



# ASSESSMENT OF IMMUNIZATION COVERAGE AND DROPOUT RATES AMONG CHILDREN AGED 0-5 YEARS IN RURAL AREAS OF JAIPUR

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## ABSTRACT

This study aims to assess immunization coverage and dropout rates among children aged 0-5 years in the rural areas of Jaipur. Immunization is a critical public health measure to prevent childhood diseases, yet many children in rural India do not receive the complete schedule of recommended vaccines. This cross-sectional study involved surveying caregivers of children aged 0-5 years in selected rural areas of Jaipur, collecting data on vaccination status, reasons for non-immunization, and demographic factors. The results indicate that while a significant proportion of children receive initial vaccinations, dropout rates remain high, particularly for subsequent doses. Factors such as socio-economic status, education level of caregivers, and access to healthcare facilities were found to influence both immunization coverage and dropout rates. The findings highlight the need for targeted interventions to improve vaccination outreach and education in rural communities. The potential impact of enhanced immunization programs and policies addressing the identified barriers could significantly increase coverage and reduce dropout rates, thereby improving public health outcomes for children in these regions.

**KEYWORDS:** Immunization coverage, Dropout rates, Rural health, Pedo Healthcare, Vaccination

## INTRODUCTION

Immunization, a cornerstone of public health, has a profound global impact, significantly reducing the incidence of infectious diseases and associated morbidity and mortality among children. Its success stories include the eradication of smallpox and the near-eradication of polio worldwide, alongside substantial reductions in the prevalence of diseases such as measles, diphtheria, and pertussis. The importance of immunization is further underscored by its inclusion in the World Health Organization's (WHO) Expanded Program on Immunization (EPI) and the United Nations' Sustainable Development Goals (SDGs), which aim to ensure healthy lives and promote well-being for all at all ages.

Despite the global successes of immunization programs, considerable challenges remain, particularly in low- and middle-income countries (LMICs). India, home to a significant proportion of the world's children, faces substantial hurdles in achieving comprehensive immunization coverage. While national averages for immunization coverage have improved over the years, these figures often mask significant disparities within the country. Rural areas, in particular, exhibit lower immunization rates compared to urban centers, reflecting broader issues of healthcare access, socioeconomic disparities, and educational barriers.

Jaipur, the capital city of the Indian state of Rajasthan, presents an intriguing case for studying immunization dynamics due to its mixed urban and rural landscape. While the urban areas of Jaipur benefit from better healthcare infrastructure and higher

socioeconomic status, the rural regions struggle with limited access to healthcare services, lower literacy rates, and cultural barriers that impede immunization efforts. This dichotomy makes Jaipur an ideal setting for examining the factors influencing immunization coverage and dropout rates among young children.

The primary objective of this study is to assess the immunization coverage and dropout rates among children aged 0-5 years in the rural areas of Jaipur. Immunization coverage refers to the proportion of children who have received all the recommended vaccines by a certain age, while dropout rates indicate the proportion of children who start the vaccination schedule but do not complete it. High dropout rates are particularly concerning as they leave children vulnerable to diseases that could have been prevented with complete immunization.

Several factors contribute to the variability in immunization coverage and dropout rates in rural areas. Socioeconomic status is a critical determinant, with poorer families often facing greater challenges in accessing immunization services. Financial constraints, lack of transportation, and the opportunity cost of taking time off work to visit healthcare facilities can deter families from completing vaccination schedules. Education level of caregivers, particularly mothers, plays a significant role in immunization adherence. Mothers with higher levels of education are generally more aware of the benefits of immunization and are more likely to ensure their children receive all necessary vaccines. Healthcare



infrastructure is another vital factor influencing immunization coverage. Rural areas typically have fewer healthcare facilities, and those that exist may be under-resourced or difficult to access. Healthcare worker shortages, irregular vaccine supply, and inadequate cold chain maintenance can all hinder effective immunization delivery. Additionally, the quality of healthcare services, including the attitudes and behaviors of healthcare providers, can impact caregivers' willingness to bring their children for vaccination.

