(Established in 1956)
Capacity Building For a Better Future

IIPS RESEARCH BRIEF

iips

Number 22

November 2022

IIPS Research Brief

Every year, IIPS undertakes many research studies on a number of themes related to population and health at the state and national levels using its own resources. The 'Research Brief' is a new initiative by the Institute to provide an opportunity to the Institute's faculty, Ph.D. students and visiting fellows to quickly disseminate the important findings of their research studies before they are published as a research report or in a scientific journal. The authors of the Research Brief look forward to receiving feedback from readers that could be helpful in revisiting the larger study report.

Editors
Research Brief Series

E-mail: publication@iipsindia.ac.in

Research Brief | International Institute for Population Sciences (IIPS) (iipsindia.ac.in)

Socio-economic and regional disparity in immunization coverage of children in India

Nandita Saikia[1], Krishna Kumar[2], Jayanta Kumar Bora[3] , Suman Singh[4], Souvik Mondal[5] & Sumeet Agarwal[6]

Background

Immunization is the most essential and cost-effective medium to prevent diseases and deaths among children. It protects children against serious illness and vaccine-preventable diseases like tuberculosis, diphtheria, pertussis, poliomyelitis, and measles. Sustainable Development Goal (SDG) 3 states good health and well-being for all, including universal immunization coverage. The new goal also focuses on monitoring immunization coverage and inequalities associated with vaccination. Despite medical and technological advancement, children suffer from vaccine-preventable diseases due to disparities in vaccine coverage. India's Universal Immunization Programme has been performing at a sub-optimal level over the past decade, with a colossal disparity in immunization coverage between states. This study investigates a differential pattern of immunization by background characteristics and shows the district-level disparity of children's immunization status for the periods 2015-16 and 2019-21.

Data and Methods

We used data from five rounds of India's Demographic Health Survey, commonly known as the National Family Health Survey (NFHS), from 1992-93 to 2019-21. The International Institute of Population Sciences conducted NFHSs under the stewardship of the Ministry of Health and Family Welfare (MOHFW). Data on immunization was collected from the child's health report card and direct reporting from the mother at each round of NFHS. We showed a trend of full immunization status in the last five rounds of NFHS (NFHS-1 to NFHS-5). In addition, we presented the states by their performance in children's full immunization status for each round of NFHS as low (when percentage of children fully immunized is less than 50), Medium (when percentage of children fully immunized is between 50-80), High (when percentage of children fully immunized is above 80).

Further, we presented bivariate distribution to examine the association of demographic, socio-economic and healthcare variables with a child's full immunization status. Full immunization is defined as children aged 12-23 months who received one dose of BCG, one dose of measles, three doses each of DPT (Diphtheria, Pertussis, Tetanus), and polio vaccine (excluding polio vaccine given at birth).

Table 1. Full immunisation among children (age 12-23 months) by sex and NFHS rounds

NFHS	Percent (C.I)	Male (C.I)	Female (C.I)	Sample
NFHS 1	35.46 (34.61-36.33)	36.84 (35.58-38.11)	34.87 (33.60-36.17)	11854
NFHS 2	41.24 (40.24-42.24)	42.49 (41.08-43.90)	39.95 (38.55-41.38)	10076
NFHS 3	43.54 (42.59-44.49)	45.41 (44.04-46.78)	41.89 (40.45-43.34)	10419
NFHS 4	62.00 (61.57-62.44)	62.01 (61.46-62.66)	62.00 (61.30-62.56)	47826
NFHS 5	76.21 (75.80-76.61)	76.77 (76.22-77.32)	75.82 (75.23-76.39)	43291

Results

Table 1 shows immunization coverage among children aged 12-23 months. Full immunization coverage of children has consistently increased since 1992-93. In NFHS-1 (1992- 93), a little over one-third of the children (35%) were fully vaccinated, which steadily increased to 41% in NFHS-2 (1998-99), 44% in NFHS-3 (2005-06), 62.5 in NFHS 4 (2015-16), and to over three-fourth (76%) in NFHS-5 (2019-21). The full immunization coverage gap between male and female children showed a considerable reduction from NFHS-1 to NFHS-5.

