

A Retrospective Comparative Study of the Frequency and Rate of Caesarean Section in Selected Government and Private Hospitals in Mizoram

Catherine Lalremruati¹, Sujana Yambem², Lalhriatpuii³

¹MSc Nursing, College of Nursing, RIPANS, Aizawl, Mizoram, India
Email: Catherine24vanchhawng[at]gmail.com

²Assistant Professor, Assam Downtown University, Guwahati
Email: Suj.yambem[at]gmail.com

³Visiting Faculty, College of Nursing, RIPANS, Aizawl, Mizoram, India
Email: Lalhriatpuiichhangte5[at]gmail.com

Abstract: *Caesarean section (CS) is one of the most commonly performed obstetric surgical procedures worldwide and plays a vital role in reducing maternal and neonatal morbidity and mortality when medically indicated. The World Health Organization (WHO) recommends that population-based caesarean section rates should ideally range between 10% and 15%, beyond which no substantial improvement in maternal and neonatal outcomes is observed. Despite this recommendation, caesarean section rates have increased considerably in many countries, including India. Furthermore, the National Family Health Survey-6 (NFHS-6, 2023-2024) reported a caesarean section rate of 13.5% in Mizoram, with higher rates in private health facilities (35.2%) than in public health facilities (10.3%). Monitoring the frequency and rate of caesarean section is important for evaluating obstetric practices and maternal healthcare services. This retrospective descriptive study was conducted in selected Government and Private Hospitals in Mizoram, including Civil Hospital, Aizawl; Synod Hospital, Durtlang; Zoram Medical College and Hospital, Falkawn; and B.N. Hospital and Research Centre, Kulikawn. Non-probability total enumerative sampling was adopted, and all eligible delivery records from January 2025 to December 2025 were reviewed using a structured checklist. A total of 6,676 delivery records were included in the study. Of these, 2,278 were caesarean section deliveries, resulting in an overall caesarean section rate of 34.12%. The caesarean section rate was higher in Private Hospitals (39.9%) than in Government Hospitals (32.3%), indicating a greater proportion of caesarean deliveries in Private Hospitals during the study period. The study concluded that although Government Hospitals performed a greater number of caesarean sections, Private Hospitals demonstrated a higher caesarean section rate. Continuous monitoring and evaluation of caesarean section practices are necessary to ensure the appropriate utilization of this life-saving procedure.*

Keywords: Caesarean section, Frequency, Rate, Government Hospitals, Private Hospitals, Mizoram, Retrospective Study

1. Introduction

Maternal health remains a major public health priority worldwide. Ensuring safe pregnancy and childbirth is essential for reducing maternal and neonatal morbidity and mortality. Caesarean section (CS) is one of the most commonly performed surgical procedures in obstetric practice and plays a vital role in preventing adverse maternal and fetal outcomes when vaginal delivery is unsafe.

According to the World Health Organization, caesarean section is a life-saving intervention when medically indicated. However, the increasing use of caesarean delivery beyond medically necessary levels has become a growing concern. WHO recommends that population-based caesarean section rates above 10–15% are not associated with additional reductions in maternal and neonatal mortality. Importantly, WHO does not endorse a specific target rate for all countries, recognizing that appropriate C-section rates may vary depending on population needs and healthcare access.

Globally, caesarean section rates have increased substantially during the past three decades. Improvements in surgical

techniques, anaesthesia, antibiotic therapy, fetal monitoring, and maternal healthcare services have contributed to this increase. Rising maternal age, previous caesarean section, multiple pregnancies, and medico-legal concerns have also been identified as important contributors. In India, caesarean section rates have shown a steady increase over recent years. The National Family Health Survey (NFHS-6) reported that the national caesarean section rate reached approximately 27.2%, with substantially higher rates in private healthcare institutions. Similar increasing trends have been observed in several states across the country.

Furthermore, the National Family Health Survey-6 (NFHS-6, 2023–2024) reported that the caesarean section rate in Mizoram increased to 13.5%. The prevalence of caesarean section was considerably higher in private health facilities (35.2%) than in public health facilities (10.3%). These findings indicate substantial differences in caesarean section practices between private and Government healthcare institutions and highlight the need for continued monitoring of caesarean section trends to ensure the appropriate use of this life-saving intervention. Limited published data are available regarding the frequency and rate of caesarean section in Government and Private Hospitals within the

state. Understanding these patterns is essential for monitoring obstetric practices and planning strategies for appropriate use of caesarean section.