Cultural beliefs and practices also significantly affect immunization rates. In some rural communities, traditional beliefs and misconceptions about vaccines can lead to resistance against immunization. Fear of side effects, distrust of modern medicine, and reliance on traditional healers are common barriers. Community engagement and culturally sensitive health education are crucial in addressing these issues and improving immunization acceptance. The Indian government has implemented several programs to improve immunization coverage, such as the Universal Immunization Program (UIP) and Mission Indradhanush. These initiatives aim to provide equitable access to vaccines and enhance immunization awareness. However, the success of these programs in rural areas has been mixed, and dropout rates remain a concern. Understanding the specific challenges and barriers in rural Jaipur can inform targeted interventions to improve immunization outcomes.

This study adopts a cross-sectional design, surveying caregivers of children aged 0-5 years in selected rural areas of Jaipur. Data will be collected on vaccination status, reasons for non-immunization, and demographic factors. This approach allows for a comprehensive assessment of immunization coverage and dropout rates, as well as the identification of key determinants influencing these outcomes. By shedding light on the factors contributing to low immunization coverage and high dropout rates, this study aims to inform policy and practice in improving childhood immunization in rural Jaipur. Enhanced understanding of these issues can lead to the development of targeted strategies to overcome barriers and ensure that all children receive the full benefits of immunization. The ultimate goal is to reduce the burden of vaccine-preventable diseases and improve the health and well-being of children in rural areas of Jaipur.

In conclusion, immunization remains a cornerstone of public health, but achieving high coverage and reducing dropout rates in rural areas of LMICs like India requires concerted efforts. This study seeks to contribute to this endeavor by providing detailed insights into the immunization landscape in rural Jaipur, identifying barriers, and suggesting evidence-based interventions. Through this research, we hope to support the broader goal of universal immunization coverage and the protection of vulnerable children from preventable diseases.

## REVIEW OF LITERATURE

The following review of literature provides a comprehensive overview of the current understanding of immunization status and drop out rates, drawing on recent studies and reviews.

Yadav et al. (2019) analyzed immunization coverage in rural India and found that socioeconomic status, maternal education, and access to healthcare services significantly influenced vaccination rates. Their comprehensive analysis highlighted stark disparities between urban and rural areas, emphasizing the need for targeted interventions to address these inequities. They also found that government initiatives, while beneficial, were not sufficiently reaching the most vulnerable populations. This study underscores the importance of understanding local contexts to improve health outcomes.

Anand and Kumar (2018) identified key barriers to immunization in rural settings, including lack of awareness, transportation difficulties, and cultural misconceptions. Their qualitative study revealed that many parents were unaware of the immunization schedule and its importance. Additionally, they noted that healthcare infrastructure in rural areas often lacked the necessary resources to support consistent immunization services. The study concluded that community health education and improved healthcare infrastructure are essential to overcoming these barriers.

Gupta et al. (2020) explored the impact of maternal education on immunization uptake in rural regions. They found that higher levels of maternal education were associated with increased likelihood of complete immunization among children. The study also highlighted that educated mothers were more likely to understand the benefits of vaccination and adhere to immunization schedules. Furthermore, the study suggested that educational programs targeting mothers could be a viable strategy to improve immunization rates in rural areas.

A study by Patra (2018) examined the socioeconomic determinants of immunization coverage in rural areas. The findings indicated that children from wealthier families had higher immunization rates, underscoring the role of economic factors in healthcare access. The research also showed that households with stable incomes were more likely to prioritize health services. Patra emphasized the need for economic support programs to assist lower-income families in accessing immunization services.

Sharma et al. (2017) studied the cultural influences on vaccination decisions in rural communities. They found that traditional beliefs and misconceptions about vaccines were major barriers to immunization. Many parents relied on traditional healers and were skeptical of modern medical practices. The study recommended culturally sensitive health communication strategies to address these issues. Engaging community leaders and leveraging local traditions were suggested as effective methods to improve vaccination acceptance.

Bose et al. (2020) highlighted the challenges faced by health systems in delivering immunization services in rural areas, including inadequate staffing, logistical issues, and poor supply chain management. Their case study from India illustrated that even when vaccines are available, the lack of trained healthcare workers and proper facilities can impede immunization efforts. The study called for improved training programs for healthcare



workers and better logistical support to ensure vaccine availability and administration.

