

**MATERNAL HEALTH SITUATION IN EMPOWERED  
ACTION GROUP OF STATES OF INDIA: A COMPARATIVE  
ANALYSIS OF STATE REPORTS FROM NATIONAL  
FAMILY HEALTH SURVEY (NFHS)-4 AND 5**

Dissertation Submitted to



**The IIHMR University, Jaipur**

for the partial fulfilment for the award of  
the degree of Master of Business Administration (MBA)

in

Hospital and Health Management by

**Dr. Gyanu Dev**

Under the Supervision and Guidance of

**Dr. Vinod Kumar SV**

Professor & Dean In-Charge

SD Gupta School of Public Health

IIHMR University, Jaipur

2023

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## **DECLARATION BY STUDENT**

I hereby declare that this dissertation titled “Maternal Health Situation in Empowered Action Group of States of India: A Comparative Analysis of State Reports from National Family Health Survey (NFHS)-4 And 5” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

**Gyanu Dev**

MBA Hospital and Health Management

2021-23



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DATE OF INTERNSHIP PROGRAM: 20 FEBRUARY, 2023 TO 19 MAY, 2023



A handwritten signature in black ink.

Himmat Singh Rathore  
Chief Executive Officer

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## **Certificate from Faculty Guide and School Dean**

### **CERTIFICATE**

This is to certify that dissertation titled “Maternal Health Situation in Empowered Action Group of States of India: A Comparative Analysis of State Reports from National Family Health Survey (NFHS)-4 And 5” is a record of the research work undertaken by **Dr Gyanu Dev** in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

**Dr Vinod Kumar SV**

IIHMR University, Jaipur

Date:

**Dr (Col) Mahender Kumar**

IIHMR University, Jaipur

Date:

## Abstract

**Background:** Maternal Mortality Rate (MMR) is a key indicator of maternal mortality, defined as the number of maternal deaths per 100,000 live births during a given period. The maternal mortality rate (MMR) in India was 97/100,000 live births between 2018 and 2020, according to the latest report on National Sample Registration System (SRS) data. Objective: The main objective of this study was to assess maternal health status in EAG states based on analysis of NFHS-4 and NFHS-5 data and to conduct a comparative analysis of key maternal health indicators in these states using NFHS data.

**Materials and Methods:** A secondary study with a descriptive design was conducted to use data obtained from the NFHS-4 and NFHS-5 reports. The study focused on the Empowered Action Group (EAG) states of India, which include Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand.

**RESULTS:** The states with the highest antenatal screening rates were Madhya Pradesh, Bihar and Uttar Pradesh. The proportion of mothers attending at least 4 antenatal visits increased in all states except Chhattisgarh, where Odisha (59.1% to 91.9%), Uttarakhand (30.9% to 61.8%) and Madhya Pradesh (35, 7% to 61.8%) showed the greatest improvements. (57.5%). Most states saw an increase in the proportion of mothers whose last delivery was protected against neonatal tetanus, with the largest improvement in Uttar Pradesh. The proportion of C-sections performed in private facilities increased in all states from NFHS-4 to NFHS-5.

**Conclusions:** A comparison of NFHS-4 and NFHS-5 data showed improvements in several key maternal health indicators in EAG states. Given the current state of maternal well-being in India, it is imperative to strengthen the implementation of activities related to maternal health, particularly by the Empowered Action Group (EAG).

**Keywords:** maternal health care, NFHS, antenatal care, postnatal care

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Sincerely,

Dr Gyanu Dev

Batch 26<sup>th</sup>

IIHMR University

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## Abbreviations

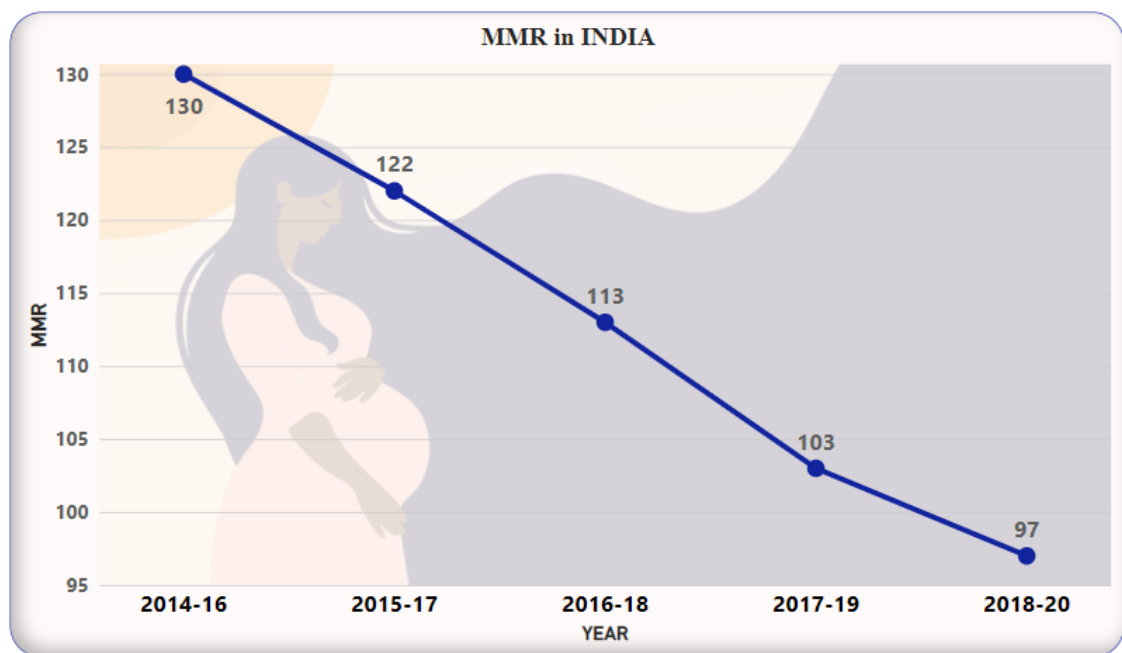
|        |                                                            |
|--------|------------------------------------------------------------|
| AHS    | Annual Health Survey                                       |
| ANC    | Antenatal Care                                             |
| ANM    | Auxiliary Nurse Midwife                                    |
| CS     | Caesarean Section                                          |
| DLHS   | District Level Household and facility Survey               |
| EAG    | Empowered Action Group                                     |
| IFA    | Iron Folic Acid                                            |
| IIHMR  | Indian Institute of Health Management Research             |
| IMR    | Infant Mortality Ratio                                     |
| JSSK   | Janani Shishu Suraksha Karyakaram                          |
| JSY    | Janani Suraksha Yojana                                     |
| MCP    | Mother and Child Protection                                |
| MMR    | Maternal mortality Ratio                                   |
| MOHFW  | Ministry of Health and Family Welfare, Government of India |
| NFHS   | National Family Health Survey                              |
| OOPE   | Out Of Pocket Expenditure                                  |
| PHC    | Primary health care                                        |
| PNC    | Postnatal Care                                             |
| RGI    | Registrar General India                                    |
| SBA    | Skilled Birth Attendant                                    |
| SDG    | Sustainable Development Goals                              |
| SRS    | Sample Registration System                                 |
| TT     | Tetanus Toxoid                                             |
| UNICEF | United Nations International Children's Emergency Fund     |
| WHO    | World Health Organization                                  |

# CHAPTER 1: INTRODUCTION

## 1.1 BACKGROUND

Maternal Health is a crucial aspect for any country's development, as it promotes equity and poverty reduction. The prosperity and welfare of mothers are not only significant but also pivotal in addressing broader economic, social, and developmental challenges.

The Maternal Mortality Ratio (MMR) is a crucial parameter of maternal mortality and is defined as the count of maternal deaths during a particular period per 100,000 live births during the same period. According to the latest report from the national Sample Registration system (SRS) data, India's Maternal Mortality Ratio (MMR) for the period of 2018-20 is 97/100,000 live births, which indicates a decline of 6 points from 103/100,000 live births in 2017-19. The ratio has been steadily declining, from 130 in 2014-2016 to 97 in 2018-20. The Sustainable Development Goals (SDGs) established by the United Nations aim to diminish the global maternal mortality ratio to less than 70 per 100,000 live births.

