

## Challenges in Immunization Service Delivery During Covid19 pandemic: A Mixed-Method Approach

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### Abstract:

**Background:** The pandemic of Coronavirus Disease 19 (COVID-19) has changed the world order and created unprecedented difficulties for healthcare systems. Immunization and other primary health care services have been disrupted, putting children at risk for vaccine-preventable infections. **Objective:** To determine the challenges faced by multi-purpose healthcare workers (MPHWs) in providing immunization services during the COVID-19 pandemic. **Methodology:** The study in the Rural Field Practice area was conducted using a mixed-method with the triangulated approach. With a Qualitative (Venn diagram, free listing, pile sorting, focus group discussion) and Quantitative component (record-based data on immunization service coverage). All the existing multi-purpose healthcare workers were chosen by Purposive Sampling. Content Analysis and Thematic Analysis were done for Qualitative data. **Results:** Lack of transport was found to be a major challenge for providing immunization services in the Venn diagram and Content Analysis with a Saliency Score of 0.9. In both challenges and solutions, the thematic analysis revealed three themes: multi-purpose healthcare workers, the health system, and the community. **Conclusion:** Our study explored the major challenges faced by the health workers like lack of transportation, fear of getting infected by the beneficiary, Lack of leaves, extra work burden reluctance for vaccine and solution like arrangement of transportation facilities, recruitment of more workforce, awareness generation.

**Keywords:** Covid-19, Immunization services, multi-purpose health workers, Visakhapatnam

### Introduction:

Immunization is a worldwide success story that saved millions of lives each year. Immunization is the process of making a person immune to an infectious disease, usually using a vaccine. Vaccines are essential for preventing and controlling outbreaks of infectious diseases. Every year, it saves the lives of 2-3 million people from diseases like diphtheria, tetanus, pertussis, influenza, and measles<sup>(1,2)</sup>.

According to the World Health Organization (WHO), VPD is a threat to 80 million children worldwide because of the disruption of healthcare systems due to the COVID-19 pandemic. Currently, the World Health Organization (WHO) and Gavi have undertaken Pulse surveys (the Vaccine Alliance). According to the studies, vaccine interruption occurred in 64 percent of the 107 nations surveyed in the first survey. SEAR (South-East Asian Region) / WPR (Western Pacific Region) reported disruptions to facility-based immunisation services

in 55 percent of 11 surveyed nations and 45 percent of outreach vaccination campaigns in the second pulse survey<sup>(3,4,5,6)</sup>. COVID-19 has been linked to a reduction in access to mass vaccination programmes and an increase in measles cases in some low- and middle-income nations<sup>(7,8)</sup>.

In India, around 150,000 Auxiliary Nurse Midwives or Multipurpose Health Workers are administering a total of nine million doses of immunisation to 27 million new-borns, children, and pregnant women, with the help of grassroot level workers efforts<sup>(9,10,11)</sup>. In response to the COVID-19 outbreak, they have been entrusted with additional tasks pivoted around the pandemic control such as conducting door-to-door surveys, conducting awareness campaigns among people, sensitization for social distancing (including for countering stigma), contact tracing, etc. Consequently, they face several challenges in delivering Immunization service. Vaccination services being disrupted has the potential to have a major public health impact<sup>(12,13,14)</sup>. Hence the present study aimed to identify the challenges being faced by the ANM's or Multi-purpose health workers during the COVID19 pandemic for providing immunization services and to compare the immunization coverage before and during the pandemic.

## **METHODOLOGY:**

The current study was undertaken in the Andhra Medical College's Rural Field Practice Area, Department of Community Medicine, Simhachalam, Visakhapatnam, Andhra Pradesh, India. Participants in the study were 9 multi-purpose health workers from 12 sub-centers who were purposefully chosen. It is a mixed-method study with the triangulated approach. The qualitative component included a Participatory rural appraisal tool, added free listing in Pile sorting, and Focus group discussion. The Quantitative component included record-based data on Immunization service coverage from the Rural Health training centre for the years 2019 and 2020.

### **Data Collection Methods:**

This exercise was undertaken during their monthly meetings at Rural Health Centre, Simhachalam. All participants were informed about the study's goal, technique, and ramifications, and their informed consent was acquired.

