

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Role of public and private funding in the rising caesarean section rate: A cohort study
AUTHORS	Einarsdottir, Kristjana; Haggard, Fatima; Pereira, Gavin; Leonard, Helen; de Klerk, Nicholas; Stanley, Fiona; Stock, Sarah

VERSION 1 - REVIEW

REVIEWER	Associate Professor Helen McLachlan Mother and Child Health Research La Trobe University, Melbourne, Australia
REVIEW RETURNED	18-Mar-2013

THE STUDY	Could the authors where possible add more recent references to the Introduction, para 1, 2nd sentence.
GENERAL COMMENTS	<p>This retrospective cohort study explored caesarean section rates for nulliparous women giving birth in Western Australia between 1996 and 2008. It specifically examined the role of funding source (private/public status) on rising caesarean rates.</p> <p>This study adds to the body of evidence regarding the important issue of trying to understand reasons for the rising rates of caesarean section which as the authors point out, have increased dramatically in many countries in recent years.</p> <p>The study uses linked data from the Midwives notification system and the Hospital Morbidity Data Collection from the Western Australian Department of Health. It includes a large sample size (343,824 births).</p> <p>The study found that the caesarean rates has increased most rapidly for women delivering as private patients in private hospitals and this was mainly attributed to pre-labour caesareans.</p> <p>Minor comments Introduction Evidence is cited for the rising caesarean rates however some of the data is not recent. Could the authors include more recent evidence of caesarean rates for England (latest included in the paper is a decade ago); Canada (latest cited is 2001); and USA (latest cited is 2006).</p> <p>The authors report on the conflicting findings of two recent studies conducted in NSW Australia; one reported the rise in caesareans was higher in private than public systems; the other divided rates by funding source only and found no difference between public and private patients. I find this a little confusing as public and private patients have different funding sources. Can the authors please explain this in more detail.</p>

	<p>Methods The authors state that two datasets were used - the Midwives notification system and the Hospital Morbidity Data Collection. Can they explain a little more about these datasets. E.g. how and why they were linked; what variables were required from each; how were they linked; what is the proportion of missing data in these datasets; have there been validation studies of the datasets?</p> <p>Discussion 2nd last paragraph – could the authors please include the actual percentages (from what to what) regarding the increases in the Australian population with private insurance following policy reforms in 2000?</p>
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REVIEWER	<p>Jocelyn Toohill Research Fellow Centre For Health Practice Innovation Griffith University, Logan Campus Meadowbrook, Queensland Australia. 4131</p> <p>I declare no conflict of interest.</p>
REVIEW RETURNED	20-Mar-2013

GENERAL COMMENTS	<p>This is an important topic particularly impact of primary caesarean section to women's reproductive health. Could you include one sentence at page 7 Line 44-45 to make clear the reason for limiting breech, multiple and placenta praevia pregnancies from analysis given the increasing numbers of women searching literature for information. Could you modify last paragraph P10 Line 46 the sentence beginning "The increase could not be and add 'multiples' to be consistent with the text identifying the limiters placed on the population analysed. Could you also review last paragraph P10 Line 47-48 to include 'to' so the sentence reads: "These results indicate that differences in delivery management and obstetric practice are likely to play a role in the rising caesarean section rate." As a general comment I am wondering if you are able to elaborate if geographic distance of women's residential address to birthing unit has any relationship to caesarean section trends in Western Australia compared to the populations within the NSW studies you refer.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer #1:

1. Evidence is cited for the rising caesarean rates however some of the data is not recent. Could the authors include more recent evidence of caesarean rates for England (latest included in the paper is a decade ago); Canada (latest cited is 2001); and USA (latest cited is 2006).

As requested, we have now updated the references in the introduction with the accompanying details highlighted in yellow and the related references shown below: In the United States, rates of operative deliveries rose from 23% in 1991 to 32% in 2007 1, in Canada they increased from 18% in 1994-95 2 to 26% in 2005-06 3 and in Australia caesarean section rates rose from 18% in 1991 4 to 31% in

2008 5, thus already reaching a higher prevalence than the 25% reported for England in 2011-12 6.

1 Menacker F, Hamilton BE. Recent Trends in Cesarean Delivery in the United States. National Center for Health Statistics Data Brief No. 35. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2010.

2 Liu S, Rusen ID, Joseph KS, Liston R, Kramer MS, Wen SW, et al. Recent trends in caesarean delivery rates and indications for caesarean delivery in Canada. *J Obstet Gynaecol Can* 2004;26(8):735-42.

3 Giving Birth in Canada: Regional Trends From 2001–2002 to 2005–2006. Canadian Institute for Health Information, www.cihi.ca, 2007.

4 Lancaster P, Huang J, Pedisich E. Australia's mothers and their babies 1991. Perinatal Statistics Series no. 1. Cat. no. AIHW 240. Australian Institute of Health and Welfare, National Perinatal Statistics Unit, Sydney, 1994.

