

# Over-medicalisation of Maternal Care in Developing Countries

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## Summary

*We reviewed available data on the frequency of obstetrical interventions (caesarean sections, episiotomies, and oxytocics) in developing countries. Rates of caesarean sections are increasing and are higher than 15% in a majority of Latin American countries and in some regions of Asia. There is no indication of rising rates of caesarean sections in Africa, but rates are already higher than 5% in many urban areas of East and Southern Africa. The situation is different in West Africa, where only Ghana has a rate higher than 5% in urban areas.*

*High episiotomy rates have been reported in Africa and Latin America. Hospitals in Argentina and Nigeria have episiotomy rates higher than 80% among primiparae. A 37% episiotomy rate among primiparae was reported in Burkina Faso.*

*High rates of use of oxytocin during the first and second stage of labor have also been observed in Africa. In three African urban areas, oxytocin was used in more than 20% of deliveries.*

*We conclude that the epidemic of caesarean sections continues in Latin America and extends into Asia. In addition, there are signs of a worldwide epidemic of other obstetrical interventions. There is an urgent need to build strong strategies to promote evidence-based interventions.*

## Introduction

Developing countries, as other regions of the world, are faced to the challenge of making the best use possible of limited resources to improve the health of women and children. Obstetrical interventions should be evidence-based, and interventions effective only in high-risk groups should not be used routinely. Morbidity and mortality caused by unnecessary interventions could be a significant problem, and a world-wide epidemic of obstetrical interventions could have a serious negative health impact. However, it is unclear if such a world-wide epidemic exists, because studies have generally been focused on one country or region. Our objective is to review available data on the frequency of obstetrical interventions in all regions of the developing world. We will focus this review on three interventions: cesarean sections, episiotomies, and oxytocics. We will also discuss potential strategies to decrease the use of unnecessary interventions.

## Caesarean Sections

The World Health Organization recommends that rates of caesarean sections should not be higher than 15% (WHO 1985). However, rates higher than 5% are not justified by well established maternal medical indications (De Brouwere 1997).

It is well documented that caesarean section rates are very high in many Latin American countries. Belizan *et al.* 1999 estimated that twelve of the nine-teen Latin American countries they examined had caesarean section rates above 15%. They calculated that around 850,000 unnecessary caesarean sections are performed each year in the Latin American region. A paper commenting Belizán's data suggested that a world-wide epidemic of caesarean sections might be going on (Flamm 2000). Data from Asia indeed suggest that the epidemic is not limited to Latin America. In one Chinese hospital, the caesarean section rate increased from 11.0% in 1990 to 29.9% in 1997 (Wu 2000). A population-based survey conducted in Shanghai, China, showed that caesarean section rates increased from 4.7% in 1960-1979 to 22.5 % in 1988-1993 (Cai *et al.* 1998). In Thailand, caesarean section rates increased from 15% in 1990 to 22% in 1996 (Saropala & Suthutvoravut 1999). A 1997 population-based survey from an affluent section of Chennai, India, found a caesarean section rate of 45% (Pai *et al.* 1999). Household surveys from rural Kerala, India, showed that caesarean section rates increased from 11.9% in 1987 to 21.4% in 1996 (Thankappan 1999). A hospital-based study performed in one city in Kerala found a 10% caesarean section rate in government hospitals compared to 30% in private hospitals (Thankappan 1999).

To further explore this issue, we have performed an on-line distance analysis of (Demographic and Health Survey 2000). For each survey for which data were available, we have calculated urban and rural caesarean section rates for deliveries that occurred during the three years preceding the interviews. The results (Table 1) confirm that rates are higher than 15% in most Latin American urban areas, and are increasing. They also show that urban rates are higher than 5% in the Asian countries for which data were available. No urban area in Africa has rates higher than 15%. However, many countries from East and Southern Africa had caesarean section rates higher than 5% in urban areas. The situation is clearly different in West Africa, where only Ghana has a rate higher than 5% in urban areas. In several African countries, data are available for two time periods. Urban rates increased very slightly in Niger, Madagascar, and Tanzania, but decreased in Burkina Faso, Ghana, Kenya, and Zambia. There is thus no indication of a rapid epidemic of caesarean sections in Africa.

