telephone in-depth interviews among 56 health workers were carried out and the data were analyzed using a content analysis method.

Results: During the COVID-19 pandemic, healthcare providers encountered many challenges at the health system, community and individual level when rendering RI services. Challenges like the limited availability of personal protective equipment and vaccines, deployment for COVID-19 duty at system level, the difficulty in mobilizing people in the community, fear among people at community level, mobility restrictions and limited family support, as well as the stress and stigma at individual level, were barriers to providing RI services. By contrast, the issuing of identification cards to health staff, engaging community volunteers, the support given to health workers by their families and training on COVID-19, were factors that enabled health workers to maintain RI services during the pandemic.

Conclusions: When addressing the COVID-19-related public health emergency, we should not lose sight of the importance of services like RI.

Keywords: barriers, COVID-19, immunization, India, pandemic

Introduction

Immunization has improved well-being and decreased mortality significantly, particularly among children.^{1–3} Research studies from different regions across the globe have flagged up issues regarding ensuring access to routine immunization (RI) services for target users.^{4,5} The coronavirus disease 2019 (COVID-19) pandemic and related restrictions have added to the challenge in making RI services available and accessible.^{6,7} Research has

suggested a need to address the increased morbidity and mortality resulting from other health crises, in addition to focusing on COVID-19-related activities carried out by the health system during the pandemic.⁸ Also, evidence from the Ebola epidemic (2014–2015) suggests that there was an increased number of deaths due to diseases other than Ebola that were attributed to failure of the health system.⁹ So it is important to ensure uninterrupted routine health services, especially RI, even during a health emergency like a pandemic to prevent morbidity and

Table 1. Distribution of the study sites, type and number of participants from five states of India

Name of the state	Study sites	Total no. of IDIs	No. of community health workers (ANMs/ASHAs/AWWs)
Odisha	Adashpur, Cuttack	12	ANMs=4, ASHAs=8
Maharashtra	Khadakwasla, Pune	12	ANMs=4, ASHAs=8
West Bengal	Joy Nagar, South 24 Parganas	12	ANMs=4, ASHAs=8
Chennai	Thirumazhisai, Thiruvallur	8	ANMs=6, AWWs=2
Assam	Lahoal, Dibrugarh	12	ANMs=4, ASHAs=8
Total	5 sites from 5 states	56	ANMs=22, ASHAs=32, AWWs=2

Abbreviations: ANMs, auxiliary nurse midwives; ASHAs, accredited social health activists; AWWs, anganwadi workers; IDIs, in-depth interviews.

mortality from other vaccine-preventable diseases (VPDs).¹⁰ To ensure better and equitable immunization coverage, the WHO initiated the Immunization Agenda 2030.¹¹

Indian scenario

From March 2020, India imposed a countrywide lockdown in different phases. During this period, other than COVID-19-related activities, only emergency healthcare services were delivered through the public health system. Different print media highlighted that health workers were no longer conducting door-to-door visits and/or holding RI sessions.¹²⁻¹⁴ The grass root-level healthcare facilities, such as Anganwadi centers and subcenters, were closed. Also, many people in the community were reluctant to use any such services and even tetanus toxoid immunization was put on hold for pregnant women.¹⁵

The Intensified Mission Indradhanush 2.0 by the Indian government, which started in October 2019 with the aim of achieving targeted full coverage of vaccination by March 2020, could not be achieved due to the pandemic situation.¹⁶ Grass root-level health workers were unable to perform outreach operations to provide health services, including RI. Additionally, because healthcare workers were reorganized to respond to the pandemic, RI services were disrupted.¹⁷ The fear of community opposition or even aggression by people and the risk of contracting COVID-19 infection added to the challenges of ensuring immunization coverage.¹⁸

In the milieu of COVID-19, various countries have undertaken different strategies to ensure RI services for their targeted end users.¹⁹⁻²¹ Although there are research studies available that suggest how RI services have been affected and what was predicted during the COVID-19 pandemic, there is a dearth of evidence on the enablers and barriers encountered by health workers rendering RI services during the pandemic. The current study intends to explore these enablers and barriers to help in formulating appropriate strategies for ensuring uninterrupted RI services applicable for a similar context.

