



Rising Caesarean Section Rates in India: An Analysis of Socio-Economic and Healthcare Factors

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ABSTRACT

World Health Organization recently highlights a global increase in caesarean sections (C-sections), with over 1 in 5 childbirths (21%) delivered via C-section. In India, the C-section deliveries increased from 17% in 2015-16 to 22% in 2019-21 as per NFHS report. In India, a total 21.5% of births are delivered by C-section, of which 12.3% planned before labor and 9% decided after labor begins. The C-section rate in public healthcare facilities is 14.3% and in private facilities it is 47.5%. C-section rate is 17.6% in rural areas and 32.3% in urban areas. The C-section rate is 24% in women of age 35-49 and 16.9% in women under 20 of age, 35.4% among women who have completed 12 or more years of schooling and 7.8% in women with no education, 28.1% in woman's first birth and only 4% in women with six or more births, 39.1% in women from the highest wealth quintile and 7.3% in women from the lowest quintile. The rising rates of C-sections is closely linked with socio-economic and healthcare factors like education, age, first-time births, and wealth of the women. This trend shows that access to healthcare resources, education, and financial status strongly influence a woman's chances of having a C-section. The use of C-section is required to save mother and baby but its overuse without the requirement is highly unethical and should be condemned. A comprehensive approach is needed to address this issue.



Background and Objectives

Childbirth is a natural process experienced by the women of fertility age. Even being the natural process, sometimes there can be complications which can impact this natural process and put the life of mother and/or baby in danger. C-section is a surgical process which is performed to save the life of mother or baby. It is an incision done on the abdomen of the women to pull out the baby safely from the mother's womb. It is a lifesaving intervention in case of complication like prolonged labour, breech position of the baby, increased or decreased fetal heart sound and Intra-partum hemorrhage in women. However, its overuse imposes a threat on women's health as well.

The World Health Organization (WHO) in its recent research, described that more than 21% of births are delivered via C-section worldwide. WHO advises that caesarean sections should only be done when medically necessary. This trend of C-section in India is almost like global trend as it has shown an increase from 17% in 2015-16 to 22% in 2019-21 as per National Family Health Survey (NFHS) data.

The C-section is the most performed surgical process that the women are experiencing. It is a blessing when it is necessary and the life of mother and or baby are at risk but performing it without the medical indication is associated with many short- and long-term health risk for women including maternal mortality, sepsis, infection and complicated future pregnancy. However, its increasing trend has ignited concerns among the health and wellbeing of the women and intention of healthcare professionals.

The aim of this paper is to find out the factor influencing the C-section in India. The study will be analyzing the various socio-economic and demographic data to identify the enablers of C-section and will discuss about the various approaches that can address this issue to provide the best health care services to mother and baby to make childbirth safe.

Methods

Data Source

The study used the secondary data from the National Family Health Survey (NFHS), which is a comprehensive health survey in India. The survey was conducted in 28 states and 8 union territories of India and was completed in two phases by the International Institute of Population Studies (IIPS) in collaboration with ICF. They have published this data in their 2022 report which is accessible online.



Trends in C-Section Delivery in India

The following table illustrates the increase in C-section delivery rates over time in India:

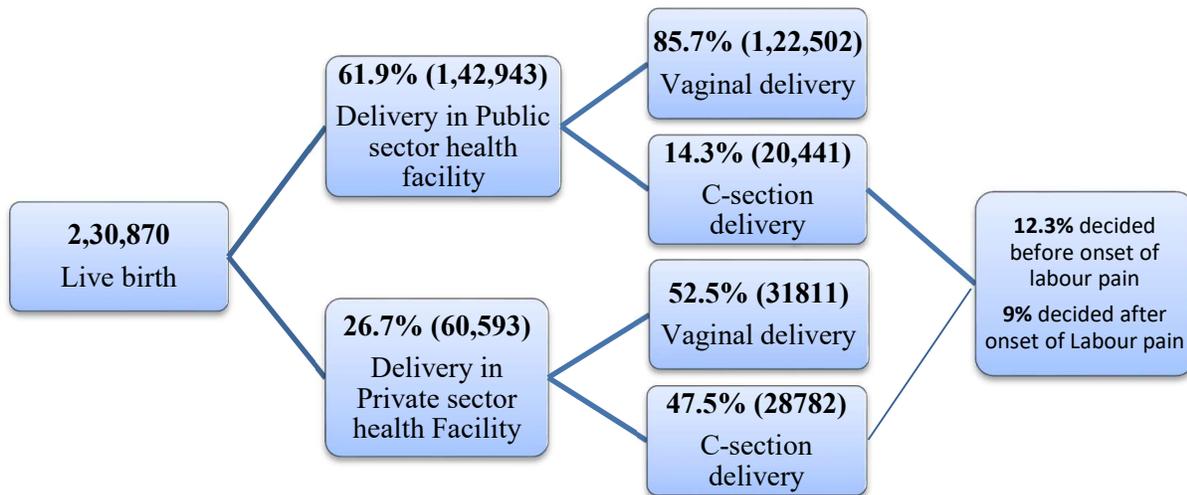
NFHS	Percentage of births delivered by caesarean section
NFHS 3 (2005-06)	9
NFHS 4 (2015-16)	17.2
NFHS 5 (2019-21)	21.5

- The increase from 9% to 17.2% (approximately 91%) over a decade (2005-2016) indicates a significant shift towards surgical deliveries.
- The subsequent rise from 17.2% to 21.5% (about 25%) over the next five years (2016-2021) shows continued growth, albeit at a slower rate.

