Number 581
September 2020

cliquer ici pour la **version française**

Population & Societies

Too many yet too few: the double burden of Caesarean births

Alexandre Dumont* and Christophe Z. Guilmoto*

What is the proportion of Caesarean births worldwide? How does it vary across countries? In this overview of the Caesarean section rate, Alexandre Dumont and Christophe Z. Guilmoto reveal significant differences between those countries where Caesarean sections are performed abusively and the rate is above the WHO-recommended standard—from 10% to 15%—and those where it is below.

Caesarean section is a surgical procedure that provides an effective means to reduce maternal and neonatal mortality when performed for medical reasons [1]. The proportion of Caesarean births in the world has increased over recent decades. According to recent estimates covering 150 countries, 21% of all births are by Caesarean section, with national averages ranging between 1% and 58% [2]. And figures published by the World Health Organization (WHO) show that the global rate of Caesarean births has almost tripled in the last quarter century, rising from 6.7% in 1990 to 19.1% in 2014. Beyond a certain level, however, the increased frequency of Caesarean births does not produce significant improvements in maternal or perinatal health, which suggests that a growing proportion of these procedures is unnecessary.

If a mother experiences obstetrical complications, her life and that of her child may be at risk if she cannot obtain a timely Caesarean section. Many pregnant women are exposed to this risk, especially in low-income countries with poor health infrastructure where women's health needs cannot be fully met [2]. That said, Caesarean deliveries are themselves associated with short- and long-term health risks for children, mothers, and future pregnancies, especially in settings where women have limited access to high-quality obstetrical care. They are also a major financial burden for the health system [3].

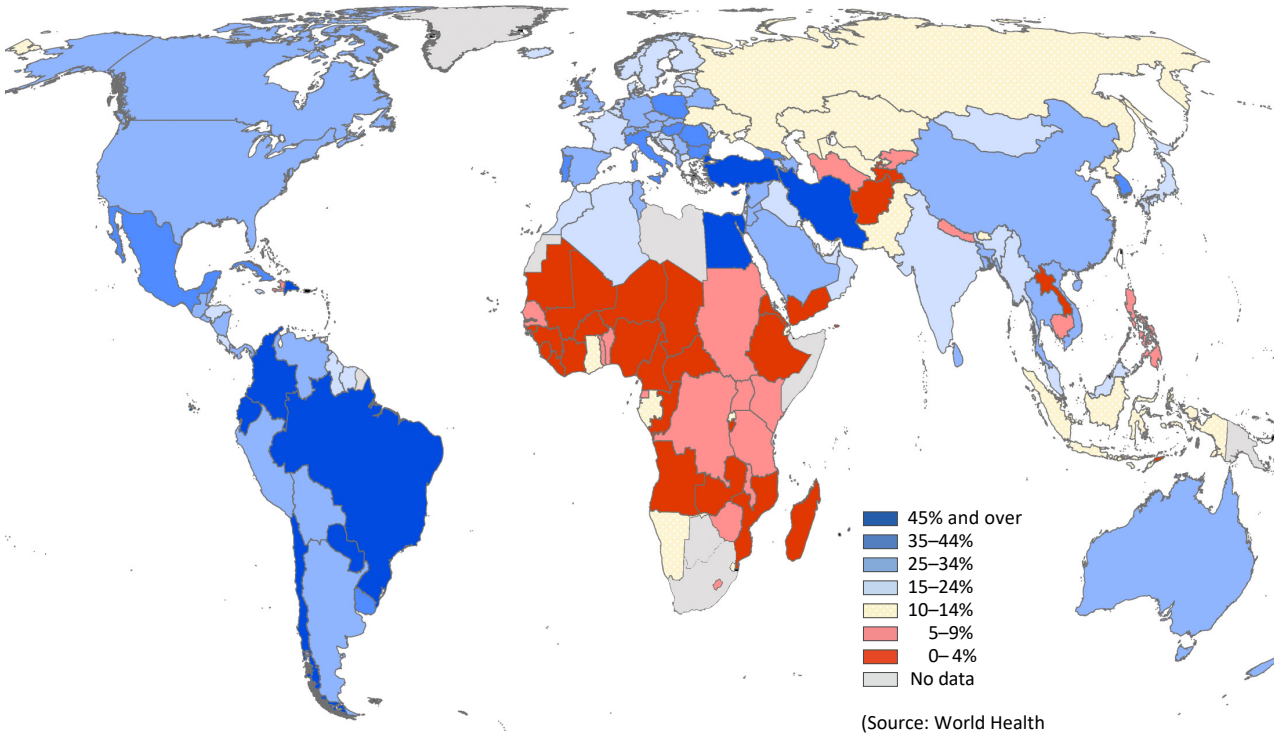
Box 1. What is being done to reduce unnecessary Caesarean sections?

