

**A Report on
National Family Health Survey (NFHS-5)
with Focus on Delivery Care**

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Introduction to Dataset

The National Family Health Survey (NFHS-5) 2019-21 factsheets provide comprehensive data on population, health, and nutrition in India and its states/union territories. The survey collects information at the district level on a range of indicators, including preschool education, disability, toilet access, death registration, menstrual practices, and abortion methods and reasons. The Clinical, Anthropometric, and Biochemical testing (CAB) has been expanded to include waist and hip circumference measurements, and HIV testing has been discontinued.

Data collection was carried out using four schedules: household, woman's, man's, and biomarker (CABI). The Household Schedule gathered information on all household members, guests, and visitors, as well as the household's socioeconomic status, water and sanitation facilities, health insurance coverage, disabilities, land ownership, number of deaths in the past three years, and use of mosquito nets. The Woman's Schedule covered a wide range of topics, including the woman's characteristics, marriage, fertility, contraception, child healthcare, nutrition, reproductive health, sexual behavior, HIV/AIDS, women's empowerment, and domestic abuse. The Man's Schedule focused on a man's characteristics, marriage, children, contraception, nutrition, sexual behavior, health, attitudes towards gender roles, and HIV/AIDS.

This report provides an overview of the significant trends and indicators in India based on the data collected by the NFHS-5 survey. The survey results will serve as a useful reference for setting targets and tracking progress in the country's health sector.

NFHS-5 fieldwork for India was conducted in two phases:

Phase I : 17 June 2019 to 30 January 2020

Phase II : 2 January 2020 to 30 April 2021

Information gathered by: **17 Field Agencies**

Total Households Covered: 636,699

Women Surveyed: 724,115

Men Surveyed: 101,839

Key Indicators

These are the various groups of variables/attributes that the dataset is comprised of:

- Population and Household Profile
- Characteristics of Adults (age 15-49 years) - Literacy
- Marriage and Fertility
- Infant and Child Mortality Rates (per 1,000 live births)
- Family Planning Services (currently married women age 15–49 years)
- Maternal and Child Health
- Delivery Care (for births in the 5 years before the survey)
- Child Vaccinations and Vitamin A Supplementation
- Treatment of Childhood Diseases (children under age 5 years)
- Child Feeding Practices and Nutritional Status of Children
- Nutritional Status of Adults (age 15-49 years)
- Anemia among Children and Adults
- Blood Sugar Level among Adults (age 15 years and above)
- Hypertension among Adults (age 15 years and above)
- Screening for Cancer among Adults (age 30-49 years)
- Knowledge of HIV/AIDS among Adults (age 15-49 years)
- Women's Empowerment (women age 15-49 years)
- Gender Based Violence (age 18-49 years)
- Tobacco Use and Alcohol Consumption among Adults (age 15 years and above)

Area of Focus

Delivery Care (for births in the 5 years before the survey).

Motivation

The medical industry is a crucial field that requires significant human interaction, even as technology continues to advance. Given this, it is important to assess the delivery care facilities available to women and children in India, particularly in both urban and rural areas.

In the past, home births were common, particularly in rural areas, and were often not safe for mothers and children. These women required prompt medical attention, which could only be provided in hospitals. Skilled medical professionals, such as doctors, auxiliary nurse midwives, nurses, and midwives, can manage complications during pregnancy and delivery, or refer the mother and/or baby to the appropriate level of care, leading to better birth outcomes and improved health for both mother and child.

The availability of public and private medical institutions also plays a significant role in this context. Access to Caesarean section deliveries can reduce maternal and neonatal mortality and minimize complications, such as obstetric fistula.

Thus, this report aims to examine the delivery care facilities offered in India and assess the role played by public and private medical institutions in providing safe and effective care to mothers and children. The findings of this report will provide valuable insights into the current state of delivery care in India and highlight areas for improvement.