**Qualitative data collection:** It was done in three steps, one after the other. To engage the participants and make it more intriguing at first Participatory rural appraisal tool – Venn diagram was chosen in which the question “What were the major challenges faced by

Multipurpose health workers while delivering Immunization service during covid19 pandemic?" was given, and after explaining the procedure doubts were clarified. Authors were on hand during the process and monitored them.

In the next step the question "List all the challenges faced by the Multipurpose health workers while delivering Immunization services during covid19 pandemic." was given and asked to do the free listing followed by pile sorting was done to identify various challenges for delivering Immunization services.

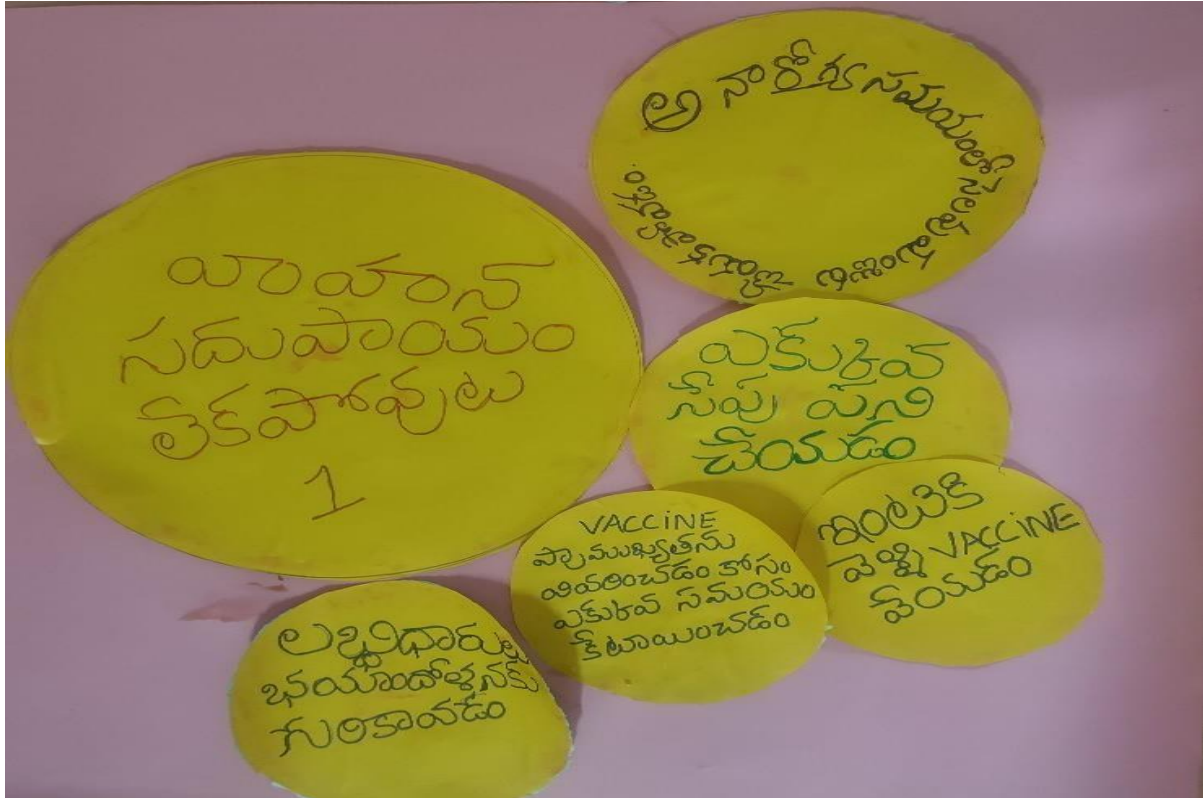
The final step was a focus group discussion (FGD) with nine participants to better grasp the challenges and solutions. The FGD guide was used, and the entire event was videotaped, with the FGD notes being taken down by the note taker. The first, second, and third writers served as moderator, note-taker, and recorder for the focus group.

**Quantitative data collection:** Record-based data on Immunization service coverage was collected from the Rural Health training centre for the years 2019 (considered as Pre-pandemic period) and 2020(considered as Pandemic period).

**Data analysis:** Content analysis of Free listing and pile sorting was done using Anthropac 4.98.1/X software. The Free listing exercise yielded 11 and 17 challenges with quite high Smith's S values. Individual participants were asked to aggregate those selected reasons that they believed went together in a pile, and multi-dimensional scaling and hierarchical cluster analysis of pile sort data were used to generate a collective view. Manual coding was used to conduct thematic analysis for the Focus Group Discussion (FGD), and themes were developed. Quantitative data was examined in Microsoft Excel and expressed as percentages and proportions.