*Table 1. Percentages of live births with caesarean section in the last three years preceding the survey*

Region	Country	Year	Urban C. section rates (%)	Rural C. section rates (%)	
Middle East	Jordan	1990	6.9	4.5	
		1997	12.6	6.1	
	Yemen	1991	2.9	0.7	
			2.8	1.2	
North Africa	Egypt	1992	10.1	2.5	
		1995	12.0	4.9	
	Morocco	1992	4.5	1.1	
West Africa	Benin	1996	4.1	1.3	
	Burkina Faso	1992	4.5	0.7	
			1999	2.3	1.1
			1991	3.4	1.8
	Central African Republic	1994	2.3	1.6	
	Chad	1997	1.1	0.1	
	Ghana	1993	9.0	2.8	
		1998	8.5	2.5	

	Guinea	1999	4.0	1.5
	Ivory Coast	1994	3.2	1.0
	Mali	1996	1.6	0.6
	Nigeria	1990	3.1	2.4
	Niger	1992	2.0	0.6
		1998	2.1	0.3
	Senegal	1993	3.6	1.7
	Togo	1998	4.6	1.2
East Africa	Comoros	1996	9.2	4.1
	Kenya	1993	13.4	4.3
		1998	10.5	6.0
	Madagascar	1992	1.5	0.8
		1997	2.2	0.3
	Malawi	1992	7.3	2.9
	Rwanda	1992	4.6	1.7
	Tanzania	1992	4.5	2.1
		1996	4.7	1.6
	Uganda	1995	6.5	2.0
Southern Africa	Mozambique	1997	7.3	1.4
	Namibia	1992	9.8	5.5
	Zambia	1992	4.2	1.4
		1996	3.5	0.8
	Zimbabwe	1994	7.0	4.6
South East Asia	Indonesia	1991	2.2	0.9
		1994	5.2	1.9
		1997	6.1	3.5
	Philippines	1993	8.3	4.6
		1998	9.8	3.0
	Vietnam	1997	12.2	2.0
Indian Subcontinent	India	1992	5.7	1.6
	Nepal	1996	5.4	0.7
Caribbean	Dominican Republic	1991	26.7	15.2
		1996	31.4	20.3
	Haiti	1994	3.9	0.4
Central America	Guatemala	1995	17.1	4.1
	Nicaragua	1997	21.6	10.3
South America	Bolivia	1994	14.8	5.9
		1997	21.4	6.0
	Brazil	1991	28.1	9.4
		1996	41.6	21.4
	Colombia	1990	18.6	8.7
		1995	22.0	10.1
	Peru	1992	14.7	3.1
		1996	14.3	2.7
	Paraguay	1990	21.8	8.3

Sources: Demographic and Health Survey 2000 and International Institute for Population Sciences 1995

Very low rates of caesarean sections are also a matter of concern. Rates lower than 1% indicate a lack of access to obstetrical care and a risk of maternal death (De Brouwere 1997). Others have suggested that caesarean section rates should not be lower than 3% (Cisse *et al.* 1998). The most recent data from Table 1 show that caesarean section rates were lower than 1% in rural areas in Chad, Mali, Niger, Madagascar, Zambia, Nepal, and Haiti. Data from

two time periods were available for Niger, Madagascar, and Zambia. Sadly, caesarean section rates decreased in rural areas in each of these three countries, suggesting that access to caesarean sections is worsening in the poorest areas of Africa.

One might wonder if it is possible to increase rates of caesarean sections in rural areas without overly increasing the rates in urban areas. A few examples suggest that it might be possible to do so. In Burkina Faso, rural caesarean section rates increased from 0.7% in 1992 to 1.1% in 1999, while urban rates decreased from 4.5% to 2.3%. In Kenya, rural caesarean section rates increased from 4.3% in 1993 to 6.0% in 1998, while urban rates decreased from 13.4% to 10.5%. However, in many other countries, an increase in rural rates was paralleled by an increase in urban rates.

