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IMMUNIZATION COVERAGE AMONG CHILDREN AGED 12–23 MONTHS ACCORDING TO SOCIO-DEMOGRAPHIC CHARACTERISTICS IN SLUMS OF NORTH-WEST DISTRICT OF DELHI, INDIA (2018)

Dr Brijesh Kumar Singh, MBBS (MAMC)
MPH (ICMR school of Public health)
Chief Medical Officer
Sanjay Gandhi Memorial Hospital
Govt of NCT of Delhi

Abstract

Delhi's North-West district has around 94.15% of its inhabitants living in urban settings and close to 13% in slum conditions. The latter are characterized by overcrowding and are under-resourced. They are also—like other slum conditions—highly vulnerable to morbidity and mortality. The reasons for this are legion a key one is the preventative health services, particularly for children, that are woefully inadequate. This is crucial because health disparities between population groups that are better off and those that are worse off are not only unjust, but they also put the health of future generations at risk.The current problem requires sorting out the immunization levels among children, aged 12–23 months, living in the slum areas of North-West Delhi. This evidence is needed just to inform how bad or good the current situation is. But it is more than a simple photo of the present day. The study aims to identify the why of the problem. It looks into the levels of U.I.N. (understanding, information, and knowledge level of caretakers, that is, parents, usually mothers) among those living in slum settings. Issues concerning the accessibility and availability of immunization services as well as socio-demographic factors are examined as possible violators of this U.I.N. hypothesis.The study found that even though there have been significant improvements in the coverage of immunizations in slum areas, they still have major gaps that are due to things like maternal illiteracy, low income, and children being born outside of hospitals. The findings push forward the idea that we need more health-centered education, better access to health services, and community-level empowerment of people to close those gaps. In effect, this study says that we need to do a better job of getting the health services that are already out there to the people who need them.

Keywords:
Slums, Immunization, Children, Public Health, Mission Indradhanush, Socio-Demographic Factors

Introduction

Vaccination is viewed as one of the most successful health interventions around the world it is also one of the most cost-effective. Nevertheless, in India and despite considerable efforts by the federal and state governments in the frame of the Universal Immunisation Programme (UIP), there are still large swathes of the country where the measles, mumps, and rubella (MMR) vaccine is not reaching children. This is true even in many urban areas, where you would think that modern health services might be better. In fact, the Disparity in Vaccination Coverage is now being seriously discussed as a public health problem. The areas affected are just as pathologically interesting as the child mortality figures from them. Urban slum areas are poor, densely populated, and with inadequate sanitation.They are also areas of limited access to health services and they have no shortage, even in the middle of a pandemic, of people who are too impoverished to pay

for health insurance or for health services in cash. All these pathologies are Immunization Challenges.

North-West Delhi is almost entirely urban, with 94.15% of its 1.1 million people living in urban areas. But there is a strikingly high rate of slum residences, with approximately 13% of the population living in slum conditions. These slum communities exist largely outside the reach of the mainstream healthcare system. According to the National Family Health Survey-3 (NFHS-3) of 2005-2006, only 51.7% of the children living in slum conditions had been fully immunized. This is a rate significantly lower than the almost universal coverage of immunization (67%) in non-slum populations in the country.

This study set out to determine the immunization status of children 12–23 months of age living in the slums of North-West Delhi and to uncover the socio-demographic factors that might influence their immunization. Better data will in turn help us understand the slum immunization problem, will inform any number of future projects, and should greatly assist policy makers in designing not just better but also more effective targeted interventions.

This research fills a crucial gap in public health knowledge by concentrating on slum populations and providing them with the evidence-based insights that ought to help bridge the immunization gap. We paid special attention to the slum community's maternal literacy, family income, place of delivery, and parental awareness, which, in this context, often determine whether or not a family utilizes available healthcare.

Objectives

1. To assess the immunization coverage among children aged 12–23 months.
2. To identify socio-demographic factors associated with incomplete immunization.
3. To analyze the reasons for non- or partial immunization among slum residents.

Methods:

A community-based analytical cross-sectional study was conducted from January to April 2018. Out of 318 slum clusters, 59 were randomly selected, and from each, 7 households with eligible children were chosen, resulting in 413 completed interviews. Data were collected using a pre-tested questionnaire on socio-demographic factors, immunization status, and reasons for incomplete immunization. Weighted analysis and logistic regression were used to assess coverage and associated factors.