### **Results:**

Six major perceived barriers among Multipurpose health workers delivering Immunization services during the covid pandemic were identified using the Participatory Rural Appraisal technique. Lack of transportation, working without a day off, long working hours, requests for home immunisation, more time spent on health education, and beneficiary fear of infection are among them. The lack of transportation was the most major difficulty among them as seen in the Venn Diagram below.

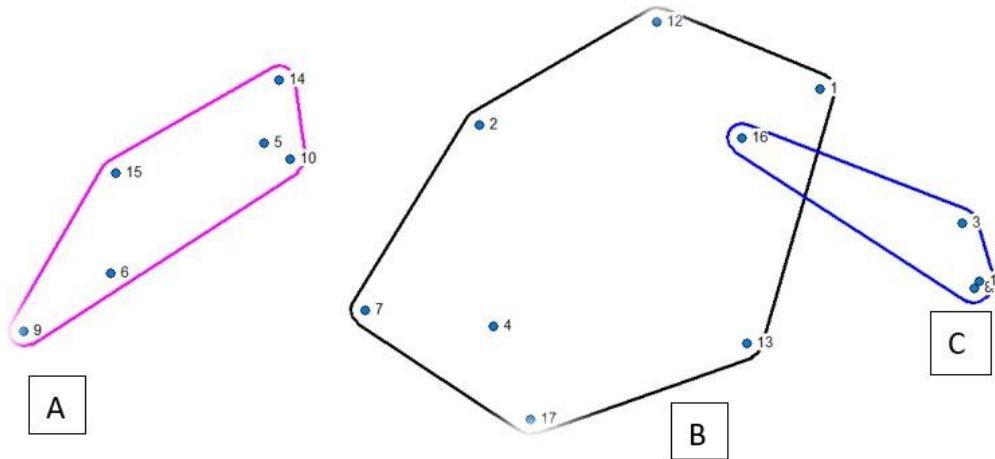


In the free list exercise, seventeen challenges identified for delivery of Immunization services in descending order of Smith's S value were as follows. The major challenges are 1) Lack of transport, 2) fear of getting infected by the beneficiary, 3) Lack of leaves, 4) time consuming as per covid norms before distributing slips, 5) reluctance for the vaccine, 6) time consuming for persuasion, 7) telephonic appointments, 8) extra working hours. These items were then subjected to a pile sorting exercise (Table 1).

Table 1: Challenges faced by MPHWS in delivering Immunizing services in Simhachalam, India

Item	Frequency (%)	Average Rank	Salience
Lack of transport	100	1.11	0.972
Fear of getting infected beneficiary	55.6	2.4	0.331
Lack of leaves	44.4	3.5	0.243
Time Consuming	33.3	2.33	0.263
Reluctance for Vaccine	22.2	2.5	0.151
Time-consuming for persuasion	22.2	5.5	0.044
Telephonic appointments for beneficiaries	22.2	5	0.053
Extra Working Hours	22.2	4.5	0.087

As found in the analysis of the pile sort data, Challenges faced by MPHWs in delivering Immunization services during the covid-19 pandemic were clustered into three groups, which they thought of as mutually related to each other. (As shown in the cluster diagram below).



**A) Community-related challenges** are 9. Uncomfortable for beneficiary 6. Time for persuasion 10. Unscheduled vaccination 15. Request for home vaccination 5. Reluctance for vaccine 14. Vaccine Stockouts.

**B) MPHW related challenges** are 1. Lack of transport 16. More out-of-pocket expenditure 13. Disturbed routine Activity 14. Not following Protocol 4. Time-consuming 7. Telephonic Appointments 2. Fear of getting Infected 12. High-risk MPHWS.

**C) Health system-related challenges** are 16. More out-of-pocket expenditure for MPHWS 3. Lack of leaves 11. Work pressure 8. Extra working hours.

Subsequently a Focus group discussion (FGD) was done at Rural Field Practice area with 9 Multi-Purpose Female Health Workers [MPHW(F)].

Three themes were evolved after manual coding of transcripts from the Focus Group discussion.

