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Sociological dimensions of child vaccination in India

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Abstract
Although childhood immunization is one of the best public health interventions, social structures and cultural norms have a significant impact on its adoption and reach. Even while India's total vaccination rate has increased dramatically, surpassing 93% during 2023- 2025, discrepancies still exist by region, gender, caste, and class. Three important sociological theories functionalism, conflict theory, and symbolic interactionism are used in this research article to examine childhood vaccination. The objectives include (1) analysing vaccination practices using sociological frameworks, (2) assessing the current status of child vaccination in India through secondary data sources such as NFHS [1], WHO [2], UNICEF [3], and government portals, and (3) identifying gaps in vaccine coverage and offering relevant policy recommendations. The methodology is qualitative and quantitative both and includes a review of the literature as well as an analysis of health statistics from both domestic and foreign sources. This research focuses on India, specifically examining socioeconomic discrepancies in vaccine access, urban-rural divides and regional disparities. Although overall vaccination rates in India have increased, the results show that there are still large disparities due to things like sociocultural opposition, a lack of healthcare facilities in rural regions, and false information. The study suggests that in order to increase universal vaccination coverage and lessen health disparities among the populace, focused awareness efforts, improved healthcare delivery systems, and increased institutional trust should be implemented.

Keywords: Child vaccination, sociological theories, public health, vaccine hesitancy, social determinants of health

Introduction
Global health has been transformed by vaccination, particularly for children, as it has stopped the spread of deadly illnesses including tuberculosis, polio, measles, and diphtheria. Mission Indradhanush, the Universal Immunization Programme (UIP), and the more recent U-WIN [4] platform are just a few of the measures, the Indian government has implemented in recent decades to increase vaccination coverage. One of the best and most economical ways to avoid viral diseases and their related problems in modern medicine is through childhood immunization (Andre *et al*., 2008) [1]. In addition to providing direct protection, vaccines also help create herd immunity, which is the result of a significant enough percentage of the population developing immunity. This lowers overall transmission and protects susceptible people, who are unable to receive vaccinations because of immunodeficiencies or medical contraindications (Fine, Eames, & Heymann, 2011) [31]. Child vaccination programmes encounter many obstacles despite their demonstrated safety and effectiveness, such as vaccine hesitancy, disinformation, logistical obstacles in low-resource environments, and unequal access to vaccines (MacDonald, 2015; Larson *et al*., 2014) [13]. However, high vaccination rates usually exceeding 90% for highly contagious illnesses like measles are necessary to achieve this population-level benefit (Orenstein & Ahmed, 2017) [16].
The foundation of immunization is the immune system's capacity to "learn" from a pathogen in a harmless form, such as one that is inactivated, attenuated, or recombinant, providing protection without causing illness (Plotkin, Orenstein, & Offit, 2018) [32]. Confidence,

[1] NFHS- National Family Health Survey
[2] WHO- World Health Organization
[3] UNICEF- United Nations International Children's Emergency Fund
[4] U-WIN- Universal Immunization Web-enabled Network

complacency, and convenience are some of the characteristics that contribute to vaccine hesitancy, which the WHO has identified as one of the top 10 dangers to global health (WHO, 2019). Misinformation has weakened public health initiatives and increased mistrust, particularly through digital platforms (Wilson & Wiysonge, 2020) [28]. According to Simons *et al*. (2020) [25], the measles vaccination alone is thought to have saved more than 25 million lives between 2000 and 2020.

Historically, the epidemiology of childhood illnesses has changed significantly since immunizations were introduced. Due to extensive vaccination campaigns, smallpox was eliminated worldwide in 1980, and polio is still in danger of being eradicated (WHO, 2022) [29]. International programmes like Immunization Agenda 2030 seek to address these issues by ensuring vaccine fairness, bolstering immunization systems, and fostering public trust through open communication and community involvement (WHO, 2022). Maintaining and increasing immunization rates is crucial for the health of each child, as well as for achieving global health security and resilience against pandemics and outbreaks in the future. The benefits of routine immunization programs have been extended beyond early childhood and into adolescence by including protection against a wide range of infections, including rotavirus, hepatitis B, pneumococcus, and human papillomavirus (HPV) (Gavi, the vaccine Alliance, 2023) [7].