Key Findings from NFHS 5

The NFHS 5 data included responses from 230,870 women aged 15-49 who had a live birth in the five years preceding the survey. The following findings summarize key insights:

1. Facility wise distribution of delivery:



- **Public Sector:** 61.9% of total live births (142,943 deliveries) occurred in public health facilities. Of these, 85.7% (approximately 122,502) were vaginal deliveries, while 14.3% (around 20,441) were C-sections.



- **Private Sector:** 26.7% of live births (60,593 deliveries) occurred in private health facilities, with 52.5% (about 31,811) being vaginal deliveries and 47.5% (around 28,782) C-sections.

2. Antenatal care visit:

Antenatal care visits by women	Percentage delivered by C-section
None	13.2
between 1-3	16.8
4 or more	29.2
don't know/missing	29.1

- No Visits: 13.2% of women without antenatal care delivered by C-section.
- 1-3 Visits: 16.8% had a C-section.
- 4 or More Visits: 29.2% delivered by C-section, indicating a correlation between antenatal care and C-section delivery rates.

3. Age of the mother:

Mother's age at Birth	Percentage delivered by C-section
<20	16.9
20-34	22.1
35-49	24

- <20 Years: 16.9% delivered by C-section; the lowest rate among age groups.
- 20-34 Years: 22.1% had a C-section.
- 35-49 Years: 24% delivered by C-section; the highest rate among the groups.

4. Education level of mother:

Mother's schooling	Percentage delivered by C-section
No schooling	7.8
<5 years complete	13



5-7 years complete	16
8-9 years complete	19.2
10-11 years complete	27.3
12 or more years complete	35.4

- No Schooling: 7.8% had a C-section; the lowest rate.
- 12 or More Years of Schooling: 35.4% had a C-section; indicating a strong correlation between education and C-section rates.

5. Wealth quintile of women of age 15-49 who had a live birth in last 5 years preceding to the survey:

Wealth quintile of women	Percentage delivered by C-section
Lowest	7.3
Second	15
Middle	23.9
Fourth	30.4
Highest	39.1

- Lowest Wealth Quintile: 7.3% had a C-section.
- Highest Wealth Quintile: 39.1% had a C-section, highlighting the impact of financial resources on delivery choices.

6. Birth order of women of age 15-49 who had a live birth in last 5 years preceding to the survey:

Birth order	Percentage delivered by C-section
1	28.1
between 2-3	20
Between 4- 5	5.9
6 or more	4

- First Birth: 28.1% delivered by C-section; the highest rate.
- Sixth Birth or More: 4% had a C-section; reflecting a preference for vaginal delivery among women with higher birth orders.

**7. Residency of women of age 15-49 who had a live birth in last 5 years preceding to the survey:**

Residence	Percentage delivered by C-section
Urban	32.3
Rural	17.6

- Urban: 32.3% of deliveries were by C-section.
- Rural: 17.6% had a C-section; a lower rate indicative of limited access to healthcare.

8. Duration of hospital stay after delivery

		<6 hour	6-11 hour	12-23 hour	1-2 days	3 or more days	don't know/missing
Public health facility	Vaginal birth	13.8	4	2.6	39.6	39.7	0.2
	C-section	4.9	1.5	9.4	7.4	85.4	0.4
Private health facility	Vaginal birth	11.6	3.2	2.8	45.7	36.6	0.2
	C-section	3.3	1.1	0.1	5.5	89.8	0.2

- Public Health Facility (C-section): 85.4% stayed for 3 or more days, indicating longer recovery times compared to vaginal deliveries.
- Private Health Facility (C-section): 89.8% also stayed for 3 or more days, highlighting a similar pattern.

9. Delivery costs

Background Characteristics	Average cost in Public Health Facility (Rs.)	Average cost in Private Health Facility (Rs.)
Mother's age at birth (<20, 20-34, 35-49)	3302	25276
Birth order (1, 2-3, 4 or more)	3094	22631
Residence (Rural, Urban)	3405	24951
Schooling (No schooling, <5 years complete, 5-7 years complete, 8-9 years complete, 10-11 years complete, 12 or more years)	3182	21623



complete)		
Religion (Hindu, Muslim, Christian, Sikh, Buddhist/Neo-Buddhist, Jain, Other)	4322	27264
Caste/tribe (Scheduled caste, Scheduled tribe, Other backward class, Other, Don't know)	3165	23167

The delivery cost is high for private sectors and no data is available for bifurcation in the cost of vaginal vs C-section delivery.

