

Opinion

Maternity Care in the Context of Demographic Decline: Lessons From Greece for Europe

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Academic Editor: Michael H. Dahan

Submitted: 3 July 2026 Revised: 5 August 2026 Accepted: 14 August 2026 Published: 8 September 2026

Abstract

Across Europe, maternity systems are increasingly challenged by demographic decline, rising medicalization, and evolving expectations surrounding childbirth. Greece represents a particularly informative case. Despite a substantial reduction in annual births, the country continues to sustain one of the highest physician densities in Europe, with a large obstetric specialist workforce alongside a persistent shortage of midwives. This structural imbalance coincides with exceptionally high cesarean section (CS) rates. As mode-of-delivery data were unavailable before 2018 and substantially incomplete between 2018 and 2020, the most reliable assessment is limited to the period 2021–2024. Throughout this period, CS rates remained elevated throughout this period, ranging from 60.5% to 62.1% of live births, with the peak plateauing across 2023 and 2024 at roughly 62.1%. Considering national vital statistics, health workforce data, and comparative European indicators, this article presents a policy-oriented ecological analysis of maternity care in Greece. It briefly explores the interrelationship between workforce composition, medicolegal pressures, maternal demographic change, and patterns of obstetric intervention. Although Greek obstetricians report a strong personal preference for vaginal birth, clinical practice remains predominantly interventionist. The sustained predominance of CS appears to reflect a multifactorial etiology, encompassing defensive medicine, advanced maternal age, increasing recourse to assisted reproductive technologies (ART), insufficient training in operative vaginal delivery, maternal request shaped by counselling practices and risk perceptions, and the geographical concentration of high-risk pregnancies. Collectively, these features are compatible with, although not sufficient to demonstrate, supplier-induced demand operating within a physician-led maternity system in which midwife-led care remains insufficiently integrated. As a policy-oriented ecological analysis, this study identifies population-level associations and generates system-level hypotheses; however, it cannot establish causal relationships or determine, at the individual level whether a CS was medically indicated or potentially discretionary. Importantly, population-level outcomes are not clearly superior despite high intensity of obstetric intervention. In 2024, the perinatal mortality in Greece reached 8.2 per 1000 births, exceeding that reported in many Western European countries, although interpretation is limited by changes in registration criteria and maternal risk profile. Infant mortality remained close to the European Union (EU) average. Greece therefore illustrates a potential misalignment between service capacity, the model of care, and demographic need. This case has broader implications for European health systems, particularly in Southern Europe, and supports reforms in midwife-led care, professional training, medicolegal frameworks, and workforce planning.

Keywords: cesarean section; vaginal birth; maternity services; midwifery; perinatal mortality; Greece; Eurostat

1. Introduction

Across Europe, maternity services are under increasing strain. In the United Kingdom (UK), maternity care has been described as being in a state of crisis, characterized by rising intervention rates, escalating litigation costs, workforce burnout, and public inquiries into high-profile safety failures [1]. Increasing tension has emerged between guideline-based practice and the movement toward woman-centered care. Paradoxically, this apparent crisis coexists with steadily improving rates of term stillbirth and neonatal mortality, as well as an expanding workforce of physicians and midwives [1]. The UK experience highlights a broader European dilemma: how maternity systems should adapt to

demographic change, increasing medicalization, and evolving expectations of care. Greece represents a contrasting case, characterized by a high density of obstetric specialists, limited midwifery capacity, and declining birth cohorts.

2. The Demographic Crisis

In 2024, data from the Hellenic Statistical Authority (ELSTAT) showed that live births in Greece declined to 68,467, the lowest number ever recorded, representing a 27.3% reduction since 2013 and a 4.2% decrease from 2023 (Table 1) [2,3]. Continuing a long-standing trend, deaths (126,916) exceeded births by nearly twofold, further accelerating natural population decline [2,3]. At the same time,



Table 1. Live births in Greece by mode of delivery [n (%)], stillbirths (n), perinatal and infant mortality rates, mean maternal age at birth, and number of obstetrician-gynecologists.

