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Factors influencing Immunization Coverage among children 12-23 months of age in Bastar division from 2013 to 2020 – A review

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ABSTRACT

Bastar is a backward division in the state of Chhattisgarh with a large tribal population (32%). It is affected by left wing extremism [2] It has 7 districts, and all are included in the Aspirational district program of NITI Aayog. In India, proper vaccination could prevent about 3 million deaths per year [2,15]. This vaccination drive is affected by several factors, which may vary from place to place depending on social, cultural, and developmental status Although there are many studies on factors influencing immunization in other parts of the country, there was a dearth of literature in Bastar division. This study reviews the literature for the factors affecting immunization coverage in Bastar division, a culturally unique entity. After removing duplicates from the 23 articles, a total of 12 factors were discovered. The main issues were a lack of human resources, inaccessibility, low female literacy, and a lack of infrastructure. Haat bazaars, a lack of awareness, a sick infant, an inconvenient time, AEFI, the place of delivery, lockdown, and a birth order were among the others.

Keywords: *Factors, Immunization coverage, Bastar*

1. INTRODUCTION

Vaccines have played a key role in India's progress in child health. India has achieved many important landmarks related to immunization in recent years, including being declared polio-free in 2014 and the elimination of maternal and neonatal tetanus in 2015[3]. However, the overall national full immunization coverage was only 62 % in 2015-2016, with just a few states reaching more than 85 % coverage. The state of Chhattisgarh had a full immunization coverage (FIC) rate of 48.7 % in 2005–2006 (NFHS -3), which increased to 59.3 % in 2007-2008 (DLHS-3) and 76 % in 2015-16 (NFHS-4) [4,5] The state has 27 districts and 5 divisions namely Bastar, Durg, Raipur, Bilaspur and Surguja. It has a total population of more than 25 million.[6] The population is primarily rural and 86% of households in the state belong to marginalized and socially excluded groups, one-third of whom are Scheduled Tribes.[7]

Several studies from across the world including India reveal that many factors affect full immunization coverage. These factors may be patient and society related or administrative and health system related. These factors include maternal education, economic status, employment, ANC follow up, institutional delivery, female household head, rural household, mothers' receipt of at least one dose of tetanus toxoid immunization, outreach activities of the health institutions, sickness of child, lack of awareness and fear of adverse events, [1, 8,9,10]. Although limited publications exist for various reasons predicting full immunization, no formal review of literature exists for Bastar division. Also, the social and cultural uniqueness of this region justifies the need for a review of factors affecting immunization. Therefore, this study examines various key factors influencing immunization in Bastar division of Chhattisgarh.

The review will offer the policy makers and administrators an opportunity to prioritize on important factors peculiar to this zone and achieve full immunization coverage. Also, it will help other aspirational districts with similar topographic and socioeconomic factors to enhance their performances.

2. METHODOLOGY

2.1 Identification of Studies

Articles published in English-language journals from 2013 to 2020 were found through systematic searches of five electronic bibliographic databases, including PubMed, Scopus, Google Scholar, Science Direct and Web of Science in the months of January to April 2021. All papers found through the searches were transferred to Zotero software, and duplicates and titles in other languages were excluded. Following that, the Zotero files were moved to an Excel sheet for Title and Abstract screening. The papers had to

follow two criteria to be included. The research should first consider Bastar Division from 2013 to 2020, and then it should concentrate on immunization, its associated factors, and immunization initiatives in Bastar Division. Gray literature, narratives, commentaries, or other document types such as UNICEF, NITI Aayog, common review mission, UNDP reports, program monitoring reports and newspapers articles were included.

2.2 Selection of Studies

The first step was made from title and abstract screening using keywords Neonates OR Infants OR Child OR Children AND full immunization coverage OR Vaccination OR vaccine hesitancy OR Parents knowledge on immunization AND tribal health OR health inequality OR health infrastructure OR female literacy AND Chhattisgarh OR Bastar OR tribal areas. The second step was made from full-text screening using the eligibility criteria (immunization, factors affecting immunization, explanations for dropouts). The details of selection of the studies have been shown in Figure 1.

- **Data Extraction from Included Studies:** Once the articles were selected, the following data were recorded in a spreadsheet: author(s), year, Districts, Division, Domains (e.g., Supply side issues and demand side issues) and level of factors influence.
- **Data Analysis:** The extracted data was analyzed using Excel to determine the factors influencing the immunization coverage in Bastar Division.