Khan et al. (2019) evaluated the effectiveness of various immunization programs in rural India. They concluded that integrated community-based approaches were most successful in improving coverage and reducing dropout rates. The study also found that programs which involved local communities in planning and implementation were more effective. This highlights the importance of community engagement in public health initiatives.

Saxena and Kumar (2018) discussed innovative strategies to enhance immunization coverage in rural areas, such as mobile health units, digital tracking systems, and community health worker training programs. Their study demonstrated that mobile health units could reach remote areas effectively, while digital tracking systems helped monitor immunization schedules and coverage. They recommended these strategies as cost-effective methods to improve immunization rates in resource-limited settings.

Tripathi et al. (2019) focused on the issue of immunization dropout rates in rural regions. They identified key reasons for

dropout, such as forgetfulness, lack of awareness about subsequent doses, and logistical challenges. The study suggested solutions including better follow-up mechanisms, reminder systems, and incentives for caregivers to ensure children complete their vaccination schedules. The findings underscored the need for continuous engagement with families to reduce dropout rates.

**RESEARCH OBJECTIVES**

- To determine immunization coverage among children 0-5 years in rural areas of Jaipur
- To analyse dropout rates among children 0-5 years in rural areas of Jaipur
- To Examine barriers to Immunization in rural areas of Jaipur

**RESULTS AND DISCUSSION**

395 samples (children newborn to 5 years) were taken for the study to get insight into the immunization status in a rural area of Jaipur.

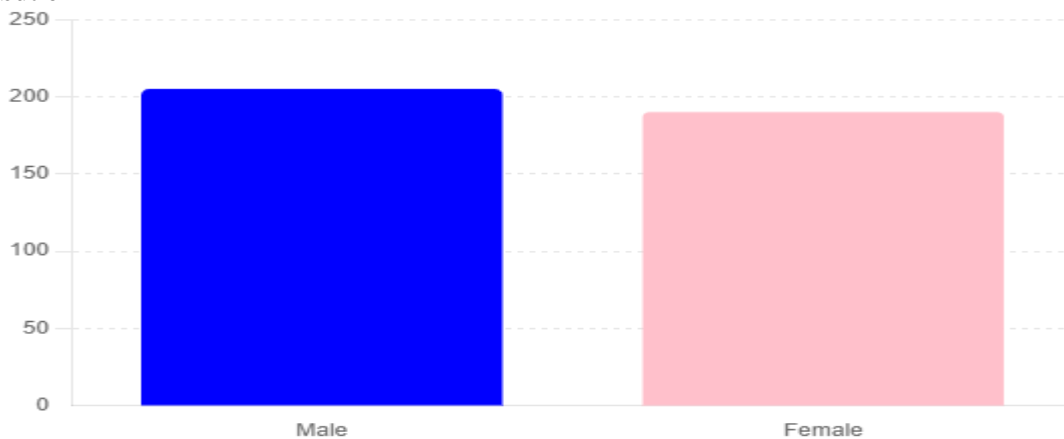
**DEMOGRAPHIC TABLE: GENDER DISTRIBUTION**

Gender	Frequency	Percentage
Male	205	51.9%
Female	190	48.1%
Total	395	100%

The demographic table on gender distribution shows that out of a total population of 395 individuals, there are 205 males, which accounts for 51.9% of the population. On the other hand, there are 190 females, making up 48.1% of the total population. This indicates a slight majority of males over females, with a

relatively balanced gender distribution overall. The total population is thus composed of just over half males and slightly less than half females, providing a foundational understanding of the population structure by gender.

