

Demographic and Health Surveys: caesarean section rates in sub-Saharan Africa

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It is well documented that caesarean section rates have increased in many Latin American and Asian countries, and that many of these interventions are unnecessary.^{1 2} Fewer data are available on trends in caesarean section rates in sub-Saharan Africa, where concern centres on lack of access to necessary interventions.³

Participants, methods, and results

We analysed Demographic and Health Surveys performed at two different times in eight sub-Saharan African countries—Burkina Faso (1992 and 1999), Cameroon (1991 and 1998), Ghana (1993 and 1998), Kenya (1993 and 1998), Madagascar (1992 and 1997), Niger (1992 and 1998), Tanzania (1992 and 1996), and Zambia (1992 and 1996).⁴ We calculated caesarean section rates for singleton live births that occurred during the three years before the interviews, weighted for the complex sample designs. We calculated urban and rural rates according to the residence of the mothers. We used a logistic regression of the pooled data from the eight countries to calculate the crude odds ratio of having a caesarean section during 1991-3 (reference group) and 1996-9. We calculated confidence intervals after taking the complex design into account. In a next step, we added mother's age (<20, 20-34, ≥35 years), parity (1, 2-4, ≥5), and residence (urban, rural) to the logistic regression. We also calculated the proportion of singleton live births delivered in health facilities and included place of delivery in the logistic regression.

The table shows that caesarean section rates were lower than 5% in all countries except Kenya, and that the rates were lower than 2% in Burkina Faso, Madagascar, Niger, and Zambia. Caesarean section rates decreased in five countries between 1991-3 and 1996-9. The proportion of singleton live births delivered in health facilities decreased between 1991-3 and 1996-9 in

Burkina Faso (43.1% and 33.3%, respectively), Cameroon (60.9% and 54.0%), Kenya (42.5% and 42.3%), Madagascar (44.0% and 34.2%), Tanzania (52.4% and 46.6%), and Zambia (50.3% and 44.8%). It increased in Ghana (41.9% and 44.2%) and Niger (16.0% and 17.8%).

The overall odds ratio for the trend was 0.88 (95% confidence interval 0.77 to 1.00). After adjustment for age, parity, and urban or rural residence, the odds ratio was 0.89 (0.79 to 1.01). After including whether delivery was in a health facility in the logistic regression, we found the odds ratio increased to 0.94 (0.83 to 1.07).

Comment

Our results show that access to caesarean sections is not improving in sub-Saharan Africa and that it might be worsening. Including delivery in a health facility in the logistic regression rendered the odds ratio closer to 1, suggesting that the trend toward a decline of caesarean section rates is partly linked to a decline in access to health services. This shows the lack of progress of "Safe Motherhood" programmes in a region where maternal mortality is extremely high.

There is suggestive evidence that a caesarean section rate of 3.6% to 6.5% (median 5.4%) is needed to address obstetric complications in west Africa, and that a rate of 2% is a minimum.⁵ Our results therefore point to an urgent need for better access to caesarean sections in sub-Saharan Africa. However, any support programmes should be carefully designed to avoid the risk of simultaneously increasing unnecessary caesarean sections and iatrogenic morbidity and mortality. Support should be part of a global effort toward appropriate use of caesarean sections, limiting its frequency where it is overused, and increasing its frequency where use is too low.

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Single live births by caesarean section in sub-Saharan African countries in the three years before health survey, by place of mother's residence

Country	Year of survey	% (No) of births by caesarean section*		
		Total	Rural areas	Urban areas
Burkina Faso	1992	1.1 (3612)	0.5 (3095)	4.7 (517)
	1999	1.1 (3534)	1.0 (3164)	2.5 (370)
Cameroon	1991	2.3 (2036)	1.7 (1238)	3.3 (798)
	1998	2.6 (2275)	2.3 (1665)	3.3 (610)
Ghana	1993	4.4 (2029)	2.9 (1468)	8.4 (561)
	1998	4.1 (1865)	2.8 (1400)	8.0 (465)
Kenya	1993	5.4 (3537)	4.1 (3086)	13.9 (451)
	1998	6.7 (3257)	5.7 (2653)	11.1 (604)
Madagascar	1992	0.9 (3467)	0.8 (3026)	1.5 (441)
	1997	0.7 (3727)	0.3 (3002)	2.3 (725)
Niger	1992	0.8 (4143)	0.6 (3490)	2.1 (653)
	1998	0.6 (4722)	0.3 (3977)	2.1 (745)
Tanzania	1992	2.6 (4935)	2.1 (3881)	4.6 (1055)
	1996	2.2 (4035)	1.5 (3304)	5.0 (731)
Zambia	1992	2.6 (3851)	1.4 (2043)	4.0 (1808)
	1996	1.6 (4331)	0.8 (2661)	3.0 (1670)

*Sample sizes are weighted.

1 Belizán JM, Althabe F, Barros F, Alexander S. Rates and implications of caesarean sections in Latin America: ecological study. *BMJ* 1999;319:1397-402.

2 Buekens P. Over-medicalisation of maternal care in developing countries. In: De Brouwere V, Van Lerberghe W, eds. *Safe motherhood strategies: a review of the evidence*. Antwerp: ITG Press, 2001:195-206.

3 Dumont A, de Bernis L, Bouvier-Colle MH, Bréart G. MOMA study group. Caesarean section rate for maternal indication in sub-Saharan Africa: a systematic review. *Lancet* 2001;358:1328-33.

4 MEASURE DHS+. Demographic and Health Surveys. Providing information for informed decisions in population, health, and nutrition. www.measuredhs.com (accessed 15 Nov 2002).

5 De Brouwere V, Dubourg D, Richard F, Van Lerberghe W. Need for caesarean sections in west Africa. *Lancet* 2002;359:974-5.

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