Therefore, the present study was undertaken to determine the frequency and rate of caesarean section in selected Government and Private Hospitals in Mizoram.

Aims and Objectives

This study was conducted to determine the frequency and rate of caesarean section in selected Government and Private Hospitals in Mizoram. The study also aimed to compare caesarean section rates between Government and Private Hospitals and to assess the association between hospital type and mode of delivery, thereby providing evidence to inform clinical practice and health policy regarding caesarean section utilization in Mizoram.

2. Research Methodology

2.1 Research Design

Retrospective research design.

2.2 Study Settings

The study was conducted in four selected hospitals in Aizawl District, Mizoram:

- Civil Hospital, Aizawl
- Synod Hospital, Durtlang
- Zoram Medical College and Hospital, Falkawn
- B.N. Hospital and Research Centre, Kulikawn

2.3 Populations

All women who delivered in the selected hospitals during 1st January to 31st December 2025.

2.4 Sample size

A total of 6,676 delivery records were included.

2.5 Sampling technique

Non-probability total enumerative sampling technique.

2.6 Sampling Criteria

2.6.1 Inclusion Criteria

All completed and documented vaginal and caesarean section

deliveries recorded in the selected Hospitals between 1st January 2025 and 31st December 2025

Both elective and emergency LSCS

2.6.2 Exclusion Criteria

Records with incomplete or missing data on the mode of delivery and/or indications for caesarean section in the selected hospital. Women undergoing caesarean hysterectomy for obstetric or gynaecological causes.

2.7 Data Collection Tool

Data were collected using a structured checklist developed by the investigator to obtain information related to the frequency and rate of caesarean section from hospital records. The checklist included variables such as type of hospital (Government/Private), total number of deliveries, total number of caesarean sections, month and year of record, and calculation of the caesarean section rate. The tool was reviewed and validated by 8 experts from hospitals, medical colleges, and nursing colleges in the Department of Obstetrics and Gynaecology to ensure its relevance, clarity, and appropriateness. Necessary modifications were made based on the suggestions provided by the experts. Data were extracted from hospital records and entered into Microsoft Excel for coding and organization. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), and the findings were presented using frequency, percentage, and caesarean section rate.

3. Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee (IEC), Regional Institute of Paramedical and Nursing Sciences (RIPANS), Mizoram, on 2nd March 2026. Formal written permission was obtained from the Directors and Medical Superintendents of Civil Hospital, Aizawl; Synod Hospital, Durtlang; Zoram Medical College and Hospital, Falkawn; and B.N. Hospital and Research Centre, Kulikawn prior to data collection. As the study was retrospective in nature, informed consent from individual patients was not required. Confidentiality, anonymity, and privacy of patient information were strictly maintained throughout the study. No personal identifiers were recorded, and all data were used solely for research purposes.

4. Data Analysis and Interpretation

Table 1: Hospital-wise Frequency and Rate of Caesarean Section

Hospital	Total Deliveries	Caesarean Section (n)	Normal Deliveries (n)	CS Rate (%)
Government Hospital 1	3447	1001	2446	29.0
Private Hospital 1	1426	562	864	39.4
Government Hospital 2	1626	638	988	39.2
Private Hospital 2	177	77	100	43.5
Total	6676	2278	4398	34.1

Table 1 presents the frequency and rate of caesarean section across the selected hospitals. A total of 6,676 deliveries were conducted in the four hospitals during the study period, of which 2,278 were caesarean sections and 4,398 were normal

deliveries, resulting in an overall caesarean section rate of 34.1%. Among the hospitals, Private Hospital 2 recorded the highest caesarean section rate (43.5%), followed by Private Hospital 1 (39.4%),

Government Hospital 2 (39.2%), and Government Hospital 1 (29.0%). Government Hospital 1 contributed the largest number of total deliveries (3,447) and caesarean sections

(1,001) among all hospitals. The findings indicate variations in caesarean section rates across the selected hospitals.