	Year											
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Live births	94,134	92,149	91,847	92,898	88,553	86,440	83,756	84,764	85,346	76,095	71,455	68,467
Vaginal births, n (%)*	-	-	-	-	-	22,702 (26.3%)	33,120 (39.5%)	34,783 (41.0%)	33,604 (39.4%)	28,884 (38.0%)	27,009 (37.8%)	25,888 (37.8%)
Cesarean sections, n (%)*	-	-	-	-	-	26,844 (31.1%)	45,351 (54.1%)	48,833 (57.6%)	51,607 (60.5%)	47,129 (61.9%)	44,406 (62.1%)	42,506 (62.1%)
Mode not declared, n (%)*	-	-	-	-	-	36,894 (42.7%)	5285 (6.3%)	1148 (1.4%)	135 (0.2%)	82 (0.1%)	40 (0.1%)	73 (0.1%)
Stillbirths**	376	353	312	339	363	335	454	443	453	446	432	454
Perinatal mortality rate	5.8	5.7	5.3	5.4	5.7	5.5	7.1	6.8	6.8	7.3	7.5	8.2
Infant mortality rate	3.7	3.7	4	4.2	3.5	3.5	3.7	3.2	3.5	3.1	3.5	3.8
Mean maternal age at birth (years)	30.9	31	31.3	31.3	31.4	31.4	31.6	31.6	32	32	32.1	32.2
Obstetricians - Gynecologists	2862	2894	2946	2978	3041	3047	3067	3035	3095	3090	3081	3137

* Mode-of-delivery data were not collected before 2018. Mode of delivery was not declared for 42.7% of births in 2018, 6.3% in 2019, and 1.4% in 2020; estimates from these years are therefore not directly comparable with the near-complete data for 2021–2024.

** In 2019, the national registration threshold was lowered from 25 to 22 completed gestational weeks.

Perinatal mortality rate: the number of stillbirths and deaths within the first week of life per 1000 total births (live births + stillbirths).

Infant mortality rate: the number of deaths of infants under one year of age per 1000 live births.

All data obtained from the Hellenic Statistical Authority (ELSTAT).

<https://www.statistics.gr/en/statistics/-/publication/SPO03/> (Vital Statistics)

<https://www.statistics.gr/el/living-conditions-in-greece#tab-2024> (Living Conditions in Greece)

<https://www.statistics.gr/el/statistics/-/publication/SHE09/> (Medical Doctors and Dentists)

obstetric service capacity remains among the highest in Europe, thereby widening the mismatch between reproductive need and provider supply.

3. Oversupply of Obstetricians, Midwife Scarcity, and CS Dominance

Greece reports one of the highest physician densities globally, with 6.6 per 1000 population compared with a European Union (EU) average of 4.3 [3,4]. The number of obstetrician-gynecologists increased from 2862 in 2013 to 3137 in 2024 despite an almost one-third decline in births (Table 1) [2,5]. In contrast, Greece has one of the lowest midwife-to-population ratios in Europe, with substantially lower midwife availability than in other high-income maternity systems in which midwife-led models predominate for low-risk care [6]. This pattern suggests that the maternity workforce may be misaligned with demographic and service needs, although ecological data cannot determine its relationship with mode of delivery.

Mode-of-delivery trends can be reliably assessed only from 2021 onward because relevant data were unavailable before 2018 and incomplete during 2018–2020 (Table 1). Between 2021 and 2024, cesarean section (CS) rates remained persistently high, ranging from 60.5% to 62.1% [2]. In 2024, 42,506 of 68,467 births (62.1%) occurred by CS, compared with 25,888 vaginal births (37.8%), placing Greece among the countries with the highest CS rates internationally [7,8].

4. Obstetricians' Preferences and the Multifactorial Drivers of Intervention

Although the Greek maternity care system is predominantly physician-led, obstetricians report a strong preference for vaginal birth. In a 2025 survey, 78.8% indicated that they would prefer vaginal birth for their own children [9]. Yet, the CS rate among obstetricians' families was 44.2%, broadly similar to that of the general population, suggesting that stated preferences alone cannot explain Greece's high national CS rate.