3. RESULTS

The five electronic databases yielded a total of 1023 records (Scopus: 3, Science Direct: 826, Google scholar: 92, PubMed: 75, Web of science: 27), plus an additional 11 records for a total of 1034. Following the removal of duplicates, a total of 1010 titles and abstracts were screened. A total of 75 articles were chosen for full text screening. Finally, 23 items were considered eligible. Among the included studies 39% were published from 2013-2016 and 61% were published from 2017-2020 (Table 1). The included studies were primarily from Bastar Division, with 82 percent hailing from Bastar District and 65 percent taking from Kanker, 47 percent from Kondagoan, 40 percent from Dantewada, 39 percent from Sukma and Narayanpur, and 26 percent from Bijapur. All the literature mention about the factors influencing the immunization coverage from 2013-2020.

***Table1*:** *Number of literatures on immunization published from 2013 to 2020 in Bastar Division.*

Years	Number of studies published
2013-2016	9(39%)
2017-2020	14(61%)

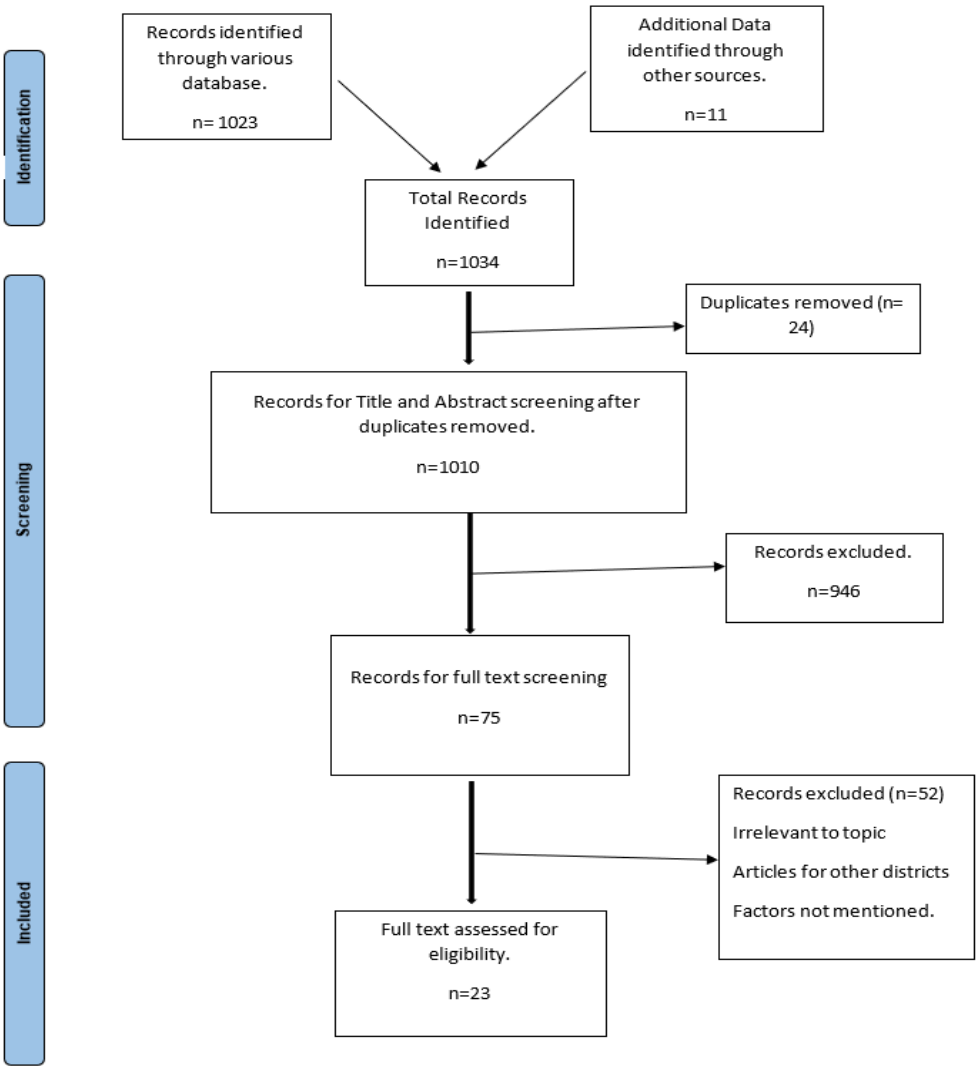


Figure 1: *Flow chart of studies identification and selection process*

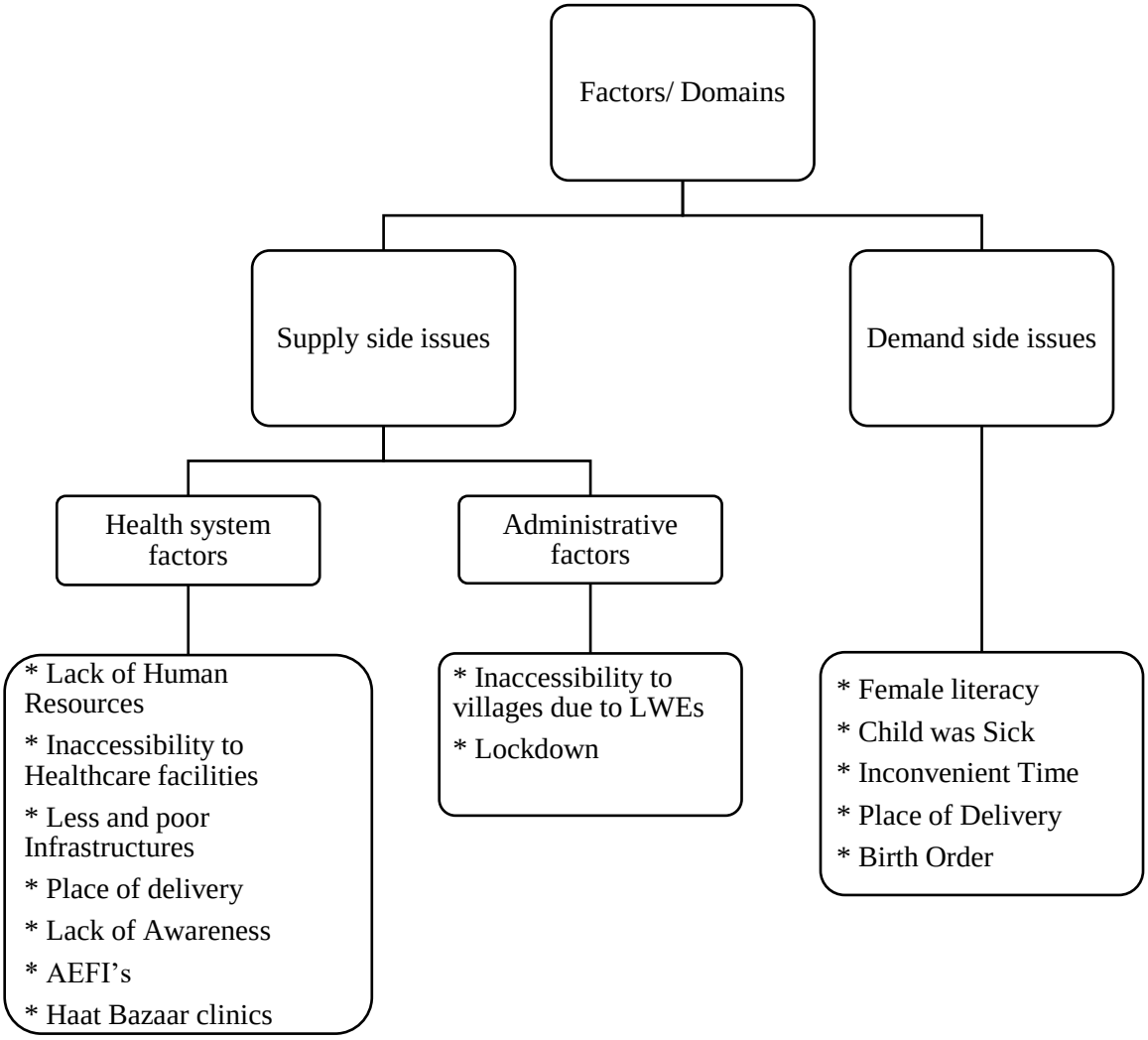
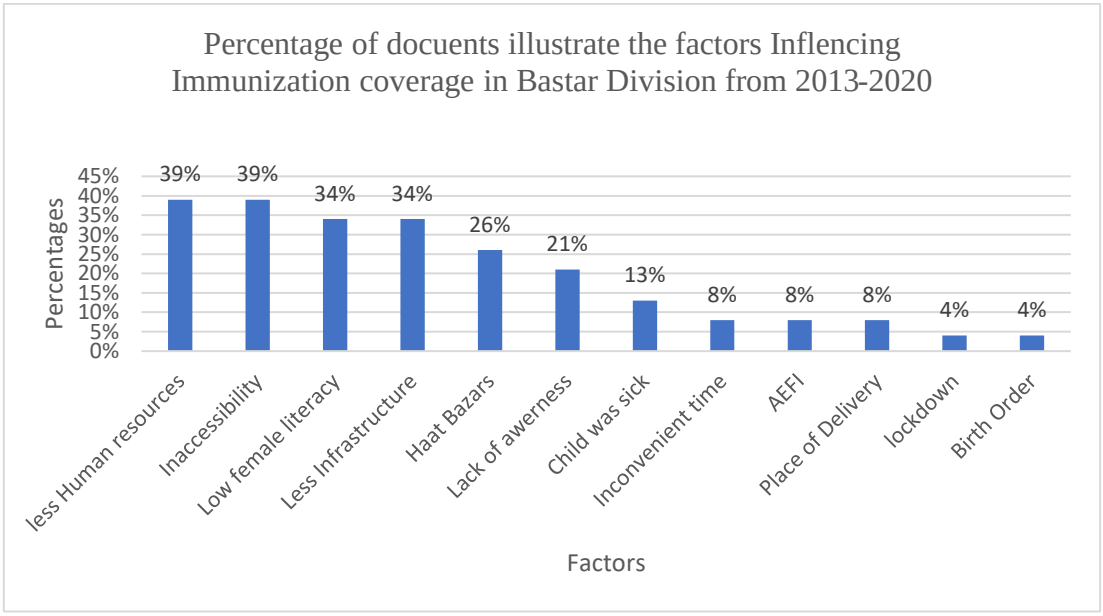