Methodology

Study setting

This study was carried out in five states from different parts of India, nested within an ongoing multicentric study on Mobile

Application for Immunization Data in India. The study was carried out over a period of 3 mo (June to August 2020). Details of the study sites are presented in Table 1.

Study design and method

A cross-sectional descriptive study was carried out using a qualitative method (in-depth interviews [IDIs]) for data collection. This design allowed researchers to build a holistic and detailed description and to analyze the enablers and barriers encountered by frontline healthcare providers (HCPs) involved in delivering RI services.

IDI guide

The IDIs specifically focused on the health system, community and individual level barriers and enablers encountered by health workers in delivering immunization services during the COVID-19 pandemic. The interview guide was pretested and finalized after making any necessary changes. Then the guide was translated into six different languages (Hindi, Odia, Tamil, Assamese, Marathi and Bengali) and backtranslated along with the necessary changes to ensure its reliability prior to implementation. The IDI guide used in the study is provided in Supplementary File S1.

Data collection and analysis

Telephone IDIs among the 56 HCPs (auxiliary nurse midwives [ANMs]=22, Anganwadi workers [AWWs]=2 and accredited social health activists [ASHA]=32) were performed. All the interviews were audiorecorded with the consent of participants and later transcribed and translated into English. Compiled data were imported into Atlas.ti (analytical windows software ATLAS.ti Scientific Software Development GmbH) for coding. According to the study objective, coded data were abstracted, categorized and themes were generated. Findings were interpreted according to concepts that reflected the objectives of the research study. All the recurrent themes are supported by verbatim from the respondents.

Results

From the study, the three major categories that emerged were: (1) barriers and enablers encountered from the health system; (2) barriers and enablers encountered from the community; and

Table 2. Study findings (enablers and barriers) according to the region/study sites

Key findings	Odisha	West Bengal	Maharashtra	Assam	Chennai
Enablers					
Issuing ID cards	++	-	-	++	-
Providing PPE and sanitizer	+	+	+	+	++
Supply of vaccines and related logistics	+	+	-	+	-
Community support	++	++	-	++	-
Parents' concern for their child's immunization	++	-	++	++	-
Family and peer support	++	++	-	++	++
Barriers					
Limited supply of PPE	+	+	-	+	-
Unavailability of vaccines	+	-	+		+
Deployment to COVID-19 duty	++	++	-	++	++
Challenges in community mobilization	++	-	++	++	-
Lack of awareness of COVID-19	++	++	-	++	++
Transportation restrictions	++	++	++	++	++
Pandemic-associated stress and anxiety	++	-	-	++	-

++, highly present; +, present; -, absent.

For a better understanding of different barriers and enablers, we presenting the current study's findings holistically.

(3) barriers and enablers at individual level. The findings are presented under each of the major categories, with quotes from participants. While some of the findings were common across the study sites, while others varied. The findings based on study sites are presented in Table 2.

Category 1: enablers and barriers from the health system

Issuing identification cards to health workers

During the pandemic, special identification (ID) cards were issued to health workers. This helped them to avoid movement-/visit-related hassle in accessing immunization session sites, especially during the lockdown period:

Police usually asked us to show the ID cards. Once we show them, they allow us to go (an ANM, Odisha).

Providing personal protective equipment and sanitizer

At study sites, COVID-19 personal protective equipment (PPE), masks, sanitizer and gloves were provided to health workers for ensuring their safety in the working environment:

They also provided us mask and sanitizer for our use. Initially we had difficulty in getting them adequately, however later we got them sufficiently (an ASHA, Assam).

Supply of vaccines and related logistics

To ensure the logistics and transportation of routine vaccines to the vaccine depots and session sites, separate vehicles were

arranged by the departments of health of the respective state governments during lockdown restrictions:

At the district level, they provided a vehicle with which it was easy to carry vaccines to the session sites (an AWW, West Bengal).