Several factors may contribute to persistently high CS rates. In a survey of Greek obstetricians, 56.3% identified medicolegal concerns and defensive practice as important influences on clinical decision-making, 42.6% identified advanced maternal age and *in vitro* fertilization as contributors to greater obstetric complexity, and 37.2% reported insufficient training in operative vaginal birth [9]. Maternal request, often associated with concerns about labor pain or pelvic floor injury, has also been reported as a contributing factor in approximately one quarter of cases. Geographic constraints, including Greece's numerous islands and remote mountainous regions, may promote the planned delivery of high-risk pregnancies in metropolitan centers and may partly account for higher CS rates observed in the Attica region [10]. At the system level, high specialist availability and limited integration of midwife-led care

may favor intervention-oriented practice, although ecological evidence cannot establish supplier-induced demand. A recent meta-analysis is consistent with this interpretation, reporting that low-risk women delivering in private European hospitals had approximately twice the CS rate of those delivering in public hospitals [11].

The Robson Ten Group Classification System is the standard framework for identifying the obstetric groups that contribute most to CS rates [12]. However, publicly available ELSTAT data do not include the individual-level variables required for a valid national Robson analysis, including parity, previous CS, fetal presentation, plurality, gestational age, and onset of labor. A single-center study from a private Greek maternity hospital identified Robson groups 2, 5, 10, and 8 as the main contributors to the overall CS rate, although these findings may not be nationally representative [13]. Standardized Robson classification and reporting across public and private maternity facilities are therefore warranted.

5. Perinatal and Infant Mortality in Greece and Europe

Despite the high intensity of obstetric intervention, Greece has not achieved commensurate improvement in early life outcomes. Between 2013 and 2018, the perinatal mortality rate remained relatively stable at approximately 5.3–5.8 per 1000 total births, before rising from 5.5 in 2018 to 7.1 in 2019 and reaching 8.2 per 1000 in 2024, the highest level recorded in more than a decade (Table 1) [2]. The initial increase coincided with the 2019 reduction in the gestational-age registration threshold from 25 to 22 completed weeks and may therefore partly reflect a definitional effect. Mean maternal age also increased from 31.4 years in 2018 to 32.2 years in 2024 (Table 1) [2]. Infant mortality fluctuated between 3.1 and 4.2 per 1000 live births over the study period, with a rate of 3.8 per 1000 in 2024 (Table 1) [2].

Across the EU, infant mortality has continued its long-term decline. Eurostat data show a reduction from 3.7 per 1000 live births in 2013 to 3.3 per 1000 in 2023, with countries such as Finland, Sweden, and Estonia reporting rates below 2.5 per 1000, whereas several Eastern and Central European countries report rates above 5 per 1000 [14]. Cross-national comparisons of perinatal mortality require greater caution because gestational-age thresholds and registration practices vary between countries. Nevertheless, Eurostat data indicate perinatal mortality rates below 6 per 1000 total births in many Western and Northern European countries, although higher rates have been reported in France and Belgium [15]. Against this background, Greece's perinatal mortality rate of 8.2 per 1000 total births in 2024 was higher than that reported in many European countries. By contrast, its infant mortality rate remained close to the most recent EU average.

6. Greece as a Warning Signal for Europe

Southern European countries experiencing pronounced fertility decline, including Portugal, Italy, Spain, and Cyprus, also report substantial obstetric intervention, although maternity care system structures vary across countries [4,11]. Greece represents a particularly pronounced example of the potential mismatch between demographic change, workforce composition, and the limited integration of midwife-led care. Its experience underscores the need for maternity service planning to adapt to declining birth numbers while maintaining an appropriate balance in workforce composition and models of care.

7. Study Limitations

This Opinion is based on aggregate ecological data and therefore does not support patient-level or causal inference. The observed associations may reflect unmeasured maternal, obstetric, and health-system factors, including maternal age, parity, previous CS, assisted reproductive technologies (ART), multiple gestation, maternal comorbidity, concentration of high-risk referrals, public-private sector differences, regional access, and changes in registration practices or quality of care. These factors cannot be adjusted for using the available data; consequently, the observed mortality trends cannot be directly attributed to CS use or workforce configuration.