The causes of the increase in Caesarean rates vary across and within countries. Several reasons may coexist, such as an erosion of the medical skills needed to deal with potentially difficult vaginal deliveries, the convenience of being able to plan birth dates, or the greater profitability of a Caesarean section over a natural birth for physicians and private clinics. Fear of vaginal delivery may also contribute to this 'Caesarean epidemic' in some countries. The steady increase in Caesarean rates is a major public health concern, and recommendations based on solid data are urgently needed to address this trend.

A recent review of the scientific literature has identified potentially effective forms of intervention for reducing unnecessary Caesarean sections [7]. They must target clinicians, women and their families, and the health system. The International Federation of Gynecology and Obstetrics recommends several approaches for limiting unnecessary Caesareans across the world: imposing a fixed fee for births, whether by Caesarean section or not; obliging hospitals to publish their statistics; informing women more fully about the risks incurred; and improving training for vaginal delivery. Each country must adapt its strategy to its own national context and to the means at its disposal for changing behaviours. In France, where women are closely followed by midwives throughout their pregnancy and attend classes to prepare for the birth, and where the indications for planned Caesarean sections are systematically reviewed by peers, the Caesarean rate has stabilized at around 20% since the early 2000s. The situation is not optimal, however, as 28% of Caesareans performed before onset of labour in 2010 were potentially avoidable. The main indications for planned Caesareans, such as breech presentation or a previous Caesarean, did not correspond to the recommendations of the French national college of gynaecologists and obstetricians [8].

* Centre Population et Développement, Institut de recherche pour le développement and Université de Paris - Inserm ERL 1244.

Figure. Caesarean rates across the world, 2010–2015



A. Dumont, C. Z. Guilmoto, *Population & Societes* no. 581, INED, September 2020.

What is the optimal Caesarean rate?

The steadily increasing frequency of Caesarean deliveries is a global public health concern (Box 1). In 1985, a group of experts brought together by the WHO concluded that the optimal rate was somewhere between 10% and 15%. These recommended levels have been widely criticized by the international scientific and medical community, and they have sometimes been used inappropriately. They do not apply to hospitals, whose patients may have very diverse characteristics from one facility to the next, but to the general population of pregnant women.

In 2015, the WHO published a statement on Caesarean section rates worldwide, confirming the range of 10% to 15% as an optimum at the population level [4]. Below 10%, women's needs are not totally covered, so maternal and perinatal mortality are liable to increase. Levels above 10% in a population do not reduce maternal and neonatal mortality rates any further, however, and above 15% the risk of unnecessary interventions is high.

Estimating the number of Caesarean sections

This analysis is based on two statistical series that we combined and mapped. The first provides national Caesarean rates per birth estimated by the WHO in 2019 for the period 2010–2015 [2]. Figures are available for only 174 countries, however. They are missing for Greece, for example, where the unofficial rate reported in the press was 57% in 2017, but also for Taiwan (unofficial rate of 33% in 2008) and South Africa (26% in 2015–2016) and for countries with no estimates, such as Papua New Guinea, Libya, Somalia, and Botswana. The second statistical series, giving the mean number of births by country in 2010–2015, was produced by the United Nations Population Division [9]. The number of births combined with the Caesarean rate gives the estimated annual number of Caesarean sections performed over this period.

Large disparities across countries and regions

According to the WHO, the Caesarean rate ranges between 1% and 58% worldwide (Figure). The proportion is very low (below 5%) in 28 countries, of which three-quarters are in sub-Saharan Africa. The lowest rates are observed in Niger, Chad, Ethiopia, Madagascar, and Timor-Leste (below 2%). Large developing countries where rates are low include Mali (2%), Nigeria (3%), Afghanistan (3%), and Congo (5%). Caesarean rates increase gradually with the level of development, and more than 100 countries are above the 15% maximum recommended by the WHO; 43 even have levels exceeding 30%. This latter group is geographically heterogeneous. It includes many European countries such as Cyprus (57%), Georgia (41%), Romania (40%), and Italy (35%), but almost

half of the countries are in Latin America, a region with a long history of Caesarean deliveries. The Dominican Republic tops the list with 58%, followed by Brazil (55%), Chile (50%), and Ecuador (49%), among others. Rates are also reaching high levels in countries of the Middle East (Turkey, Lebanon, and Iran, with 46%–48%) and East Asia, such as South Korea (39%) and China (35%).

The Caesarean rate is generally linked to the level of development (prosperity, education, fertility level) and the weight of the private sector in healthcare provision [2]. Yet these links do not explain regional concentrations, such as that observed in Latin America. Both patients' and clinicians' demand for Caesarean births for non-medical reasons also contributes to the increase in frequency [5]. However, some of the richest and best-equipped countries in terms of healthcare provision have resisted this pressure, as illustrated by the cases of Finland, the Netherlands, Sweden, and Japan, where rates are below 20%.