## Episiotomies

Episiotomy has been practised with increasing frequency within recent years without strong scientific evidence of its effectiveness. A systematic review of six randomized controlled trials comparing the possible beneficial and harmful effects of selective versus routine use of episiotomy has been recently published (Carroli & Belizán 2000). The selective use of episiotomy shows a lower risk of clinically relevant morbidity including posterior perineal trauma (Relative Risk (RR) 0.88, 95% Confidence Interval (CI) 0.84 to 0.92), a reduced need for suturing perineal trauma (RR 0.74, 95% CI 0.71 to 0.77), and fewer healing complications at seven days (RR 0.69, 95% CI 0.56 to 0.85). The only disadvantage shown in the selective use of episiotomy is an increased risk of anterior perineal trauma (RR 1.79, 95% CI 1.55 to 2.07). There was no difference in the incidence of major complications, such as severe vaginal or perineal trauma nor in pain, dyspareunia or urinary incontinence. There is clear evidence to recommend a selective use of episiotomy.

A recent Editorial of the British Medical Journal strongly advocated the need to decrease the use of routine episiotomies in developing countries (Maduma-Butshe *et al.* 1998). The authors polled 10 midwives from Ghana, Kenya, Malawi, Nepal, Nigeria, and Zambia, attending courses in Liverpool, England. Most respondents indicated that health professionals perform episiotomies routinely on primiparae to prevent third degree perineal tears. Maduma-Butshe *et al.* 1998 also cited a study from Botswana, where one in three mothers having a normal delivery had episiotomy. A study from Burkina Faso reported an episiotomy rate of 37% among primiparae (Lorenz *et al.* 1998). The rate was 46% among primiparae when trained midwives attended the delivery and of 26% among primiparae delivered by auxiliary midwives. A study of all vaginal deliveries performed in 1997 and 1998 at the University of Benin Teaching Hospital, Benin City, Nigeria found episiotomy rates of 46.6% among all deliveries, and of 87.4% among primiparae (Otoide *et al.* 2000).

High frequencies of episiotomies have been reported in Latin America. Several studies from Argentina showed that episiotomy is routinely performed among primiparae. Eight hospitals from the City of Rosario participated in a randomized controlled trial comparing routine and selective use of episiotomies (Argentine episiotomy Trial Collaborative Group 1993). The episiotomy rate among primiparae was 90.7% in the four control hospitals, compared to 39.5% in the four intervention hospitals. A follow up study performed in one of the intervention hospitals showed that the rate of episiotomies among primiparae increased again after the end of the trial, and reached 65.3% in 1996 (Belizan *et al.* 1998). Another Argentine study showed that in the Province of Nequen, the episiotomy rate was 45.9% among all vaginal births, with hospital rates ranging from 33.4% to 62.5% (Cravchik *et al.* 1998). Hospital rates of episiotomies among primiparae ranged from 81.5% to 96.0%, and differences among hospitals were not statistically significant.

The situation might be different in other countries, regions, or hospitals. Women interviewed in a population-based maternal morbidity study from southern India reported that an episiotomy was performed in 9% of deliveries (Bhatia 1995). An episiotomy rate lower than 1% has been reported in a small secondary care facility in Jamaica (Doherty & Cohen 1993). However, a study from the University Hospital of the West Indies showed overall episiotomy rates of 31.5% among low birth weight infants delivered vaginally (The 1990).

## Oxytocics

The use of oxytocics is part of the package of basic emergency obstetrical care recommended by international agencies (Donnay 2000). There is very strong evidence in favor of injecting oxytocics routinely during the third stage of labor. A systematic review of four trials that compared active management (including injection of oxytocics) of third stage to expectant management showed that routine active management is superior to expectant management in terms of blood loss, post-partum haemorrhage (RR 0.35 95% CI 0.28-0.42), severe post-partum haemorrhage (RR 0.37 95% CI 0.23-0.61), the need of blood transfusion during the puerperium (RR 0.34 95% CI 0.22-0.54) and postpartum anaemia (RR 0.40 95% CI 0.29-0.55) (Prendiville *et al.* 2000).