### 1. Challenges faced by Multi-Purpose Female Health Workers [MPHW(F)]

MPHW's highlighted that COVID-19 had affected all aspects of public life. They also voiced their fears and anxiety brought about by the COVID-19. Despite the fear in society, they were determined to deliver the services with high morale. The major challenge they had faced is a lack of transportation for providing Immunization services. There were no clear guidelines, on how to carry out immunization services during the COVID-19 pandemic. They even worked for long working hours without day-offs as there is pressure on them from higher authorities to reach the targets. One

respondent (MPHW2) from the Rural Field Practice area responded very emotionally as,

“వేరకే ట్రాన్స్పోర్ట్ ి ిక్ ఉండకేది కాదు బండి ఎవ్వరు ఇవ్వకే మారు కాదు కారియర్ పట్టకుని గంటలు గంటలు నీలయిచోవాలిసప వడ్డీ ది . యానానిఫామ్ చూసి మాన్ కారియర్ చూసి కోపిడ్ ి సంబంధించినది ఏమో అనన అనుమానంతో మమమ లీసన ఎవ్వరు తీసుకువెళ్ళకే డానర్స్ ఇప్పడేవారు కాదు.”

*[no other modes of transportation and no vehicle being provided by anyone, and we use to hold the carrier for long hours. By looking at our uniform and vaccine carrier people use to think that we are doing covid related work and with that in mind nobody likes to give a lift for us.]*

In response to the above, another MPHW showed her frustration and anger stating that they were forced to do covid related activities apart from regular activities with meagre manpower. They also faced challenges such as a lack of adequate PPE.

Response from MPHW 5,

ఇంట్లో ఎలా ఉనన పొదుంున్నన వస్తే సాయంంం ఇంటికి పరిసరితి వెళ్ళకే వాలం ,రోజు రావాలి.  
*[Whatever may be our situation at home, we attend the duty regularly and work without a day off.]*

When talking about the Community-related challenges many of them spoke about the Vaccine hesitancy, stigma related to healthcare Workers as they can be carriers of the infection. Regarding routine Immunization sites, parents faced challenges, such as long waiting hours because of the covid19 protocol. MPHW 3 responded as,

“కరోనా ఎక్కు వ్ ఉంది కదా బయట తిరగప్పు అని అంటునాన రు వీరే ఇంటికి వచ్చి వేయింపకే కదా.”

*[Due to rising Covid19 cases, parents requested for home vaccination to their children.]*

## 2. Solutions

The provision of transportation facilities for healthcare personnel offering immunisation services was identified as a solution. They proposed that a particular action plan with suitable structure be created, and that the workforce be trained in case they are assigned to a new task. Involve local residents and Village Sachivalayam volunteers in spreading the word about the immunisation campaign. MPHW 6 responded as,

“పభురవ ం మందంగాన్న ఒక యాక్షన్ ప్లాన్ రయారు చేసకుని ఉంచకోవల్సి దానీ  
 వాళ్ళోల మా  
 మీద పనీ ఒత్తిడిరగతందీ.”

[Government must come up with an Action plan prior so that work burden could be reduced on us.]

Recruitment of more workforce to share the work burden by the concerned authorities and provision of basic equipment such as PPE, gloves, masks, etc. MPHWH 1 responded as,

“రపిహోరింగ్ సరిసం అనది సాపఫ్ల జంగ్ సోర్ చ్చయాలీస . మేమ ఎకం వగా  
 చదంవకోలేదు మేమే  
 రోజు అపో ఆడరింగ్ కూడూ చేయల్సి దానీ వలో ఎకం వ సమయం పడతంది .”

[Data entry has to be done by the supervisor. We are not trained in data entry and this adds additional work burden and time to us.]

Further, they suggested that there should be more community engagement, and awareness generation should be promoted.

Response by MPHWH4,

“వాక్సేషన్ నేమ్మే మీద రలంలకు అవగాహన కల్పించి పలిగిన తీసుకు వచ్చే టుట్టర్  
 చూడల్సి.”