Objective 1

It is crucial to assess immunization coverage among children aged 12–23 months to understand the public health situation of any community, particularly that of its most vulnerable members. This assessment provides a much-needed lifeline to the public health landscape of the slums of North-West Delhi and makes for a most unpleasant read.

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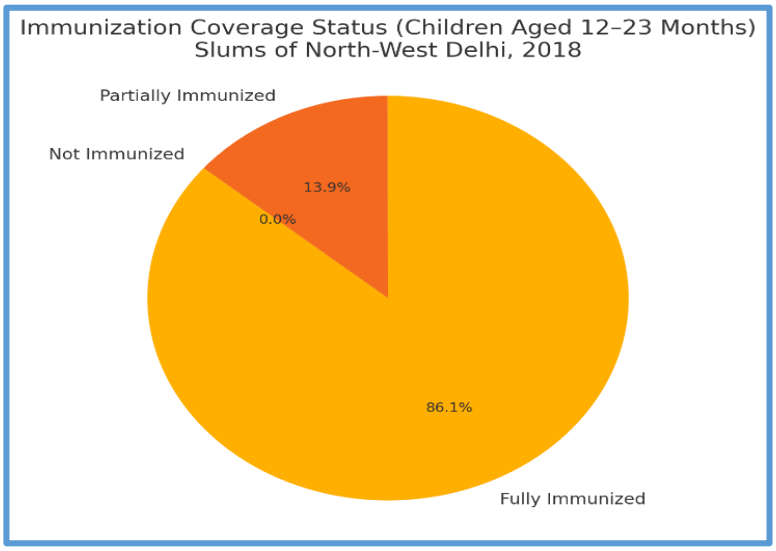

Table 2: Immunization Coverage Status

Coverage Status	Percentage (%)
Fully Immunized	86.14
Partially Immunized	13.86
Not Immunized	0.00

According to the 2018 survey, 86.14% of children were found to be fully immunized. This is a substantial achievement toward the 90% coverage target set by Mission Indradhanush, an Indian government initiative that aims to ensure complete immunization in underserved regions. The remaining 13.86% of children were only partially immunized, while no children were completely unimmunized in the sample—an encouraging sign that suggests outreach efforts have at least introduced immunization to all children surveyed.

The pie chart clearly illustrates the distribution of immunization status, showing that the vast majority have received all recommended vaccinations by the age of two. However, the presence of a 13.86% partial immunization rate still raises concerns. This population of children, many not much older than two, is at high risk of contracting any number of vaccine-preventable diseases, such as measles, diphtheria, and polio, due to incomplete protection. Although the reasons behind this population's partial immunization need to be explored more fully (as discussed in Objective 3), some likely culprits include missed vaccination appointments, a lack of awareness, and the common misconception that one or two doses of a vaccine are sufficient.

This data carries two important messages. First, it indicates that outreach and vaccination campaigns are mostly successful, even in populations that are typically hard to reach, like slum dwellers. Second, it signals that further targeted micro-planning will be necessary to convert partially immunized children into fully immunized ones. This may involve ensuring that the service is delivered successfully that the children, their parents, or other guardians are reminded in a timely fashion to return for the remaining doses and that such logistical challenges as the

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distance to the clinic and the timing of the clinic do not hinder the return of the first group to the second half.

Not only does assessing immunization coverage show the overall progress being made, but it also reveals the specific areas where we are falling short. It is absolutely essential that we achieve complete immunization coverage if we're going to have community-level herd immunity and if we're going to prevent outbreaks. And I think this is particularly relevant to the densely populated slum areas. So, I see this objective being a really foundational benchmark for public health performance and a way to plan for what we're going to do next.

Objective 2:

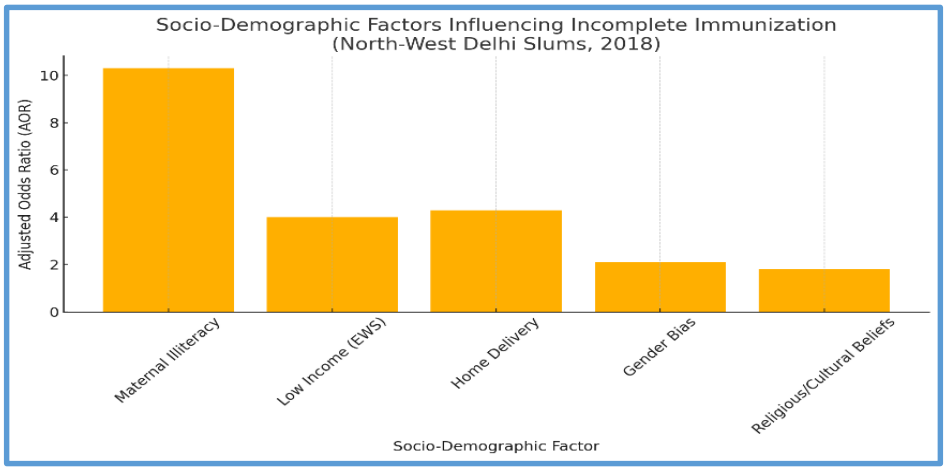

Table 2: Socio-Demographic Factors Influencing Incomplete Immunization

Socio-Demographic Factor	Adjusted Odds Ratio (AOR)
Maternal Illiteracy	10.3
Low Income (EWS)	4.0
Home Delivery	4.3
Gender Bias	2.1
Religious/Cultural Beliefs	1.8

Identifying socio-demographic factors linked to incomplete immunization is essential to ensure health interventions are directed toward the populations they are meant to assist. The study analyzed data from slum areas in North-West Delhi gathered in 2018 to uncover factors that seem to contribute to incomplete immunization among children. It calculated the Adjusted Odds Ratios (AORs) using multivariate logistic regression. These AORs show strong associations between certain identified socio-demographic characteristics and incomplete immunization. For instance, the study found that maternal illiteracy is the most significant predictor of partial immunization. The AOR of 10.3 attached to that association indicates that children of illiterate mothers were over 10 times more likely to be found partially immunized in 2018.

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Deliveries at home (AOR: 4.3) and belonging to the Economically Weaker Section (EWS) (AOR: 4.0) significantly increased the odds of children being incompletely immunized. Home deliveries often serve to disconnect families from the formal health system. This disconnection may manifest itself in missed follow-ups, immunization schedules, or both. Similarly, coming from a low-income family may mean that the family prioritizes day-to-day survival over preventive health measures, especially if those measures require the investment of either time and effort to travel to a service location or a significant change of pace to manage service appointments. Another factor that improved the odds of children being incompletely immunized was gender bias (AOR: 2.1). Female children were less likely to be fully immunized than male children. This is a result of deep-seated, pervasive gender inequality. Coming from a family of a certain religion (AOR: 1.8) also increased the likelihood of having an incompletely immunized child. This may be due to some family's beliefs that result in either a lack of trust in the formal health system, a belief that a child's health is in the hands of a higher power, or both.

Objective 3

Comprehending the why of partial or non-immunization is crucial for designing potent, local health-directed interventions. A 2018 study carried out in the slums of North-West Delhi unearthed that even though the fairly high overall immunization coverage was noted, a significant part of the studied children (approx.13.86% of them) were found to be partially immunized let alone the non-immunized. The why of their being partially immunized (or not at all) puzzles those of us who work in public health and motivates us to dig deeper.

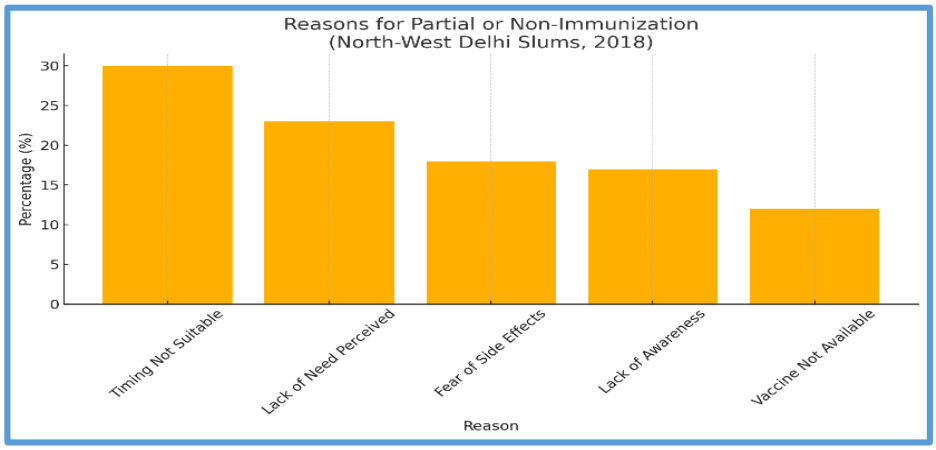

Table 3: Reasons for Partial or Non-Immunization

Reason	Percentage (%)
Timing Not Suitable	30%
Lack of Need Perceived	23%
Fear of Side Effects	18%
Lack of Awareness	17%
Vaccine Not Available	12%

The most generally mentioned reason for incomplete immunization was "Timing Not Suitable," which accounted for 30% of the responses. This signifies that the immunization session was not synchronized with the daily routine or the availability of the parent who had to work in an unorganized and rather inflexible sector. This is a big indicator for ensure operational timing of immunization services is indeed a key player in the role of many factors and should be adjusted according to the local community patterns and may be extended to include weekends or evening hours.