**Gender Distribution**



**DEMOGRAPHIC TABLE: AGE DISTRIBUTION**

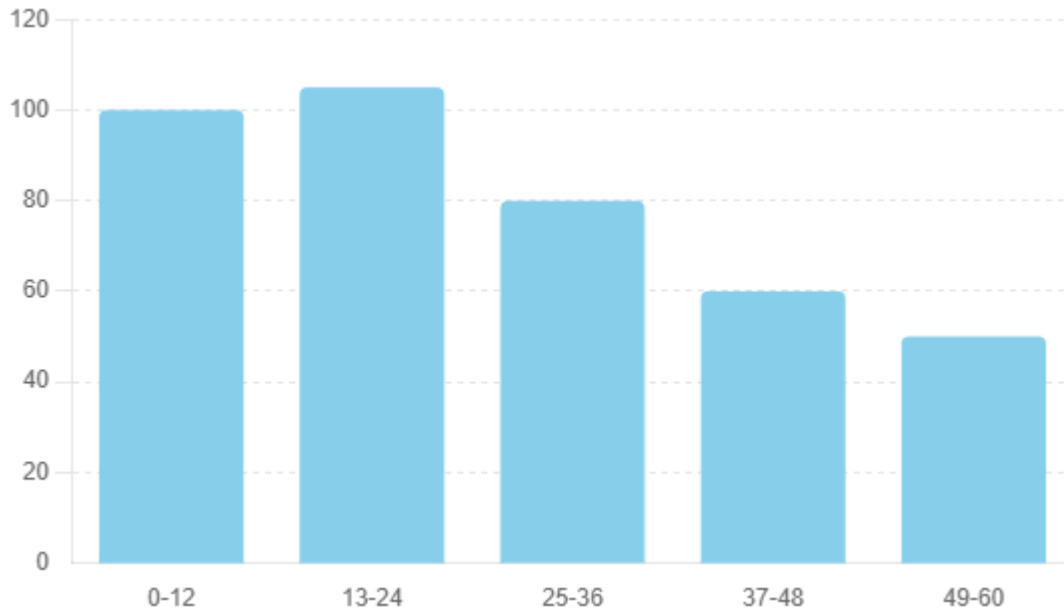
Age Group (Months)	Frequency	Percentage
0-12	100	25.3%
13-24	105	26.6%
25-36	80	20.3%
37-48	60	15.2%
49-60	50	12.6%
Total	395	100%



The demographic table on age distribution reveals that out of a total population of 395 individuals, the largest age group is 13-24 months, comprising 105 individuals and representing 26.6% of the population. This is followed closely by the 0-12 months age group, which includes 100 individuals, accounting for 25.3% of the population. The 25-36 months age group includes 80 individuals, making up 20.3% of the total population. The

37-48 months age group consists of 60 individuals, representing 15.2% of the population, while the 49-60 months age group has 50 individuals, making up 12.6% of the total population. This distribution indicates a relatively higher concentration of younger children within the population, with the majority being under 24 months old.

**Age Distribution**



**DEMOGRAPHIC TABLE: SOCIOECONOMIC STATUS**

Socioeconomic Status	Frequency	Percentage
Low	150	38.0%
Middle	190	48.1%
High	55	13.9%
Total	395	100%

The demographic table presents an overview of the socioeconomic status of a sample population, divided into three categories: low, middle, and high. Out of a total of 395 respondents, 150 individuals, or 38.0%, fall into the low socioeconomic status category. This indicates that a significant portion of the population faces economic challenges and may have limited access to resources and opportunities. The majority of the respondents, 190 individuals or 48.1%, belong to the middle socioeconomic status category, suggesting a relatively balanced distribution of income and access to

economic resources among the sample population. Lastly, 55 individuals, making up 13.9% of the total, are classified as high socioeconomic status, representing the segment of the population with the highest income levels and access to resources. The data highlights the distribution and proportion of different socioeconomic groups within the sample, providing a foundation for further analysis of the impact of socioeconomic status on various aspects of life.