India has attained a remarkable national complete immunization rate of roughly 93.5% among children under five as of 2025. In spite of these developments, immunization rates for children in India are still unequally distributed among various societal segments. Access to and acceptability of vaccines are still impacted by ingrained social hierarchies, cultural views, economic disparities, and gender biases. Due to inadequate healthcare facilities, low awareness, and mistrust of government services, rural and tribal areas in particular fall behind urban areas.

This study looks at childhood vaccination as a social practice influenced by relationships, structures, and beliefs in addition to being a biological intervention. It examines the dynamics of childhood vaccination in modern-day India using three main sociological theories: symbolic interactionism, conflict theory, and functionalism. This research attempts to identify the invisible obstacles to fair immunization and provide evidence-based, socially conscious policy interventions by fusing sociological interpretation with recent national data.

Review of Literature

India's child immunization status and determinants have been the subject of numerous research studies. Enhancing healthcare worker training and modifying communications to take into account local beliefs have also shown promise (Dubé *et al*., 2013) [6]. On the other hand, false information disseminated through social media might result in delays or refusals, suggesting that human interaction is an essential element of effective immunization campaigns (Dubé *et al*., 2013) [6].

Carer decisions are greatly influenced by vaccine hesitancy, which is stoked by mistrust of medical professionals, cultural misconceptions, and false information on social media platforms (Larson *et al*., 2018) [13]. India's vaccination coverage varies significantly by region, according to empirical data. While states like Uttar Pradesh and Bihar have coverage rates around 85%, states like Kerala and Tamil Nadu claim nearly universal coverage rates (over 95%), which are associated with sociocultural opposition and a lack of adequate health facilities (Ramachandran *et al*., 2018) [20].

In their 2019 [3] study, Barman and Mishra highlighted how maternal education influences vaccination uptake. According to research, systemic obstacles like poverty, a lack of adequate healthcare infrastructure, and social exclusion cause marginalised groups such as Scheduled Castes (SCs), Scheduled Tribes (STs), and economically disadvantaged populations to have much lower vaccination rates (Singh *et al*., 2019; Kumar *et al*., 2020) [26, 12]. In a similar vein, Shrivastava and Shrivastava (2020) [24] discovered a robust association between complete immunization and household income. Furthermore, there are still gender inequities that reflect ingrained gender prejudices, with male children in many places receiving preferential vaccinations over female children (Bose & Singh, 2020) [4].

Desai and Verma (2020) [5], on the other hand, used symbolic interactionism to investigate how vaccine acceptability is influenced by personal perceptions, cultural beliefs, and contacts with healthcare professionals. In their analysis of the Mission Indradhanush initiative's efficacy, Sarkar and Ghosh (2020) [22] observed that while the program had considerable success in expanding coverage in eastern states, it was difficult to maintain without ongoing community involvement. Research conducted in rural India shows that vaccination acceptability is increased by social trust and referrals from reliable local sources, such as elders and religious leaders (Banerjee *et al*., 2021) [2]. For instance, according to NFHS-5 data, SC/ST children's vaccination coverage is lower than that of the general population, which reflects larger caste-based inequalities (International Institute for Population Sciences [IIPS], 2021) [10]. Although vaccination rates have improved, the National Family Health Survey (NFHS-5, 2021) [15] showed enduring regional and socioeconomic inequalities. Access problems are made worse by urban-rural divisions; in rural regions, there is frequently a paucity of medical staff and interruptions in the provision of vaccines (Patel & Vaidya, 2022) [18]. From a sociological perspective, Kumar (2022) [11] demonstrated how vaccination promotes societal stability by averting illness outbreaks using functionalist theory.

