

Vaccination in India during Covid - A Focus on Children of Migrant Workers

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Received: July 06, 2023; **Published:** July 19, 2023

DOI: 10.55162/MCMS.05.152

Vaccination is one of the most effective preventive measures for reducing the deadly morbidities and mortality. Immunization has become the major focus of child survival programs throughout the world. Over the years vaccines successfully provided highly cost-effective improvements to human health by reducing avoidable human suffering, costs of care and treatment, economic consequences of work involving lower productivity and loss of work. With ongoing research among scientific community, more and more diseases have become vaccine preventable; including those for prominent killers like pneumonia and diarrhoea. Immunization is a highly efficient process of improving child survival in developing countries.

Optimal vaccination coverage is one of the key elements contributed to the success of immunization and children's good health status. But vaccines are still under-utilized among migrant children. Lower coverage and lower compliance among migrant children in variety of settings have been clearly reported by Swain BK.

Vaccines save an estimated 2-3 million lives globally every year, and in India, they have played an important role in reducing the annual number of deaths among children under the age of five years from 3.4 million in 1990 to 1.2 million in 2015. With an estimated 26 million children born every year in India, routine immunization at scale is a challenging task. Although the Universal Immunization Programme (UIP) was launched during the mid-1980s, coverage rates of diphtheria-pertussis-tetanus third dose (DPT3) among children under the age of two years – a commonly used measure of efficiency of national immunization programs– remained in the 60-70% range until almost the end of 2000s. It is only during the past decade that UIP has shown tremendous progress, reaching 91% DPT3 coverage in 2019. Not only were children vaccinated at higher rates than ever before, rates of receiving DPT3 on time (at recommended age) increased by 26% during the decade leading to 2016. Timely receipt of the BCG vaccine increased by an astounding 94% during this time.

The goal of the Expanded Program on Immunization (EPI) established by the World Health Organization (WHO) in 1974 was to provide vaccination to all children globally against six initially targeted, vaccine-preventable diseases: severe infant tuberculosis, poliomyelitis, diphtheria, tetanus, pertussis and measles¹. India being one among the first few countries to adopt National immunization programmes to fight vaccine preventable diseases in the world following the success of smallpox eradication. In 1978, India implemented the EPI four years after it was adopted by the WHO. The Universal Immunization Program (UIP) was introduced in India in 1985, with the objective of achieving complete immunization coverage of all infants and pregnant women by the 1990s.

The immunization programme in the current form is the largest in the world and covers eight vaccine-preventable diseases: diphtheria, whooping cough, tetanus, poliomyelitis, tuberculosis, measles, Hepatitis B, and Haemophilus influenzae type B (Hib) (for prevention of pneumonia and meningitis). The programme also provides vaccination for Japanese encephalitis in areas affected by the disease. Recently, a vaccine against rotavirus has been introduced in nine states, and pneumococcal vaccine has been introduced in a cohort of three states with a plan to rapidly scale up in other cohorts or states.

The National Family Health Survey (NFHS) shows a marginal improvement in the vaccination coverage of India over the years. NFHS-1 conducted in 1992-93 reported a vaccination coverage of 35.4%, which rose to 42% in NFHS 1998-99. The NFHS-3 conducted in 2005 reported a vaccination coverage of 43.5%. According to the National Family Health Survey-4 (2015-16), the full immunization coverage of children aged 12-23 months was 63.9%, reflecting a small rise over last decade. Also the private share of immunization increased from 7.2% to 16.7% over the last decade.

UIP in India covers about 30 million pregnant women, 26 million infants born annually and about 100 million under 5 years' children. These beneficiaries are vaccinated through over 9 million immunization sessions (fixed, outreach and mobile), and the outreach sessions constitute a major share (59% of the vaccination given through the public health system). The immunization sessions are usually linked to the Village Health and Nutrition Days integrating the health and nutrition outreach services. Lot of energy and money has been spent on the UIP but it does not reap the expected outcome.