Mode-of-delivery data are unavailable before 2018 and incomplete during 2018–2020, limiting long-term trend assessment and supporting a focus on 2021–2024. The 2019 change in the gestational-age registration threshold limits the comparability of perinatal mortality estimates over time, while the aggregate ELSTAT tables used in this analysis do not permit quantification of the extent to which this change contributed to the observed trend. The dataset also lacks the individual-level variables required for a national Robson classification. Cross-country comparisons are further limited by differences in definitions, registration thresholds, reporting completeness, and case-mix. The findings should therefore be interpreted as hypothesis-generating and policy-oriented.

8. Policy Implications and Conclusions

Greece's high CS rate is likely shaped by multiple interacting factors, including defensive medicine, shifting maternal demographics, training gaps, limited midwifery integration, and systemic constraints. Addressing this pattern requires broader health-system reform rather than isolated targets for reducing CS rates. Policy priorities should include medicolegal reform to reduce defensive practice, greater integration of midwife-led care, improved training in operative vaginal birth, and workforce planning aligned with demographic needs [16,17]. As the UK debate illustrates, increasing obstetric intervention is not inherently in-

dicative of a crisis; concern arises when service configuration, population needs, and models of care become misaligned.

In the context of demographic contraction, European maternity systems should reassess how workforce configuration, medicolegal pressures, and models of care interact. Greece highlights the risks of maintaining workforce capacity and composition that are poorly aligned with declining birth numbers. Where system-level incentives favor intervention, maternity care may move away from evidence-based, value-driven practice. Europe's central challenge is therefore to align workforce capacity, professional roles, and care pathways with demographic and societal realities while maintaining safety and quality.

Availability of Data and Materials

The data in this article are sourced from ELSTAT and Eurostat. These datasets are free to access and download via their respective official web portals (<https://www.statistics.gr> and <https://ec.europa.eu/eurostat>).

Author Contributions

GMichas conceptualized the original idea, which was further developed in consultation with SP, GMichail, and GV. SP, GMichail, and GV also made substantial contributions to the interpretation of the data in the work. GMichas drafted the initial manuscript, which was further developed, completed, and finalized with contributions to the writing by SP, GMichail, and GV. All authors contributed to the critical review and editorial revision of the manuscript. All authors contributed to editorial changes in the manuscript. All authors have read and approved the final manuscript. All authors have participated sufficiently in the work and assume responsibility for all aspects of this work.

Ethics Approval and Consent to Participate

Not applicable.

Acknowledgment

Not applicable.

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflicts of interest. George Valasoulis is serving as one of the Editorial Board members of this journal. We declare that George Valasoulis had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to Michael H. Dahan.

Declaration of AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT 5.5 and Gemini 3.1 to improve clarity and enhance the use of the English language. After employing these tools, the authors thoroughly reviewed and edited the content as necessary and took full responsibility for the final content of the publication.