Limited supply of PPE

HCPs were frontline warriors during the COVID-19 pandemic. During the initial period of the pandemic, most healthcare facilities faced a shortage of PPE, including face masks, gloves, sanitizers and gowns. Most study participants raised concerns about the insufficient supply of PPE during the initial period. They were worried about being exposed to COVID-19 infection:

From the hospital, I have received masks, gloves and sanitizer. But they were not sufficient. Enough PPE should be given to us (an ANM, Odisha).

Participants also raised concerns about the quality of the face masks provided. Hence, most participants used their scarf, cotton clothes or handkerchief while delivering services during the initial period of the pandemic:

The mask I received was for one-time use. So, sometimes, I used my scarf or handkerchief (an ANM, Odisha).

At [the] least [the] government should provide N-95 mask[s] to the frontline workers (an ANM, Assam).

Participants also spoke about the issues they faced at immunization session sites. During immunization sessions, some

parents violated COVID-19 protocols (i.e. maintaining social distancing and using masks). When health staff asked them to wash their hands and use sanitizer, many avoided doing so and instead they asked health staff to change their gloves:

I told the parents to maintain a queue, but they did not follow. Instead, they asked us to use new gloves for each child. Now you tell me, how I can manage to do this when providing services to about 40 to 45 children per session (an ANM, West Bengal).

Unavailability of vaccines

Many of the study participants mentioned that the supply of routine vaccines was a challenge during lockdown, leading to stock-out of different vaccines. One of the study participants said that:

Rota and Penta vaccine supply was interrupted during this lockdown. However, we managed to provide both the vaccines. We asked all eligible children to come to a single site. But [a] few parents did not agree to go to other sites. We explained [to] them about the issues and then they agreed (an ANM, Maharashtra).

In some places, supplies of routine vaccine were not interrupted, even during this difficult period. The district administration was vigilant and ensured a regular supply of vaccine to session sites:

In my area, I did not face any such difficulty related to vaccine. All the vaccines were available at the center (an AWW, Chennai).

Deployment to COVID-19 duty

Participants from all study sites mentioned that, during the pandemic, they experienced a tight duty schedule and they had to strictly manage their work schedules:

It was [a] very difficult time because in addition to our routine work, we had to do COVID-19-related activities. However, I managed. I start the day with the routine duties such as doing immunization or VHND sessions and after that visit the panchayat [office of the head of the village; otherwise called the 'Sarpanch'] for COVID-19 screening and every day report to [the] medical authority (an ANM, Chennai).

Category 2: enablers and barriers at community level

Community support and volunteer help

In some places, people in the community were aware of the necessity for RI, so they willingly took their children to sites. Many people had to take their children to a new session site for immunization. People within and outside the health department supported and helped as volunteers during immunization:

People are now aware of the consequences if their child does not get vaccinated. [A] few did not come to the ses-

sion site, but most of them came to the session sites (an ANM, West Bengal).

Parents' concerns regarding the immunization of their children

Some parents were very much concerned about the immunization of their children, so they took their children to immunization sites on their own.

Parents are concerned about their child[']s immunization, so they came to session sites as per the schedule (an ANM, Odisha).

Challenges in community mobilization

Mobilizing some beneficiaries to immunization session sites was a challenge. They perceived that visiting hospitals and meeting medical staff carried the risk of contracting COVID-19 infection. However, consistent engagement with the community and informing people regarding COVID-19 infection and emphasizing the importance of immunization helped them to address this:

A father asked me to come to his home for immunization. In my site, [a] total [of] 45 children were present. I tried to convince him to bring his child to [the] session site and, after visiting four times, he came (an ASHA, Assam).

Additionally, HCPs had more challenges when their catchment areas were declared as containment zones. In such scenarios, the immunization sessions were stopped in those areas and they had to ask the parents to visit other nearby session sites for immunization.

Lack of awareness of COVID-19

While most people were aware of COVID-19 infection, some had false beliefs and stigmas about COVID-19 disease. In some instances, the HCPs had to face resistance from a few people in the community during their visits. Participants explained that this happened because people had a belief that if someone from outside visits their village, then they might contract COVID-19:

People had the fear of getting COVID[-19] infection by going near to a person, irrespective of his/her infection status. Some also believed that wearing a mask means the person is already infected (an ASHA, West Bengal).