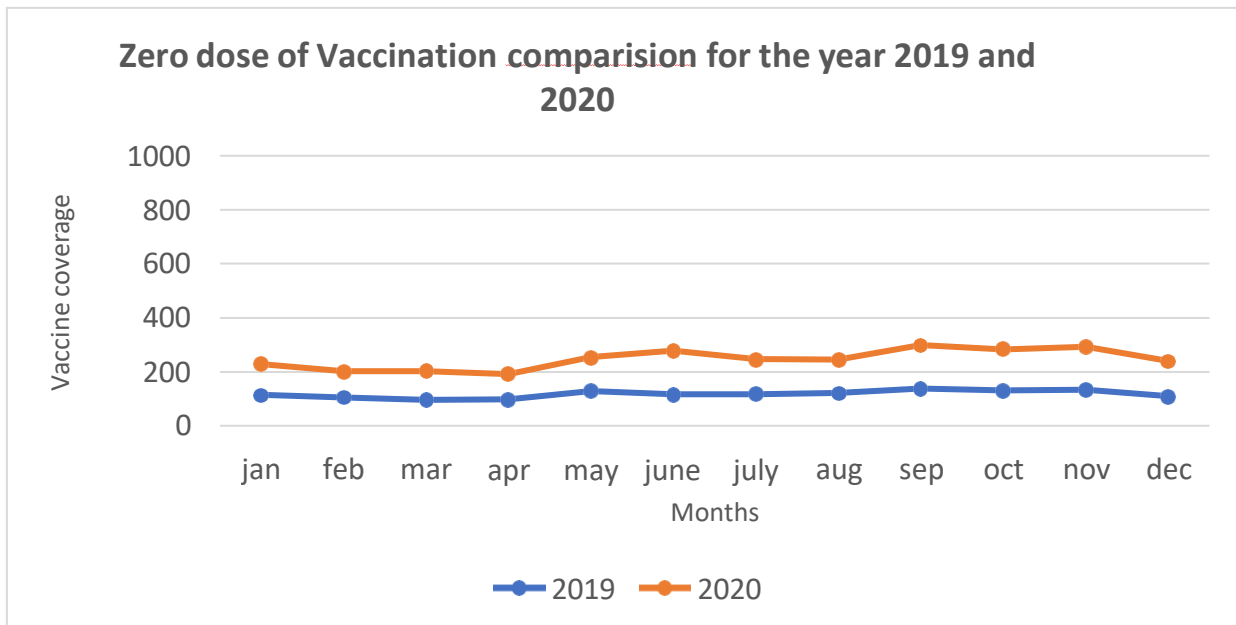
[Need to bring more Awareness regarding Vaccination to Mothers to bring their kids for Vaccination.]

Table: Thematic analysis of FGD

CATEGORIES	CHALLENGES	SOLUTIONS
Health care worker related	Lack of transportation Extra work burden, Working without a day off, Long working hours, Work pressure from higher authorities to reach the targets.	Arrangement of transportation facilities Identify Volunteers Development of Action plan and multiple pieces of training.

<p>Health System-related</p>	<p>Vaccine Stockout</p> <p>Lack of Health Workforce according to population Norms</p> <p>Lack of Adequate PPE for MPHWS</p>	<p>Uninterrupted supply</p> <p>Recruitment of more Workforce</p> <p>Provision of basic protective equipment</p>
<p>Community-related</p>	<p>Vaccine Hesitancy</p> <p>Stigma towards health workers.</p> <p>Requesting home vaccination.</p> <p>Long waiting hours lead to restlessness</p> <p>Urge to get vaccinated first on the session site.</p> <p>Requesting for vaccination after session hours.</p>	<p>Awareness generation</p> <p>following of safety protocols</p> <p>Community Engagement</p>