In their study on vaccine hesitancy, Patel *et al*. (2022) [19] discovered that parental attitudes in both rural and urban slums were increasingly influenced by digital disinformation, especially on platforms like WhatsApp. Numerous strategies, such as community-based awareness campaigns, enlisting local influencers, and mobile health initiatives to reach rural people, have been effective in increasing vaccine coverage and acceptance (WHO, 2023) [30].

Furthermore, reports from WHO (2022) and UNICEF (2023) [27] emphasise international and Indian initiatives to advance vaccine equity. They emphasise the necessity of inclusive policymaking and culturally sensitive communication techniques. The theoretical and empirical underpinnings of this study are informed by these findings taken together.

Objectives

1. **To analyses vaccination practices using sociological**

theories

Understanding childhood vaccination as a socially rooted practice as well as a biological intervention is the aim of this purpose. Sociological theories including the Functionalism, Conflict Theory and Symbolic Interactionism will be used to investigate the factors that affect vaccine hesitancy, parental decisions, institutional trust, and cultural views on vaccination.

2. **To examine the current status of child vaccination in India**

   This goal entails a thorough analysis of secondary data sources, such as government health portals, academic literature, and national surveys (such as the NFHS and WHO/UNICEF reports).

3. **To identify gaps in coverage and provide policy recommendations**

   This purpose is to draw attention to structural and systemic barriers to universal vaccination, such as a lack of proper healthcare infrastructure, socioeconomic disparities, or disinformation, by building on the theoretical and empirical findings.

Sociological Analysis of Vaccination Programme

A. Functionalism

Every element of society contributes to preserving social stability, according to functionalist philosophy. By preventing disease, childhood vaccinations maintain a productive population and help the health system run smoothly. Public immunization initiatives such as the Universal Immunization Programme (UIP) foster social cohesiveness and a sense of shared responsibility in India. To guarantee that children receive vaccinations, schools, healthcare professionals, and community leaders collaborate, demonstrating the interconnectedness of societal institutions.

B. Conflict Theory

Inequality and the allocation of power and resources are central to conflict theory. According to this viewpoint, systemic inequalities are exposed by India's childhood vaccination initiatives. Because of poverty, discrimination, and bad infrastructure, marginalised groups like SCs, STs, and the urban poor have restricted access to healthcare. Health initiatives benefit elites and urban people more than vulnerable populations, who are left behind by social exclusion and resource limitations. This viewpoint emphasises the necessity of inclusive government and redistributive measures.

C. Symbolic Interactionism

Symbolic interactionism investigates the interpretations people make of social behaviours and exchanges. Beliefs, anxieties, and interpersonal communication are important factors when it comes to kid immunization. For example, a mother's choice to vaccinate her child may be influenced by her opinions of medical professionals, guidance from elders, or posts on social media. Peer pressure, cultural myths, and healthcare system trust all have a significant impact on vaccination uptake. In India, reluctance has been successfully overcome by culturally sensitive outreach and interpersonal communication techniques.

This theoretical analysis demonstrates that vaccination is not just a biomedical intervention but a deeply social process shaped by institutions, inequality, and personal beliefs.

Child Vaccination in India: Current Trends

Table 1: National Vaccination Indicators (2023-2025)

Indicator	Value
Full Immunization Coverage (12-23 months)	93.5%
Zero-dose Children	0.11%
Dropout Rate (BCG [5] to Measles-1)	4.7%
Coverage of Pentavalent-3	91.8%
DPT [6] Booster Coverage	87.4%

Source: NFHS and HMIS, Ministry of Health and Family Welfare (2023-2025)

This table outlines India's national vaccination statistics in 2023-2025. A high full immunization coverage indicates effective outreach and logistics. The minimal percentage of zero-dose children reflects substantial initial access to vaccines. However, a dropout rate of 4.7% reveals gaps in follow-up and compliance with the entire vaccination schedule. Pentavalent-3 and DPT booster coverages nearing or above 87% suggest successful integration into routine immunization services, though there is still room for improvement.