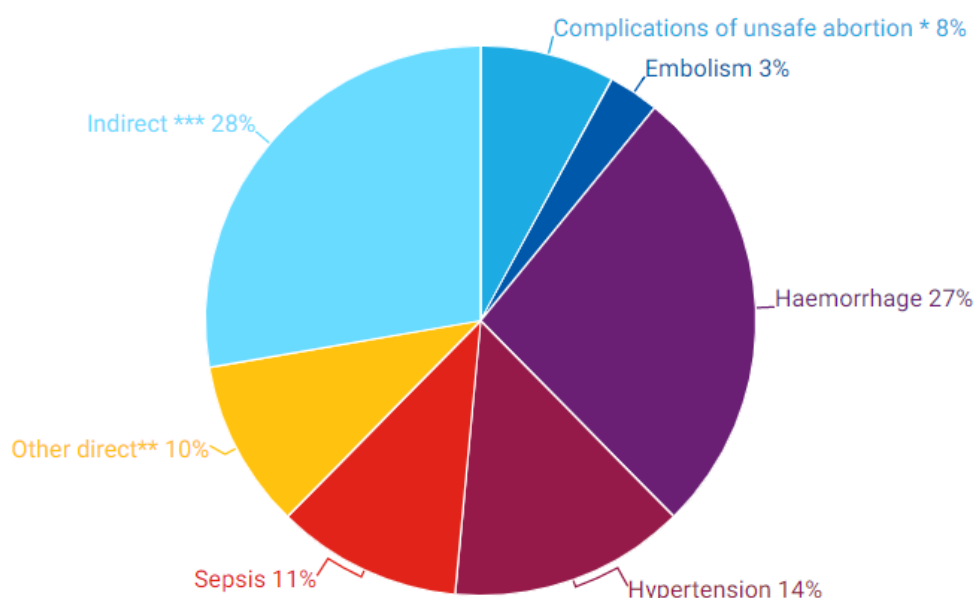


Source: SRS\_MMR\_Bulletin\_2018\_2020

**Fig-1.1: Trend of Maternal Mortality Ratio in India**

Based on the fifth round of NFHS conducted between 2019 and 2021, the national Total Fertility Rate (TFR) has decreased to 2.0 from 2.2 in NFHS-4, which was conducted in 2015-16. Bihar (TFR: 3.0), Jharkhand (2.3), and Uttar Pradesh (2.4) are EAG states with a TFR higher than 2.1.

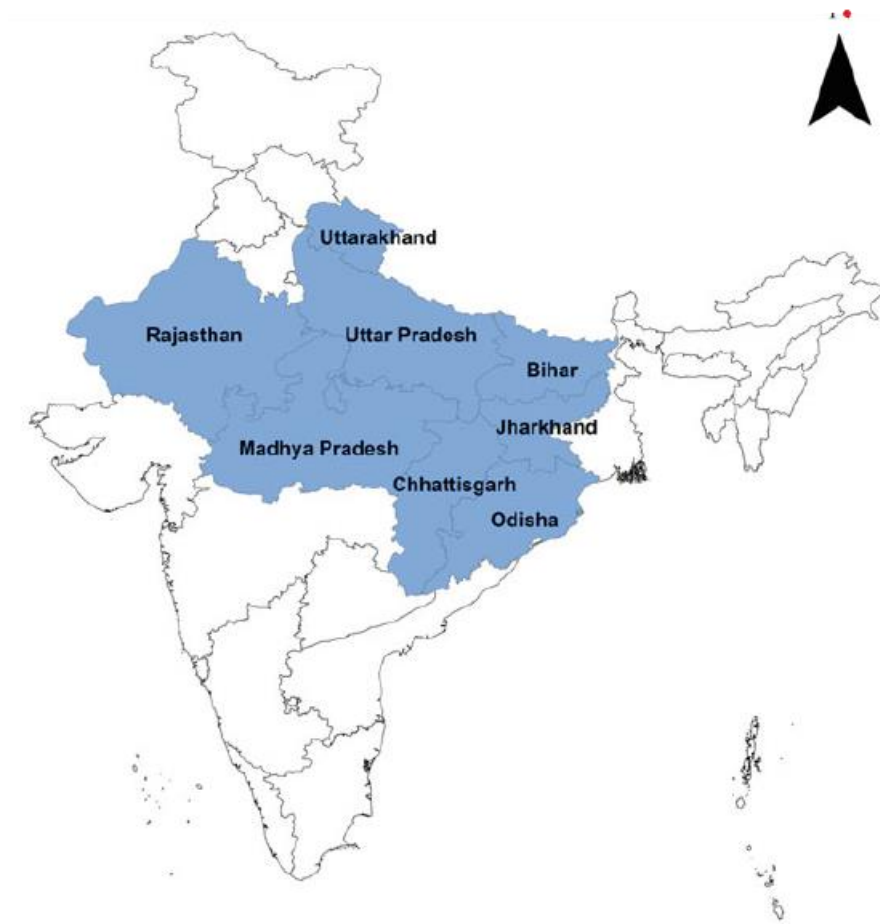
Maternal deaths are mainly caused by complications that arise during pregnancy, delivery, and postpartum. The primary complications that account for 80% of all maternal deaths are excessive bleeding (mostly postpartum haemorrhage), infections (usually following childbirth), high blood pressure during pregnancy (pre-eclampsia and eclampsia), and unsafe abortions. The remaining maternal deaths are referred to as "indirect maternal deaths," which occur when a pregnancy is complicated by another condition or disease, such as malaria, diabetes, or heart disease.



Source: Say L et al., 'Global causes of maternal death: a WHO systematic analysis' *Lancet Global Health*. [http://dx.doi.org/10.1016/S2214-109X\(14\)70227-X](http://dx.doi.org/10.1016/S2214-109X(14)70227-X),

**Fig 1.2: Causes of Maternal Death**

To gain a better understanding of the maternal mortality situation and track changes that have occurred, the states have been classified into three groups: "Empowered Action Group" (EAG) States, which include Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh & Uttarakhand, and Assam; "Southern" States, which comprise Andhra Pradesh, Telangana, Karnataka, Kerala, and Tamil Nadu; and "Other" States, which cover the remaining states and union territories.



**Fig 1.3: India and EAG states**

The key aim of this inquiry is to evaluate maternal well-being in the Empowered Action Group (EAG) states of India by comparing the state records of the National Family Health Survey (NFHS)-4 and NFHS-5. The EAG states include Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh, and Uttarakhand.

The Ministry of Health and Family Welfare (MoHFW) conducts the National Family Health Survey (NFHS) every three years, and it has completed five rounds so far. The survey provides reliable, high-quality, and comparable data on population dynamics, health indicators, and emerging health and family welfare issues. This information helps policymakers and program implementers set benchmarks and provides evidence of the effectiveness of the Indian government's ongoing programs.

The Indian government's Ministry of Health and Family Welfare (MoHFW) has launched several flagship initiatives, including Ayushman Bharat and Poshan Abhiyan, to improve the overall health of the Indian population and address the needs of vulnerable and underprivileged groups. Additionally, India is shifting towards directly transferring benefits to the beneficiaries of its diverse programs. Furthermore, India has committed to

achieving the Sustainable Development Goals (SDGs), and the MoHFW is continuously monitoring the health-related SDG targets. However, the COVID-19 pandemic has created new health system challenges in the country.

## **1.2. AIM & OBJECTIVES**

The aims and objectives of this study are as follows:

- To assess the situation of maternal health in EAG states based on analysis of NFHS-4 and NFHS-5 data.
- To do a comparative analysis of key maternal health indicators of these states using NFHS data and to correlate the findings with sociodemographic factors.
- To identify state wise priority areas for action

