

Statistical analysis of Cesarean Sections in Bangladesh in 2016

Total number of births	3,552,000
Total number of C-sections	820,512
Proportion of C-sections among all hospital births	62%
Proportion of C-sections among all private hospital births	80%
Total number of necessary C-sections	248,640
Proportion of necessary C-sections among all C-sections	30%
Total number of unnecessary C-sections in a given year	571,872
Proportion of unnecessary C-sections among all C-sections	70%
Number of women who are in need of but yet to receive life-saving C-sections	Between 106,560 and 284,160
Total direct cost (out of pocket) to patients for C-sections	\$360 million
Total indirect cost (out of pocket) to patients and their family for C-sections	\$92 million
Total cost to patients for C-sections	\$453 million
Total direct cost (out of pocket) to patients for unnecessary C-sections	\$251 million
Total indirect cost (out of pocket) to patients and their family for unnecessary C-sections	\$64 million
Total cost to patients for unnecessary C-sections	\$315 million
Per capita burden (cost) of unnecessary C-sections	\$1.97

**All dollar figures are in USD.*

The figures in the table above were calculated using a broad range of sources, in particular:

- [The Bangladesh Demographic and Health Survey \(BDHS\) 2014](#)
- A. P. Bertran: Rates of caesarean section: analysis of global, regional and national estimates. *Paediatric and Perinatal Epidemiology*, 21, 98-113, 2007

Detailed workings

Total number of births per year

The population is taken from Bangladesh Bureau of Statistics website for 2016. The Crude Birth Rate (CBR) of 22.2/1000 population is taken from Bangladesh Demographic and Health Survey 2014 (BDHS2014). Applying CBR to the total 2016 population gives 3,552,000 as the annual birth cohort.

Total number of C-sections per year

Multiplying the annual birth cohort for 2016 (3,552,000) with the C-section rate (23%) as per the BDHS2014 provides the total number of C-sections in a given year (820,512).

Proportion of C-sections in private hospitals and all hospitals

Data taken from BDHS2014.

Total number of necessary/unnecessary C-sections per year

- a. The World Health Organisation recommends a C-section rate of between 10% and 15% of all births per country. Since the current C-section rate in Bangladesh is 23%, a minimum excess (unnecessary C-sections) of 8% exists if we use the conservative end (15%) of the WHO range.
- b. Given the current maternal mortality rate in Bangladesh is relatively high (176/100,000 live births: Source: Interagency Projection, 2013) and 63% of all deliveries in Bangladesh still take place at home, it can be assumed that even within that 15%, a substantial proportion are unnecessary C-sections. Based on global projections of maternal mortality and C-section rates, a maternal mortality rate of 176 should have a C-section rate of around 7% (see figure 2, page 102 of A. P. Bertran AP et al). Therefore it can be assumed that there is an additional 8% unnecessary C-sections ($15\% - 7\% = 8\%$) on top of the original 8%.
- c. By adding these two proportions ($8\% + 8\%$), it can be derived that approximately 16% of all births in Bangladesh in 2016 were unnecessary C-sections and 7% were necessary C-sections. This equates to 70% of all C-sections being unnecessary.

Total number of women in need of a C-section who can't access one

Currently 63% women in Bangladesh deliver at home, according to BDHS2014. If all women delivered at a health facility or had full access to Emergency Obstetric Care (EmOC), a certain proportion of these women would require life-saving C-sections. Given 7% of all births in Bangladesh are necessary C-sections and the WHO says the number who need C-sections is actually between 10% and 15%, it can be assumed that the remaining 3% to 8% of women who need C-sections are among those who deliver at home without EmOC. When we calculate 3% to 8% of the total number of births per year (3,552,000), we get a range of the total number of women who require C-sections but are unable to have them because, (a) they deliver at home and, (b) they have limited access to EmOC services (range between 106,560 and 284,160).

Women in Bangladesh still do not have full access to EmOC owing to a variety of reasons, these include: (i) economic reasons, (ii) fear of hospital delivery ending in a C-section (iii) a lack of decision making ability and knowledge, (iv) distance to health facilities, (v) less responsive health systems, (vi) lower societal value of women. These factors are both the experience of staff at Save the Children and in line with the BDHS2014, which indicated that facility delivery is positively correlated to wealth and education of the women.

Direct/indirect costs of all/necessary C-sections

Conservative estimates were applied to a range of direct/indirect costs that would be incurred by a patient having a C-section across NGO, public and private facilities. It was conservatively assumed that 25 percent of C-sections would involve complications, and additional costs were determined for these. Overall, the calculations put an average total (direct and indirect) cost for an individual to have a C-

section at US\$552.09, which is in line with the experience of staff at Save the Children. The direct cost per C-section was US\$438.75. Wage data was taken from INSERT SOURCE IF WE HAVE ONE.

Direct cost estimates for the 75 percent of C-section patients without further complications

- Medicine, Doctor's Fee, Stay Charge (based on 7 days total stay) – Public or NGO: \$125; Private: \$312.5
- Food and incidentals (based on 7 days total stay) – Public or NGO: \$6.25/day, Private: \$12.5/day
- Transport including those of the family members (based on 7 days total stay) – Public or NGO: \$2.5/day, Private: \$5/day

Indirect cost estimates for the 75 percent of C-section patients without further complications

- Wage loss of the delivering women (based on 7 days loss): Public or NGO: \$5.6/day, assuming 20% women of this group are in workforce, Private: \$6.88/day, assuming 40% women of this group are in workforce.
- Wage loss of the husband of the delivering women (based on 5 days loss): Public or NGO: \$6.5/day for an estimated 80% of husbands of this group in the workforce; Private: \$12.5/day, for an estimated 90% of husbands of this group in the workforce.
- Wage loss of the additional family members of the delivering women (based on 3 days loss): Public or NGO: \$5.6/day, assuming 50% of this group are in workforce, Private: \$6.5/day, assuming 70% of this group are in workforce.

Direct cost estimates for the 25 percent of C-section patients with further complications

- Medicine, Docs Fee, Stay Charge (assuming 12 days total stay) – Public or NGO: \$187.5, Private: \$437.5
- Food and incidentals (assuming 12 days total stay) – Public or NGO: \$6.25/day, Private: \$12.5/day
- Transport including those of the family members (assuming 12 days total stay) – Public or NGO: \$2.5/day, Private: \$5/day

Indirect cost estimates for the 25 percent of C-section patients with further complications were assumed to be the same as those without further complications. IS THIS CORRECT?

With these unit costs for direct and indirect costs, total estimated costs could be calculated by multiplying the unit costs against the total number of C-section cases in each category (NGO facility, public facility, private facility). The total number of C-sections cases in each category was calculated applying percentages from BDHS2014.

Per capita burden of unnecessary C-sections

The total cost of unnecessary C-sections (\$315 million) was divided by Bangladesh's population (163 million), providing the per capita burden per person.

This is a draft calculation estimate referenced by Dr. Ishtiaq Mannan, Deputy Country Director, Save the Children in Bangladesh.