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MATERNAL MORTALITY TRENDS AND INTERVENTIONS: A COMPREHENSIVE STUDY OF HOJAI DISTRICT, ASSAM, INDIA

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Abstract

Maternal health has long been a critical focus in public welfare, as it impacts both the well-being of mothers and their children. India has achieved commendable progress in lowering the MMR in the recent past. Assam located in the north-eastern part of India has recorded a significant decrease in the MMR, evidencing state commitment to a healthcare strategic plan, facility expansion and societal mobilisation. This research therefore seeks to assess the situation of maternal health in the state of India especially in the region of Assam but more specifically for the district of Hojai by unravelling both primary and secondary data.

Keywords: Maternal health, maternal mortality ratio.

Introduction

Women are part and parcel of society and take up responsibility as mothers, sisters, daughters and most importantly as economic and reproductive beings. As per data gathered about 287000 women passed away worldwide in 2020 during pregnancy and within one week postpartum, and 25220 women lost their lives in India due to pregnancy-related complications [1,2]. Pregnancy-complicating conditions arise from other illnesses the mother had before getting pregnant. The evaluation of the health status of the women involves factors including expectation of life, rate of infant mortality, birth rate, death rate, MMR, DALYs and the prevalence of specific diseases such as malaria [3]. MMR measures the maternal mortality ratio in terms of the number of deaths per 100000 live births [4].

In 2017, there were 24 million births in India; with 35,000 maternal deaths and MMR of 145 per 100,000 live births which accounts for 12% of the global maternal mortality [6,7]. A high incidence of maternal mortality entails high losses in the lives and social well-being of many people. Therefore, reducing MMR faster is an international issue [6,7] According to WHO, maternal mortality is the death of a woman while pregnant or within 42 days of delivery or abortion from a pregnancy-related cause [4]. The rate of maternal mortality is an important one that defines the health of women in a given country. Hence, out of these set indicators, measuring women's health is based on the Maternal Mortality Ratio.

Objectives of the study

To assess the current maternal health indicators in India, with a particular focus on Assam, it is essential to analyze and compare maternal mortality ratios (MMR) both within this state and across the rest of the country. This involves a detailed examination of MMR across various districts of Assam to identify regional disparities and assess the effectiveness of local health interventions. Additionally, estimating the MMR and the proportion of high-risk pregnancies and maternal obstetric (MO) cases within the defined study area will provide valuable insights into the specific challenges faced by this region. Such analysis will not only highlight areas of concern but also help in tailoring targeted strategies to improve maternal health outcomes in Assam and contribute to national health goals

The MMR has dropped significantly across the globe from 342 in the year 2000 to 211 in 2017 the maternal mortality has lowered worldwide ranging from 451000 to 295000 during the same period [5]. This means that about 40 per cent of this absolute reduction was a result of reduced maternal mortality in India [6]. According to “MMEM data of Maternal Mortality Estimation Inter-Agency Group UN” in the year of 2020 The MMR of India has declined from 384 per 100000 live births in 2000 to 103 in 2020 While the global MMR has decreased from 339 per 100000 LB in the year 2000 to 223 in 2020. The saving in the number of “Maternal Mortality Rates, MMR” in all the countries combined in the period under review, 2000-2020 is 2 years hence demonstrating that it has improved. The MMR figures however depict the fact that the MMR of Nigeria has only improved to 07% while that of India has improved by 6.36 % which is way higher than the global average drop which according to report stands at 28.