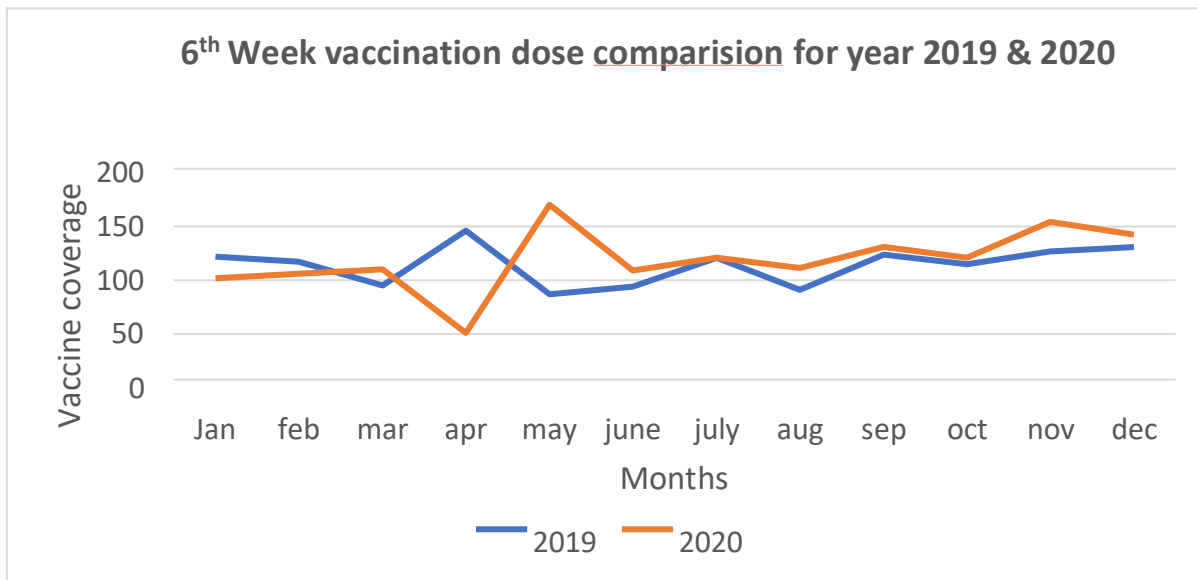
**Quantitative data analysis:**



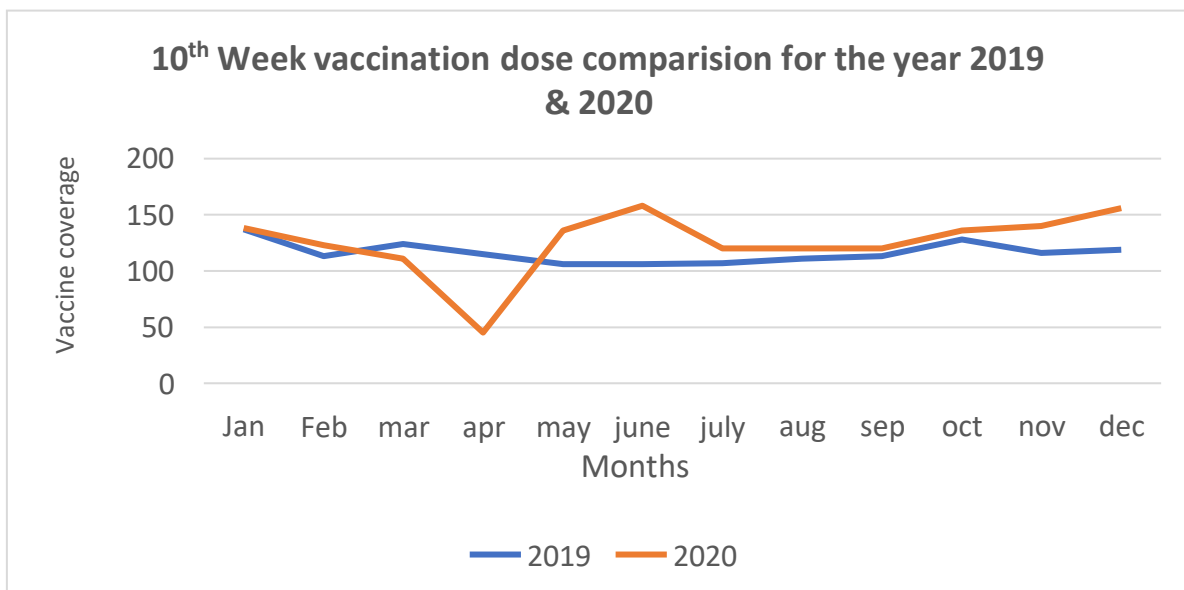
**Fig1: Zero dose/Birth dose Vaccination Comparison for the years 2019 and 2020**