Some people asked us to remove our masks when the lockdown got over. We had to make them understand that[']s why we wear a mask and it doesn't mean that we have the COVID[-19] disease (an ANM, Odisha).

Participants suggested that during such emergency situations, appropriate community awareness campaigns are required to inform individuals regarding disease-related facts. This would help in reducing the stigma, false beliefs and resistance towards HCPs.

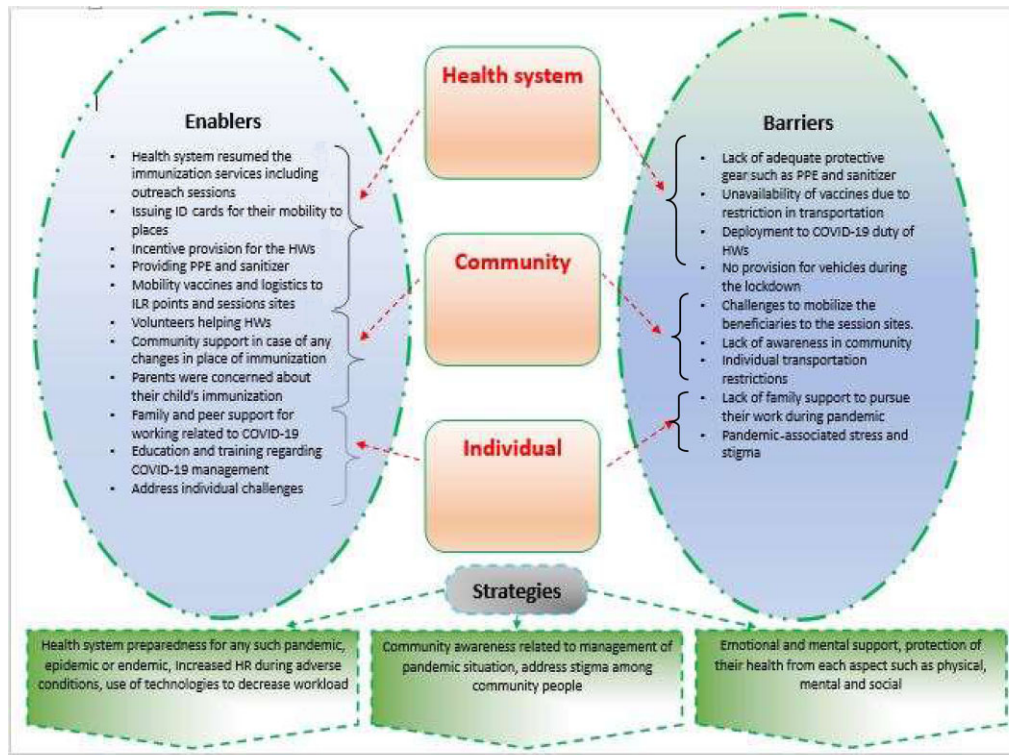


Figure 1. A conceptual framework based on the barriers, enablers and strategies for ensuring RI services during the COVID-19 pandemic and proposed strategies. HR, human resource; HWs, health workers; ILR, ice lined refrigerator.

Category 3: individual level challenges

Family and peer support

Family and peer support played an important role in motivating health workers to perform their duties during the pandemic. This motivated and encouraged them to continue providing services, including carrying out immunization sessions during the COVID-19 pandemic.

Transportation restrictions

Because of nationwide lockdowns and containment area protocols, there were interruptions to delivering routine healthcare services. During this time, HCPs faced many challenges due to mobility restrictions and a lack of transportation facilities:

Transportation cessation made our work further difficult. If I wanted to go somewhere, I had to come with my husband or with any of my family members. Sometimes, [an] ASHA worker had to send her son, so that I could visit to the village in his bike (an ANM, Odisha).