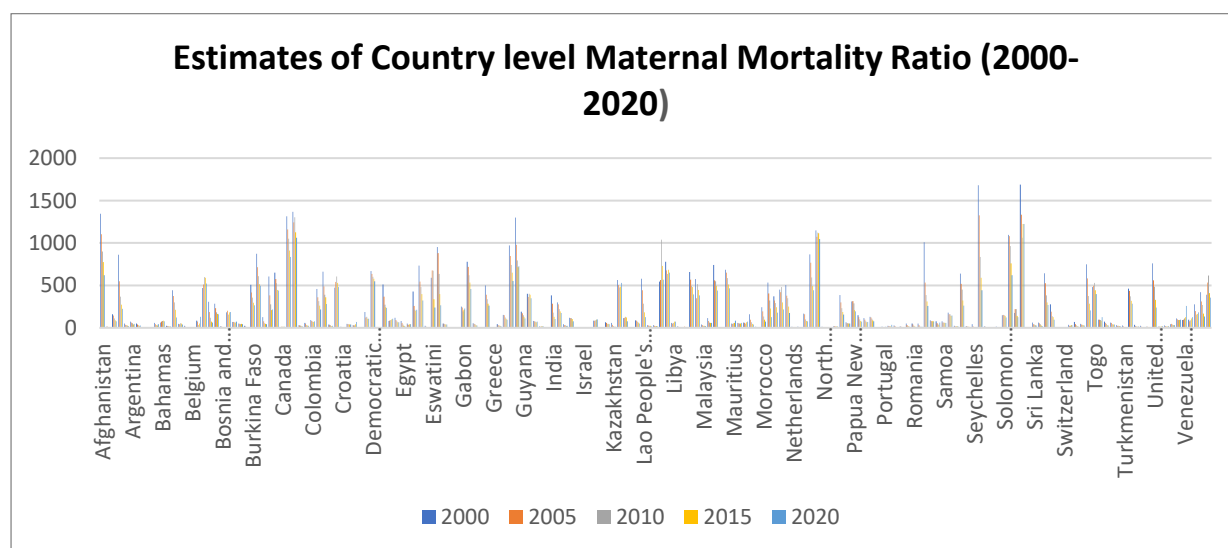


Figure 1. Estimates of Country level Maternal mortality Ratio (2000-2020)

(Source: “WHO, UNICEF, UNFPA, World Bank Group and UNPD (MMEIG) - February 2020”)

The Government of India has aligned with the United Nations Sustainable Development Goals and set an aim of attaining Sustainable Development Goals to reduce the MMR to less than 70 per 100,000 live births by the year 2030. To accomplish this goal, it is crucial to get the specifics of the count for Maternal Deaths and determine the leading causes of the same at a sub-national level. As in numerous other countries where maternal mortality is high, India's Civil Registration System and Vital Statistics record only a portion of births, deaths and other vital events. However, in developing countries, especially the rural area the figure is exaggerated, especially for maternal deaths. Moreover, there are issues of equity, which are evident by the existing gap between states and even within states as well as by impacts on vulnerable populations including minorities and tribal groups [5]. India uses SR to track fertility and mortality by Sample Registration System with one million sample Households with nationwide coverage for more than five decades [5]. According to the NFHS-3 report, the MMR in India was 178 per 100,000 live births which was estimated for 2010-2012. As per UN estimate, there were 287000 maternal deaths in the world in 2010 of which 19 % occurred in India [8]. As depicted in table-2, between 2016 and 2018, the highest MMR was recorded in Assam (215) and then Uttar Pradesh/Uttarakhand (192). Maharashtra and Kerala had the lowest MMR rates 46 and 43 respectively. The MMR trends in Assam and Uttar Pradesh/Uttarakhand were 9 years behind the national trends throughout 2016-2018, and in Madhya Pradesh/Chhattisgarh, these were 6 years behind overall. Of the projected total of 23,800 maternal deaths in India for the year 2020, Uttar Pradesh/Uttarakhand contributed 7,600 maternal deaths followed by Bihar/Jharkhand 3,500 and Madhya Pradesh/Chhattisgarh 3,100 [5].

Methodology

Selection of the study area

Assam, spanning 45,294.26 square kilometers, is the 20th largest state in India by land area. It is divided into 27 districts and has an estimated population of over 3.12 crore, making up about 2.58% of India's total population. Hojai district, one of Assam's newer districts, has a population of 931,218, with 48.8% of its residents being female. The district has a population density of 885 people per square kilometer. Under the National Rural Health Mission (NRHM), Hojai is categorized into three Health Development Blocks: Jugijan BPHC, Lanka BPHC, and Kathiatoli BPHC (Hojai). Jugijan Block alone serves a population of 367,288, which constitutes nearly 40% of the district's total population.

The Jugijan BPHC has been divided into four sectors the Jugijan sector, the Hojai sector, the Nilbagan sector and the Dighaljar Sector. Each sector includes government as well as private hospitals and subcentres. Primary data relating to this study has been obtained from all pregnant women from the year 2022 to February 2024.

Data Sources

This research work hereby consist of primary as well as secondary sources of data collection. Primary data was gathered by administering questionnaires to the selected sample population of Jugijan BPHC. Secondary information was also collected in the form of reports and other publications put out by the Central and State governments at different time points.

