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Caesarean Section in South Korea: National Trends, Determinants, Clinical Considerations, and Strategies for Evidence-Based Maternity

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Abstract

Caesarean section (CS) is an essential obstetric intervention when medically indicated, but its increasing use has become an important maternal-health and health-system issue internationally. South Korea represents a particularly important setting because its national CS rate has risen substantially while the number of births has declined. National Health Insurance claims analyses reported an increase in the CS rate from approximately 36.3% in 2006 to 40.6% in 2015, while a later national review reported an increase from 36.9% in 2012 to 58.7% in 2021 [Kim et al., 2020; Kim et al., 2023]. A nationwide population-based study using National Health Insurance data reported that the crude CS rate reached 67.4% in 2024 [Lee et al., 2026]. These trends occur in a context of advanced maternal age, changing parity patterns, declining fertility, assisted reproductive technology, multiple pregnancy, placenta previa, pre-eclampsia, changing obstetric practice, and health-system and medico-legal considerations [Kim et al., 2020; Kim et al., 2023; Lee et al., 2026]. This review synthesizes evidence concerning the epidemiology, indications, maternal and neonatal consequences, determinants, and policy responses relevant to caesarean delivery in South Korea. It emphasizes that a national CS percentage should not be interpreted as an appropriate target for individual hospitals or patients. The World Health Organization recommends case-by-case decision-making and the use of the Robson 10-group classification to understand the clinical composition of CS use rather than pursuing a predetermined population rate [WHO, 2017; WHO, 2021]. The paper proposes a South Korea-focused framework based on Robson classification, shared decision-making, evidence-based labour management, appropriate use of vaginal birth after caesarean (VBAC/TOLAC), audit and feedback, maternity-service quality improvement, and support for clinicians and women. The objective is not to promote vaginal delivery at the expense of safety, but to optimize the appropriateness, safety, and quality of mode-of-delivery decisions.

Keywords: Republic of Korea; caesarean section; cesarean delivery; maternal health; obstetric care; Robson classification; VBAC; TOLAC

1. Introduction

Caesarean section is one of the most frequently performed surgical procedures worldwide. It can be lifesaving when vaginal birth poses substantial risk to the mother or fetus, including selected cases of placenta previa, fetal malpresentation, labour complications, fetal compromise, and other obstetric conditions [WHO, 2015; WHO, 2021]. At the same time, CS is major abdominal surgery and can be associated with maternal surgical complications, infection, thromboembolic events, anaesthetic complications, longer recovery, and consequences for subsequent pregnancies. Neonatal outcomes can also be affected, particularly when delivery is performed without a clear medical indication or at an inappropriate gestational age [WHO, 2018; Gialdini et al., 2024].

South Korea has experienced a marked change in mode of delivery over the past two decades. A nationwide National Health Insurance study found that the CS rate increased from 36.3% in 2006 to 40.6% in 2015 [Kim et al., 2020]. A later national review using Korean Health Insurance Review and Assessment Service data reported that the rate rose from 36.9% in 2012 to 58.7% in 2021, while the number of births fell from approximately 469,000 to 249,000 during the same period [Kim et al., 2023]. More recent nationwide data covering 2007–2024 reported a crude CS rate of 67.4% in 2024 [Lee et al., 2026].

These figures should be interpreted carefully. A national CS rate is not, by itself, a measure of poor-quality obstetric care. Countries and hospitals differ in maternal age, parity, referral patterns, pregnancy complications, fetal presentation, multiple pregnancy, and availability of obstetric and neonatal services. WHO explicitly states that it does not recommend a specific national or hospital CS rate and instead recommends that CS be performed when medically necessary [WHO, 2021]. Consequently, the central question for South Korea is not simply why the percentage is high, but how clinical, demographic, institutional, economic, and social factors interact to shape decisions about mode of delivery.

This review therefore examines the South Korean evidence base and proposes a patient-centred framework for evaluating and improving caesarean delivery practice.