Table 2. Use of oxytocics in developing countries

Country (city)	Year	Reference	Oxytocin during 1 <sup>st</sup> and/or 2 <sup>nd</sup> stage of labor (%)	Oxytocics during 3 <sup>rd</sup> stage of labor or postpartum (%)
Jamaica (Parish A)	1986-1987	(Escoffery <i>et al.</i> 1994)	14.9	90.4
Jamaica (Parish B1)	1986-1987	(Escoffery <i>et al.</i> 1994)	11.4	85.2
Jamaica (Parish B2)	1986-1987	(Escoffery <i>et al.</i> 1994)	10.8	82.5
Jamaica (Parish C)	1986-1987	(Escoffery <i>et al.</i> 1994)	5.6	80.7
Benin (Abomey)	1990-1991	(Dujardin <i>et al.</i> 1995)	16.1	NA
Benin (Porto Novo)	1990-1991	(Dujardin <i>et al.</i> 1995)	24.2	NA
Congo (Loubomo)	1990-1991	(Dujardin <i>et al.</i> 1995)	5.7	NA
Senegal (Pikine)	1990-1991	(Dujardin <i>et al.</i> 1995)	10.9	NA
Ivory Coast (Abidjan)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	13.4	35.7
Mali (Bamako)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	26.1	5.7
Niger (Niamey)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	5.7	12.5
Mauritania (Nouakchott)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	13.0	29.3
Burkina Faso (Ouagadougou)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	10.5	23.3
Senegal (St Louis)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	32.9	63.1
Senegal (Kaolack)	1994-1996	(Bouvier-Colle <i>et al.</i> 1998)	2.5	48.1
Nepal (Kathmandu)	1995-1996	(Ellis <i>et al.</i> , 2000)	31.1	NA

NA denotes data not available.

How frequently oxytocin needs to be used during the first and second stages of labor is a far more controversial issue. Oxytocin is used both to induce and to augment labor. The administration of excessive doses of oxytocin may cause hyper-stimulation and even uterine contracture (Dujardin *et al.* 1995). The risk is probably higher in developing countries where the drug is often administered by intra-muscular injection, or without a pump controlling the speed of intravenous infusion. Studies from West Africa and Nepal suggest an increased risk of foetal distress and neonatal morbidity associated with the use of oxytocin during labor (Dujardin *et al.* 1995, Ellis *et al.* 2000).

Data on the use of oxytocics are very limited. However, Table 2 shows large variations of frequencies of use of oxytocin during first and second stage of labor. Interestingly enough, the two extreme values of the distribution were observed in Senegal, with a frequency of 2.5% in Kaolack and of 32.9% in St Louis. The table also shows that active management of the third stage of labor was far more common in Jamaica than in West Africa.

## **Strategies to Decrease the Use of Unnecessary Interventions**

Health authorities, agencies, and consumers could all play a role in changing birth practices. However, change will probably not be possible without a very pro-active strategy targeting birth attendants themselves. Many methods to change medical behaviour have been used in industrialized countries. A comprehensive review by (Oxman *et al.* 1995) examined 102 studies of improving physician practices and concluded that there are no "magic bullets." They suggest that the best approach is to combine several strategies, such as local opinion leaders, workshops, outreach visits (academic detailing), reminders, and audit and feedback.

Several randomized controlled trials have been performed in North America and Europe to evaluate strategies to change behaviours of birth attendants (Lomas *et al.* 1991, Hodnett *et al.* 1996, Wyatt *et al.* 1998, Leviton *et al.* 1999). For example, (Lomas *et al.* 1991) conducted a trial in Canada with 76 physicians, to test 3 interventions to increase the number of vaginal births after caesarean section. The interventions compared were 1) distribution of educational materials, 2) local opinion leaders + distribution of educational materials and 3) audit and feedback + distribution of educational materials. The use of opinion leaders was significantly more effective than audit and feedback and than educational materials alone in increasing the number of women offered a trial of labor and increasing the number of vaginal births.