## CHAPTER 2: LITERATURE REVIEW

Table 2.1: Literature Review on Maternal Health Situation

| Authors (Year)            | Title                                                                                                                  | Study Location                                          | Sampling Techniques                 | Salient Features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Akkiraju VS et al. (2022) | A Comparative Study of Maternal and Child Health Indicators of Tribal and Non-Tribal Areas of Selected States in India | Chhattisgarh, Jharkhand, Maharashtra, Orissa, Rajasthan | Descriptive secondary data analyses | The percentage of Infant Mortality Rates, Maternal Mortality Rates and Still Birth Rates is greater in the scheduled (tribal) regions as compared to the non-scheduled (non-tribal) regions, whereas the percentages for Female Literacy, completion of 4 ANC check-ups and Institutional Births are almost equivalent between the scheduled and non-scheduled regions. The proportion of mothers who took iron-folic acid tablets for 180 days during pregnancy stayed low in scheduled regions.                                        |
| Raj P et al. (2022)       | A Review of the National Family Health Survey Data in Addressing India's Maternal Health Situation                     | India                                                   | Systematic review of literature     | The impact of non-communicable diseases on maternal health is an area of research in India that has yet to be fully explored. Moreover, there is an uneven distribution of studies conducted, with some regions receiving more attention than others.                                                                                                                                                                                                                                                                                    |
| Kulkarni R et al. (2021)  | Survey Data in Addressing India's                                                                                      | 17 states and five Union territories (UTs)              | Descriptive secondary data analyses | The proportion of expectant mothers with iron deficiency has risen in 17 states in NFHS-5 when compared to NFHS-4, which was at 15 states. In 14 states, institutional deliveries are over 90%, while only three states have less than 79%. OOPE per delivery in public health facilities has surged in 12 states over time and has exceeded 5000 INR in eight states. The enhancement of healthcare quality, fortifying the Janani Suraksha Yojana (JSY), training programs for skilled birth attendants, a decrease in iron deficiency |

|                              |                                                                                             |       |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------|---------------------------------------------------------------------------------------------|-------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                                                                                             |       |                         | among expectant mothers, and a reduction in OOPE per delivery in public health facilities can contribute to better maternal health indicators in India.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Meh C, Sharma A et al (2021) | Trends in maternal mortality in India over two decades in nationally representative surveys | India | Cross-sectional surveys | From 1997-98 to 2020, the maternal mortality ratio (MMR) in India decreased by 70%, dropping from 398/ 100 000 live births (95% CI 378–417) to 99/100 000 (90–108). During this time, approximately 1.30 million (95% CI 1.26–1.35 million) maternal deaths occurred, with about 23,800 (95% CI 21,700–26,000) in 2020. The majority of maternal deaths occurred in poorer states (63%) and among women aged 20-29 years (58%). The states with the highest MMRs were Assam (215), Uttar Pradesh/Uttarakhand (192), and Madhya Pradesh/Chhattisgarh (170), exceeding India's 2016-2018 estimate of 113 (95% CI 103-123). After adjusting for education and other variables, maternal death risks were highest in rural and tribal areas of northeastern and northern states. The primary causes of maternal mortality were obstetric bleeding (47%, more prevalent in poorer states), pregnancy-related infections (12%), and hypertensive pregnancy disorders (7%). |

|                     |                                                                                                                                                     |                     |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Das et al. (2021)   | Maternal health situation in the empowered action group states: how far we reached: a comparative analysis of national family health survey-3 and 4 | EAG states of India | Descriptive secondary data analyses  | In this inquiry, there has been advancement from NFHS-3 to NFHS-4; however, the advancement is encouraging but sluggish. The increase of their comprehensive antenatal care (ANC) measure is consistent. Notwithstanding this, education and domestic abuse are still obstructing the complete maternal health and welfare. Considering the present condition of maternal health in India, specifically in EAG states, there is an urgent requirement for further enhancement in maternal health-related undertakings. This mandates reinforcing the healthcare system, political determination, and community mobilization in the EAG states. |
| Yadav et al. (2021) | Comparative study on maternal healthcare services utilisation in selected Empowered Action Group states of India                                    | EAG states of India | Stratified Random Sampling Technique | In Rajasthan, the utilization of maternal healthcare services surpassed that of Madhya Pradesh, Uttar Pradesh, and Bihar, in a descending order. Women who were socioeconomically underprivileged had a low rate of availing these services in all the chosen EAG states. The study highlights the noteworthy correlation between the usage of maternal healthcare services and factors such as female education, media exposure, women's independence, and economic standing. The implementation of the national and Sustainable Development Goals is occurring at a relatively tardy pace in the EAG states.                                 |

|                                |                                                                                                                                              |                     |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sharma Vandana et al. (2020)   | Efficiency Assessment of Maternal health services in the Aspirational Districts of EAG states in India: A Data Envelopment Analysis Approach | EAG states of India | Descriptive secondary data analyses      | Improving the institutional deliveries creates possibilities for enhancing various connected facets of maternal healthcare. The results signify that the Gaya locality holds the highest potential to increase its output (Institutional Births) from current levels. The evaluation has additionally assessed the standards for inefficient aspiring districts. Sirohi and Bokaro, which are frequently cited, have unquestionably contributed valuable perspectives into enhancing maternal healthcare frameworks for other aspiring districts.                                                                                    |
| Dehury RK, Samal et al. (2017) | Status of Women's Health in Goa and Sikkim: A Comparative Analysis of State Fact Sheets of National Family Health Survey (NFHS)-3 And 4      | Goa and Sikkim      | Descriptive analysis of NFHS fact sheets | The rate of progress in Sikkim is relatively sluggish in comparison to Goa, nevertheless, the state of women's empowerment is comparatively better in Sikkim. To achieve future goals, it is essential to expand on the improved performance displayed in various factors in both regions. The factors scrutinized in this study, such as access to resources, have a significant influence on the welfare and empowerment of women, which is connected to outcomes related to reproductive health. Furthermore, both reports indicate that women in these two states are involved in making decisions related to household matters. |

|                               |                                                                                                                                                                                     |                                        |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dehury<br>RK et al.<br>(2016) | Maternal Health<br>Situation in<br>Bihar and<br>Madhya<br>Pradesh: A<br>Comparative<br>Analysis of<br>State Fact<br>Sheets of<br>National Family<br>Health Survey<br>(NFHS)-3 and 4 | Bihar and<br>Madhya<br>Pradesh<br>(MP) | Descriptive<br>secondary<br>data<br>analyses | MP has shown remarkable progress in comparison to Bihar. All three stages of maternal health, namely pregnancy (Ante-Natal Care (ANC), Tetanus toxoid (TT), and Iron and Folic Acid (IFA)), childbirth (Institutional delivery by Skilled Birth Attendant (SBA), Caesarean Section (CS), and post-partum care (hospital stay and Janani Suraksha Yojna (JSY)), have demonstrated inadequate outcomes. The poor performance of both these states across all these parameters calls for a comprehensive approach, which includes strong political will, reinforcement of the health system, mobilization of the community, and education. |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## **Chapter 3: Methodology**

### **3.1 Key Research Question**

This study addressed the following key research question:

1. What is the progress of EAG states in terms of the Key Maternal health indicators over the past 5 years?

### **3.2 Materials and Methods**

A secondary study was conducted with a descriptive design that aimed to utilize data extracted from the reports of NFHS-4 and NFHS-5. The research centred on the Empowered Action Group (EAG) regions of India, comprising Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, and Uttarakhand.

### **3.3 Duration of Study:**

The analysis was completed in three months (01/03/2023 to 31/05/2023).

### **3.4 Data analysis**

The information was evaluated through the application of statistical program SPSS 27.

## Chapter 4: Results

### ANC Indicators in the EAG states

Antenatal check-ups are crucial for ensuring the safety of both mother and fetus during pregnancy. The guidelines recommend a minimum of four ANC visits, with the first trimester visit being the most important for the mother's overall health.

According to the latest NFHS-5 data, there has been an increase in the number of mothers receiving first trimester antenatal check-ups as well as those who have had at least four ANC visits, as compared to the previous NFHS-4 survey. States such as Madhya Pradesh (NFHS-4=53%; NFHS-5=75.4%), Bihar (34.6% to 52.9%), and Uttar Pradesh (44.9% to 62.5%) have shown significant improvements in antenatal check-up rates. However, Chhattisgarh has seen a decrease in the percentage of mothers receiving antenatal check-ups in the first trimester (70.8% to 65.7%). The data also reveals that there has been an improvement in the percentage of mothers receiving at least four antenatal care visits in all states except Chhattisgarh. The largest improvements were observed in Odisha (59.1% to 91.9%), Uttarakhand (30.9% to 61.8%), and Madhya Pradesh (35.7% to 57.5%).