Two special programs played a key role in intensifying childhood vaccination efforts under UIP. Following the footsteps of the Pulse Polio Campaign which freed India from the curse of poliomyelitis, the Government of India implemented Mission Indradhanush (MI) during 2015-2017, followed by Intensified Mission Indradhanush (IMI) during 2017-2020 (in two phases). Scientific evidence using large scale survey and administrative databases shows that both programs substantially increased routine vaccination coverage and timely receipt of doses. Full immunization rates among under-2 children who benefited from the first two phases of MI increased by 27%, while median rise in vaccine delivery due to IMI was 11%. IMI 2.0 ended in March, 2020, and then the pandemic Arrived.

Every aspect of life in India was disrupted, including health systems, public service delivery, schooling and learning, livelihoods, and physical and mental well-being. The Indian government reports that around half a million Indians lost their lives to COVID-19 by the end of 2021; although, independent experts have estimated much higher death tolls. An important but overlooked collateral damage from the pandemic was the global interruption in childhood vaccine delivery. Health systems were overburdened with COVID-related care, and childhood immunization rates reduced substantially. DPT3 coverage rates in India fell to 85% in both 2020 and 2021, while coverage rates of individual vaccines reduced by 2-10% and timely receipt rates decreased by 3-5% through April, 2021. Nevertheless, this study and other related research show that even with the rapid rise in childhood immunization rates in recent years, there is no room for complacency. Vaccine preventable diseases (VPDs) continue to kill close to half a million Indian children every year, and the pandemic may have made the situation worse.

Between March, 2020 and April, 2021, more than 2.5 million scheduled doses of DPT3 vaccine were not delivered to Indian children. Intensified Mission Indradhanush 3.0 was launched by the Indian government in early 2021, across 250 districts, with a primary goal of vaccinating children and pregnant women who had missed their scheduled vaccines during the pandemic. IMI 3.0 was followed by IMI 4.0, which was launched in 2022 to cover 416 districts.

While these efforts are laudable, regular vaccine delivery under UIP should also be strengthened. The current annual funding gap of UIP is estimated to be a staggering \$560 million (routine childhood vaccines only), which must be closed. A robust UIP, together with periodic intensification of vaccine delivery through special programs when necessary, can help India achieve the Sustainable Development Goals target of reducing under-5 mortality to 25 per 1,000 live births by 2030 (from 31 in 2021).

The generation of children who were not vaccinated, partially vaccinated, or vaccinated with a delay due to the pandemic, may experience higher morbidity and mortality from VPDs than the previous cohorts of children. These children may also suffer from poorer non-health outcome over the life course, as childhood vaccinations in India have been linked with 0.2-0.3 gains in schooling years completed and 14% higher wages in adulthood.

Major barriers towards high coverage of migrant children include lack of knowledge or information on vaccination, poorer awareness or negative attitude towards vaccination, misperceptions or rumours on vaccines safety concerns from media or Internet. A meta-analytic study done by Awon AB, based on researches done in India and China revealed that the proportion of fully immunized Rural to

