

DEMOGRAPHIC DETERMINANTS FOR CESAREAN DELIVERY

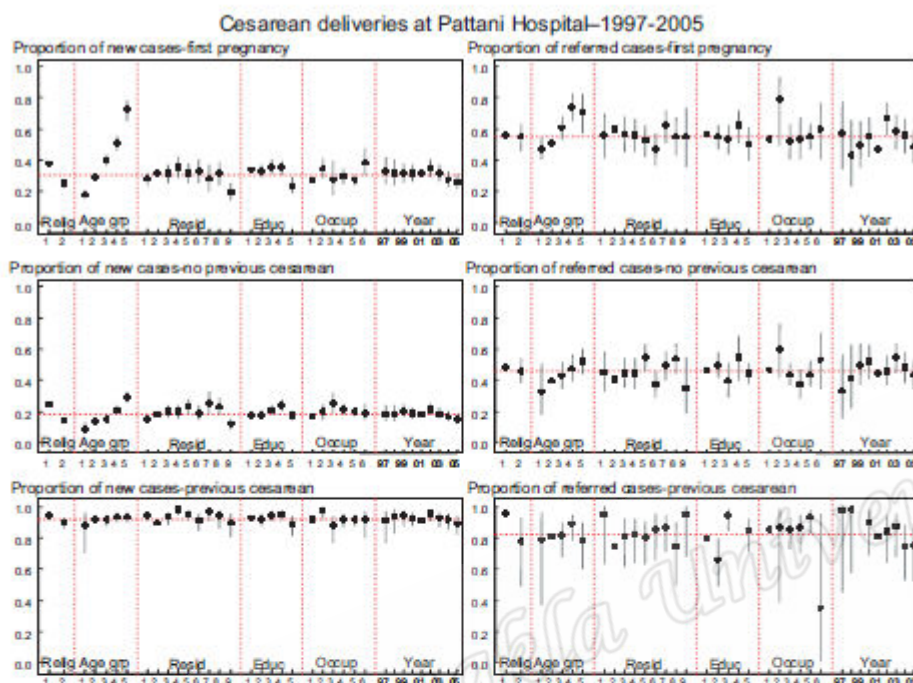


Fig 1–Prevalence of cesarean sections by demographic factors.

after adjusting for other factors for this group. Mothers coming from Yarang were less likely to deliver by cesarean section.

For Group 3:2+NoCNew (subsequent pregnancy and no previous cesarean), mothers over 30 years, those who came from Pattani East, Pattani South and Songkhla, those who had completed senior high school or a diploma/bachelor's degree, and those in the farmer/gardener, business and worker categories, were more likely to have a cesarean section birth. Mothers who were Islamic were less likely to have a cesarean section.

For Group 4:2+NoCRef (subsequent pregnancy and no previous cesarean and referred or transferred), mothers who came from Pattani City, KP/Mae Lan, Pattani East

or Pattani South, those who completed senior high school and also government officers, were more likely to have a cesarean section birth. Mothers who were Islamic were less likely to have a cesarean section.

For Group 5:2+PreCNew (subsequent pregnancy and previous cesarean delivery), mothers from Pattani East, Pattani South and Songkhla, and those age 30 or older were more likely to have a cesarean section.

For Group 6:2+PreCRef (subsequent pregnancy and previous cesarean delivery and referred or transferred), mothers who were Islamic were clearly less likely to have a cesarean section. Mothers who had finished only junior high school were less likely to have a cesarean section.

Table 4
Adjusted odds ratios for high risk cesarean section separated by case type (Bold type indicates statistical significance, 95% CI).