Ethics Approval: All data utilized in this study are published and available in the public domain.

Case Study: The Rising Trend of C-Sections in India

India's has a three tier and vast healthcare delivery system which can support the case study while analyzing the increasing rates of C-sections. Currently, approximately 21.5% of births in India occur via C-section, out of which 12.3% are planned C-sections and 9% are emergency C-sections initiated during labor.

The data is showing the huge difference between the rate of C-section delivery in public health facilities and private health facilities. In public health facilities, only 14.3% of deliveries are via C-section, whereas in private hospitals, this figure escalates to 47.5%. The data is indicating that the private sectors are opting C-section as a preferred mode of delivery because of financial benefits as well as the availability of resources to perform C-section delivery. The stay after C-section for 3 or more day is almost equal in Public as well as Private sector but as the cost of delivery is high in private sector, it increases more as the stay increases. C-section

Demographic Factors Influencing C-Section Rates

There are many demographic factors that may influence the increase in C-section delivery:

- **Age:** Women aged 35-49 are more likely to undergo C-sections (24%) compared to younger women, particularly those under 20 years old (16.9%).
- **Education:** The data is showing that women with 12 or more year of schooling will be having more chances of C-section (35.4%) in comparison to the women with no education (7.8%).



- **Previous Births:** As per the data, the birth order is having an influence on mode of delivery as well. The women who are going to deliver for the very first time are more likely to undergo C-sections (28.1%) in comparison to the women who are delivering second time or more. This percentage decreases to 4% in women having six or more children.
- **Wealth:** As per the data, the wealth quintile of women plays an important role to decide the mode of delivery as the women from the highest wealth quintile are having more chance to have a C-section (39.1%) in comparison to the women coming from the lowest wealth quintile (7.3%).

Discussion: The Implications of Rising C-Section Rates

The increase in C-section nationally as well globally over the period of time has started multiple debates. C-section is essential to prevent the complication during the child birth and saving the life of mother and baby, however its increase especially in public health sector, even without medical indication has raised concern.

The C-section rate in private health facilities is really high and indicates the financial profit being a biggest influencer to conduct the C-section delivery by the private health facilities. It is showing that the C-section are being done without necessity or medical indication just to make profit which is against the medical ethics to serve the community in the best possible ways.

The data is also showing increase in C-section in Urban area as the private facilities which are equipped with the facility to conduct C-section deliveries are mostly located in Urban areas. The data is indicating that the women with more education and wealthy background are more likely to undergo C-section because of the perceived fear of vaginal deliveries and convenience in scheduled labour. Also, women in the age group of 35-49 are likely to have C-section delivery because of the fear of complication due to the age. Likely, women who are delivering their first child opt for C-section to deliver their child safely and avoid any complication that can impact the baby and its health.

As C-section delivery is crucial in certain conditions, its overuse increases the short- and long-term risks on women's health and wellbeing. Various studies have suggested that C-section is more associated with higher maternal mortality and morbidity rates in comparison to vaginal deliveries. Also, women who had C-section delivery, take longer time to recover physically and emotionally.



The Role of Healthcare Providers

Most of the women follow the advice provided by the health care provider specially for the wellbeing of their baby. The health care provider's advice plays an importance role in the decision-making process while choosing the mode of delivery. While the vaginal deliveries are higher in public and private sector, its increasing rate specially in private sector, that is almost half (47.5%) of the total deliveries conducted in private hospital, is raising concern about the intention of the health care provider.

The C-section deliveries are financially beneficial for private health facilities, irrespective of its necessity, is an alarming sign to reform the policy related to health care in India which can ensure the health and wellbeing of the women on priority.

Conclusion

The increase in C-section is contributed by many factors including many socio-economic and demographic factor. The use of C-section is required in situation where the health of mother or baby is in danger, its overuse even without the requirement is highly unethical and should be condemned.

A comprehensive approach is needed to address this issue. Few suggestions are as follow:

1. Policy Reformation and regulation act: The policy and guidelines should be formed to ensure the appropriate usage of C-section delivery in India. There will be some penalty if a C-section is found to be unnecessary in case the women was not willing for that and was forced to have C-section because of the financial gain by health care facility.
2. Orientation and sensitization of health care Providers: The healthcare providers need to be trained and sensitized to prioritizing the health of mother and baby.
3. Counseling of the women: The women should be counseled by the professional counselor during ANC period about the delivery, various mode of delivery and associated risk with each type of delivery. The purpose of counseling is to empower the women with the knowledge to make the decision for health and wellbeing of her and baby.
4. Accountability of private health care facilities: The private health care provider should make accountable for the c-section conducted by them. There should be proper justification provided by them for each C-section delivery conducted by them.



By ensuring all the above mentioned approach, child birth can be a safe and pleasant experience for mother irrespective of the mode of delivery.

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