| State                                                              | NFHS-4 | NFHS-5 |
|--------------------------------------------------------------------|--------|--------|
| Mothers who had antenatal check-up in the first trimester (%)      |        |        |
| Bihar                                                              | 34.6   | 52.9   |
| Madhya Pradesh                                                     | 53     | 75.4   |
| Rajasthan                                                          | 63     | 76.3   |
| Uttar Pradesh                                                      | 45.9   | 62.5   |
| Uttarakhand                                                        | 53.5   | 68.8   |
| Jharkhand                                                          | 52     | 68     |
| Chhattisgarh                                                       | 70.8   | 65.7   |
| Odisha                                                             | 64     | 76.9   |
| Mothers who had at least 4 antenatal care visits (%)               |        |        |
| Bihar                                                              | 14.4   | 25.2   |
| Madhya Pradesh                                                     | 35.7   | 57.5   |
| Rajasthan                                                          | 38.5   | 55.3   |
| Uttar Pradesh                                                      | 26.4   | 42.4   |
| Uttarakhand-                                                       | 30.9   | 61.8   |
| Jharkhand                                                          | 30.3   | 38.6   |
| Chhattisgarh                                                       | 59.1   | 60.1   |
| Odisha                                                             | 59.1   | 91.9   |
| <b>Table 4.1: Percentage of mothers who received ANC services.</b> |        |        |

### **Protection against neonatal tetanus and anaemia in the EAG states.**

Most states have demonstrated progress in protecting mothers against neonatal tetanus, with Uttar Pradesh exhibiting the most significant improvement (86.5% to 92.1%). Bihar remained relatively stable, while Jharkhand and Chhattisgarh experienced a minor decline in percentages. Across all states, there was a noteworthy increase in the percentage of expectant mothers consuming Iron and Folic Acid (IFA) for at least 100 days during their pregnancy. Madhya Pradesh exhibited the most significant improvement, with an increase from 23.5% to 51.4%, followed by Odisha (36.5% to 60.8%) and Uttarakhand (24.9% to 46.6%). Overall, the NFHS-5 data indicates progress in safeguarding expectant mothers against neonatal tetanus and increasing the consumption of iron-folic acid (IFA) throughout the states.

| State                                                                                        | NFHS-4 | NFHS-5 |
|----------------------------------------------------------------------------------------------|--------|--------|
| % of mothers whose last birth was protected against neonatal tetanus                         |        |        |
| Bihar                                                                                        | 89.6   | 89.5   |
| Madhya Pradesh                                                                               | 89.8   | 95     |
| Rajasthan                                                                                    | 89.7   | 93.4   |
| Uttar Pradesh                                                                                | 86.5   | 92.1   |
| Uttarakhand                                                                                  | 91.4   | 93.6   |
| Jharkhand                                                                                    | 91.7   | 90.8   |
| Chhattisgarh                                                                                 | 94.3   | 91.9   |
| Odisha                                                                                       | 94.3   | 95.2   |
| % of mothers who consumed IFA for 100 days or more when they were pregnant                   |        |        |
| Bihar                                                                                        | 9.7    | 18     |
| Madhya Pradesh                                                                               | 23.5   | 51.4   |
| Rajasthan                                                                                    | 17.3   | 33.9   |
| Uttar Pradesh                                                                                | 12.9   | 22.3   |
| Uttarakhand                                                                                  | 24.9   | 46.6   |
| Jharkhand                                                                                    | 15.3   | 28.2   |
| Chhattisgarh                                                                                 | 30.3   | 45     |
| Odisha                                                                                       | 36.5   | 60.8   |
| <b>Table 4.2: Percentage of mothers who are protected from neonatal tetanus and anaemia.</b> |        |        |

### **Mother and Child Protection (MCP) card in the EAG states.**

The MCP Card functions as a tool for imparting information and education to mothers and families regarding diverse aspects of maternal and childcare. Furthermore, it links maternal and childcare as part of an uninterrupted care system, which is facilitated by the Integrated Child Development Services (ICDS) program of the Ministry of Women and Child Development and the National Rural Health Mission (NRHM) of the Ministry of

Health and Family Welfare. Between NFHS-4 and NFHS-5, most states reported a significant increase in the proportion of registered pregnancies where mothers were issued a mother and Child Protection (MCP) card and other healthcare professionals within two days of delivery. Bihar, Rajasthan, Uttar Pradesh, and Chhattisgarh demonstrated notable progress, while Madhya Pradesh and Jharkhand exhibited moderate advancement. Uttarakhand was the only state that experienced a minor decline between NFHS-4 and NFHS-5, and Odisha showed a slight improvement but still achieved an exceptionally high rate compared to other states. Overall, there is a positive trend of improvement across most of India's states.

| State                                                                                                                                             | NFHS-4 | NFHS-5 |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
| % of registered pregnancies for which the mother received Mother and Child Protection (MCP) card other health personnel within 2 days of delivery |        |        |
| Bihar                                                                                                                                             | 79.9   | 89.5   |
| Madhya Pradesh                                                                                                                                    | 92.2   | 96.7   |
| Rajasthan                                                                                                                                         | 92.3   | 98.1   |
| Uttar Pradesh                                                                                                                                     | 86.5   | 92.1   |
| Uttarakhand                                                                                                                                       | 93.4   | 91.4   |
| Jharkhand                                                                                                                                         | 86.9   | 91.5   |
| Chhattisgarh                                                                                                                                      | 91.4   | 97.5   |
| Odisha                                                                                                                                            | 97.2   | 99.4   |
| <b>Table 4.3: Percentage of registered pregnancies for which the mother received Mother and Child Protection (MCP) card.</b>                      |        |        |

#### **ANM-Auxiliary Nurse Midwife, LHV-Lady Health Visitor in the EAG states.**

Odisha (88.4%) and Rajasthan (85.3%) were the states with the highest coverage of post-delivery care in NFHS-5, while Bihar (57.3%) had the least. Although Bihar has made significant progress, it still lags behind other states, highlighting the need for further improvements. Jharkhand was the sole state to experience a decrease in postnatal care provision (69.1-66.7%). The most notable increase in postnatal care provision within two days of delivery was observed in Madhya Pradesh (NFHS-4=54.9%; NFHS-5=83.5%), followed by Rajasthan (NFHS-4=63.7%; NFHS-5=85.3%) and Uttarakhand (NFHS-4=54.8%; NFHS-5=78%). Jharkhand was the only state to experience a reduction in postnatal care.

| State                                                                                                                          | NFHS-4 | NFHS-5 |
|--------------------------------------------------------------------------------------------------------------------------------|--------|--------|
| % of mothers who received postnatal care from a doctor/nurse/LHV/ANM/midwife/ other health personnel within 2 days of delivery |        |        |
| Bihar                                                                                                                          | 42.3   | 57.3   |
| Madhya Pradesh                                                                                                                 | 54.9   | 83.5   |

|                                                                                                                           |      |      |
|---------------------------------------------------------------------------------------------------------------------------|------|------|
| Rajasthan                                                                                                                 | 63.7 | 85.3 |
| Uttar Pradesh                                                                                                             | 54   | 72   |
| Uttarakhand                                                                                                               | 54.8 | 78   |
| Jharkhand                                                                                                                 | 69.1 | 66.7 |
| Chhattisgarh                                                                                                              | 63.6 | 84   |
| Odisha                                                                                                                    | 73.2 | 88.4 |
| <b>Table 4.4: Percentage of women who received post-natal care. *ANM-Auxiliary Nurse Midwife, LHV-Lady Health Visitor</b> |      |      |

### **Children who received care at health centre and by skilled health care personnel in the EAG states.**

The proportion of children receiving healthcare from skilled personnel at health centres has increased in all states from NFHS-4 to NFHS-5, indicating better healthcare and awareness. The most notable improvements were seen in Madhya Pradesh (2.5%-9.4%) and Chhattisgarh (4.7%-9.8%), which could be attributed to enhanced healthcare infrastructure and programs aimed at improving maternal and child healthcare in these regions. Rajasthan and Uttarakhand showed relatively minor improvements, suggesting the need for continued efforts and interventions in these areas.

The data demonstrates a significant improvement in the percentage of children receiving postnatal care from healthcare personnel within 48 hours of delivery across all states between NFHS-4 and NFHS-5. Odisha has the highest percentage of children receiving postnatal care in NFHS-5 at 88.1%, followed by Rajasthan at 86.9%. Bihar, despite having the lowest percentage in NFHS-4, has made remarkable progress in NFHS-5 (NFHS-4=10.8%; NFHS-5=59.3%). The change in percentage ranges from 45.8% to 66.4%, with Madhya Pradesh recording the most significant increase (66.4%) and Uttar Pradesh with the least increase (24.4% - 70.2%).