Concern among family members

It is obvious that HCPs were at a higher risk of acquiring COVID-19 infection and infecting their family members because of the nature of their work. Their family members were in a state of mental stress. Some respondents explained that their family

members were reluctant to allow them to attend for duty during the pandemic. It was difficult on their part to convince their own family members. However, a few participants mentioned that they received full cooperation, support and motivation to perform their obligatory duties during this health emergency:

My family members especially my mother-in-law did not want me to go to the field during the COVID-19. She thought that I will get the infection by going to the community. My children were also afraid and reluctant to leave me out of the house (an ANM, Pune).

Pandemic-associated stress and anxiety

Many health workers were experiencing mental stress and fear due to the load and nature of their work. Many respondents narrated that they were putting their family members at risk because of their job. However, gaining family support was a key factor that morally boosted them to perform their duties more efficiently during the crisis. A few participants stated that a lack of family support made them feel weak and increased their stress further:

I have a baby of 1 y. It was very difficult to work because I would have felt guilty if he gets the infection (an ANM, Assam).

Table 3. Comparison of the current study's findings with those of the present situation

Our study's findings	Current status/strategies (based on available literature)
Barriers	
Inadequate availability of PPE and sanitizer during initial days	1. The supply of PPE and sanitizer was immediately restored through prompt procurement and the supply chain management system ²² 2. ANMs should perform standard hygiene practices and wash their hands with soap and water for at least 20 s before the start of each session and sanitize their hands with an alcohol-based sanitizer before and after vaccinating every beneficiary ²³
Non-adherence to COVID-19 protocols by people seeking RI	Practices of social distancing, handwashing and respiratory hygiene need to be maintained at all immunization sessions irrespective of zones/district categorization by all (i.e. beneficiaries and service providers) in all sessions ²³
Limited supply of vaccines and logistics	Vaccine stocks to be reviewed at all locations using eVIN and adequate refilling and mobilization as per program need ²³
Difficulty in managing the immunization sessions	The categorization of containment and buffer zones is a dynamic process updated on a weekly basis or earlier. In alignment with the area categorization, immunization services are classified into two Categories: immunization in containment and buffer zones, and immunization in areas beyond buffer zones and green zones ²⁴
Staff deployed to COVID-19 duty	In India, routine immunizations were disrupted due to healthcare workers being reorganized in response to the pandemic. Currently, as the pandemic situation is getting better, more focus has shifted to routine activities

Abbreviation: eVIN, electronic vaccine intelligence network.

I am here to help others. But sometimes I feel depressed. This may be because of this pandemic situation (an ASHA, Odisha).

A conceptual framework based on the barriers, enablers and strategies is outlined in Figure 1.

A comparison of our study's findings with those of the current situation is presented in Table 3. The current situation was elicited based on available literature or in reference to available guidelines and recommendations issued by the government.

Discussion

The current study highlights the enablers and barriers at three different levels (health system, community and individual) encountered by frontline workers in India when ensuring RI services. During the COVID-19 pandemic, RI services were more or less affected in countries globally, posing a threat to VPDs. According to a report by the Centers for Disease Control and Prevention, until 1 June 2020, approximately 125 mass vaccination campaigns against various VPDs were postponed in low- and middle-income countries.^{25–27} Even temporary disruption of RI services may lead to secondary health crises, for instance, measles outbreaks.²⁸ According to the WHO, prolonged interruption of RI during a pandemic can lead to more risks than benefits.²⁸ Such consequences

significantly affect the vulnerable groups of society.²⁹ According to a study from India, due to the COVID-19 lockdown and containment strategies,³⁰ the Universal Immunization Program was badly affected.³⁰

In the current study, we found many challenges at health system, community and individual levels that presented barriers to the RI program. Inadequate availability of PPE during the early period of the pandemic, no supply or an unavailability of vaccines at session sites (because of transportation restrictions affecting the supply chain) and deployment of health staff for COVID-19-related activities were the major system-level challenges. According to a study in India, RI services were disrupted during COVID-19 because healthcare workers were deployed to curb the pandemic situation.³¹ In the event of any health emergency, it is critical to have adequate human resource management to render quality healthcare services.³² Proper and adequate planning at state, district and block levels needs to take place for utilizing the available health workers smartly and engaging more staff if required.³³ Proper supply chain management emphasizing the availability of PPE, gloves and masks at all session sites is also equally important.²²