Where are there too few or too many Caesarean births?

Let us examine the countries where rates are outside the recommended range (10%–15%). For each one, we estimated the annual excess or deficit of Caesarean births. In Colombia, for example, where the estimated Caesarean rate is 46%, 31 percentage points above the 15% recommended maximum, the excess is estimated at 230,000, representing 31% of the 746,000 annual births recorded over the period 2010–2015. These 230,000 excess Caesareans account for two-thirds of all Caesarean births.

For countries with levels below 10%, there is a world deficit of 2.1 million Caesareans per year, representing 6% of all births in those countries. The countries of sub-Saharan Africa—Nigeria (with an annual deficit of 500,000 Caesareans), Ethiopia (260,000), Congo (150,000), Angola (70,000), etc.—are major contributors to this global deficit (Box 2).

Conversely, 11.9 million excess Caesareans are performed in countries above the 15% recommended maximum, a figure that alone corresponds to 42% of all Caesarean births worldwide. The countries that contribute most to this global excess are very diverse and include China (an annual excess of 3.5 million), Brazil (1.2 million), Egypt (930,000), and the United States (670,000). In Europe and the Maghreb, the excess remains relatively low by comparison.

While Caesarean sections are performed abusively in many countries, the deficit remains severe in poor countries, resulting in increased risk of death during and after childbirth. In many developing countries, such as India, Indonesia, and even certain African countries, efforts are needed not only to guarantee access to safe delivery for vulnerable populations but also to combat abusive recourse to medically unjustified Caesarean sections among the middle classes. National public health authorities face the dual challenge of promoting the medicalization of births while preventing the uncontrolled development of abusive practices (Box 3).

Box 2. Deficit of Caesarean deliveries in West and Central Africa: situation, trends, and political response

In the 1990s, Caesarean rates were dramatically low (below 1%) in most countries of West and Central Africa, largely because many women were unable to pay for the surgical procedure or lived too far from the nearest hospital. At that time, maternal mortality was falling more slowly in these two regions than elsewhere, and even in 2015, at 7 deaths per 1,000 births, it was still the highest in the world.

After stagnating for almost 2 decades, Caesarean rates increased in the early 2000s, notably in countries that had introduced policies to make reproductive health services more affordable for women by subsidizing obstetrical care, Caesarean sections especially. Pregnant women still pay for their care, but if they need a Caesarean, its cost is partially or fully covered.

In Mali and Senegal, for example, government policies to provide free Caesarean sections were introduced in 2005 and 2006. Therefore, the Caesarean rate rose from 1.7% in 2006 to 2.9% in 2012–2013 in Mali and from 3.5% in 2005 to 5.3% in 2016 in Senegal. In Burkina Faso, where 80% of the cost of a Caesarean has been covered since 2006, the rate increased from 0.7% in 2003 to 3.7% in 2015. It nonetheless remains below 10% throughout West and Central Africa, and major inequalities in access persist. Among the poorest 20% of women, less than 1% of births are by Caesarean section in most countries.

While many African women cannot obtain a Caesarean delivery, others give birth in this way for no justifiable medical reason. A study in Burkina Faso showed that 24% of the Caesareans performed in hospitals eligible for the state subsidy were not medically justified. Such abusive practices are more common in cities, when performed by less trained personnel, and among women from the most affluent social groups.

The increase in Caesarean rates is set to continue

The global situation regarding Caesarean births is constantly evolving. Caesarean rates are increasing, sometimes very rapidly, in regions such as South and Southeast Asia where they are below the average. This signals early progress in the least developed countries where access to safe delivery remains very limited, especially in rural areas and among poor populations. But Caesarean rates are also increasing in cities and among wealthy populations in low- and middle-

Box 3. The case of India: progress and inequalities

The uptrend in Caesarean rates in India is typical of the pattern observed in emerging Asia. The situation is also worrying because of the large numbers of avoidable Caesareans performed [6]. For many years, the Caesarean rate remained low, at just 3% in the early 1990s and less than 10% in 2008. But since the introduction 10 years ago of a policy to encourage poor women to give birth in hospital, the rate has risen sharply, reaching 17% in the mid-2010s.