5 Laws PJ, Li Z, Sullivan EA. Australia's Mothers and Babies 2008. Perinatal Statistics Series no. 24. Canberra, 2010.

6 Statistical Bulletin: NHS Maternity Statistics, England: 2011-2012, 2012.

2. The authors report on the conflicting findings of two recent studies conducted in NSW Australia; one reported the rise in caesareans was higher in private than public systems; the other divided rates by funding source only and found no difference between public and private patients. I find this a little confusing as public and private patients have different funding sources. Can the authors please explain this in more detail.

This section of the introduction has now been clarified as follows (yellow highlights): Recent evidence from New South Wales, Australia published last year indicated that the rise in caesarean delivery rates has been higher in women delivering in private hospitals than public hospitals 32. A similar study published at the same time divided caesarean delivery rates during 1994-2009 by patient funding source only – not hospital type – and found similar increases in the caesarean section rates for private and public patients 33.

3. The authors state that two datasets were used - the Midwives notification system and the Hospital Morbidity Data Collection. Can they explain a little more about these datasets. E.g. how and why they were linked; what variables were required from each; how were they linked; what is the proportion of missing data in these datasets; have there been validation studies of the datasets?

In response to the reviewer's requests, we have now amended the first paragraph of the methods section as follows: This study used routinely collected, administrative data from the Midwives Notification System held by the Western Australian Department of Health. The midwives data included births occurring on or after 20 weeks gestation or infants born with birth weight of at least 400g. It also included information on maternal characteristics, pregnancy complications, labour and delivery complications, and newborn characteristics. The midwives data was linked with data from the Hospital Morbidity Data Collection in order to obtain information on the mother's hospital stay at the time of birth. This information included patient funding source and type of delivery hospital.

The collection of birth and hospital data is governed by legislation requiring all births as well as all hospital admissions to all hospitals in Western Australia to be registered. Both data systems regularly undergo stringent quality audits by the Western Australian Department of Health. Computerised probabilistic matching is used to link data relating to the same person from the two different datasets. Linking procedures are based on full name and address, date of birth and other identifiers and are estimated to be 99.89% accurate 34.

4. 2nd last paragraph – could the authors please include the actual percentages (from what to what) regarding the increases in the Australian population with private insurance following policy reforms in

2000?

We have now changed the following sentence in the discussion as highlighted in yellow: Also, the federal government announced policy reforms in 2000 which increased the percentage of the Australian population with private health insurance from 30% in 1999 to ~45% in 2001 45.

Reviewer #2:

1. Could you include one sentence at page 7 Line 44-45 to make clear the reason for limiting breech, multiple and placenta praevia pregnancies from analysis given the increasing numbers of women searching literature for information.

We have now attempted to clarify the first two sentences of the last paragraph of the results as follows: Given the rise in placenta praeviae and breech deliveries for private patients during the study period, the next step was to remove all breech deliveries and pregnancies complicated by placenta praevia from the data before re-analysing the pre-labour caesarean delivery rate (Figure 4). This was done to assess whether the rise in placenta praeviae and breech deliveries in private patients delivering in private hospitals accounted for some or all of the rate increase of pre-labour caesarean deliveries for this patient group.

We also added more information to the last sentence of that paragraph: The difference in the average annual rate increase between the two groups from 1996 and until the peak in 2005 was statistically significant ($p=0.0007$) and all trend lines had similar shape to those shown in Figure 3, which included the full set of data.

2. Could you modify last paragraph P10 Line 46 the sentence beginning "The increase could not be and add 'multiples' to be consistent with the text identifying the limiters placed on the population analysed.

We have made the requested change to the sentence as highlighted in yellow: The increase could not be explained by an increase in breech deliveries, multiples or pregnancies complicated by placenta praevia.

3. Could you also review last paragraph P10 Line 47-48 to include 'to' so the sentence reads: "These results indicate that differences in delivery management and obstetric practice are likely to play a role in the rising caesarean section rate."

We thank the reviewer for pointing the typo out to us and have corrected it as follows: These results indicate that differences in delivery management and obstetric practice are likely to play a role in the rising caesarean section rate.

4. As a general comment I am wondering if you are able to elaborate if geographic distance of women's residential address to birthing unit has any relationship to caesarean section trends in Western Australia compared to the populations within the NSW studies you refer.

That is a very interesting question and something that we have not yet investigated with our data. However, it would be very worthwhile doing and we will certainly be keeping that in mind for future papers on the Western Australian C-section rates.

VERSION 2 – REVIEW

REVIEWER	Assoc Prof Helen McLachlan Mother and Child Health Research La Trobe University
REVIEW RETURNED	05-Apr-2013

GENERAL COMMENTS	The authors have responded to all of the points raised in my original review.
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