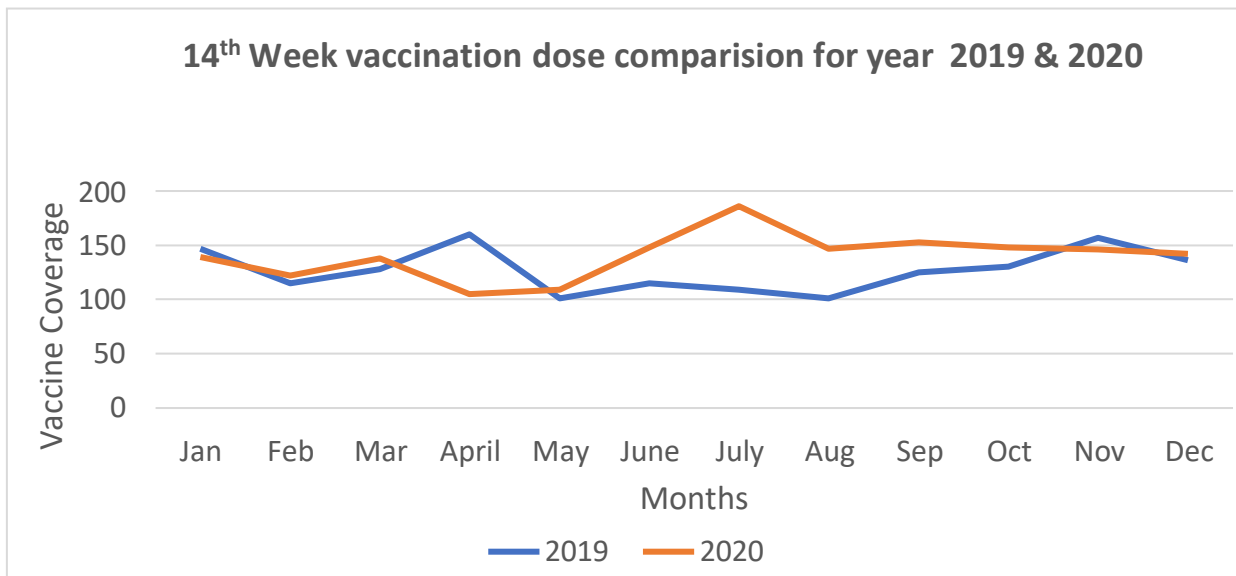
When compared to previous UIP (Universal Immunization Program) data for the years 2019 and 2020 there is an increase in coverage in the year 2020. The most probable reason might be during covid-19 pandemic, all the private institutions were not fully delivering maternal services. All the deliveries might be at government institutions where the Zero dose is given immediately after birth.



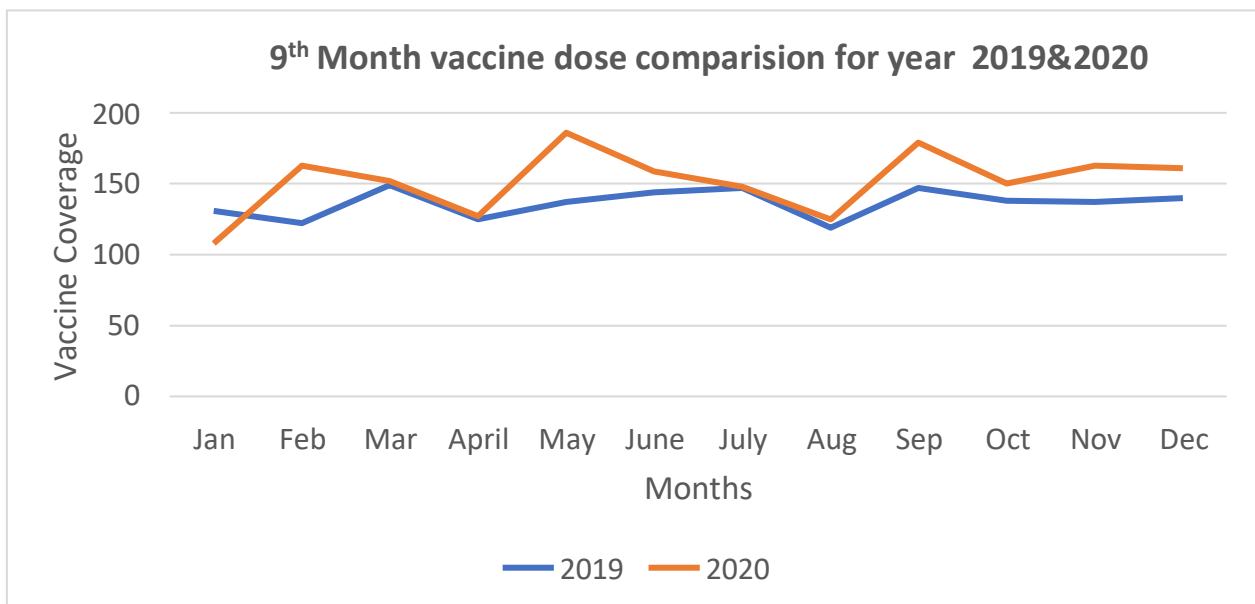
**Fig 2: 6<sup>th</sup>Week vaccination dose comparison for the years 2019 & 2020**