Figure 2: *Categorization of factors under various domains*

The factors which were identified from the review had been categorized as two domains one was Supply side issues and with it the government has taken the initiative to improve immunization coverage and the second domain was demand side issues such as the barriers from the public for dropouts (Figure2).



Graph 1: *Factors influencing immunization coverage in Bastar Division from 2013-2020.*

The graph 1 illustrates the percentage of literatures stating various factors influencing immunization coverage in the Bastar division from 2013 to 2020. Twelve factors were identified of which four factors namely human resource, inaccessibility to the healthcare facilities, low female literacy and less infrastructure occupied more than 30% of factors reviewed. Two factors namely Haat bazar clinics and lack of awareness occupied more than 20% of factors reviewed. Rest occupied less than 15 % of factors reviewed.

4. SUPPLY SIDE ISSUES

4.1 Health System Factors

1. Human resource: Among 23 studies, nine indicated that the Bastar division had a huge shortfall in trained health related manpower. Inadequate strength of ANM's, ASHA's and Anganwadi workers in the sub-centers, villages and Anganwadi's respectively adversely affected the immunization services [11,12,13]. Moreover, they were involved in activities other than primary health like enrolling the public for ration cards, which have been a cause for missed immunization sessions and poor immunization coverage in the past [14,15]. Bastar also has severe shortage of doctors and staff nurses, both in regular and contractual posts. The age limit for entry of contractual staff is 35 years with no increment and can be absorbed or terminated after 5 years, making them less attractive. Also pertaining to regular staff, many were unaware of the incentives for working in these areas making them less popular [16,17,18,19].

2. Infrastructure: Eight literatures mentioned that poor or inadequate health infrastructure affected immunization coverage [11]. The number of Anganwadi centers, Sub-centers and PHC's were insufficient to cater the population. Often it was found in poor conditions and their renovation or construction was under way in many regions. These infrastructures lack continuous power supply which breaks the cold chain maintenance [13, 15,17, 18, 20,21]. This situation was particularly exacerbated by heavy rains during monsoon season [15,22].

3. Adverse Events Following Immunization: eight percent of the literature published indicate AEFI's such as fever and abscess at injection site as the cause for dropouts in these districts from 2013-20. The fear of such events after vaccination pushed back the immunization program by preventing the villagers from approaching the vaccination centers [23,24].

4. Awareness: Less than a quarter of the studies pointed out the lack of awareness as a factor for poor immunization or dropouts. The people of this region were unaware of the need for multiple doses of vaccines and its benefits after successive doses. Several studies reveal that many were unaware of VHND session sites. IEC was also noted to be lacking with even the health workers wary of the benefits of immunization. The current process, in which contents and IEC materials sent directly from capital Raipur were not in the local language (Gondi or Madia), and hence not effective [15,17,23,24,25].