2. Materials and Methods

This manuscript uses a narrative review methodology. Priority was given to national population-based studies using Korean National Health Insurance or Health Insurance Review and Assessment Service data; Korean maternal-health literature; WHO guidance on caesarean section and the Robson classification; and recent evidence concerning caesarean trends. Searches focused on the terms South Korea, Republic of Korea, caesarean section, cesarean delivery, childbirth, Robson classification, VBAC, maternal age, assisted reproductive technology, and obstetric practice. Sources were assessed for relevance to national trends, determinants, outcomes, and policy.

The article is a synthesis rather than a systematic review or meta-analysis. Reported national rates are retained with their original data source and time period because estimates may differ according to denominator, data system, inclusion criteria, and definition of delivery. The most recent nationwide estimate cited here is from a study published in 2026 using National Health Insurance claims for deliveries from 2007 through 2024 [Lee et al., 2026].

3. Epidemiology of Caesarean Section in South Korea

The long-term trend is characterized by a substantial increase in CS use despite a sharp decline in the absolute number of births. Kim et al. reported an increase from 36.3% in 2006 to 40.6% in 2015 using national insurance

data [Kim et al., 2020]. A subsequent Korean review documented rates of 36.9% in 2012, 42.3% in 2016, 51.0% in 2019, 54.0% in 2020, and 58.7% in 2021 [Kim et al., 2023]. The newer age–period–cohort analysis reported a crude rate of 67.4% in 2024 and analysed 6,635,390 deliveries occurring from 2007 to 2024 [Lee et al., 2026].

Year/period	Reported CS rate	Source
2006	36.3%	Kim et al., 2020
2012	36.9%	Kim et al., 2023
2015	40.6%	Kim et al., 2020
2019	51.0%	Kim et al., 2023
2020	54.0%	Kim et al., 2023
2021	58.7%	Kim et al., 2023
2024	67.4%	Lee et al., 2026

The increase has occurred alongside a decline in the number of births. This means that the absolute number of CS procedures and the population CS percentage represent different dimensions of the problem. The percentage is particularly sensitive to changes in the composition of the obstetric population.

4. Demographic and Clinical Determinants

4.1 Maternal age

Maternal age is strongly associated with CS in South Korea. The nationwide age–period–cohort study found a strong association between maternal age and CS after adjustment for parity, insurance type, and hospital type, while period and birth-cohort effects also remained [Lee et al., 2026]. Increasing maternal age can coincide with greater prevalence of pregnancy complications and a higher frequency of obstetric interventions.

Advanced maternal age should not, however, be interpreted as an automatic indication for CS. The appropriate decision depends on the complete clinical picture, including gestational age, parity, fetal presentation, placental location, maternal disease, fetal condition, and the progress of labour.

4.2 Parity and previous caesarean delivery

Previous CS is an important determinant of subsequent mode of delivery. Once a woman has undergone CS, future pregnancies may involve decisions concerning elective repeat CS or trial of labour after caesarean (TOLAC), depending on the previous uterine incision, current pregnancy characteristics, institutional capacity, and patient preference. Because primary CS can influence the mode of delivery in subsequent pregnancies, reducing avoidable primary procedures may have implications beyond a single birth.

4.3 Multiple pregnancy and assisted reproductive technology

South Korea has substantial use of assisted reproductive technology (ART), and national ART reports show that treatment increasingly involves women in their late 30s and early 40s [Korean Society of Obstetrics and Gynecology, 2022]. ART is relevant to caesarean delivery because it is associated with particular pregnancy profiles, including older maternal age and, historically, multiple pregnancy. A Korean nationwide cohort also found higher severe maternal morbidity among women who underwent IVF-ET compared with women without ART, although the observed associations are influenced by maternal and pregnancy characteristics [Kim et al., 2022].