Tools and Techniques:

To calculate the Maternal Mortality Ratio of the Jugijan Block Primary Health Centre we have applied the following formula as it is.

$$\text{“MD Maternal Mortality Ratio (MMR) = } \frac{\text{No. of Maternal deaths (MD)}}{\text{No. of Live Births}} \times 100000$$

In accordance with the objective of the study, tabular presentation and multiple bar diagram have been employed.

Maternal Mortality Ratio (MMR) of India during the last five years:

Since the information regarding maternal mortality and the stillbirth rate is current, it is available with the Ministry of Health and Family Welfare. Firstly, here we are going back to the .time period of 2014-2020, to look at the MMR; the “Maternal Mortality Ratio of India”. Given the “Sample Registration System SRS Report of the Registrar General of India, the Maternal Mortality Ratio” in India for the year 2014 to 2020 could be broken down as follows: That the MM Ratio in India has declined in its current numerical strength to 97 for the year 2018-20, down from that of 103 for the year 2017-19 as well as 130 for the year period of 2014-2016.

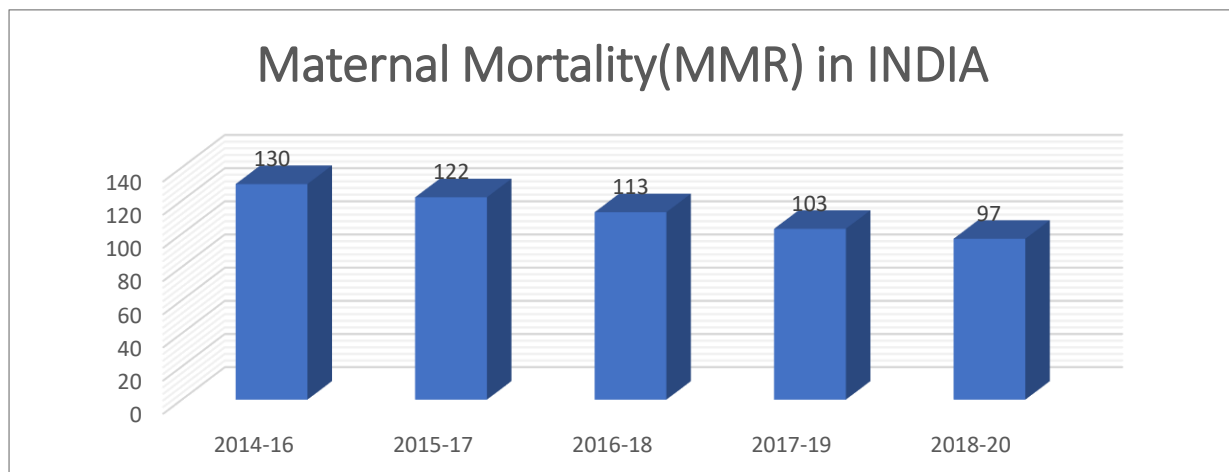


Figure 2: Maternal Mortality Ratio (MMR) of India during the years 2014-202

(Source: RGI: Special Bulletin on MMR in India 2018-2020)

Maternal Mortality Ratio in Assam and other States of India. In this paper, the MMR of Assam from 2014 to 2020 have been studied and then these were compared with other states of India. In order to develop a clear understanding of the level of MMR throughout the country and to monitor shifts in regional MMR, states have been categorized into three groups:

- **Empowered Action Group (EAG) States:** Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Orissa Rajasthan, Uttar Pradesh and Uttaranchal.
- **Southern States:** AP, Telangana, Karnataka, Kerala, and TN.

- **Other States:** All the other States and Union Territories [13,14].