Urban Migrant (RUM) children was lower than the WHO bench-mark of 90% at the national level. RUMs were also less likely to be fully immunized than the urban-non-migrants and general population. For the individual Expanded Program on Immunization vaccines, all but two studies showed lower immunization coverage in RUMs compared with the general population using national coverage estimates. For these reasons we can say that migrant children vaccine cover is lesser in proportion to the settled population. In a study done by Wani RT et al, in the year 2016 at Kashmir on 60 mothers who visited immunization clinic, it was found that 61.6% of mothers completed their preschool education and majority of them were housewives (63.30%). Both mother and father used to make decision regarding child immunization in 71.7% of the cases. TV/Radio, Anganwadi workers, Hospitals were the major sources of information about immunization. 65% of mothers knew the correct age to start vaccination and majority (58.33%) of mothers believed that vaccines are not harmful. Most of the mothers believed that child with fever and cold should not be vaccinated. The attitude of mothers towards vaccination was satisfactory. 93.33% of mothers believed that vaccination was important and 91.66% of mothers believed that it was important to follow the vaccination schedule. The practices of mothers towards immunization were found to be satisfactory. In a study at Kerala, K. K. Lamiya et al., (2016-17) studied 235 subjects to assess the knowledge, attitude and practice regarding childhood immunization among mothers of under-five children. The study found that the average age of the participants was 27.30 ± 5.42 years with many of them educated up to 10th grade (40.3%) and most being housewife (74.5%). Knowledge of mothers regarding the diseases that can be prevented by immunization was fairly good. But the knowledge regarding individual vaccines, their dosages and schedule were found to be low. Majority of mothers had good attitude about immunization. Immunization coverage of the locality was relatively good (87.7%). Significant relation was established between attitude and practice. Sick at the time of vaccination was the most common cause of being partially immunised (68.96%). Kalyani V C et al (2016) conducted a cross sectional study at Uttarakhand, to assess the knowledge, attitude and practice of mothers of under five children regarding immunization, it was found that majority, (72%) of the subjects mentioned that decision making regarding child's immunization was by both the parents. Almost all of them (96%) reported that the source of information regarding immunization is from health care personnel. 80% of the under five children are partially immunized. Majority, (50%) had moderately adequate knowledge whereas 32% showed adequate knowledge. About 18% had inadequate knowledge regarding immunization. However, 90% have favourable attitude towards immunization. On the other hand, majority 88% had poor practice whereas 12% demonstrated good practice about their children's immunization. There was significant association was found between subjects' level of knowledge and attitude while no association was found between knowledge and practice of mothers of under five children regarding immunization. A cross sectional survey done by Singh S et al (2019) among 550 mothers of children less than 2 years at Maharashtra, it was found that 73.1%, 23.8% and 3.1% children were fully, partially and unimmunized, respectively. In cases of children with partial or no immunization, major reasons quoted were: (i) mothers too busy (35.8%), (ii) fear of side effects (25.0%), (iii) family related problems (20.9%) and (iv) immunization site or time unknown (16.9%). Almost 86.0% children received quality immunization coverage. In the regression analysis, reminder for immunization services was found to be the single most significant correlate of full and quality immunization coverage. The awareness regarding the importance of adequate immunization was largely lacking in the slum population. Emphasizing on reminders for immunization services, encouraging institutional deliveries, and scaling up use of postnatal care services were required for improving the immunization coverage. A study done by Selvaraj K et al in the year 2013, at Puducherry on 215 mothers of under 5 children, it was found that mean age of the 215 mothers interviewed was 27 ± 3.7 yr and their children was 23.7 ± 16.7 months. Among these 215 mothers, 36.7% had knowledge about pentavalent vaccine. Vaccine knowledge was higher for polio (94.4%), followed by measles and DPT (77-79%). Mothers of children who had received the pentavalent vaccine were significantly more aware of this vaccine compared with mothers whose children did not receive it. Siddiqui N S et al (2015) conducted a cross-sectional survey among 364 mothers of under-five age group at Maharashtra. 78.5% the children were considered as having had complete immunization, but 21.4% children had one or more than one missed doses and were considered as partially immunized. 57.97% of the study population was found to have adequate knowledge-practice scores and 42.03% were found to have inadequate knowledge practice scores. In a study done by Mugada V et al., in Andhra Pradesh, in the year 2016 with an objective to assess of knowledge among mothers towards immunization on 377 mothers of under-five age group, it was found that 30.50% of the children were partially immunized. Unavailability of vaccine was considered to be the major reason for incomplete immunization. The association between gender and immunization status, mother's education and

knowledge score and area of residence and knowledge score towards immunization was found to be statistically significant. Mother's education and area of residence were found to get associated with knowledge of immunization. However, knowledge towards immunization and immunization status was not significantly associated. Gender disparity in immunization was observed in the study. No association was found between the children's immunization status and area of residence, birth order or mother's education. Area of residence and mother's education and was found to get associated with knowledge of immunization. In a study done by Sunny A et al., (2018) at Bangalore on 143 mothers, with an objective to assess parent's knowledge, attitude and practice towards vaccination and to correlate these factors with vaccination status of their child, it was found that most of the mothers had satisfactory knowledge, attitude and practice but almost 25% children were identified as un-immunized or partially immunized. Educational status of mothers was identified as an independent factor in the determination of their children 'timely vaccination status.

Our study, Deepak and Edwin Dias showed a definite delay in migrant workers children vaccination during the Covid pandemic. There is increasing recognition within the international aid community that improving the health of poor people across the world depends upon adequate understanding of the socio-cultural and economic aspects of the context in which public health programmes are implemented.

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Volume 5 Issue 2 August 2023

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