5. Haat Bazar: The Chhattisgarh government, in collaboration with UNICEF and other NGOs, launched the Haat bazar Immunization Day initiative (later renamed as Mukhyamantri Haat Bazaar Clinic Yojana in the year 2019) in 2012. This was in response to the increasing dropouts of children from most disadvantaged tribes, especially of Bastar division due to left-wing extremism. The aim of the initiative was to provide immunization and other health care services to tribals who visit weekly markets with their children for buying and selling goods. These bazaars were visited by people from remotest corners of the villages, providing the government authorities a golden opportunity to meet them [17,23].

The dense vegetation with inaccessible geographical terrain along with poor socio-economic status of the tribes had created a perfect ground for left wing extremism which affected the delivery of all government welfare programs. The problem was compounded by the absence of transport facilities and low awareness. The people hardly tried to visit district hospitals or PHC's for treatment as they were more confident with traditional healers and superstitions. With the launch of Haat bazar clinic initiative, healthcare became accessible in a traditionally and culturally acceptable way. The government was now able to close the last mile gap and streamline health initiatives to increase immunization coverage and reduce malnutrition, MMR and IMR. There was convergence of other departments too such as education, women, and child development [23,24,26].

These clinics were fully equipped for storing medicines and equipment's, have seating arrangements for consultation with specialist doctors. They also offer routine diagnostic tests. The beneficiary is provided with a Haat bazar health card which makes delivery of services and management easier.

In conclusion, this initiative is unique in a way that they provide low-cost, high-quality healthcare [23].

4.2 Administrative Factors

1. Inaccessibility: The rugged topography with dense forest and poor connectivity was a major factor affecting the immunization services in Bastar division [11,25]. Several parts of these areas were inhabited by primitive tribes such as Gond, Madia, Halbas and Bada Madia who lack access to roads, health institutions and schools. After certain points, the roads disappeared and became accessible only by foot or vehicles such as tractors. Many subcenters and PHC's were located far from the villages, sometimes even 5 to 10 kms away. The shortage of roads in general, with particularly difficult conditions in the monsoon season, exacerbated the situation [15,17]. These districts of Bastar also face the additional challenge of Naxalism or leftwing extremism, which make many of these areas inaccessible to ASHA's and ANM's for VHND (Village health and Nutrition Day) sessions. This factor was a major factor hindering in Hepatitis B immunization for babies born at home [20,21,22,23,27].

2. Lock Down: It was noted that immunizations at sub-center levels in some districts such as Kanker and Kondagoan dropped in the early April 2020 due to lock down [28].

4.3 Demand Side Issues

1. Female Literacy: Among eight literatures, three mentioned that low literacy among mothers was a common factor affecting immunization [11,25,29]. One article revealed that Female illiteracy superadded with unawareness and unfamiliarity hinders them from approaching immunization sites [24]. Also, uneasiness and absence of faith on immunization prevents these women from getting their children vaccinated [12,13, 14,23].

2. Child was Sick: Two documents mentioned that Sickness such as diarrhea, fever, common cold and cough were responsible for dropouts in many districts [25, 29]. Contraindication to vaccinate children with sickness resulted in missed dose of vaccination [11].

3. Inconvenient time: A small percentage of studies have pointed out to the inconvenience of mothers in reaching the immunization sessions as they were at work in the farm. Often during the Tendu patta (beedi leaves) season, which is the predominant source of seasonal income for the villagers, they chose plucking leaves to vaccination [15,25].

4.Place of delivery: Place of delivery was playing a crucial role in complete immunization. Some studies have pointed out that children born in homes are three times more prone for partial immunization than those born in the institutions [12,25,29].

5.Birth Order: One study revealed that in these districts, the higher order of birth was associated with poor performance in vaccinations [29].

5. CONCLUSION

Of various factors affecting immunization coverage for children under 23 months of age in Bastar division, human resource, inaccessibility, and poor infrastructure have been reported maximum. The severe shortage of health-related manpower like Doctor's, ANM's, ASHA's have affected the vaccination program of the division. The review also identifies other important factors such as female illiteracy, lack of awareness, child sickness and adverse events following immunization which have been negatively influencing immunization coverage. A unique factor associated with immunization in Bastar division is Haat Bazar clinic which improved the confidence among the indigenous population for vaccination. In conclusion, focusing on improving human resource, accessibility, awareness along with building adequate healthcare infrastructure, and increasing female literacy rate will work greatly in improving immunization coverage of this topographically and socially distinct area.

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Conflicts of Interest
There are no conflicts of interest.

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