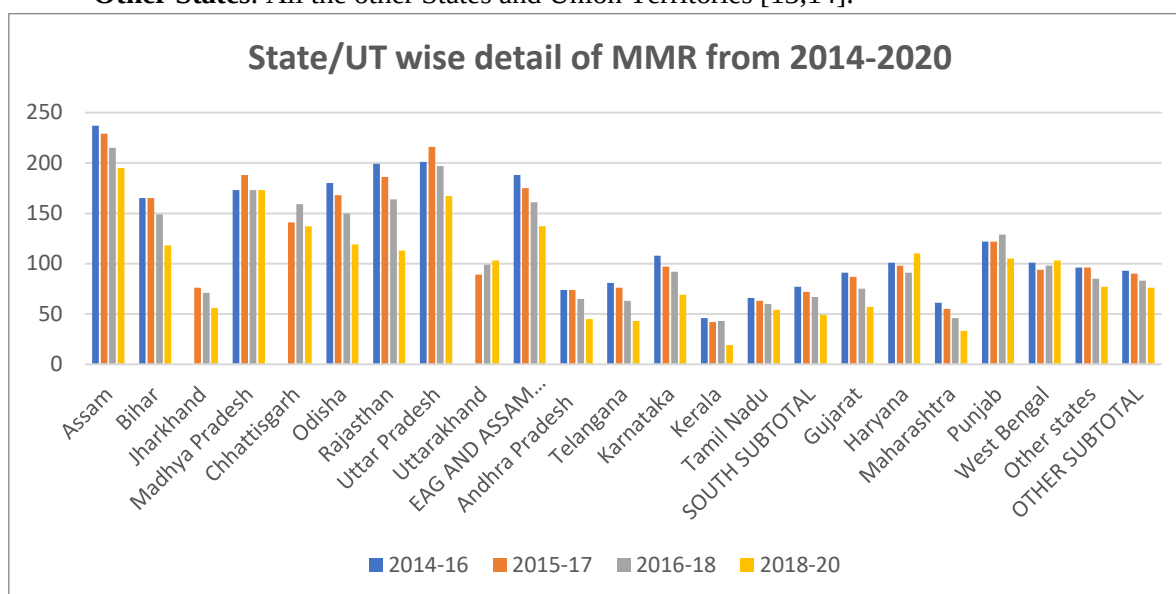


Figure 3. State/ UT Wise Details of Maternal Mortality Ratio (MMR)

(Source-“Sample Registration System (SRS) report of Registrar General of India (RGI”)

The ‘Special Bulletin on Maternal Mortality’ released by the Registrar General of India for the year 2018-2020 shows that the Maternal Mortality Ratio in Assam was 195 per lakh live births. However, it was somewhat better as compared to the previously recorded deaths; which were 215 for the period of 2016 to 2018. On a national level, there is a dramatic reduction in the MMR, which has reduced to 97 per lakh live births for the year 2018-20 from 130 of 2014-16[28]. According to the study, the MMR of Assam in the year 2005 was 480 per one lakh live births. The maternal death rate in 2022-23 (May-February) is 448 against 680 in 2021-22, thus indicating reduction of 232 deaths have been reduced. There were reduced cases of maternal death in Assam in the financial year 2023-24, however with 374 deaths compared to the 510 recorded in the financial year 2022-23. It depicts that the number of maternal deaths in 2023-24 has reduced by 136 or 26 per cent. A considerably smaller number is 7 per cent less than such deaths in 2022-23 [8].

District	MMR
Baksa	107
Barpeta	150
Bongaigaon	139
Cachar	431
Chirang	170
Darrang	120
Dhemaji	109
Dhubri	186
Dibrugarh	379
Dima Hasao	232
Goalpara	179
Golaghat	296
Hailakandi	169
Jorhat	170

Kamrup	409
Kamrup Metropolitan	143
Karbi Anglong	200
Karimganj	310
Kokrajhar	365
Lakhimpur	73
Morigaon	142
Nagaon	134
Nalbari	88
Sivasagar	141
Sonitpur	246
Tinsukia	81
Udalguri	225

Table 1: District wise estimates of MMR of Assam

(Source: Health Management Information System (HMIS) 2021)

Maternal Mortality Ratio in Selected Sample Area

For the trends of Maternal Mortality in the selected block, we have collected the data from a field survey of the Jugijan block from the year 2016- 2019 along with our field survey data of the year 2020-2024 and tabulated as follows.

Results and Discussion

SN	Year	Pregnancy recorded	Maternal Death (MD)	MMR
1	2016-17	8797	11	156
2	2017-18	8536	11	155
3	2018-19	8302	09	130
4	2020-21	7569	2	26.56
5	2021-22	7875	4	89.10
6	2022-23	7877	2	25.51
7	2023-24	6673	2	30.08

Table 2: Maternal Health in Survey Block 2016-2024, Assam

(Source: Authors' Field Survey and Reference no.16)