4.4 Placenta previa and hypertensive disorders

National Korean data demonstrate changes in pregnancy complications alongside the rise in CS. Kim et al. reported increases in maternal age and placenta previa and increases in CS among women with pre-eclampsia and multiple pregnancy during 2006–2015 [Kim et al., 2020]. Such conditions can create legitimate clinical

indications for operative delivery. Their increasing prevalence should therefore be considered when interpreting population trends.

5. Indications for Caesarean Section

Clinical situation	Examples of circumstances in which CS may be indicated	Key decision principle
Placental disorders	Placenta previa or selected placenta accreta-spectrum conditions	Assess placental location and severity; plan multidisciplinary care where required
Fetal presentation	Transverse lie and selected breech presentations	Consider gestational age, presentation, expertise and individual circumstances
Fetal compromise	Persistent evidence of fetal compromise requiring expedited birth	Base timing and route on clinical assessment and urgency
Labour complications	Selected cases of arrest disorders or failed induction	Use evidence-based labour management before diagnosing failed progress
Maternal disease	Conditions where continuation of pregnancy or labour poses substantial maternal risk	Balance maternal benefit, fetal maturity and urgency
Previous CS	Repeat CS or selected TOLAC candidates	Individualize according to uterine scar, current pregnancy and patient preference
Multiple pregnancy	Selected twin or higher-order pregnancies depending on presentation and complications	Use fetal presentation and obstetric risk profile

The list is illustrative rather than exhaustive. Clinical indications must be assessed by qualified maternity professionals in the context of individual patient findings and local clinical protocols.

6. Robson Classification as a Quality-Improvement Tool

The Robson 10-group classification provides a standardized method for understanding CS rates by obstetric population rather than relying on a single overall percentage. The classification uses five basic characteristics: parity and previous CS, onset of labour, gestational age, fetal presentation, and number of fetuses [WHO, 2017].

Robson domain	Information required	Quality-improvement value
Parity/previous CS	Nulliparous; multiparous with or without previous CS	Separates primary and repeat CS patterns
Onset of labour	Spontaneous, induced or pre-labour CS	Identifies elective/pre-labour and induction-related patterns
Gestational age	Term or preterm	Distinguishes clinical populations with different indications
Presentation	Cephalic, breech or transverse	Identifies presentation-specific CS use
Number of fetuses	Singleton or multiple	Accounts for different obstetric risk profiles

For South Korea, routine Robson reporting could make national and institutional comparisons more informative. For example, a hospital with a high overall rate because it receives high-risk referrals should not be interpreted in the same way as a low-risk facility. Robson-based analysis can identify which groups contribute most to the institutional rate and where clinical review is warranted [WHO, 2017; WHO, 2021].

7. Maternal Consequences of Caesarean Delivery

Caesarean delivery can be safely performed in appropriately equipped settings, but it remains major surgery. Potential short-term maternal complications include haemorrhage, infection, thromboembolic events, anaesthetic complications, urinary tract injury, wound complications, postoperative pain, and longer hospitalization. Risk varies substantially according to indication, urgency, maternal health, operative circumstances, and quality of perioperative care [WHO, 2018; Gialdini et al., 2024].

The implications extend into subsequent pregnancies. Repeat CS is associated with cumulative surgical exposure, while previous uterine surgery is relevant to the risk of placenta previa and placenta accreta-spectrum disorders in later pregnancies. Therefore, the appropriateness of the first CS can have consequences across the reproductive life course.

8. Neonatal and Childbirth Considerations

Neonatal outcomes depend on gestational age, indication, fetal condition, anaesthetic and surgical circumstances, and the quality of neonatal care. Planned CS performed before the onset of labour without an appropriate indication may expose newborns to avoidable respiratory morbidity, particularly when performed before 39 completed weeks [Gialdini et al., 2024]. Conversely, emergency CS may be the safest response to acute fetal or maternal compromise.