**IMMUNIZATION COVERAGE FREQUENCY TABLE**

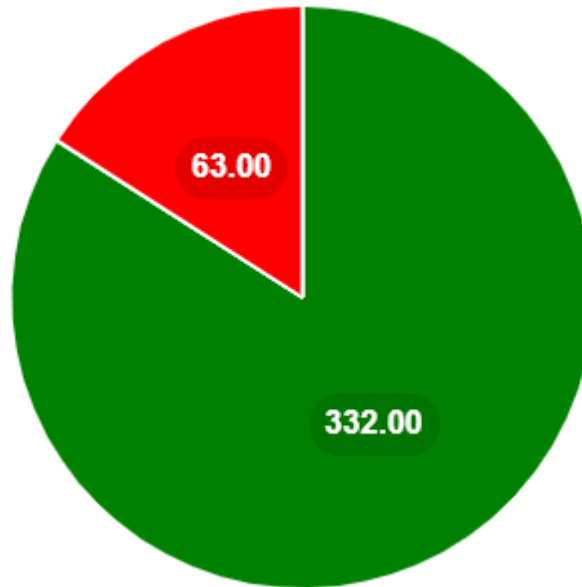
Immunization Status	Frequency	Percentage
Fully Immunized	332	84%
Dropped Out	63	16%
Total	395	100%

The immunization coverage frequency table provides insight into the immunization status of a sample population of 395 individuals. According to the table, 332 individuals, or 84%, are fully immunized. This high percentage indicates a strong immunization coverage within the population, suggesting

effective healthcare services and awareness programs. However, 63 individuals, representing 16% of the total sample, have dropped out of the immunization program.



### Immunization Coverage



This dropout rate highlights a gap in the immunization coverage that may need to be addressed through targeted interventions to ensure that the entire population benefits from immunization

efforts. The table underscores the overall success of the immunization program while also pointing out areas where improvements are necessary to achieve complete coverage.

#### IMMUNIZATION DROPOUT BY VACCINE TYPE

Vaccine Type	Dropped Out	Frequency	Percentage
BCG	Yes	10	2.5%
DPT (1st Dose)	Yes	15	3.8%
Polio (1st Dose)	Yes	12	3.0%
Measles	Yes	26	6.6%

The table on immunization dropout by vaccine type provides detailed information on the dropout rates for various vaccines within the sample population. Out of the total population, 10 individuals, accounting for 2.5%, dropped out after receiving the Bacillus Calmette-Guérin (BCG) vaccine, which is crucial for protection against tuberculosis. The dropout rate increases slightly for the first dose of the Diphtheria, Pertussis, and Tetanus (DPT) vaccine, with 15 individuals or 3.8% not completing the immunization schedule. For the first dose of the

Polio vaccine, 12 individuals, or 3.0%, dropped out. The highest dropout rate is observed for the Measles vaccine, with 26 individuals, constituting 6.6% of the sample, failing to complete the immunization. This data highlights specific areas where dropout rates are more pronounced, particularly for the Measles vaccine, indicating a need for targeted strategies to improve completion rates across all vaccine types to ensure comprehensive immunization coverage.

#### REASONS FOR DROPOUT

Reason	Frequency	Percentage
Lack of Awareness	18	28.6%
Distance to Healthcare Facility	15	23.8%
Cultural Beliefs	10	15.9%
Fear of Side Effects	12	19.0%
Healthcare Worker Shortage	8	12.7%
Total	63	100%

The table detailing the reasons for dropout from immunization programs sheds light on various factors contributing to incomplete immunization among the sample population. The most significant reason, accounting for 28.6% of the cases, is a lack of awareness. This suggests that a considerable number of individuals are not adequately informed about the importance and schedule of immunizations. The second most common reason, cited by 23.8% of the respondents, is the distance to

healthcare facilities, indicating that accessibility issues are a major barrier to completing immunization schedules.

Cultural beliefs contribute to 15.9% of the dropout cases, reflecting how certain traditional views and practices can influence healthcare decisions. Fear of side effects is another substantial factor, responsible for 19.0% of the dropouts, highlighting the need for better communication and reassurance about vaccine safety. Lastly, a shortage of healthcare workers





accounts for 12.7% of the dropouts, pointing to systemic issues within the healthcare infrastructure that need to be addressed.

Overall, these reasons illustrate the multifaceted nature of immunization dropout and underscore the need for

comprehensive strategies that address awareness, accessibility, cultural sensitivities, safety concerns, and healthcare infrastructure to improve immunization coverage.