Selected Attributes

- Names of States/UTs
- Percentage of Institutional births - live births that took place in a medical facility under the supervision of medical personnel with availability of amenities to handle the situation and save the life of child and the mother.
- Percentage of Institutional births in public facility - births that took place in government medical institutions
- Percentage of Home births that were conducted by skilled health personnel - births that took place outside medical institutions under the supervision of medical personnel
- Births attended by skilled health personnel
- Percentage of Births delivered by Caesarean section
- Percentage of Births in a private health facility that were delivered by Caesarean section
- Percentage of Births in a public health facility that were delivered by Caesarean section

Initial Observations

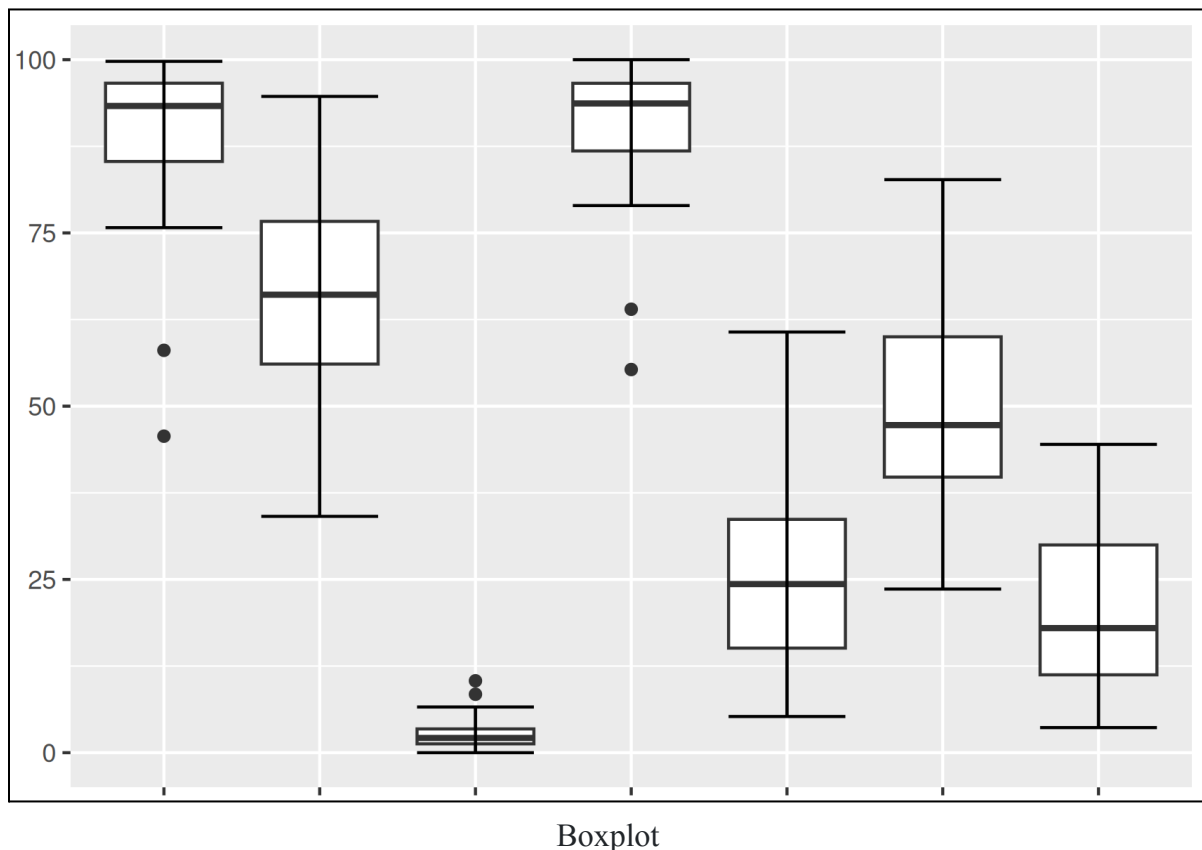
- States/UTs is a nominal attribute that represents the name of states and union territories.
- All selected attributes in the dataset are continuous and ratio-valued.
- The various parameters related to delivery care are reported for each of the 36 states/UTs except Ladakh. In addition, an overall tuple also exists for country-level data points.
- In order to handle missing values where needed, we replaced them with a measure of central tendency (mean).
- Outlier values were noted in some of the attributes not removed from the dataset as those could contribute to some inferences.