Risk factor	1:1 st New OR (CI 95%)	2:1 st Ref OR (CI 95%)	3:2+NoCNew OR (CI 95%)	4:2+NoCRef OR (CI 95%)	5:2+PrCNew OR (CI 95%)	6:2+PrCRef OR (CI 95%)
Residence						
Mueang (City)	0.84 (0.70-1.01)	0.85 (0.48-1.51)	0.80 (0.68-0.95)	1.74 (1.17-2.59)	1.21 (0.73-2.01)	7.75 (0.75-79)
Nong Chik	0.99 (0.77-1.27)	0.90 (0.57-1.43)	1.12 (0.90-1.40)	1.56 (0.87-2.82)	1.18 (0.81-1.73)	1.36 (0.53-3.50)
KP/Mae Lan	1.18 (0.90-1.53)	0.87 (0.57-1.32)	1.10 (0.87-1.40)	5.13 (2.11-12.48)	1.16 (0.79-1.71)	1.50 (0.59-3.84)
Pattani East	0.99 (0.74-1.31)	0.74 (0.50-1.10)	1.37 (1.07-1.75)	2.25 (1.21-4.16)	1.78 (1.25-2.52)	1.37 (0.60-3.14)
Yarang	1.05 (0.75-1.48)	0.60 (0.40-0.89)	1.08 (0.81-1.43)	1.17 (0.63-2.19)	0.87 (0.61-1.23)	1.99 (0.64-6.17)
Pattani South	0.84 (0.56-1.26)	1.10 (0.72-1.70)	1.52 (1.08-2.14)	3.27 (1.11-9.68)	1.45 (1.01-2.09)	2.05 (0.80-5.27)
Songkhla	0.99 (0.71-1.38)	0.84 (0.52-1.34)	1.35 (1.00-1.82)	1.74 (0.73-4.15)	1.74 (1.17-2.57)	1.04 (0.35-3.05)
Yaring	1	1	1	1	1	1
Nar/Yala/NS	0.52 (0.37-0.72)	0.84 (0.38-1.83)	0.59 (0.42-0.81)	0.99 (0.48-2.03)	0.78 (0.34-1.79)	7.10 (0.80-63.31)
p-value	0.0002	0.17	<0.0001	0.0012	0.0005	0.28
Age group						
>20	0.53 (0.45-0.62)	0.87 (0.65-1.14)	0.62 (0.41-0.95)	0.70 (0.22-2.18)	0.74 (0.35-1.57)	0.89 (0.15-5.40)
20-24	1	1	1	1	1	1
25-29	1.65 (1.45-1.88)	1.48 (1.11-1.97)	1.14 (0.98-1.33)	1.05 (0.70-1.58)	1.16 (0.82-1.63)	1.03 (0.51-2.08)
30-34	2.53 (2.11-3.04)	2.75 (1.77-4.27)	1.66 (1.43-1.94)	1.30 (0.85-1.98)	1.41 (1.02-1.96)	1.86 (0.86-4.02)
≥35	6.38 (4.68-8.70)	2.34 (1.29-4.26)	2.62 (2.24-3.07)	1.38 (0.84-2.25)	1.67 (1.22-2.29)	0.82 (0.35-1.94)
p-value	<0.0001	<0.00001	<0.0001	0.45	0.0024	0.28
Religion						
Islamic	0.55 (0.49-0.61)	0.96 (0.68-1.36)	0.50 (0.45-0.55)	0.51 (0.37-0.71)	0.91 (0.68-1.23)	0.41 (0.04-0.51)
Other religions	1	1	1	1	1	1
p-value	<0.000	0.243	<0.000	<0.000	0.555	0.002
Education						
Primary	1	1	1	1	1	1
Junior high	0.98 (0.81-1.18)	0.94 (0.69-1.29)	1.01 (0.85-1.19)	0.97 (0.63-1.49)	1.13 (0.82-1.56)	0.49 (0.25-0.98)
Senior high	1.10 (0.91-1.34)	0.89 (0.62-1.29)	1.23 (1.03-1.47)	1.40 (0.83-2.39)	0.75 (0.48-1.17)	2.68 (0.85-8.49)