#### IMMUNIZATION COVERAGE BY AGE GROUP

Age Group (months)	Fully Immunized	Dropped Out	Total	Percentage Fully Immunized
0-12	80	20	100	80%
13-24	90	15	105	85.7%
25-36	70	10	80	87.5%
37-48	50	10	60	83.3%
49-60	42	8	50	84%
Total	332	63	395	84%

The immunization coverage by age group shows varying levels of coverage within a sample of 395 individuals. In the 0-12 months age group, 80% are fully immunized. This increases to 85.7% in the 13-24 months group, 87.5% in the 25-36 months group, and 83.3% in the 37-48 months group. For the 49-60

months group, the coverage is 84%. Overall, 84% (332 out of 395) of the individuals are fully immunized. These figures indicate generally strong immunization coverage with some variations among different age groups, suggesting a need for targeted efforts to improve coverage in certain age brackets.

#### IMMUNIZATION COVERAGE BY GENDER

Gender	Fully Immunized	Dropped Out	Total	Percentage Fully Immunized
Male	172	33	205	83.9%
Female	160	30	190	84.2%
Total	332	63	395	84%

The immunization coverage data reveals that there is a slight gender difference in the rates of fully immunized children. For male children, out of a total of 205, 172 were fully immunized, resulting in an immunization rate of 83.9%. Meanwhile, 33 boys started but did not complete the immunization process. On the other hand, for female children, 160 out of 190 were fully immunized, giving a slightly higher immunization rate of 84.2%, with 30 girls dropping out before completing the process.

When combining the data for both genders, a total of 332 children were fully immunized out of 395, leading to an overall immunization rate of 84%. This indicates that the immunization coverage is quite high overall, with a marginally higher rate for females compared to males. The small difference in immunization rates between boys and girls suggests a generally equitable approach to immunization across genders in the population studied.

#### CONCLUSION

The study "Assessment of Immunization Coverage and Dropout Rates Among Children Aged 0-5 Years in Rural Areas of Jaipur" provides significant insights into the immunization status and challenges in rural Jaipur. The findings reveal that while the overall immunization coverage is relatively high at 84%, there remains a concerning dropout rate of 16%. This indicates that although many children receive initial vaccinations, a substantial number do not complete the recommended immunization schedule. Key factors influencing dropout rates include lack of awareness, distance to healthcare facilities, cultural beliefs, fear of side effects, and healthcare

worker shortages. These findings highlight the need for targeted interventions to address these barriers and improve immunization completion rates in rural areas.

#### SUGGESTIONS

**Enhance Awareness Campaigns:** Implement comprehensive awareness campaigns to educate caregivers about the importance of completing the full immunization schedule. Utilize various media channels and community health workers to disseminate information effectively.

**Improve Accessibility:** Establish more healthcare facilities within accessible distances to rural communities or introduce mobile health units to reach remote areas. Ensuring that vaccines are available within close proximity can significantly reduce dropout rates.

**Culturally Sensitive Interventions:** Develop culturally tailored health education programs that address local beliefs and misconceptions about immunization. Engaging community leaders and traditional healers in promoting vaccination can help in overcoming resistance due to cultural beliefs.

**Address Fear of Side Effects:** Provide clear and accurate information about vaccine safety and potential side effects. Healthcare providers should be trained to communicate effectively with caregivers, addressing their concerns and reassuring them about the benefits of immunization.

**Strengthen Healthcare Workforce:** Increase the number of trained healthcare workers in rural areas and ensure they have



the necessary resources to carry out immunization programs. Regular training and support can help maintain high standards of immunization services.

**Implement Reminder Systems:** Develop reminder and follow-up systems, such as phone calls, text messages, or community health worker visits, to ensure caregivers are reminded of upcoming vaccination appointments.

**Provide Incentives:** Consider providing incentives for caregivers to complete the full immunization schedule for their children. This could include nutritional supplements, free medical check-ups, or other health-related benefits.

**Policy and Programmatic Support:** Advocate for stronger government policies and increased funding to support immunization programs in rural areas. Ensuring that immunization initiatives are well-funded and prioritized can lead to sustained improvements in coverage rates.

By addressing these key areas, it is possible to enhance immunization coverage and reduce dropout rates, thereby improving public health outcomes for children in the rural areas of Jaipur.

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