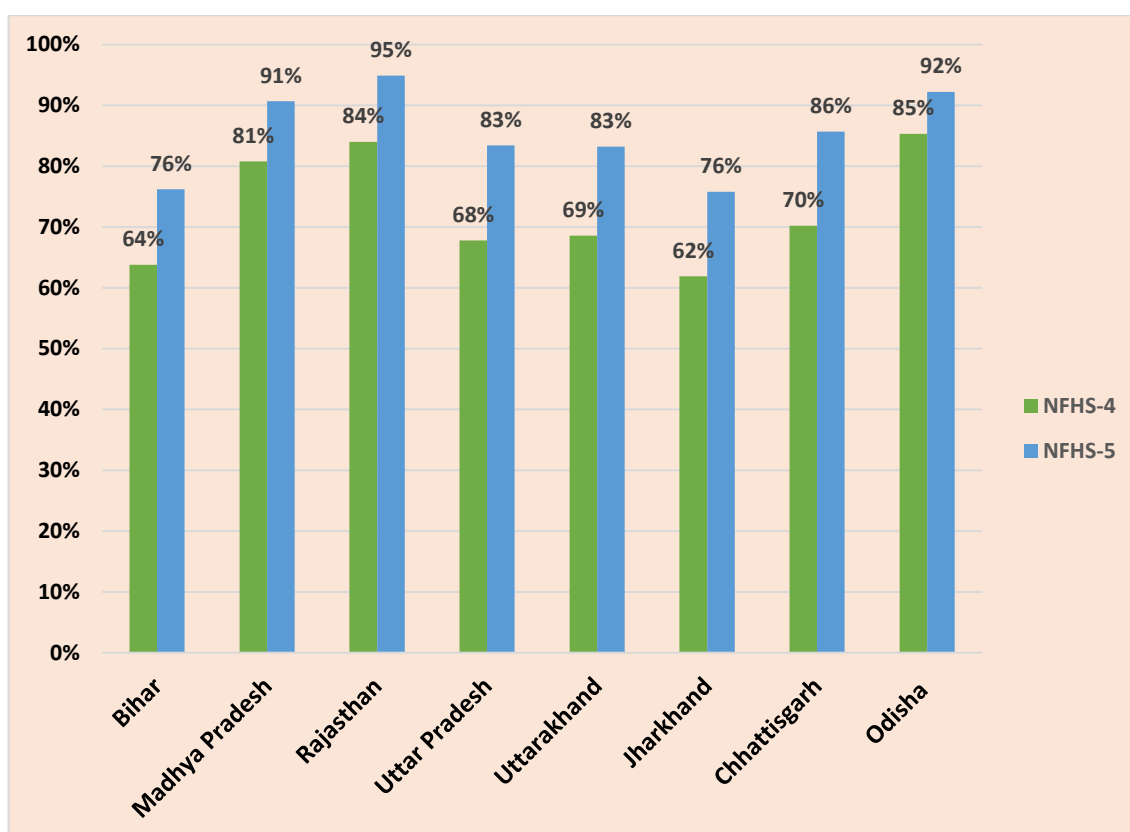
| State                                                                                                | NFHS-4 | NFHS-5 |
|------------------------------------------------------------------------------------------------------|--------|--------|
| % of children born at home who were taken to a health facility for check-up within 24 hours of birth |        |        |
| Bihar                                                                                                | 1.8    | 2.9    |
| Madhya Pradesh                                                                                       | 2.5    | 9.4    |
| Rajasthan                                                                                            | 1.2    | 1.3    |
| Uttar Pradesh                                                                                        | 0.8    | 2.4    |
| Uttarakhand                                                                                          | 2.4    | 3.1    |
| Jharkhand                                                                                            | 2.2    | 3.4    |
| Chhattisgarh                                                                                         | 4.7    | 9.8    |
| Odisha                                                                                               | 6.9    | 10.5   |
|                                                                                                      |        |        |

| % of children who received postnatal care after birth from a doctor/nurse/LHV/ANM/ midwife/other health personnel within 2 days of delivery |      |      |
|---------------------------------------------------------------------------------------------------------------------------------------------|------|------|
| Bihar                                                                                                                                       | 10.8 | 59.3 |
| Madhya Pradesh                                                                                                                              | 17.5 | 83.9 |
| Rajasthan                                                                                                                                   | 22.6 | 86.9 |
| Uttar Pradesh                                                                                                                               | 24.4 | 70.2 |
| Uttarakhand                                                                                                                                 | 19.3 | 78.9 |
| Jharkhand                                                                                                                                   | 21.7 | 68.7 |
| Chhattisgarh                                                                                                                                | 34.2 | 81.7 |
| Odisha                                                                                                                                      | 29.5 | 88.1 |
| <b>Table 4.5: Percentage of Children who received care at health centre and by skilled health care personnel.</b>                           |      |      |

## **Delivery Care in the EAG states**

### **Institutional delivery in the EAG states**

Ensuring proper maternal and infant care is crucial for reducing the infant and maternal mortality rate, making institutional births essential. The EAG states have all demonstrated progress in conducting institutional delivery, as shown by the comparison between NFHS-4 and NFHS-5, indicating that healthcare facilities and awareness of institutional deliveries have improved. In NFHS-5, Rajasthan boasts the highest percentage of institutional births (94.9%), followed by Madhya Pradesh (90.7%) and Odisha (92.2%), indicating that these three states have robust healthcare systems for maternal care. Although Jharkhand recorded the lowest percentage of institutional births (61.9%) in NFHS-4, it saw a significant increase in NFHS-5 (75.8%). However, along with Bihar, they still rank among the lower percentage of institutional births in NFHS-5. Uttar Pradesh (67.8% to 83.4%) and Uttarakhand (68.6% to 83.2%) have made noteworthy strides in increasing institutional births, reflecting their commitment to improving healthcare infrastructure.

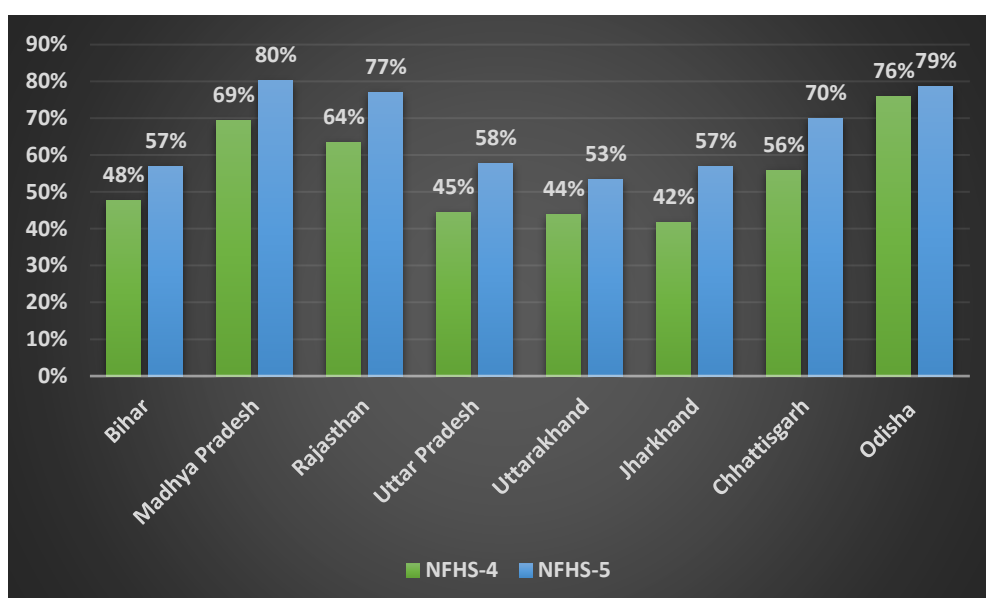


**Figure 4.1: Institutional delivery in the EAG states.**

The incidence of institutional deliveries has recorded a favourable escalation in all states from NFHS-4 to NFHS-5, signifying an enhancement in healthcare amenities and consciousness. Nevertheless, Bihar and Jharkhand necessitate emphasizing more on amplifying the proportion of institutional deliveries as it stays comparatively low in these states. It is imperative to persist in endeavours to stimulate institutional deliveries in all states to guarantee better outcomes of maternal and infant health.