This figure conceals large variations across regions and social groups, however. In a large northern state such as Bihar, the rate is just 6%. But rates now exceed 35% in several southern states, with a peak of 58% in the state of Telangana, a level comparable to the world record held by the Dominican Republic. Rates also vary widely across social classes. Among the wealthiest 10%, they already exceed 37%. A breakdown by region and social group reveals large pockets of Caesarean rates either above or below the recommended range. It is estimated that 2 million medically unjustified Caesarean sections were performed annually in the first half of the 2010s. Conversely, the poor regions have an estimated annual deficit of half a million Caesareans, a figure equivalent to that estimated for Nigeria. These excesses and deficits illustrate the double burden facing the Indian public health system.

The differences by family income or regional fertility level suggest that Caesarean rates will continue to climb steadily in a country experiencing rapid economic growth. In the disadvantaged regions, the proportion of women giving birth at home will continue to decline, and the share of Caesarean sections will reach 10%. Among the middle classes, the steady increase in living standards and the decrease in family size will encourage a growing number of women to give birth in private clinics (where Caesarean rates have already reached 40%). India will soon overtake neighbouring China, where birth numbers are in steady decline and Caesarean rates are levelling off (35% in 2014), to hold the world record for the highest absolute number of Caesarean births.

income countries, thus widening internal inequalities in access to reproductive health (Boxes 2 and 3).

A model of 'modern' and risk-free childbirth, based on unnecessary medicalization, is spreading across the developing world. The frequency of surgical deliveries is increasing due to the rise in Caesarean births performed simply to guarantee the patients' comfort, to make life easier for practitioners, and to boost the profits of private clinics. The medical community must work together with future mothers to resist this therapeutic overkill.

REFERENCES

[1] World Health Organization, 2018, *WHO recommendations: Non-clinical interventions to reduce unnecessary Caesarean section*, Geneva, WHO.

[2] Boerma T., Ronsmans C., Melesse D. Y., Barros A. J., Barros F. C., Juan L., Moller A. B., Say L., Hosseinpoor A. R., Yi M., Neto D. D., Temmerman, M., 2018, Global epidemiology of use of and disparities in caesarean sections, *The Lancet*, 392(10155), 1341–1348.

[3] Keag O. E., Norman J. E., Stock S. J., 2018, Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis, *PLoS Med*, 15(1), e1002494.

[4] World Health Organization, 2015, *WHO statement on Caesarean section rates*, Geneva, WHO.

[5] Schantz C., Loenzien M. de, Goyet S., Ravit M., Dancoisne A., Dumont A., 2019, How is women's demand for caesarean section measured? A systematic literature review, *PLoS One*, 14(3), e0213352.

[6] Guilmoto C. Z., Dumont A., 2019, Trends, regional variations, and socioeconomic disparities in cesarean births in India, 2010–2016, *JAMA Network Open*, 2(3), e190526.

[7] Betrán A. P., Temmerman M., Kingdon C., Mohiddin A., Opiyo N., Torloni M. R., Zhang J., Musana O., Wanyonyi S. Z., Gülmezoglu A. M., Downe S., 2018, Interventions to reduce unnecessary caesarean sections in healthy women and babies, *The Lancet*, 392(10155), 1358–1368.

[8] Coulm B., Blondel B., Alexander S., Boulvain M., Le Ray C., 2014, Potential avoidability of planned cesarean sections in a French national database, *Acta Obstetricia et Gynecologica Scandinavica*, 93, 905–912.

[9] United Nations, Department of Economic and Social Affairs, Population Division, 2019, *World population prospects 2019*, https://population.un.org/wpp/

Abstract

The Caesarean section rate varies worldwide from 1% to 58%. It is particularly low (below 5%) in less developed countries in sub-Saharan Africa such as Mali (2%), Nigeria (3%), and the Congo (5%). At the other end of the spectrum, it is over 30% in European countries such as Cyprus (57%), Georgia (41%), Romania (40%), and Italy (35%). It is also high in Latin America, which has a long history of Caesarean deliveries. The Dominican Republic has the highest rate (58%), followed by Brazil (55%), Chile (50%), and Excuador (49%).

Keywords

Caesarean section rate, international comparisons, development, safe childbirth, maternal mortality, abusive recourse to Caesarean section, double burden

ined INSTITUT NATIONAL D'ÉTUDES DÉMOGRAPHIQUES

INED: 9, cours des Humanités • CS 50004 • 93322 Aubervilliers Cedex • France
Director of Publications: Magda Tomasini
Editor-in-chief: Gilles Pison
English Language Editor: Christopher Leichtnam
Translated by Catriona Dutreuilh
Graphic Designer: Isabelle Milan
Printer: Mérico Delta Print, Bozouls, France
D.L. 3rd quarter 2020 • ISSN 0184 77 83

No. 581 • September 2020 • *Population & Societies*
Monthly bulletin of the French Institute for Demographic Studies
Download *Population & Societies* free of charge and subscribe at:
www.ined.fr/en/publications/editions/population-and-societies
Contact:
edition@ined.fr