Table 2: Social and Geographic Disparities

Category	Coverage Rate (%)	Remarks
Rural Areas	90%	Slightly lower due to access and manpower gaps
Urban Areas	95%	Better infrastructure and outreach
Male Children	94.7%	Cultural preference often influences priority
Female Children	90.5%	Gender bias in some regions persists
SC/ST Households	88-91%	Lower due to economic, educational barriers
General Category	95%	Highest among social groups

Source: NFHS& HMIS [7], Ministry of Health & Family Welfare (2023-2025)

This table presents disparities in child vaccination based on geographic and social variables. Rural areas have slightly lower coverage due to infrastructural and logistical challenges. A gender gap is visible, with male children receiving more vaccinations than females, influenced by deep-rooted cultural norms. Caste-based disparities also exist SC/ST households show lower immunization rates compared to the general category, which may be attributed to socioeconomic disadvantages and access to healthcare information and services.

Table 3: State-wise Vaccination Performance

State Category	States	Full Immunization Coverage (%)
High-performing	Kerala, Tamil Nadu, Odisha	96-99%
Medium-performing	Maharashtra, West Bengal, Rajasthan	91-95%
Low-performing	Uttar Pradesh, Bihar, Jharkhand	82-88%

Source: NFHS and HMIS, Ministry of Health and Family Welfare (2023-2025) [14].

[5] BCG- It is a vaccine primarily used to protect infants and young children against tuberculosis (TB).
[6] DPT- Diphtheria, Pertussis (Whooping Cough), and Tetanus.
[7] HMIS- Health Management Information System.

This table categorizes Indian states based on immunization performance. States like Kerala and Tamil Nadu lead with high coverage, thanks to efficient public health systems and better awareness. Medium-performing states maintain national averages but show potential for improvement. Low-performing states face challenges such as inadequate infrastructure, high population density, and socio-cultural resistance, necessitating focused interventions to enhance vaccination coverage.

These tables collectively illustrate that while India is approaching universal coverage, targeted interventions are essential to address persistent gaps influenced by social and regional determinants.

To identify gaps in coverage and provide policy recommendations: Despite India's progress in expanding child immunization coverage, several structural, socioeconomic, and behavioural barriers hinder universal and equitable access. These gaps are summarized below:

Table 4: Summary of Identified Gaps in Child Vaccination in India

Gap Category	Specific Issues Identified	Impacted Groups/Regions
Socioeconomic Inequity	Low access due to poverty, education gaps, and caste-based exclusion	SCs, STs, rural poor, urban slums
Gender Disparities	Female children vaccinated less frequently than males due to cultural bias	Predominantly in northern and rural states
Urban-Rural Divide	Inadequate healthcare infrastructure and outreach in rural areas	Rural India (esp. in low-performing states)
Dropout in Vaccine Series	High dropout from BCG to Measles-1 and low DPT booster coverage	Across lower-literacy populations
State-Level Variance	Weak governance and socio-cultural resistance in certain states	UP, Bihar, Jharkhand (coverage < 88%)
Vaccine Hesitancy	Driven by misinformation, distrust, and cultural beliefs	Conservative and low-literacy communities, tribal regions

Source: NFHS, HMIS, and MoHFW reports, Government of India (2023-2025)