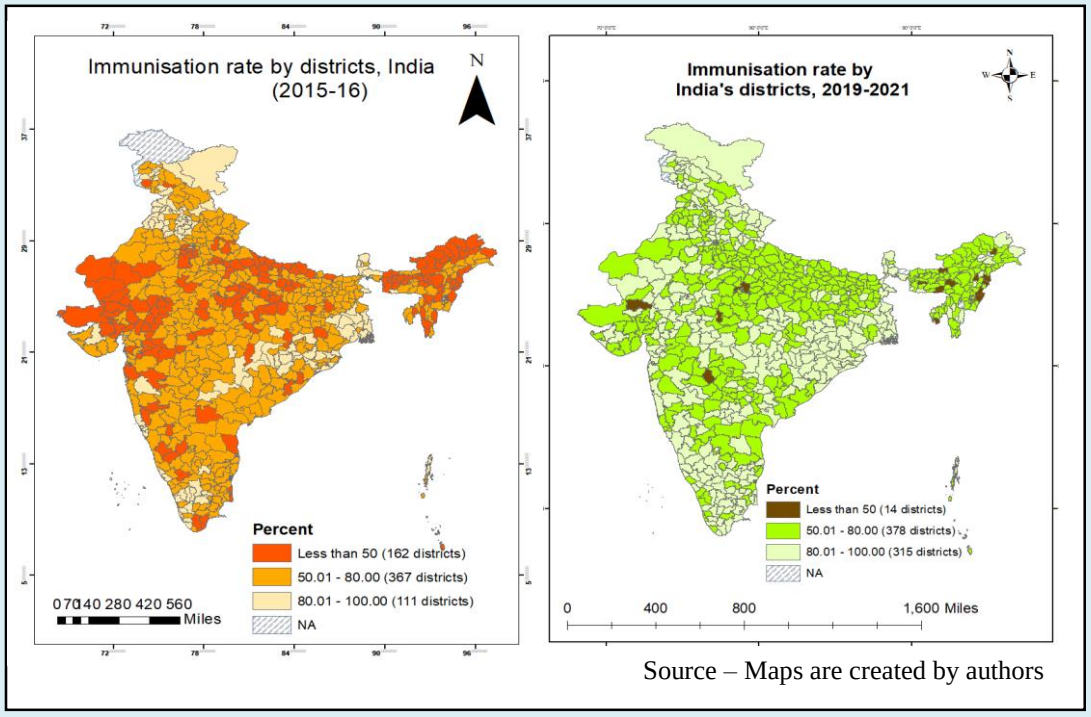
Table 2 shows the number of states by the status of children's immunization coverage achieved during five rounds of the NFHS (NFHS-1 to NFHS-5). During the first three rounds of the NFHS, the number of states with low full immunization coverage was nearly identical (15). Still, in NFHS-5, the number of states with low full childhood immunization coverage was substantially reduced (from 14 states in NFHS-1 to no state in NFHS-5). In addition, in 2019-2021, there were 14 states which had immunization coverage of more than 80 percent.

Table 2. Number of states by immunization status

	Number of states				
Immunisation status	NFHS 1	NFHS 2	NFHS 3	NFHS 4	NFHS 5
Low (<50%)	14	15	15	4	0
Medium (50-80%)	11	9	13	25	22
High (>80%)	0	2	1	7	14
Total	25	26	29	36	36

Figure 1 shows the immunization coverage rate among children aged 12-23 months in Indian districts. We found that out of 640 districts in India, fully immunized children were below 50% in 162 districts in 2015-16. On the other hand, in 2019-21, out of 707 districts in India, fully immunized children were below 50% in only 14 districts.

Figure 2 shows the full childhood immunization status by background characteristics of children and their mothers for the period, 2019-21. We found no gender difference in full childhood immunization coverage. However, as the child's birth order rises, the coverage of immunization gradually decreases. Just over half (52%) of the children, with mothers having no formal schooling, had full immunization in 2015-16, and this increased to 68 percent in 2019-21. On the other hand, a higher proportion of children belonging to better-educated mothers had full immunization. The percentage of children who had complete vaccination was the lowest among the scheduled castes (56%), and higher among the OBC's (62%) in 2015-16. Interestingly, the inequality in immunization considerably decreased and no substantial gap existed among castes by 2019-21.