The clinical goal should therefore be appropriate timing and route of delivery rather than maximizing either CS or vaginal birth. Perinatal outcomes should be assessed together with maternal outcomes, patient experience, and longer-term reproductive consequences.

9. Health-System and Professional Factors in South Korea

South Korean evidence suggests that the increase in CS cannot be explained by a single clinical factor. Kim et al. described changes in maternal characteristics and obstetric risk factors, while later national analyses have identified persistent period and cohort effects after adjustment for several measurable characteristics [Kim et al., 2020; Lee et al., 2026]. A recent nationwide analysis of the COVID-19 period found a pre-existing upward trend before the pandemic and concluded that the pandemic did not explain the long-term increase [Lee et al., 2026b].

Potential system-level influences discussed in the Korean literature include changing practice norms, obstetric workforce constraints, medico-legal considerations, hospital characteristics, and incentives associated with health-care organization [Kim et al., 2022; Kim et al., 2023]. These factors should be evaluated empirically rather than assumed to have identical effects across hospitals.

10. Economic and Health-Service Considerations

CS generally requires more operating-room resources and may involve longer maternal recovery than uncomplicated vaginal birth. Higher CS use therefore has implications for hospital capacity, staffing, surgical infrastructure, postoperative care and health expenditure. However, an analysis that treats CS solely as a cost problem would be incomplete because medically indicated CS can prevent severe maternal or neonatal morbidity and mortality.

A useful health-system approach is therefore to assess the appropriateness of CS by clinical indication and Robson group, while also monitoring outcomes, patient experience, resource use and equity. WHO's guidance emphasizes ensuring access to medically necessary CS rather than imposing a target rate [WHO, 2018; WHO, 2021].

11. Patient-Centred Decision-Making

Mode-of-delivery decisions should incorporate the woman's clinical condition, the fetus's condition, available alternatives, benefits and risks, and the woman's informed preferences. Shared decision-making is particularly important in planned CS, VBAC/TOLAC decisions, breech presentation, induction of labour, and circumstances in which more than one clinically reasonable option exists.

Patient-centred care does not mean treating all delivery modes as equivalent in every clinical situation. Instead, it means explaining the relevant evidence, uncertainty and individual risks clearly and supporting an informed decision within the boundaries of safe obstetric practice.

12. Strategies to Improve Appropriateness and Safety

Strategy	Example action	Expected contribution
Robson-based audit	Report CS rates by the 10 Robson groups and review trends over time.	Improves case-mix interpretation and identifies priority groups.
Audit and feedback	Provide clinicians and institutions with risk-adjusted or group-specific feedback.	Supports evidence-based practice improvement.
Evidence-based labour management	Use contemporary criteria for induction, labour progress and diagnosis of arrest disorders.	May reduce avoidable primary CS while preserving safety.
VBAC/TOLAC support	Offer appropriately selected TOLAC when institutional resources and clinical conditions permit.	Provides an alternative to routine repeat CS for selected women.
Shared decision-making	Discuss indications, alternatives, benefits and risks with women and families.	Strengthens informed consent and patient-centred care.
Perioperative safety	Use standardized infection prevention, anaesthesia, haemorrhage preparedness and postoperative pathways.	Reduces complications when CS is clinically necessary.
Neonatal timing	Avoid non-medically indicated planned CS before recommended gestational age.	Reduces preventable neonatal morbidity.
Workforce and service planning	Assess obstetric, anaesthetic, midwifery and neonatal capacity.	Improves safe access to both emergency CS and supported vaginal birth.

13. Proposed South Korea Caesarean Quality Framework

A national quality-improvement framework can combine five domains: clinical appropriateness, patient-centred decision-making, system capacity, safety and outcomes, and equity. The purpose should be continuous improvement rather than a predetermined national CS target.