**Fig 3: 10<sup>th</sup> Week vaccination dose comparison for the years 2019 & 2020**



**Fig4: 14<sup>th</sup> Week vaccination dose Comparison for the years 2019 & 2020**



**Fig5: 9<sup>th</sup>-Month vaccination dose Comparison for the years 2019 & 2020**

When compared to previous UIP data for the year 2019 and 2020 for 6<sup>th</sup>,10<sup>th</sup>, 14<sup>th</sup>, week and 9<sup>th</sup> month there is a sudden dip of vaccination in April, the most probable cause might be because there is a peak rise of covid19 cases and there is strict lockdown implementation in the country. Hence, the immunization services had been hampered during that period as shown in fig 2,3,4,5.

## **Discussion:**

At all levels of the health system, the COVID-19 epidemic has impacted and hindered health service delivery. Immunization is an essential health service delivery for every country. Effective immunisation management, both in normal and catastrophe situations, demonstrates the health system's resilience and strength. Multipurpose health workers are the backbone of the primary health care system, and they are critical to the delivery of immunisation services. The study focuses on the problems that multipurpose health professionals experience while providing routine vaccination services during COVID-19.

According to the survey conducted by **Anja Saso** et al, the challenges were categorised as access issues, provider issues, and user concern concerns<sup>(15)</sup>. Lack of personal protective equipment (PPE), vaccination supply issues, fear of contracting COVID-19 through volunteers, and vaccine apprehension are among the concerns. Majority of studies (**Rebecca C. Harris** et al, **Zohra S. Lassi** et al, **Jeanne M. Santoli**) pointed out the main reasons for the breakdown of immunisation delivery services were fear of infection, movement/travel restrictions, and the lack of protective equipment and parental concerns, decline in routine pediatric vaccine administration due to Parental concerns about potentially exposing their children to COVID-19 during vaccination visit<sup>(16,17,18,19,20)</sup>. These findings are in line with the present study.

**Sameer M Dixit** et al, approximately half of Nepal's immunisation clinics closed their doors when lockdown measures were implemented at the end of March 2020. Due to safety concerns, even the nationwide measles-rubella campaign was halted. Patient attendance in Senegal also decreased, owing to a combination of travel limitations, worries about COVID-19 exposure, and/or rumours concerning COVID-19 and vaccine reliability. In Liberia, growing vaccine hesitancy emerged as a major challenge, with rumours rapidly spreading about COVID-19 vaccines being tested on citizens. **Neil Chanchlani**, **Helen I McDonald**, and **Kate Causey** et al, stated that in comparison to 2019, there was a general reduction in vaccination rates in 2020, although this trend was reversed in week 15, with a percent gain in weeks 16 and 17. Immunization rates dropped in April and May, but were restored later in the following quarter thanks to additional vaccination initiatives by healthcare staff. Globally, routine Immunization doses of DTP3 and MCV1 fell by an estimated 30% compared to expected levels in several regions of the world<sup>(21,22,23,24,25)</sup>. According to the **Ziad Mansour** et al, study, immunisation services supplied in the private sector has decreased by

about half, with the greatest fall occurring during the confinement period, which runs from February to April 2020. There is no difference in the birth dose, however there is a decline in vaccination in the 6th, 10th, 14th, and 9th months. We observed a similar pattern of decreased vaccination rates in April and May 2020 when compared to the previous year 2019. There is no difference in birth dose but there is a decrease in 6<sup>th</sup>,10<sup>th</sup>,14<sup>th</sup> week, and 9<sup>th</sup>-month vaccination<sup>(26,27,28,29,30)</sup>.

## **Conclusion**

Covid19 had a visible impact on all aspects of health services delivery including disruptions in routine and essential health care such as immunization. Our study explored the major challenges faced by the health workers like lack of transportation, fear of getting infected by the beneficiary, lack of leaves, extra work burden reluctance for vaccine and solution like arrangement of transportation facilities, recruitment of more workforce, awareness generation.

Field-level health care workers are the backbone for implementing Primary Health care services. Noting the challenges and taking the remedial actions will go a long way in enhancing the delivery of healthcare services.

**Limitations:** The study was limited in its generalizability because it was conducted in a specific hospital setting. By supporting more studies with a bigger sample size, the true picture of vaccination coverage can be established.

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