Table 2: Frequency and Rate of Caesarean Section by Hospital Type

Hospital Type	Total Deliveries	Caesarean Section (n)	Normal Deliveries (n)	CS Rate (%)
Government	5073	1639	3434	32.3
Private	1603	639	964	39.9
Total	6676	2278	4398	34.1

Table 2 shows the frequency and rate of caesarean section according to hospital type. Of the 6,676 total deliveries, 5,073 occurred in Government Hospitals and 1,603 in Private Hospitals. Government Hospitals recorded 1,639 caesarean sections and 3,434 normal deliveries, resulting in a caesarean section rate of 32.3%. Private Hospitals recorded 639 caesarean sections and 964 normal deliveries, resulting in a

higher caesarean section rate of 39.9%. Overall, 2,278 caesarean sections and 4,398 normal deliveries were reported, yielding an overall caesarean section rate of 34.1%. The findings indicate that the proportion of caesarean section deliveries was higher in Private Hospitals compared to Government Hospitals.

Table 3: Association between type of hospital and mode of delivery

Type of Hospital	Caesarean Section f (%)	Normal Delivery f (%)	Total	χ^2	df	p-value
Government	1,639 (32.3%)	3,434 (67.7%)	5,073	30.93	1	< .001
Private	639 (39.9%)	964 (60.1%)	1,603			
Total	2,278 (34.1%)	4,398 (65.9%)	6,676			

The association between hospital type and mode of delivery was analyzed using the Chi-square test. The analysis revealed a statistically significant association between hospital type and mode of delivery ($\chi^2 = 30.93$, $df = 1$, $p < .001$). These findings indicate that the distribution of mode of delivery differed significantly between Government and Private Hospitals, with Private Hospitals reporting a higher caesarean section rate than Government Hospitals.

5. Discussion

The present study was conducted in selected Government and Private Hospitals in Aizawl District, Mizoram, to determine the frequency and rate of caesarean section. The study reviewed 6,676 delivery records and identified 2,278 caesarean section deliveries during the study period. Of these, 1,639 caesarean sections were performed in Government Hospitals and 639 in Private Hospitals. The higher frequency of caesarean section observed in Government Hospitals may be attributed to the larger number of deliveries managed in these institutions, as Government Hospitals serve as major referral centres and provide maternity services to a larger population. The findings revealed an overall caesarean section rate of 34.12% in the selected hospitals.

The findings of the present study are comparable with those reported by Katoch et al. (2025), who observed a caesarean section rate of 35% in a tertiary care centre. Similarly, Tognon et al. (2019) reported a caesarean section rate of 35.2%, while Gupta and Garg (2017) documented a prevalence of 31.46%. The similarity between these findings and those of the present study suggests that elevated caesarean section rates are common in hospital-based settings, particularly in tertiary and referral institutions.

The findings are also supported by Guner and Karabudak (2025), who reported a caesarean section rate of 55% in a tertiary care centre. Although the reported rate was higher

than that observed in the present study, both studies indicate substantial utilization of caesarean section in institutional deliveries. Likewise, Rasool et al. (2021) reported a high frequency of caesarean section rate of 69.7% and emphasized the growing public health importance of monitoring caesarean delivery trends.

The increasing trend in caesarean section rates observed in the present study is consistent with global evidence. Betran et al. (2021) reported a continuous rise in caesarean section rates worldwide and projected further increases in many regions. While caesarean section remains a life-saving intervention when medically indicated, monitoring its utilization is essential to ensure that the procedure is performed appropriately and based on clinical need.

Overall, the present study demonstrates a substantial frequency and rate of caesarean section in the selected Government and Private Hospitals in Mizoram. The findings highlight the importance of continued surveillance of caesarean section practices and provide baseline information for future research and policy planning aimed at improving maternal healthcare services.

6. Conclusion

The study concluded that the overall caesarean section rate in selected Government and Private Hospitals in Mizoram was 34.12%. While Government hospitals performed a greater number of caesarean sections, Private hospitals demonstrated a higher caesarean section rate. Continuous monitoring and evaluation of caesarean section practices are necessary to ensure appropriate utilization of this life-saving procedure.

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