Domain	Suggested indicators	Interpretation
Clinical appropriateness	Robson-group CS rates; primary CS rate; indications	Identifies patterns requiring clinical review
Maternal safety	Haemorrhage, infection, readmission, thromboembolism, surgical injury	Assesses perioperative outcomes
Neonatal safety	NICU admission, respiratory morbidity, gestational age at planned CS	Assesses neonatal consequences
Patient experience	Informed-choice measures, birth experience, postpartum recovery	Captures outcomes beyond procedure rates
System capacity	Emergency response, staffing, operating-room readiness	Assesses ability to provide safe CS when needed
Equity	Variation by region, age, socioeconomic indicators and hospital type	Identifies disparities requiring further study

14. Discussion

The South Korean trajectory is notable for the scale and persistence of the increase in CS use. The national rate reported in the literature rose from roughly 36% in the mid-2000s to 67.4% in 2024 [Kim et al., 2020; Lee et al., 2026]. At the same time, South Korea has undergone major demographic change, including very low fertility and increasing maternal age. These changes mean that comparisons across years cannot be interpreted without considering the changing obstetric population.

Importantly, the evidence does not support attributing the entire increase to a single cause. Clinical factors such as maternal age, placental disorders, pre-eclampsia and multiple pregnancy contribute to CS use, while national analyses also identify period and cohort effects that remain after adjustment [Kim et al., 2020; Lee et al., 2026]. Health-system organization, clinical practice patterns and professional incentives may also matter. Further causal research is required to quantify the contribution of each factor.

WHO's position is particularly relevant to interpreting the Korean rate: there is no recommended universal population or hospital CS target. Instead, the appropriate question is whether women who need CS can obtain it safely and whether women who do not need CS are being exposed to avoidable surgical risks [WHO, 2021]. The Robson classification offers a practical way to operationalize this approach.

15. Research Priorities for South Korea

- Establish routinely updated national Robson-classified CS surveillance using standardized definitions.
- Examine the contribution of maternal age, parity, prior CS, induction, fetal presentation, ART, multiple pregnancy and placenta-related disorders to changing CS patterns.
- Evaluate regional and hospital-level variation after accounting for case mix and referral patterns.
- Study the relationship between obstetric workforce availability, hospital organization and CS decisions.
- Investigate patient preferences, information sources and perceptions of CS versus vaginal birth in contemporary Korean populations.
- Evaluate the safety, availability and outcomes of TOLAC/VBAC in Korean hospitals.
- Assess the effects of evidence-based labour-management interventions on primary CS rates and maternal and neonatal outcomes.
- Develop longitudinal studies of maternal and child outcomes after repeated CS.

- Evaluate socioeconomic and geographic inequalities in access to both medically indicated CS and supportive vaginal-birth care.

16. Limitations

This review has several limitations. First, it is a narrative rather than systematic review and therefore does not provide a formal meta-analysis of effect sizes. Second, national CS estimates come from different periods and data sources and should not be treated as perfectly interchangeable. Third, claims databases provide substantial information about delivery patterns but may not capture every clinical nuance behind an individual decision. Fourth, some potentially important influences, such as patient preferences and institutional culture, are difficult to measure using administrative data alone. Finally, the most recent national estimate cited was published in 2026, so subsequent data may modify the observed trajectory.

17. Conclusion

Caesarean section in South Korea is a complex clinical and health-system phenomenon. National evidence demonstrates a substantial increase in CS use over time, reaching 67.4% in 2024 in a recent nationwide claims analysis, alongside a major decline in the number of births [Lee et al., 2026]. The increase is associated with demographic, obstetric and health-system changes rather than a single determinant.

Improving maternity care should therefore not be framed as simply reducing the national CS percentage. The appropriate objective is to ensure that every woman receives the mode of delivery that best fits her clinical circumstances and informed preferences, with access to safe emergency and planned CS when medically indicated. For South Korea, routine Robson classification, clinical audit, evidence-based labour management, appropriate TOLAC/VBAC pathways, shared decision-making, strong perioperative safety systems and better national outcome surveillance provide a coherent framework for improving the appropriateness and quality of caesarean care.

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