Unfortunately, very few trials of a similar nature have been performed in developing countries, and they were not focused on birth practices (Ross-Degnan *et al.* 1996, Santoso 1996). There is an urgent need to perform randomized controlled trials to evaluate strategies to change birth practices in developing countries.

## Discussion and Conclusions

We have found high frequencies of obstetrical interventions in every region of the developing world. There is an ongoing epidemic of caesarean sections in Asia and Latin America. There is no indication of rising rates of caesarean sections in Africa, but rates are already high in many countries of East and Southern Africa.

The low rates of caesarean sections observed in many West African countries might reflect a lack of resources more than a consensus of birth attendants. Episiotomies and oxytocics are used very often in African countries having low caesarean section rates. This suggests that many birth attendants favor frequent use of interventions. Better availability of operating theaters in such countries could thus trigger the same epidemic of caesarean sections as the one observed elsewhere. Better availability of operating theaters is of course urgently needed, but should, in our opinion, be accompanied by the promotion of evidence-based practices. This should not be limited to appropriate use of caesarean sections, episiotomies, and oxytocics. Many other interventions might be overused, even though data are not available to study trends in their use. There is a need for in depth studies on the use of interventions such as perineal shaving, enema, and vacuum and forceps extraction.

We conclude that there is indeed a world-wide epidemic of obstetrical interventions, and that countries that have not observed such epidemic yet will probably face it soon. This should by no mean slow down our efforts to provide better access to obstetrical care. However, it should encourage us to build stronger strategies to promote evidence-based interventions.

## References

- Argentine Episiotomy Trial Collaborative Group (1993). Routine versus selective episiotomy: a randomised controlled trial. *Lancet* **342**,1517-1518.
- Belizan JM, Caroli G (1998). Routine episiotomy should be abandoned. *British Medical Journal* **317**,1389.
- Belizan JM, Althabe F, Barros F, Alexander S (1999). Rates and implications of caesarean sections in Latin America: Ecological study. *British Medical Journal* **319**, 1397-1402.
- Bhatia JC (1995). Levels and determinants of maternal morbidity: results from a community-based study in southern India. *International Journal of Gynecology and Obstetrics* **50(Suppl. 2)**,S153-S163.
- Bouvier-Colle MH, Prual A, Bernis A *et al.* (1998). *Morbidité maternelle en Afrique de l'Ouest*. Ministère des Affaires Etrangères - Coopération et Francophonie, Paris, France, pp. 1-116.
- Cai WW, Marks JS, Chen CH, Zhuang YX, Morris L, Harris JR (1998). Increased cesarean section rates and emerging patterns of health insurance in Shanghai, China. *American Journal of Public Health* **88**,777-780.
- Caroli G & Belizán J (2000). Episiotomy for vaginal birth (Cochrane Review). In: *The Cochrane Library*, Issue 2. Update Software, Oxford, England.
- Cisse CT, Faye EO, de Bernis L, Dujardin B, Diadiou F (1998). Césariennes au Sénégal: couverture des besoins et qualité des services. *Santé* **8**,369-377.
- Cravchik S, Munoz D, Bortman M (1998). Indicaciones de episiotomia en maternidades publicas de Neuquen, Argentina. *Revista Panamericana de Salud Publica* **4**,26-31.
- De Brouwere V (1997). *Les besoins obstétricaux non couverts*. Thèse. Université Catholique de Louvain, Brussels, Belgium, pp. 1-225.
- Demographic and Health Survey (2000) August 16.
- Doherty P & Cohen I (1993). Spontaneous vaginal deliveries and perineal trauma in Lucea, Jamaica. *Journal of the Louisiana State Medical Society* **145**,531-533.
- Donnay F (2000). Maternal survival in developing countries: what has been done, what can be achieved in the next decade. *International Journal of Gynecology and Obstetrics* **70**, 89-97.
- Dujardin B, Boutsen M, De Schamphelleire I, Kulker R, Manshande JP, Bailey J, Wollast E, Buekens P (1995). Oxytocics in developing countries. *International Journal of Obstetrics and Gynecology* **50**,243-251.
- Ellis M, Manandhar N, Manandhar D, Costello A (2000). Risk factors for neonatal encephalopathy in Kathmandu, Nepal, a developing country: unmatched case-control study. *British Medical Journal* **320**,1229-1236.
- Escoffery C, Greenwood R, Ashley D, Coard K, Keeling J, Golding J (1994). Deaths associated with intrapartum asphyxia in Jamaica. *Paediatric Perinatal Epidemiology* **8**(suppl 1),119-142.
- Flamm BL (2000). Cesarean section: A worldwide epidemic? *Birth* **27**, 139-140.