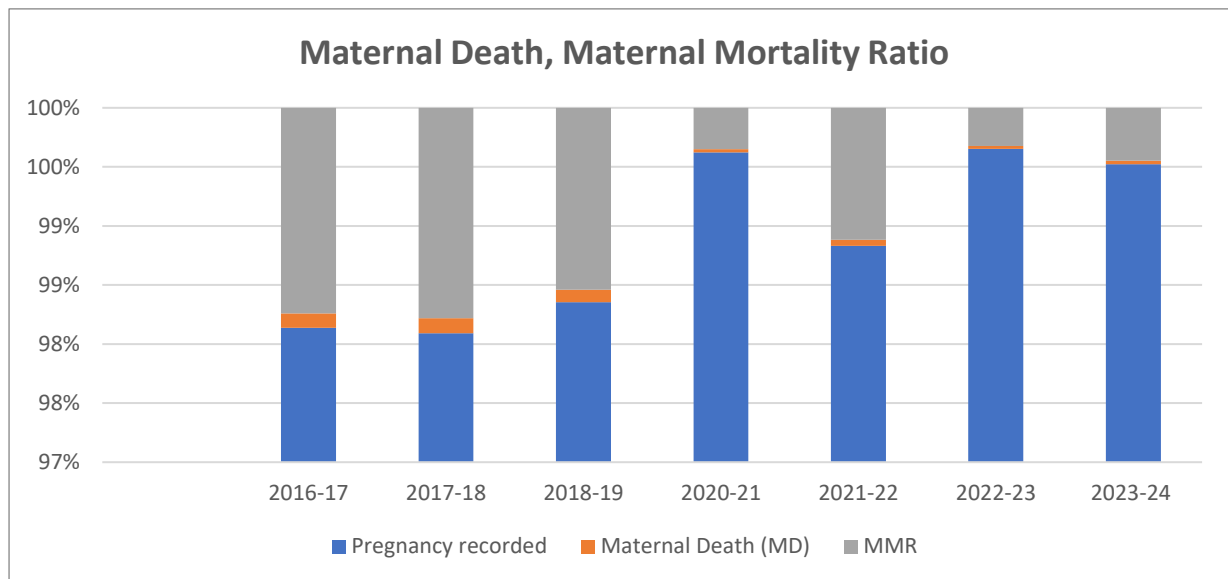


Figure4. Maternal Health in Jugijan BPHC 2016-2024, Assam

(Source: Table number 2)

SN	Year	Pregnancy recorded	High Risk pregnancies	Maternal Death (MD)	MMR
1	2020-21	7569	11	2	26.56
2	2021-22	7875	71	4	89.10
3	2022-23	7877	56	2	25.51
4	2023-24	6673	223	2	30.08