Descriptive Statistics

Attributes	Min	Q1	Median	Mean	Q3	Max	SD
Institutional births (in 5 years before the survey)	45.70 %	85.70 %	92.40 %	89.35 %	96.50 %	99.80 %	11.58147
Institutional births in public facility (in 5 years before the survey)	34.10 %	56.20 %	65.30 %	65.46 %	76.60 %	94.70 %	14.5125
Home births that were conducted by skilled health personnel (in 5 years before the survey)	0.00 %	1.300 %	2.300 %	2.714 %	3.400 %	10.400 %	2.417425
Births attended by skilled health personnel (in 5 years before the survey)	55.30 %	87.10 %	93.60 %	90.53 %	96.50 %	100.00 %	9.541626
Births delivered by Caesarean section (in 5 years before the survey)	5.20 %	15.20 %	23.60 %	25.64 %	32.80 %	60.70 %	12.52143
Births in a private health facility that were delivered by Caesarean section (in 5 years before the survey)	23.60 %	39.67 %	47.35 %	50.15 %	56.62 %	82.70 %	18.00155
Births in a public health facility that were delivered by Caesarean section (in 5 years before the survey)	3.60 %	11.70 %	17.70 %	20.72 %	29.90 %	44.50 %	11.34101

Inferences

- There was a state in India where 100% of live births were attended by skilled health personnel. Contrastingly, there was also a state where only 55.30% of the births were attended by trained medical personnel.
- On an average, 89.35% of the live births in India take place in medical facilities, of which about 65.46% take place within government or public medical institutions.
- About 25.64% of the live births in India take place by Caesarean or C-section operation.

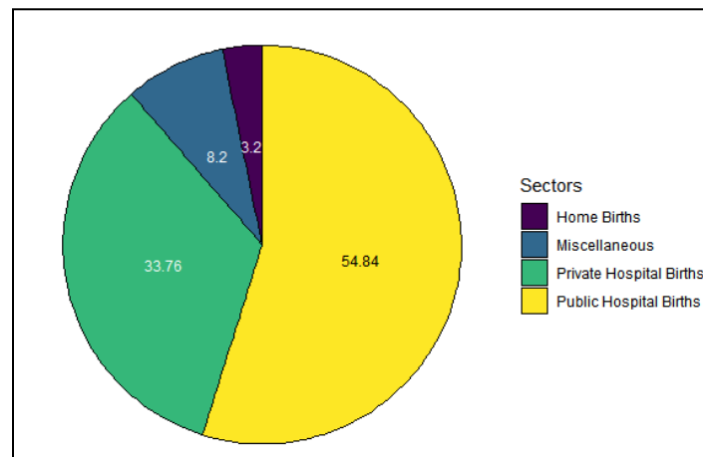


Insights

1. What can we say about the distribution of births occurring inside and outside medical facilities across India?

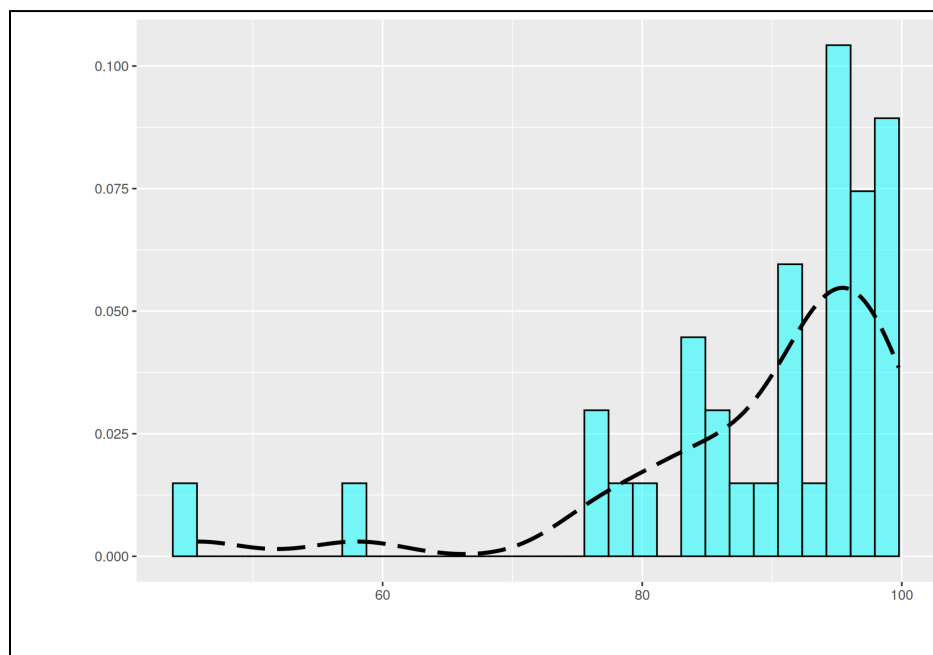
Methodology: Among the selected attributes, the percentage of institutional births, percentage of institutional births in public facility and percentage of home births that were conducted by skilled health personnel were used to construct a pie chart to visualize the average country-level data to show the fractions of births that are taking place in different settings as a part of all the live births

taking place in India. We also plotted the histogram and density plot for this specific attribute to have an idea about the distribution of the data over all states and union territories.