Detailed Explanation of Vaccination's Gap

1. **Socioeconomic Inequity**
   Socioeconomic disparity is one of the most enduring obstacles to complete vaccination coverage in India. Access to immunization services is restricted for children from economically disadvantaged groups, particularly those who are members of Scheduled Tribes (ST), Scheduled Castes (SC), and urban slum communities. Poverty, ignorance, lack of access to transportation, and opportunity costs such as forgoing a day's pay to attend a clinic are frequently the causes of this. Additionally, families with less educated parents are less likely to finish their child's vaccination programme. These disparities underscore the necessity of customised treatments that tackle informational and financial obstacles.
2. **Gender Disparities**
   Decisions about vaccinations are still influenced by gender bias in some parts of India. Compared to male children, female children are less likely to have received vaccinations, according to data from recent national surveys. In patriarchal countries, females' full immunization rates are lower because families may place a higher priority on their boys' health than their daughters'. Deeper cultural traditions that devalue the girl child, especially in rural and northern areas, are reflected in this. Targeted monitoring of gender-based disparities in vaccine uptake and culturally responsive awareness campaigns are necessary to address this.
3. **Urban-Rural Divide**
   Vaccination services are less available and used in rural locations, despite the fact that urban areas often have better access to healthcare facilities. Rural areas have a somewhat lower immunization rate (90%) than metropolitan areas (95%). Lack of medical facilities, inadequate staffing, inadequate transportation systems, and challenging topography in many areas are major contributing causes. Additionally, social restraints or a lack of autonomy may prevent rural women from accessing healthcare treatments for their children.
4. **Dropout in Vaccine Series**
   Despite the relatively good coverage of early vaccine doses like BCG and Pentavalent-1, many youngsters discontinue their vaccinations before finishing the entire course. Between BCG and Measles-1, the dropout rate is roughly 4.7%, which suggests systemic problems with record-keeping, follow-up, and understanding the significance of finishing all doses. Due to insufficient tracking methods, many parents—especially those with lower reading levels—may not comprehend the entire schedule or may neglect follow-up appointments.
5. **Regional Disparities**
   States in India have varying rates of vaccination coverage. Northern and eastern provinces like Uttar Pradesh, Bihar, and Jharkhand continue to struggle, with rates as low as 82-88%, while southern states like Kerala and Tamil Nadu record nearly universal coverage (over 96%). Variations in public health investment, infrastructure, governance, and the availability of health workers all have an impact on these regional discrepancies. Uptake is further hampered by cultural opposition and disinformation, which are more common in some areas.
6. **Vaccine Hesitancy and Misinformation**
   Complete immunization coverage is still at risk from vaccine hesitancy, which is fuelled by cultural views, religious myths, false information on social media, and mistrust of public health systems. Unfounded concerns about the safety or effectiveness of vaccines may cause parents in conservative and less educated groups to postpone or refrain from vaccinating their children. This is particularly noticeable in some metropolitan peripheries and tribal areas, where conventional healthcare institutions are distrusted.

These discrepancies highlight how intricately social structures, cultural values, regional differences, and structural flaws in India's healthcare system interact.
In addition to increasing vaccination accessibility,

addressing them calls for enhancing health education, fostering community trust, and enforcing inclusive policies that give priority to the most vulnerable groups. To get closer to universal and equitable childhood vaccination in India, the next step is to match policy suggestions to these hurdles.

Policy Recommendations

To address these systemic and structural barriers, targeted, evidence-based policy initiatives are required:

Table 5: Policy Recommendations to Address Vaccination Gaps

Issue Area	Policy Recommendation	Expected Outcome
Health Infrastructure	Increase SHCs [8]/PHCs [9], mobile units, and cold-chain logistics in rural and tribal areas	Improved rural coverage and last-mile delivery
Socioeconomic Inequities	Conditional cash transfers, transport vouchers, and caste-sensitive outreach	Enhanced access among SC/ST and low-income groups
Gender Disparity	Gender-inclusive health messaging and female-focused awareness drives	Higher immunization rates for female children
Vaccine Dropout	SMS reminders, digital tracking, and house-to-house follow-up by ASHAs [10]/ANMs [11]	Reduced dropout rates between vaccine doses
Regional Gaps	Performance-linked funding for low-coverage states; state equity monitoring reports	Increased accountability and focused improvement in lagging states
Misinformation and Hesitancy	Faith-based leader involvement, local-language IEC campaigns [12], WhatsApp helplines	Increased vaccine confidence and acceptance
Intersectoral Collaboration	Integrate vaccination with nutrition (POSHAN [13]), school health, and maternal programs	Unified service delivery and wider immunization touchpoints