Hodnett ED, Kaufmann K, O'Brien-Pallas L, Chipman M, Watson-MacDonell J, Hunsberger W (1996). A strategy to promote research-based nursing care: effects on childbirth outcomes. *Research in Nursing & Health* **19**,13-20.

International Institute for Population Sciences (1995). *National Family Health Survey, India 1992-93*. International Institute for Population Sciences, Bombay, India, p. 244.

Leviton LC, Goldenberg RL, Baker CS, *et al.* (1999). Methods to encourage the use of antenatal corticosteroid therapy for fetal maturation: a randomized controlled trial. *JAMA* **28**,46-52.

Lomas J, Enkin M, Anderson G, Hannah W, Vayda E, Singer J (1991). Opinion leaders vs. audit and feedback to implement practice guidelines. *JAMA* **265**,2202-2207.

Lorenz N, Nougara A, Garner P (1998). Episiotomy in Burkina Faso. *Tropical Doctor* **28**, 83-85.

Maduma-Butshe A, Dyal A, Garner P (1998). Routine episiotomy in developing countries; Time to change a harmful practice. *British Medical Journal* **316**,1179-1180.

Otoide VO, Ogbonmwan SM, Okonofua FE (2000). Episiotomy in Nigeria. *International Journal of Gynecology and Obstetrics* **68**,13-17.

Oxman AD, Thomson MA, Davis DA, Haynes RB (1995). No magic bullets: a systematic review of 102 trials of interventions to help health care professionals deliver services more effectively or efficiently. *Canadian Medical Association Journal* **153**,1423-1431.

Pai M, Sundaram P, Radhakrishnan KK, Thomas K, Muliyl JP (1999). A high rate of Caesarean sections in an affluent section of Chennai: Is it cause for concern? *The National Medical Journal of India* **12**,156-158.

Prendiville WJ, Elbourne D, McDonald S (2000). Active versus expectant management in the third stage of labour (Cochrane Review). In: *The Cochrane Library*, Issue 2. Update Software, Oxford, England.

Ross-Degnan D, Soumerai S, Goel PK *et al.* (1996). The impact of face-to-face educational outreach on diarrhoea treatment in pharmacies. *Health Policy and Planning* **11**,308-318.

Santoso B, Suryawati S, Prawaitasari JE (1996). Small group intervention vs formal seminar for improving appropriate drug use. *Social Sciences and Medicine* **42**,1163-1168.

Saropala N & Suthutvoravut S (1999). The outcome of the first VBAC program in Thailand. *International Journal of Obstetrics and Gynecology* **64**,307-308.

Thankappan KR (1999). Caesarean section deliveries on the rise in Kerala. *The National Medical Journal of India* **12**,297.

The T (1990). Is routine episiotomy beneficial in the low birth weight delivery? *International Journal of Gynecology and Obstetrics* **31**,145-140.

World Health Organization (1985). Appropriate technology for birth. *Lancet* **ii**, 436-437.

Wu W (2000). Cesarean delivery in Shantou, China: A retrospective analysis of 1922 women. *Birth* **27**,86-90.

Wyatt JC, Paterson-Brown S, Johanson R, Altman DG, Bradburn MJ, Fisk NM (1998). Randomised trial of educational visits to enhance use of systematic reviews in 25 obstetric units. *British Medical Journal* **317**,041-1046.