Pie Chart

Inference (1): Around 88.60% of women gave birth in public and private medical institutes (e.g. hospitals, dispensaries, child care facilities etc.), 3.2% women gave birth at home under the supervision of trained medical personnel while the rest of the live births (8.2%) took place unsupervised and outside medical facilities.

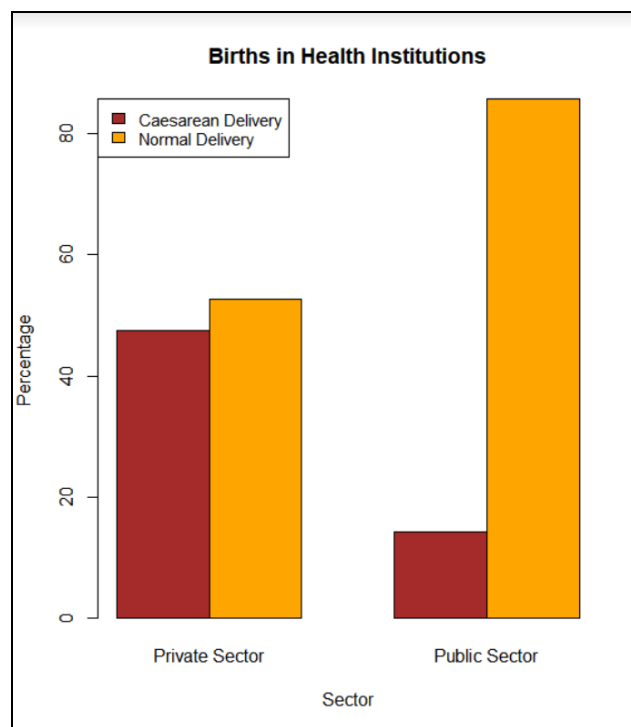


Histogram and Density Plot

Inference (2): From the histogram and density plot, we can infer that in the majority of the states, more than 85% live births happen at medical facilities, however, there are some states where less than 60% live births happen at medical facilities.

2. What are the trends of Caesarean versus Non-Caesarean deliveries in India in the public and private healthcare facilities?

Methodology: We considered the percentage of births in a private health facility that were delivered by Caesarean section and percentage of births in a public health facility that were delivered by Caesarean section attributes to answer this question. The rest of the births in these facilities were normal deliveries. We plotted a bar plot to show the distribution of the kind of deliveries taking place for the private and public sector facilities.