#### **Institutional births in public facility in the EAG states**

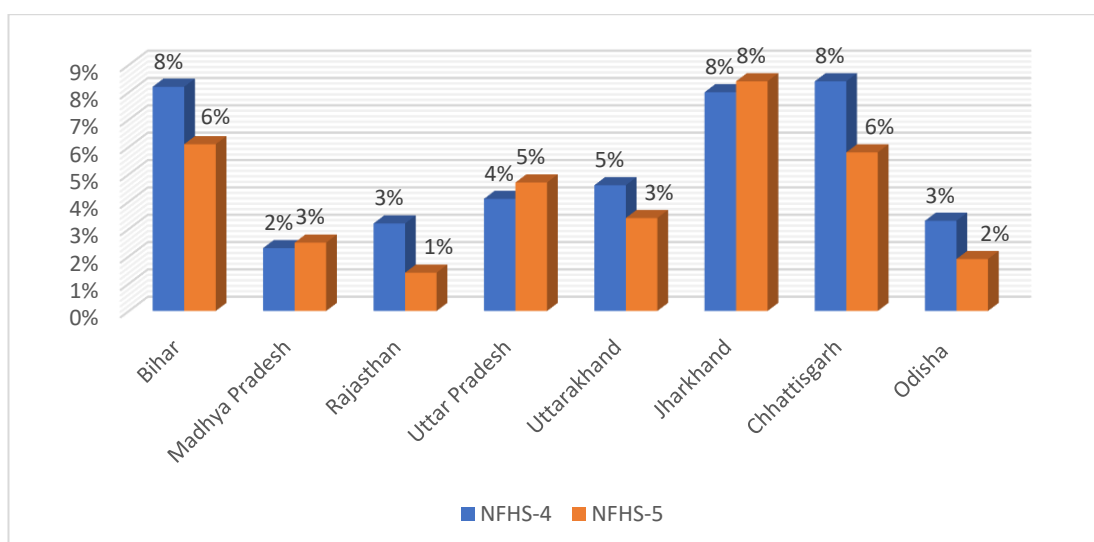
The communal amenities in all the cited states have experienced a surge in the proportion of institutional deliveries from NFHS-4 to NFHS-5, denoting an enhancement in healthcare infrastructure and availability. In public facilities, Odisha registered the highest proportion of institutional births, trailed by Madhya Pradesh in both NFHS-4 and NFHS-5. Jharkhand and Uttarakhand recorded the least percentage of institutional births in communal amenities. While some states have displayed more notable advancements than others, the general trend is affirmative.



**Figure 4.2: Percentage of institutional births in public facilities**

#### **Home births that were conducted by skilled health personnel.**

The percentage of home deliveries conducted by skilled health personnel has decreased in most states, except in Madhya Pradesh, Uttar Pradesh, and Jharkhand. Chhattisgarh and Bihar have shown a significant decrease in the percentage of home deliveries conducted by skilled health personnel.

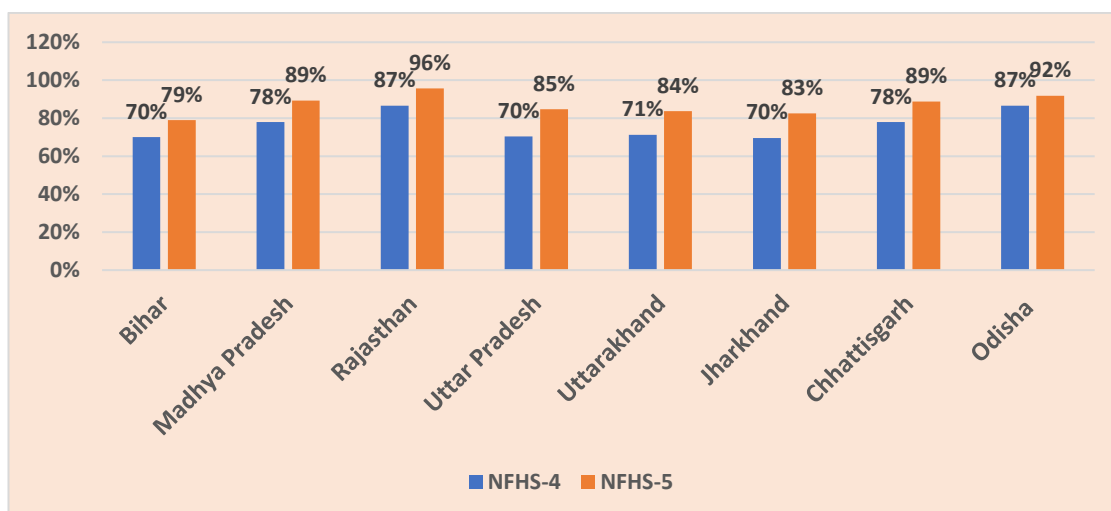


**Figure 4.3: Percentage of home deliveries conducted by skilled health personnel.**

#### **Births attended by skilled health personnel in the EAG states.**

The provision of maternal healthcare services has witnessed an overall enhancement across the mentioned states from NFHS-4 to NFHS-5, indicating progress in securing safer childbirth practices, raising awareness, and improving accessibility to high-quality

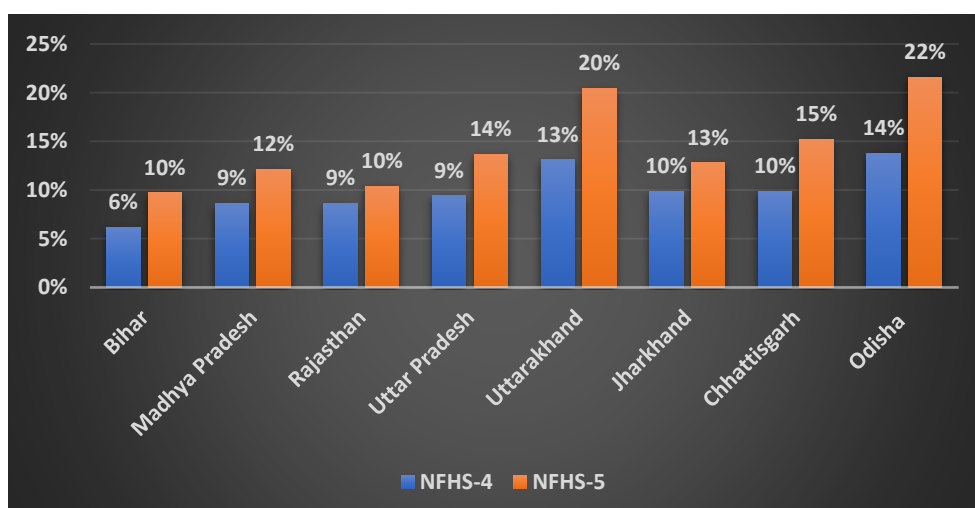
healthcare services, as evidenced by the increased proportion of births attended by skilled healthcare personnel. Uttar Pradesh and Jharkhand have shown the most significant improvement in the proportion of births attended by skilled healthcare personnel between the two surveys. Rajasthan has achieved the highest percentage of births attended by skilled healthcare personnel (95.6%) during NFHS-5, while Bihar has reported the lowest percentage (79.0%).



**Figure 4.4: Percentage of births attended by skilled health personnel.**

#### **Births delivered by caesarean section in the EAG states.**

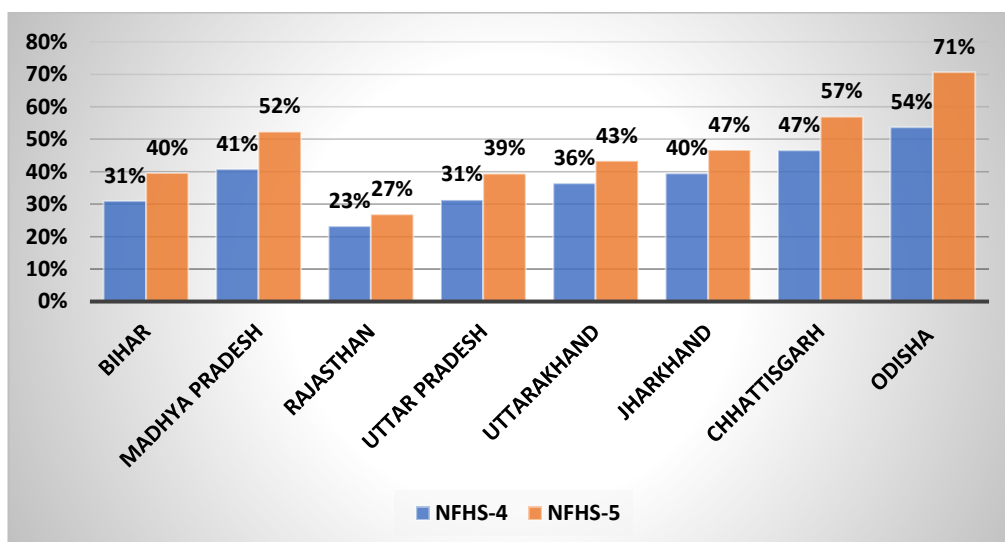
All states have shown an increase in the percentage of caesarean section births from NFHS-4 to NFHS-5. Bihar had the lowest percentage of caesarean section births in both NFHS-4 and NFHS-5, while Odisha had the highest percentage in NFHS-5. Odisha had the highest increase in the percentage of caesarean births, whereas Rajasthan had the smallest increase. Uttarakhand and Odisha had the most significant increase in caesarean section births.