Source – Maps are created by authors

Figure 1. District level full-immunization rate in India, 2015-16 & 2019-21

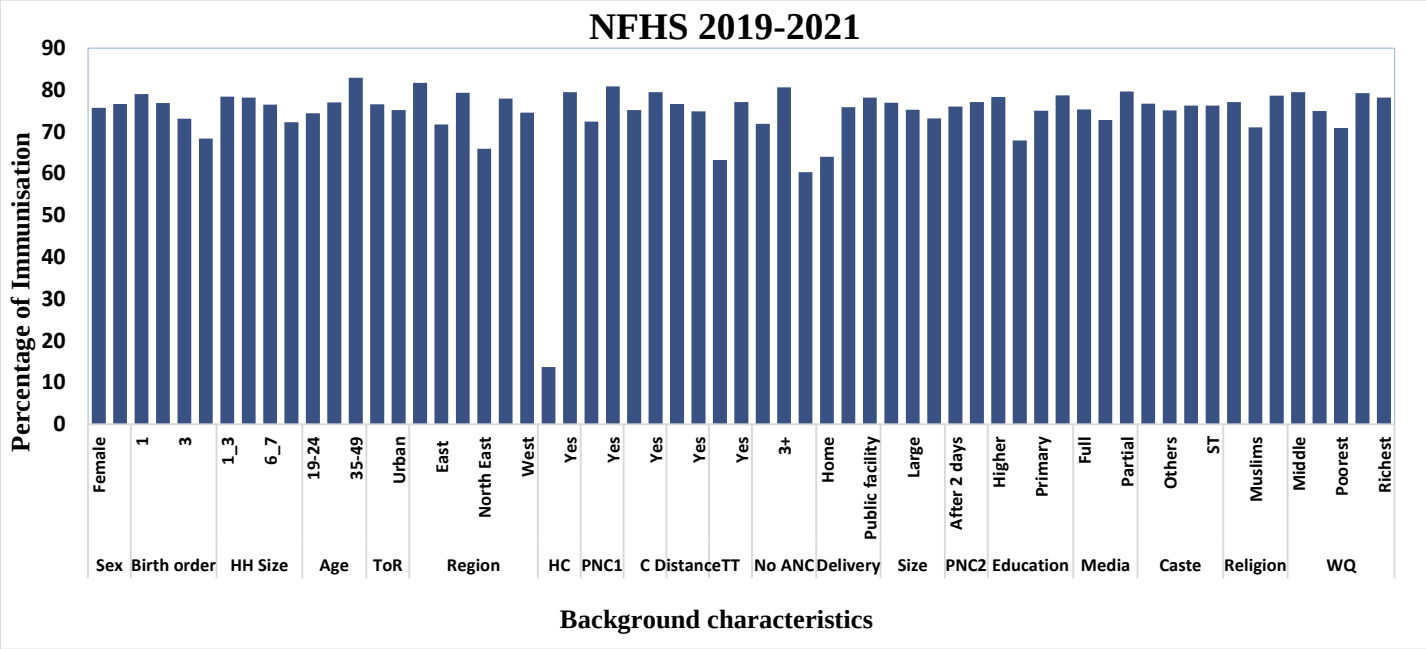
Interestingly, we found a substantial disparity in full immunization coverage between children born via C-section and children born via conventional delivery. A high proportion of children with health card were vaccinated. Besides, looking at the distance between a child's home and a health facility, a high proportion of children were found fully vaccinated when mothers reported that their residence was near a health facility. Finally, it was observed that disparity in immunization based on gender, place of residence, and caste vanished in the last five years.

Conclusions

This study shows that children's immunization rates had substantially increased in the last 5 years (2016-2020). The effectiveness of the Mission Indradhanush program was clearly evident in our findings. The program was launched in 2014 and aims to reach 90 percent immunization coverage by 2022. Besides, it was observed that demographic, socioeconomic, and healthcare characteristics were significantly associated with children's immunization status.

Interestingly gender and caste differentials in immunization status has reduced substantially. In addition, children with health card have much higher immunization rates. We suggest an awareness program regarding the benefits of full immunization and the distribution of health cards that makes them accessible to immunization centers.

Figure 2. Immunisation of children by background characteristics, India, 2019-21



Note: HH Size: Household size; TOR: Type of Residence; HC: Possessing a Health Card; PNC1: Baby postnatal care; C: C- Section Delivery; Distance: Distance to health facility; TT: Mothers received TT Injections; No ANC: Number of ANC visits; Delivery: Place of delivery; Size: Size of the baby at birth; PNC2: Mother's postnatal check-up; Education: Mother's education; Media: Mother's mass media exposure; WQ: Wealth Quintile.

Authors' Affiliation:

1.Professor, Department of Public Health and Mortality Studies, IIPS (E-mail: nanditasaikia@iipsindia.ac.in) .

2. Senior Research Scholar, JNU, New Delhi.

3. Founding and Executive Director, Vart India.

4. Junior Research Scholar, IIPS

5. Research Assistant, CSRD, JNU, New Delhi

6. Associate Professor, Department of Electrical Engineering, IIT-Delhi.