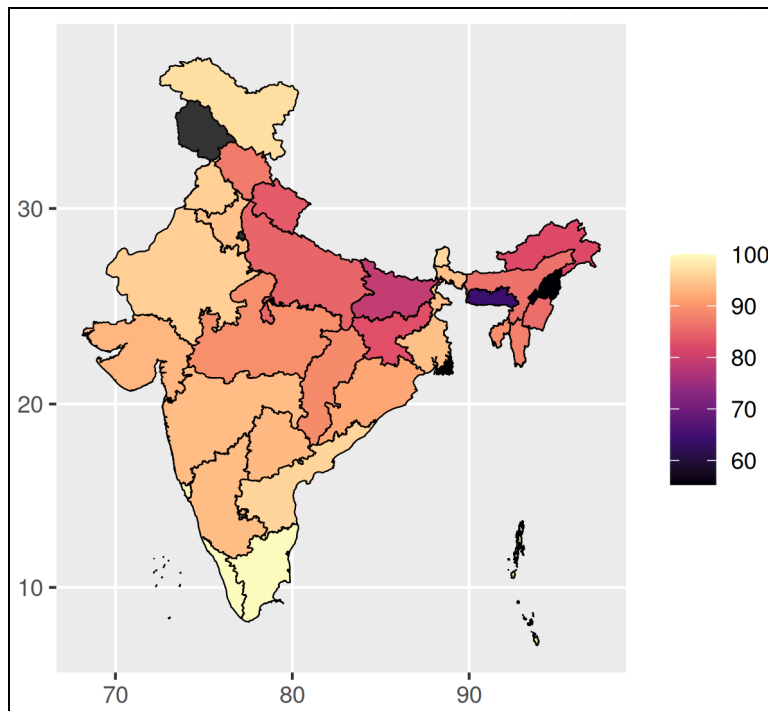


Bar Plot

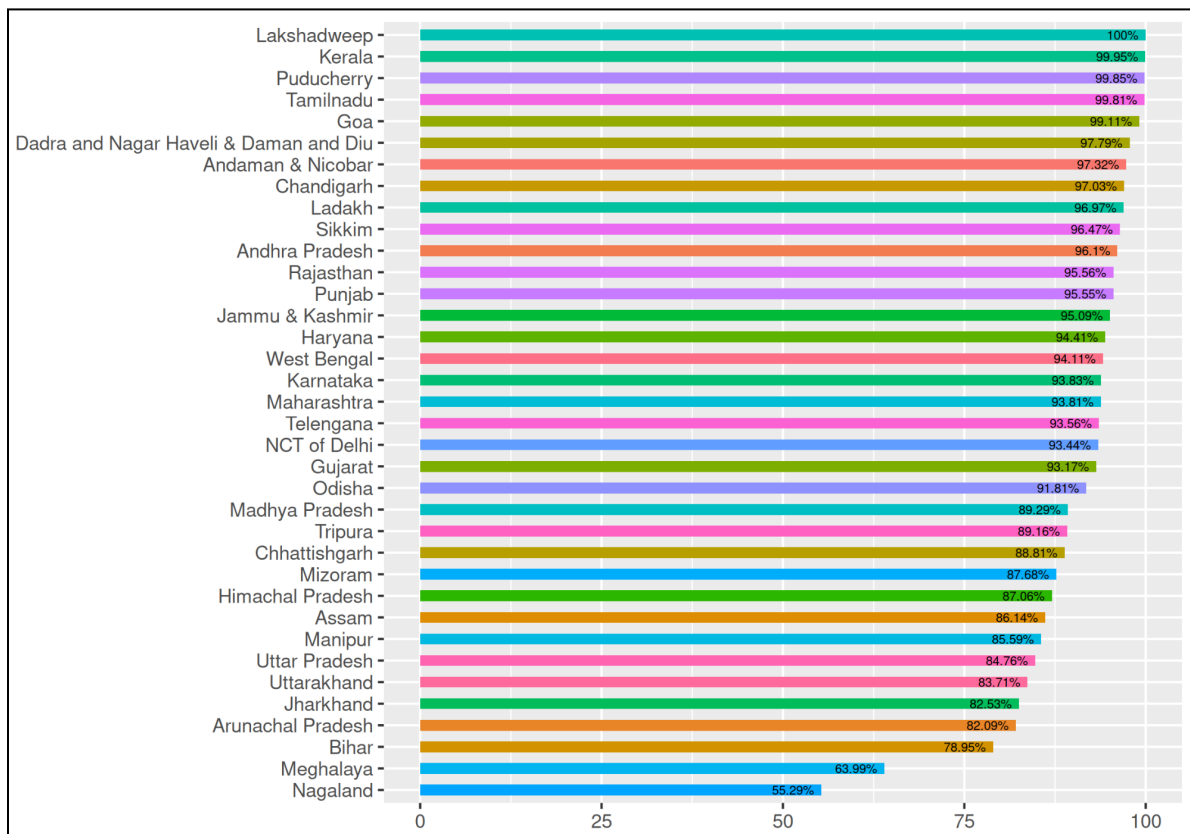
Inference:

- In the **private health sector**, around 43% of the live births were by Caesarean deliveries and around 46% births were by normal deliveries.
- In the **public health sector**, around 18% of the live births were by Caesarean deliveries and around 82% births were by normal deliveries.
- Caesarean deliveries are very much common in private facilities as compared to public health facilities where normal deliveries are more common by a large margin.