**Figure 4.5: Percentage of Births delivered by caesarean section.**

**Births in a private health facility that were delivered by caesarean section in the EAG states.**

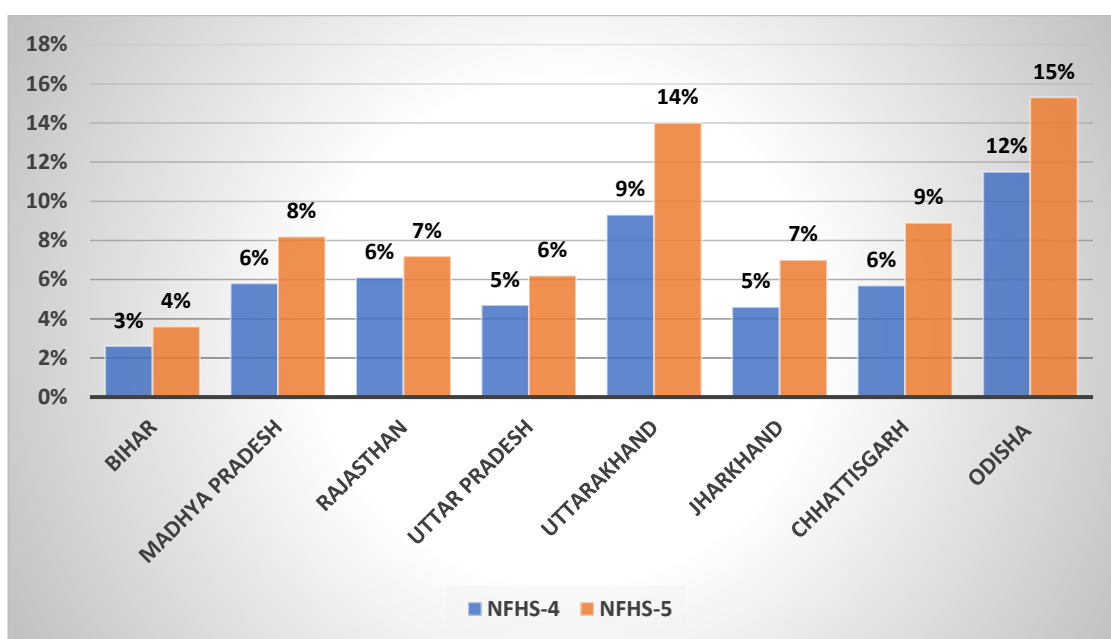
There has been an escalation in the proportion of caesarean sections carried out in private facilities in all states from NFHS-4 to NFHS-5. During the NFHS-5 period, Odisha recorded the highest proportion of caesarean sections in private facilities. The state also showed the most significant increase in caesarean section procedures, rising from 53.7% to 70.7%. Rajasthan, on the other hand, had the lowest increase in caesarean section procedures, going from 23.2% to 26.9%. During the NFHS-4 period, Rajasthan had the smallest percentage of caesarean sections in private facilities, which stood at 23.2%. Across all states, there was a notable surge in the number of caesarean section procedures in private facilities between the NFHS-4 and NFHS-5 periods.



**Figure 4.6: Percentage of caesarean section in private facilities**

**Births in a public health facility that were delivered by caesarean section in the EAG states.**

The proportion of caesarean deliveries in government healthcare centres has witnessed a surge in all the mentioned states. As per the statistics, Uttarakhand reported the highest spike in the percentage of caesarean deliveries in public health facilities, whereas Bihar had the least growth. In general, there is an evident upward trend in the proportion of caesarean sections in the EAG states.



**Figure 4.7: Percentage of caesarean section public health facilities**

| Table 4.6 Delivery Care                                           |        |        |
|-------------------------------------------------------------------|--------|--------|
| State                                                             | NFHS-4 | NFHS-5 |
| <b>% of institutional birth</b>                                   |        |        |
| Bihar                                                             | 63.8   | 76.2   |
| Madhya Pradesh                                                    | 80.8   | 90.7   |
| Rajasthan                                                         | 84     | 94.9   |
| Uttar Pradesh                                                     | 67.8   | 83.4   |
| Uttarakhand                                                       | 68.6   | 83.2   |
| Jharkhand                                                         | 61.9   | 75.8   |
| Chhattisgarh                                                      | 70.2   | 85.7   |
| Odisha                                                            | 85.3   | 92.2   |
| <b>% of institutional births in public facilities</b>             |        |        |
| Bihar                                                             | 47.6   | 56.9   |
| Madhya Pradesh                                                    | 69.4   | 80.2   |
| Rajasthan                                                         | 63.5   | 77     |
| Uttar Pradesh                                                     | 44.5   | 57.7   |
| Uttarakhand                                                       | 43.8   | 53.3   |
| Jharkhand                                                         | 41.8   | 56.8   |
| Chhattisgarh                                                      | 55.9   | 70     |
| Odisha                                                            | 75.8   | 78.7   |
| <b>% of home deliveries conducted by skilled health personnel</b> |        |        |
| Bihar                                                             | 8.2    | 6.1    |
| Madhya Pradesh                                                    | 2.3    | 2.5    |
| Rajasthan                                                         | 3.2    | 1.4    |
| Uttar Pradesh                                                     | 4.1    | 4.7    |
| Uttarakhand                                                       | 4.6    | 3.4    |
| Jharkhand                                                         | 8      | 8.4    |
| Chhattisgarh                                                      | 8.4    | 5.8    |

|                                                         |      |      |
|---------------------------------------------------------|------|------|
| Odisha                                                  | 3.3  | 1.9  |
| <b>% of births attended by skilled health personnel</b> |      |      |
| Bihar                                                   | 70   | 79   |
| Madhya Pradesh                                          | 78   | 89.3 |
| Rajasthan                                               | 86.6 | 95.6 |
| Uttar Pradesh                                           | 70.4 | 84.8 |
| Uttarakhand                                             | 71.2 | 83.7 |
| Jharkhand                                               | 69.6 | 82.5 |
| Chhattisgarh                                            | 78   | 88.8 |
| Odisha                                                  | 86.5 | 91.8 |
| <b>% of Births delivered by caesarean section</b>       |      |      |
| Bihar                                                   | 6.2  | 9.7  |
| Madhya Pradesh                                          | 8.6  | 12.1 |
| Rajasthan                                               | 8.6  | 10.4 |
| Uttar Pradesh                                           | 9.4  | 13.7 |
| Uttarakhand                                             | 13.1 | 20.4 |
| Jharkhand                                               | 9.9  | 12.8 |
| Chhattisgarh                                            | 9.9  | 15.2 |
| Odisha                                                  | 13.8 | 21.6 |
| <b>% of caesarean section in private facilities</b>     |      |      |
| Bihar                                                   | 31   | 39.6 |
| Madhya Pradesh                                          | 40.8 | 52.3 |
| Rajasthan                                               | 23.2 | 26.9 |
| Uttar Pradesh                                           | 31.3 | 39.4 |
| Uttarakhand                                             | 36.4 | 43.3 |
| Jharkhand                                               | 39.5 | 46.7 |
| Chhattisgarh                                            | 46.6 | 57   |
| Odisha                                                  | 53.7 | 70.7 |
| <b>% of caesarean section public health facilities</b>  |      |      |
| Bihar                                                   | 2.6  | 3.6  |
| Madhya Pradesh                                          | 5.8  | 8.2  |
| Rajasthan                                               | 6.1  | 7.2  |
| Uttar Pradesh                                           | 4.7  | 6.2  |
| Uttarakhand                                             | 9.3  | 14   |
| Jharkhand                                               | 4.6  | 7    |
| Chhattisgarh                                            | 5.7  | 8.9  |
| Odisha                                                  | 11.5 | 15.3 |
| Table 4.6 Percentage of delivery Care.                  |      |      |

## Educational Attainment

| State          | Median number of years of schooling completed |        |
|----------------|-----------------------------------------------|--------|
|                | NFHS-4                                        | NFHS-5 |
| Bihar          | 0.9                                           | 2.0    |
| Madhya Pradesh | 3.6                                           | 4.3    |
| Rajasthan      | 1.7                                           | 4.0    |
| Uttar Pradesh  | 3                                             | 4.3    |
| Uttarakhand    | 4.9                                           | 6.3    |
| Jharkhand      | 2.3                                           | 3.4    |
| Chhattisgarh   | 0.2                                           | 4.6    |
| Odisha         | 4                                             | 4.5    |

**Table 4.7 Educational Attainment of household population**

In general, there has been an uptick in the median duration of schooling completed in most states from NFHS-4 to NFHS-5. Greater educational attainment (as indicated by a higher median number of years of schooling) is typically linked to greater proportions of expectant mothers undergoing antenatal check-ups during the first trimester and receiving at least four antenatal care visits. Bihar, Madhya Pradesh, and Rajasthan are among the states that have witnessed an enhancement in both educational levels and the utilization of ANC services between the two surveys. Chhattisgarh has experienced a noteworthy escalation in educational levels.