References

- [1] Weeks AD, Espenhahn S, Crowe S. The UK Maternity Crisis: Analysing the Underlying Causes to Find Solutions. *BJOG : an International Journal of Obstetrics and Gynaecology*. 2025; 132: 1713–1715. <https://doi.org/10.1111/1471-0528.18326>
- [2] Hellenic Statistical Authority (ELSTAT) [Internet]. 2013–2024. Vital Statistics. Available at: <https://www.statistics.gr/en/statistics/-/publication/SPO03/> (Accessed: 21 January 2026).
- [3] Living Conditions in Greece [Internet]. Hellenic Statistical Authority (ELSTAT). 2026. Available at: <https://www.statistics.gr/el/living-conditions-in-greece#tab-2024> (Accessed: 21 January 2026).
- [4] Healthcare personnel statistics - physicians [Internet]. Eurostat. 2025. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare_personnel_statistics_-_physicians (Accessed: 5 February 2026).
- [5] Hellenic Statistical Authority (ELSTAT) [Internet]. Medical Doctors and Dentists. 2013–2024. Available at: <https://www.statistics.gr/el/statistics/-/publication/SHE09/> (Accessed: 5 February 2026).
- [6] Healthcare personnel statistics - nursing and caring professionals [Internet]. Eurostat. 2025. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare_personnel_statistics_-_nursing_and_caring_professionals (Accessed: 5 February 2026).
- [7] Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM, WHO Working Group on Caesarean Section. WHO Statement on Caesarean Section Rates. *BJOG : an International Journal of Obstetrics and Gynaecology*. 2016; 123: 667–670. <https://doi.org/10.1111/1471-0528.13526>
- [8] Alipour A, Hantoushzadeh S, Hessami K, Saleh M, Shariat M, Yazdizadeh B, et al. A global study of the association of cesarean rate and the role of socioeconomic status in neonatal mortality rate in the current century. *BMC Pregnancy and Childbirth*. 2022; 22: 821. <https://doi.org/10.1186/s12884-022-05133-9>
- [9] Christopoulos P, Tsarna E, Eleftheriades A, Korompokis I, Karampas G, Vlachos NF. Mode of Delivery in Greece: A Study of Obstetricians' Personal Preferences Regarding Delivery of Their Offspring. *Journal of Clinical Medicine*. 2025; 14: 2444. <https://doi.org/10.3390/jcm14072444>
- [10] Kontopoulos A, Tsakiridis I, Dagklis T, Boureka E, Mamopoulos A, Athanasiadis A. Cesarean section rates in each region of Greece: A retrospective analysis. *Hellenic Journal of Obstetrics & Gynecology*. 2023; 22: 35–44. <https://doi.org/10.33574/hjog.0522>
- [11] Ebadi S, Radaf VE, Mahmood T, Savona-Ventura C, Zaigham M. Caesarean section rates in public vs private hospitals in Europe: a systematic review and meta-analysis using the Robson ten group classification system. *European Journal of Obstetrics, Gynecology, and Reproductive Biology*. 2026; 318: 114921. <https://doi.org/10.1016/j.ejogrb.2025.114921>
- [12] Zeitlin J, Durox M, Macfarlane A, Alexander S, Heller G, Loghi M, et al. Using Robson's Ten-Group Classification System for comparing caesarean section rates in Europe: an analysis of routine data from the Euro-Peristat study. *BJOG : an International Journal of Obstetrics and Gynaecology*. 2021; 128: 1444–1453. <https://doi.org/10.1111/1471-0528.16634> Erratum in: *BJOG*. 2022; 129: 2214. <https://doi.org/10.1111/1471-0528.17308>
- [13] Giaxi P, Gourounti K, Vivilaki V, Zdanis P, Galanos A, Antsaklis A, et al. Implementation of the Robson Classification in Greece: A Retrospective Cross-Sectional Study. *Healthcare (Basel, Switzerland)*. 2023; 11: 908. <https://doi.org/10.3390/healthcare11060908>
- [14] Mortality and life expectancy statistics [Internet]. Eurostat. 2025. Available at: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mortality_and_life_expectancy_statistics#:~:text=Around%2012%20280%20children%20died%20before%20reaching,deaths%20in%202023%20\(down%20by%2012.9%20%25\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mortality_and_life_expectancy_statistics#:~:text=Around%2012%20280%20children%20died%20before%20reaching,deaths%20in%202023%20(down%20by%2012.9%20%25)) (Accessed: 6 February 2026).
- [15] Fetal, peri- and neonatal mortality rates by country of occurrence [Internet]. Eurostat. 2026. Available at: https://ec.europa.eu/eurostat/databrowser/view/hlth_cd_aperrto/default/table?lang=en&category=hlth.hlth_cdeath.hlth_cd_pnmor (Accessed: 6 February 2026).
- [16] Papoutsis D, Klazoglou P, Valasoulis G, Tzavara C. The improvement and retention of skills in shoulder dystocia management with the use of high-fidelity simulation: The SAFE (SimulAtion high-FidElity) study. *Women and Birth : Journal of the Australian College of Midwives*. 2024; 37: 101590. <https://doi.org/10.1016/j.wombi.2024.02.006>
- [17] Papoutsis D, Klazoglou P, Valasoulis G, Tzavara C. Time perception in shoulder dystocia management; a secondary analysis of the prospective cohort simulation SAFE study. *European Journal of Obstetrics, Gynecology, and Reproductive Biology*. 2025; 311: 114016. <https://doi.org/10.1016/j.ejogrb.2025.114016>