Source: Based on policy briefs, NFHS, HMIS, and MoHFW guidelines, Government of India (2023-2025)

Detailed Explanation of Recommendations

1. **Health Infrastructure**
   India needs to expand its Sub-Health Centres (SHCs), revamp its cold-chain systems, and deploy mobile immunization vans to enhance healthcare delivery in distant areas. To reach underserved communities, rural ASHA and ANM networks must be strengthened.
2. **Socioeconomic Inequities**
   Provide targeted vaccination campaigns for urban slums, tribal pockets, and places inhabited by SC/ST people, along with financial incentives such as conditional cash transfers. To promote uptake, these ought to be linked with social assistance programmes.
3. **Gender Disparity**
   Gender-sensitive communication techniques and the equal importance of girls' health should be emphasised in policy communications. Male and female vaccination rates should be tracked fairly through school-based immunization programmes.
4. **Vaccine Dropouts**
   Use mobile alerts and follow-up appointments to monitor immunization schedules in real time digitally. Give frontline employees the tools they need to spot and interact with defaulters early.
5. **Regional Gaps**
   The federal government should provide targeted financial support and technical help to underperforming states. To track disparities and provide quantifiable improvement objectives, annual equity reports ought to be required.
6. **Misinformation and Hesitancy**
   In order to spread accurate, culturally relevant vaccine information, public health agencies should collaborate with local authorities and the media. Create community radio stations and WhatsApp helplines to connect with semiliterate people.
7. **Intersect oral Collaborations**
   To guarantee greater coverage and integration of health messaging, combine immunization services with nutrition (POSHAN Abhiyaan), maternity health (Janani Suraksha Yojana), and school health activities.

The ongoing disparities in childhood vaccination rates are a reflection of broader systemic injustices that extend beyond vaccine accessibility. To achieve universal immunization, a comprehensive approach based on digital health tracking, gender involvement, equity-sensitive programming, infrastructure development, and misinformation management is necessary. In addition to increasing the availability of vaccines, India's progress will hinge on making sure that no child is left behind because of their family's financial situation, where they live, or who they are.

Conclusion

India's child immunization programme is at a turning point, characterised by both ongoing societal issues and impressive national achievement. India's vaccination campaign, which achieved a nationwide coverage of 93.5% during 2023-2025, has demonstrated that extensive public health campaigns can have revolutionary effects. This achievement, however, obscures the underlying inequalities that still impact marginalized communities, such as lower-caste households, rural populations, and female children.

From a sociological perspective, vaccination is a social institution impacted by human relationships, cultural meanings, and structural injustices, rather than only a biological requirement. Vaccination improves societal

[8] SHCs- Sub-Health Centres
[9] PHCs- Primary Health Centres
[10] ASHAs- Accredited Social Health Activists
[11] ANMs- Auxiliary Nurse Midwives
[12] IEC campaigns- Information, Education, and Communication campaigns
[13] POSHAN- Prime Minister's Overarching Scheme for Holistic Nourishment

health and collective functioning, according to functionalism. While symbolic interactionism illustrates how social interactions and individual perceptions impact whether vaccines are accepted or rejected, conflict theory reveals systemic injustices that restrict access for underprivileged communities.

The information in this article shows that coverage and compliance gaps persist even with robust policy initiatives. In order to address issues, culturally sensitive approaches that involve local people are just as important as infrastructure upgrades. According to the findings, a multifaceted strategy that combines sociological insights with policy reforms is needed to guarantee that all children, regardless of their background, receive timely and comprehensive vaccinations.

To sum up, it can be said that closing the immunization gap in India necessitates the use of sociological knowledge in public health practice, equity-centred health governance, and active community involvement. Only then, India will be able to preserve the health of its youngest population and attain truly universal vaccination.

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