In the community, health workers encountered challenges in the form of difficulty in mobilizing people to attend immunization session sites, low community awareness leading to misbelief and stigma about COVID-19 disease, as well as fear among people in the community regarding visiting hospitals or accessing healthcare staff, and these were found to be the prevalent barriers in

availing immunization services. According to a study conducted in Saudi Arabia, a potential reason for postponing or delaying vaccination was the fear of contracting COVID-19 infection from people in the community.³⁴ It is critically important to disseminate accurate information and to stop the spread of misinformation. A public awareness campaign using appropriate communication platforms would educate and promote beneficiaries in availing immunization services. According to Singh, effective information, education and communication activities communicating the risk of not completing immunization and COVID-19 safety practices are very important in the case of an ongoing pandemic.³⁰

Individual level challenges, such as mobility restrictions during lockdown, limited support from family members, pandemic-related stress and stigma were barriers to maintaining RI services. These findings were consistent across all study sites. Research shows that pandemic-related stress and stigma encountered by HCPs also affected their service delivery.^{35,36} Considering this backdrop, adequate support during any health emergency situation is necessary for improved health outcomes.³⁷

While there were hindrances, we also observed many enabling factors that helped in providing uninterrupted RI services in many places, even during adversity. The issuing of special ID cards to health workers to avoid any movement issues, as well as the provision of PPE to HCPs and access to gloves, masks and sanitizer at session sites, helped in carrying out sessions successfully. At some sites, special vehicles were engaged for transporting vaccines to vaccine depots (Ice lined refrigerator points) and session sites. Support from community volunteers helped HCPs to perform their duties better. Family support encouraged them to perform their jobs successfully. Training on COVID-19 management for HCPs has helped them to encounter challenges and ensure immunization service delivery.²⁶ Also, Olorunsaiye et al. suggested that an expanded framework based on the Global Routine Immunization Strategic Plan incorporating recent immunization guidelines during the pandemic could possibly help HCPs and policymakers to minimize the emerging gaps in vaccination coverage that occurred because of the pandemic.³⁸

Although this study was conducted during the initial phase of the COVID-19 pandemic to better understand the enablers and barriers facing frontline workers when delivering RI services, and to explore the current challenges and strategies adopted by frontline workers to overcome those barriers, it also provides scope for future researchers to understand comparisons made between ongoing and postpandemic emergencies.

Limitations

All of our study sites were in rural and peri-urban communities, so observations may vary for an urban context with good transportation access. Our observations were based on difficulties encountered during the COVID-19 lockdown period (the initial period of the pandemic) and so the findings need to be interpreted accordingly. Although in our findings there were intersite variations, these are presented holistically to highlight the barriers and enablers for future appropriate strategies to ensure quality RI, even during a health emergency.

Conclusions

During an unprecedented health emergency like the COVID-19 pandemic, in addition to the priority of pandemic management, it is also critically important to ensure routine health services like RI continue. Adequate and proper management by the health system to address the existing context-specific barriers and challenges at the system, community and individual level will help in improving the work performance of HCPs. Engaging people in the community and adopting an effective communication platform will make them aware of the true facts regarding the disease. This will help in building their trust in the health system and HCPs. The enablers and barriers identified in this study provide us with the scope to formulate and implement appropriate strategies in similar contextual situations to ensure RI services continue during health emergencies.

Supplementary data

Supplementary data are available at [Transactions](#) online.

Authors' contributions: SKP, BVT and SP designed the study. KP, BN, YL, MKD, AM and BG performed implementation. KP made a major contribution to writing. KP and BN performed the data analysis. SR, PK, BVT, SB, AS, MSK, PB, HS, NG and SD read and approved the final version of the manuscript.

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Data availability: The data sets generated for this study are available upon request from the corresponding author.

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