3. Can we analyze if childbirths in India take place under the supervision of trained medical personnel?



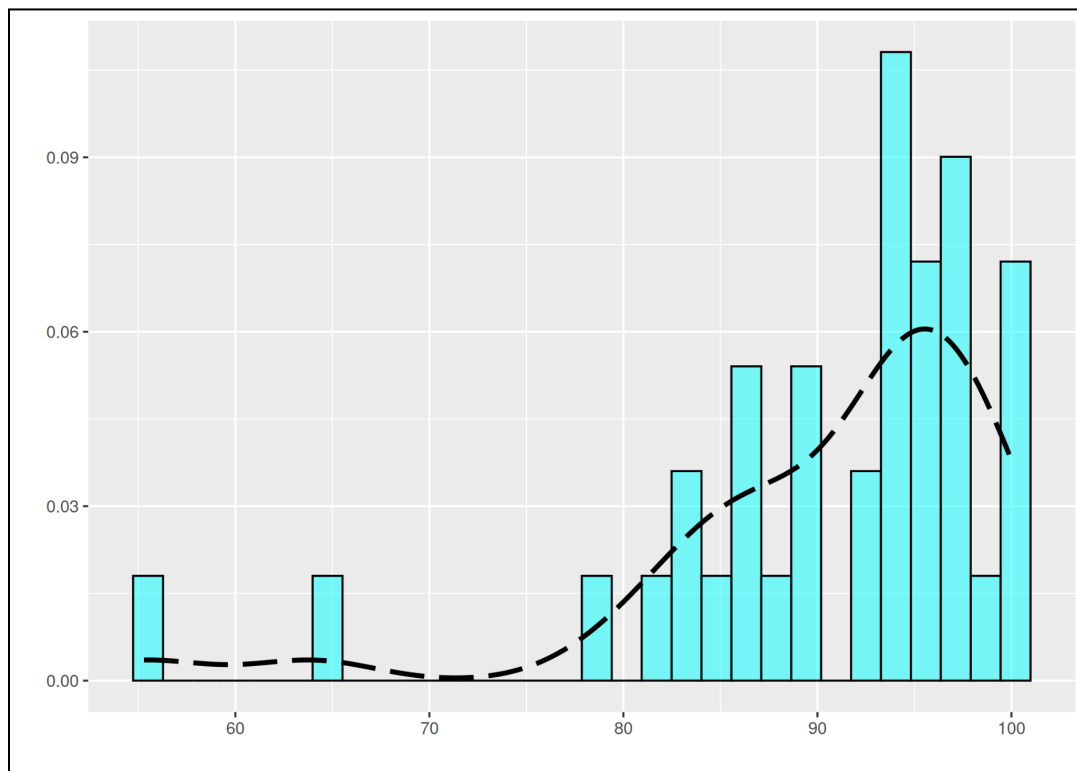
Choropleth and Bar Plot



Methodology: We considered the percentage of births attended by skilled health personnel and visualized it on a map to understand the context and variation in the data geographically. This was helpful in easily identifying states where medical facilities are lacking or there are societal reasons interfering in institutional delivery care. We constructed a bar plot to quickly determine best performing and worst performing states in India. We also constructed a histogram and density plot to observe the distribution.

Inference:

- In Lakshadweep Islands, 100% of the births and in Kerala, Tamil Nadu, Puducherry and Goa, more than 99% of the births are done under the supervision of medical personnel.
- In states like Meghalaya and Nagaland, less than 65% births are attended by skilled health personnel. Bihar too lags behind, with only 78.95% of births taking place in medical facilities.



Histogram and Density Plot

Inference (2): In majority of the states and UTs in India, more than 90% of births are attended by skilled health personnel whether in private or public medical institutes, however, there are some states where less than 65% of the live births are supervised.

Conclusion

In India, delivery care facilities are generally adequate, although certain regions require improvement. According to the data, public hospitals are favored over private hospitals by a majority of the population. However, 11% of women still give birth outside of medical facilities, either at home or in other non-medical settings. The ratio of normal births to Caesarean deliveries in private hospitals is almost equal, while normal births are more prevalent in public facilities.

In 19 states of India, medical professionals attend births, particularly in the southern region where all births are attended. In the northern, central and western states, a significant percentage of deliveries are attended, but this is not the case in the north-eastern region where attendance figures are low.

There is a need for additional birthing centers in some parts of India to provide quality prenatal and postpartum care for mothers and babies at affordable costs. The provision of these facilities would improve maternal and child health outcomes in the country.

Sources/References

1. All India and State/UT-wise Factsheets of National Family Health Survey (NFHS) - 5, 2019-2021, Open Government Data Portal, National Informatics Centre
<https://data.gov.in/resource/all-india-and-stateut-wise-factsheets-national-family-health-survey-nfhs-5-2019-2021>
2. [National Family Health Survey \(NFHS-5\)](#), International Institute of Population Studies, 2021 [Retrieved through The Demographic Health Survey Program Archives]
3. ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York. Wickham H (2016). ISBN 978-3-319-24277-4, <https://ggplot2.tidyverse.org>.