Generally, attaining higher levels of learning is linked with improved accessibility to and usage of healthcare facilities, such as antenatal care (ANC) and early enrolment. It is probable that women with advanced education would have higher rates of ANC visits in the first trimester and a greater percentage of registered pregnancies.

Attaining knowledge plays a vital role in empowering women and enhancing their overall health and well-being, which includes maternal health. Obtaining higher levels of knowledge is often associated with lower MMR, as knowledgeable women are more likely to have better understanding about maternal health, access healthcare facilities, and make informed decisions regarding their reproductive health.

## Chapter 5: Discussions

### 5.1 Discussion

The study's findings offer valuable insights into the state of maternal health in the EAG states of India. The results of the research indicate that the EAG states have made significant progress in improving maternal health indicators, especially in antenatal care and postnatal care within two days of delivery. The improvement in maternal care indicators can be attributed to increased investment in healthcare infrastructure, greater utilization of skilled healthcare personnel, and targeted public health interventions such as the Janani Suraksha Yojana and Pradhan Mantri Surakshit Matritva Abhiyan. The study supports the findings of other studies that have reported progress in maternal health indicators among the EAG states, such as Kulkarni et al. (2021), Das et al. (2021), and Yadav et al. (2019). However, our study provides a more comprehensive and up-to-date analysis of the situation in these states as we compared two consecutive National Family Health Surveys (NFHS-4 and NFHS-5). The percentage of expectant mothers who received antenatal care (ANC) in the first trimester increased between NFHS-4 and NFHS-5. The highest increase of 20 percentage points was observed in Madhya Pradesh. In contrast, there was a slight decrease in first trimester ANC visits in Chhattisgarh.

Kulkarni et al. (2021) found that the percentage of pregnant women with anaemia increased in 17 states in NFHS-5 compared to NFHS-4. The study supports this finding and highlights the need for interventions that address anaemia in pregnant women in the EAG states. Regarding institutional births, Kulkarni et al. (2021) found that 14 states had an institutional birth rate of over 90%. However, the study identified some EAG states with institutional birth rates below 79%, indicating the need to reinforce strategies that encourage institutional births in these areas.

In India, efforts to address anaemia primarily focus on pregnant women, with regular provision of TT and IFA tablets to maintain pregnancy health and well-being. However, NFHS-4 survey results showed low consumption of IFA tablets in EAG states, with only half of women protected against anaemia compared to NFHS-5. To address this, a systematic review recommends providing routine IFA to adolescents, particularly in malaria-prone areas, which many EAG states are susceptible to. Regular IFA provision and improved consumption through advocacy and communication measures are crucial for maternal and child health, as haemoglobin levels play a significant role. Regular ANC check-ups are also emphasized by WHO guidelines. Das et al. (2021) conducted a

comparative analysis of NFHS-3 and NFHS-4 data to evaluate maternal health in EAG states, revealing slow progress in improving maternal health indicators, with education and domestic violence identified as obstacles. The study called for strengthened health systems, political will, and community mobilization to improve maternal health outcomes in these states. Significant improvements in legal marriage have been observed in Chhattisgarh, Madhya Pradesh, and Rajasthan, with decreases in underage marriage incidence among women and men. Institutional births in India have significantly increased, with a more than 10% increase in Bihar, Chhattisgarh, and Uttar Pradesh. Over 91% of districts had more than 70% of births in health facilities in the last five years.

Yadav et al. (2021) conducted a comparative analysis on maternal healthcare service utilization in selected EAG states, highlighting the significant influence of factors such as female education, media exposure, women's autonomy, and economic status. The study emphasized the need to expedite implementation of national and Sustainable Development Goals at the grassroots level in EAG states.

This study supports the conclusions of Meh et al. (2021) on the reduction of maternal mortality ratio in India over the past two decades but highlights the persistently high MMR in certain EAG states, indicating the need for targeted efforts to further decrease it in these regions.

Based on the data obtained from NFHS-4 and 5, private hospitals have a significantly higher rate of Caesarean Section (CS) deliveries compared to the benchmarks established by the WHO. This implies that there might be an excessive use of CS deliveries and questionable evaluation of cases. This trend is particularly noticeable in Bihar and MP. It is plausible that private hospitals prioritize CS deliveries for financial gain. Conversely, the low rate of CS deliveries in the public sector might suggest a scarcity of qualified healthcare professionals, including obstetricians and anaesthetists. It is imperative to address this issue by deploying adequate numbers of specialists to ensure that CS deliveries are carried out when necessary.

All EAG states have demonstrated improvement in SDG indicators in NFHS-5. The significant involvement of married women in three household decisions (related to healthcare for themselves, making significant household purchases, and visiting family or relatives) indicates that their participation in decision-making is meaningful. NFHS-5 provides crucial information on key indicators that can be used to monitor the country's progress towards the Sustainable Development Goals (SDGs). The baseline values for a

considerable number of SDG indicators were based on estimates from NFHS-4 (2015-16), and NFHS-5 will furnish data for approximately 34 SDG indicators at different levels.

## **5.2 Limitations and Strengths**

The strengths of the study include the large sample size, which provides reliable estimates for most indicators, and the use of surveys that represent the states' populations. Furthermore, the comparative analysis enables an understanding of the progress made between two survey rounds.

Nonetheless, there are certain constraints in our research that should be acknowledged. To begin with, we utilized secondary data sources that may not encompass all the subtleties, causes, and intricacies in maternal health outcomes throughout various states. Additionally, the study is confined to the EAG states in India, and therefore, the findings may not be appropriate for all states or the entire nation. Nevertheless, these limitations do not diminish the significance of the investigation, as it provides valuable perspectives into the maternal and child health indicators in EAG States of India.

Overall, the findings of these research add to India's current knowledge base on mother and child health and emphasise the need of tackling inequities and problems. Although the EAG states have achieved great gains in maternal health, inequities remain, and persistent efforts are required to further enhance mother health in these regions. Future study should look at current trends and factors that influence the success or failure of maternal health programmes in these states.

## **Chapter 6: Conclusion**

### **6.1 Conclusion:**

Finally, by comparing state data from the National Family Health Survey (NFHS)-4 and NFHS-5, this dissertation attempted to give a complete study of the maternal health condition in the Empowered Action Group (EAG) states of India. Significant changes and trends in maternal health indices were found, reflecting both success and persisting problems.

The comparison of NFHS-4 and NFHS-5 data revealed improvements in a number of critical maternal health indicators across the EAG states. Maternal mortality ratios have decreased, prenatal care coverage has increased, institutional delivery rates have increased, and availability to competent birth attendants has improved. These advances were made possible by a variety of efforts and interventions undertaken by the government, civil society organisations, and healthcare professionals to improve maternal health services.

However, despite the progress made, the analysis also identified areas that still require attention and intervention. The continuance of high maternal mortality ratios in certain EAG states is a major source of worry, necessitating specific strategies and targeted expenditures to address the underlying causes and enhance the quality and accessibility of maternal healthcare services.

Overall, this study contributes to current information by providing a comparative analysis of maternal health across India's EAG states. It emphasises success in specific measures while highlighting areas that require concentrated attention and assistance. The findings highlight the importance of continuous efforts, focused interventions, and cross-sector cooperation to enhance maternal health outcomes and reduce inequalities in the EAG states.

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