The second most frequent reason, cited by 23% of respondents, was "Lack of Perceived Need". This finding points to a dangerous misconception within communities—that immunization is optional or unnecessary. This indicates a pressing need for health education campaigns that clearly communicate the benefits and necessity of complete immunization to parents and caregivers.

Responses that reflected a fear of side effects accounted for 18% of the responses. This indicates a substantial number of people who are hesitant to receive the vaccine—likely influenced by some combination of rumors, past negative vaccine experiences, or a misunderstanding of the risk and benefit profile of the vaccine. It is crucial that healthcare workers receiving this training understand the basic tenets of effective risk communication so they can have clear beneficial conversations with parents.

Lack of Awareness (17%) and Vaccine Not Available (12%) reflect both educational and supply-side barriers.Although community engagement and outreach by ASHA and Anganwadi workers can enhance awareness, the problems associated with vaccine stock-outs call for better logistics and real-time inventory management.The bar chart shows the clear weight of each factor, giving us good guidance on where to prioritize interventions.The main factors helping the partial immunization scenario seem to be behavioral—people have trouble with timing, are misinformed, or fearful of the vaccine. The solution, then, seems to be moving in the direction of community-centered education and flexible service delivery.It is critical to identify the causes of immunization gaps if we are to customize local health strategies.To achieve full immunization coverage and protect every child, especially in underserved slum communities, a three-pronged strategy is essential: 1. **Community education:** Families must understand the importance of immunization for their children and themselves.

2. **Schedule flexibility:** Because many families do not have a reliable, daily routine, clinics must be open on weekends and evenings to accommodate parents and children who need vaccines.

3. **Supply Assurance:** The clinics must have adequate stocks of vaccines when families come for them.

Results

The study found complete immunization coverage among children aged 12–23 months residing in the slums of North-West Delhi at 86.14%. This indicates significant progress toward universal immunization goals. However, it is concerning that dropout rates between the first and subsequent doses of key vaccines are still high. The dropout from BCG to Pentavalent-3 was recorded at 12.07%. From BCG to OPV-3, the dropout was 11.44%, and from BCG to Measles, the dropout was 7.37%. These figures suggest that there are some challenges in maintaining continuity of the vaccination schedule even after initial contact with healthcare services. Multivariate logistic regression was used to analyze the data, and it identified maternal illiteracy as the most significant

socio-demographic determinant of incomplete immunization. The Adjusted Odds Ratio (AOR) was found to be 10.3. Children from Economically Weaker Sections had an AOR of 4.0, while home deliveries were associated with an AOR of 4.3. All of these findings indicate a strong link between health infrastructure access and immunization completion.Behavioral barriers also exist, with inconvenient vaccination timings (30%) and the perceived lack of necessity for immunization (23%) emerging as the two leading barriers. These findings reflect both knowledge gaps and service delivery problems that need to be fixed to reach full coverage.

Conclusion

Immunization in the slums of Delhi is progressing well and nearly reached the target set.The current study highlights that even within the slum populations of North-West Delhi, substantial progress has been made, with coverage levels reaching 86.14%—nearly hitting the target of 90% set by Mission Indradhanush. This improvement signifies effectiveness of not just one, but several national immunization campaigns and outreach programs in urban underserved areas. However, it should be noted that several children within these populations were found to show incomplete immunization and dropout patterns. Essential aspects like mother's education, families' financial situations, and decisions about where to give birth all affect immunization rates in a direct way. Not enough mothers can read, and too many live in poverty. These vulnerabilities limit family access to, and use of, basic health services. As a result, the children in these families are at increased risk of not receiving all their vaccinations on time or at all.Also, we're gonna get some fortifying behavioral factors like nullifying misunderstandings by the community about the paradigm and scheduling conflicts, if any, and with a kind of hands' on the shoulders community health sensatization, make our communities a lot more receptive to what's probably the most universally good thing in human health.To sum up, although the district is nearly at complete immunization coverage, directed initiatives that underscore education, service delivery, and engagement with the target communities are necessary to ensure that not a single child living in the slum area goes unprotected from diseases that can be prevented with vaccines.

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