Table 3:Field Survey, Jugijan block

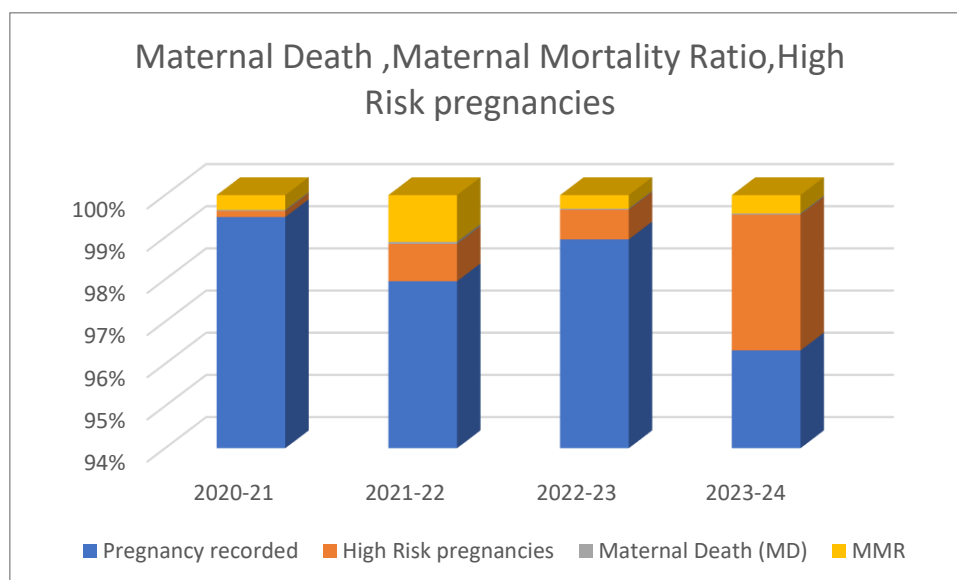
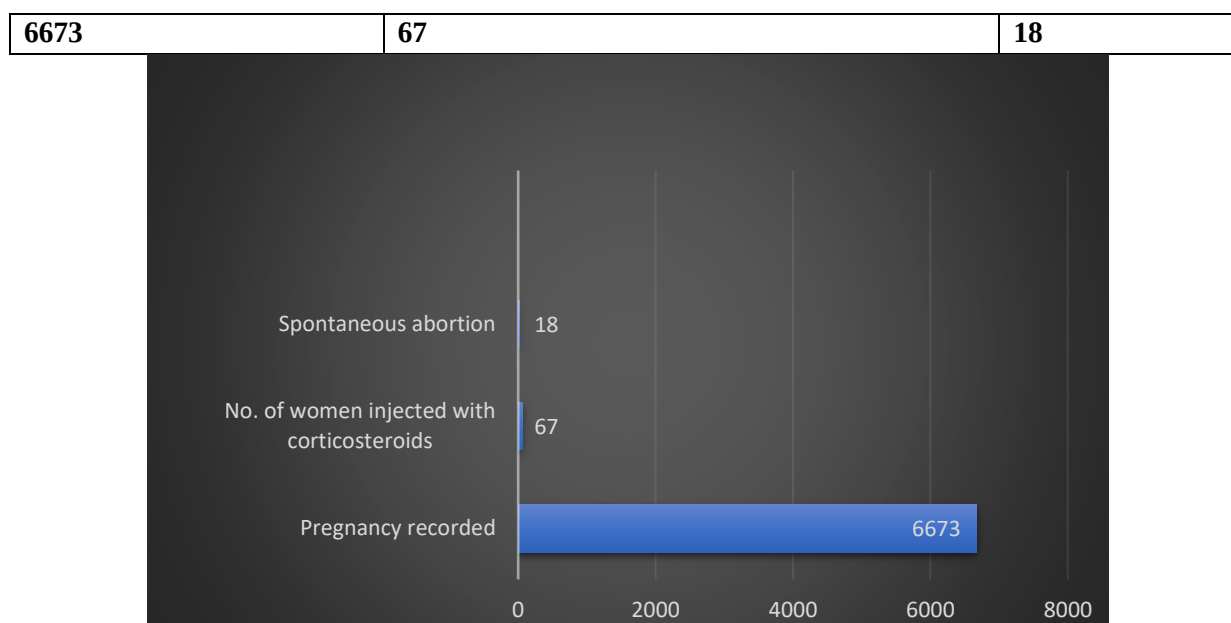


Figure 5: Maternal Death (MD), Maternal mortality Ratio (MMR), High Risk pregnancies

(Source: Table 3)

Pregnancy recorded	Number of women injected with corticosteroids	Spontaneous abortion
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**Table 4: Field survey Jugijan Block**

(Source-Table 4)

Discussion

This is the trend that has been observed in maternal deaths in the recent past. The total number of pregnancies and maternal deaths recorded in the period 2016-February 2024 has realised a cause for celebration through the reduction of maternal mortality. The percentage of high-risk pregnancies has risen in the year 2021-2022 and dropped in the year 2022-23. As is indicated in table no. 3 from April 2023- February 2024 there were 2 maternal mortality among 6673 live births hence $MMR=30.08$. The cause of death labelled on the record was Eclampsia and the other one was Septicaemia. From the table above, one can note that, for High-risk pregnancies there were a total of 223, out of these 152 had Pregnancy Induced hypertension while 71 women had anaemia. In preterm labour, 67 women received corticosteroids; There were 18 Patients with Spontaneous abortion.

Conclusion

The general observation of the decline in MMR in recent years in India and particularly in Assam also exemplifies the improvement in the state of maternal health. Some of the policy intervention strategies that have contributed to improving Skilled birth attendance, institutional deliveries, and quality maternal health care are Janani Suraksha Yojana (JSY), Janani Shishu Suraksha Karyakarm (JSSK), Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) and National Health Mission (NHM). All these have helped in the elimination of MMR disparities in different socio-economic and geographical contexts. However, challenges such as geographical, prohibition of cover by health facilities in particular regions and regions with limited health facilities and socio-cultural barriers are still an issue. To maintain and expand the progress made governments and other stakeholders need to increase investment in health facilities human resource development and public awareness. Thus, this study offers localized findings specific to the Hojai district in Assam for the development of context-specific policies and interventions that are imperative for bringing long-term qualitative changes in maternal health. Partnering high-quality maternal care to all women continues to be critical to improving the health of mothers across Assam and India.

Ethical considerations: Permission to conduct the study was obtained from the Institutional ethics committee of Assam University Diphu campus. Reference no. ADC/AD/Misc-IEC-I/2015/3032.

Conflict of interest: None declared

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