Dipl/Bach	1.07 (0.89-1.29)	1.26 (0.80-1.99)	1.48 (1.22-1.79)	1.71 (0.95-3.08)	1.35 (0.77-2.37)	1.87 (0.86-4.09)
Other/NS	0.62 (0.47-0.80)	0.79 (0.52-1.19)	0.98 (0.82-1.17)	0.64 (0.37-1.13)	0.90 (0.69-1.16)	
p-value	0.0005	0.53	0.0005	0.0062	0.31	0.004
Occupation						
Housewife	1	1	1	1	1	1
Govt officer	1.42 (1.09-1.86)	3.15 (0.87-11.40)	1.24 (0.93-1.65)	3.61 (1.06-12.2)	1.74 (0.83-3.66)	1.65 (0.83-3.66)
Farmer/G	1.01 (0.59-1.73)	0.94 (0.61-1.47)	1.71 (1.22-2.39)	0.62 (0.29-1.30)	0.89 (0.68-1.18)	0.89 (0.68-1.18)
Business	1.14 (0.91-1.43)	1.02 (0.60-1.74)	1.38 (1.16-1.64)	0.99 (0.60-1.64)	0.67 (0.45-0.99)	0.67 (0.45-0.99)
Worker	1.01 (0.87-1.18)	1.07 (0.77-1.48)	1.27 (1.10-1.47)	0.96 (0.63-1.47)	0.89 (0.65-1.23)	0.89 (0.65-1.23)
Other/NS	1.68 (1.19-2.38)	1.30 (0.61-2.76)	1.22 (0.91-1.65)	0.94 (0.36-2.45)	1.29 (0.61-2.72)	1.29 (0.61-2.72)
p-value	0.0088	0.51	<0.0001	0.17	0.17	0.304
Budget year						
1997	1.08 (0.75-1.56)	1.47 (0.58-3.76)	1.02 (0.73-1.42)	0.94 (0.32-2.75)	0.62 (0.24-1.60)	
1998	1.03 (0.71-1.49)	0.84 (0.34-2.07)	1.03 (0.74-1.43)	1.39 (0.47-4.12)	0.86 (0.36-2.06)	6.15 (0.18-205)
1999	1.03 (0.79-1.34)	1.10 (0.60-2.01)	1.15 (0.91-1.45)	1.62 (0.69-3.79)	1.25 (0.73-2.13)	9.33 (0.34-255)
2000	1.02 (0.81-1.29)	1.36 (0.81-2.26)	1.06 (0.86-1.29)	1.26 (0.68-2.34)	1.35 (0.88-2.06)	2.07 (0.53-8.16)
2001	1	1	1	1	1	1
2002	1.19 (0.95-1.49)	2.24 (1.43-3.50)	1.21 (0.99-1.47)	1.98 (0.99-3.97)	1.06 (0.73-1.55)	1.30 (0.44-3.79)
2003	1.03 (0.82-1.29)	1.54 (0.99-2.42)	1.03 (0.84-1.27)	1.15 (0.65-2.04)	1.50 (1.04-2.18)	1.71 (0.57-5.15)
2004	0.85 (0.68-1.07)	1.39 (0.90-2.16)	0.92 (0.74-1.13)	1.03 (0.58-1.81)	1.15 (0.79-1.68)	0.74 (0.29-1.88)
2005	0.77 (0.61-0.97)	1.06 (0.70-1.62)	0.80 (0.65-0.99)	0.78 (0.45-1.33)	0.97 (0.67-1.41)	0.77 (0.29-2.10)
p-value	0.014	0.0035	0.0089	0.11	0.12	0.24

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In this study we found that all of the determinants (religion, age, education, occupation, residence and budget year) were statistically significantly associated with cesarean-section delivery for two of the "new case" groups: Group 1:1st New (first pregnancy mothers new case) and group 3:2+NoCNew, (subsequent pregnancy and no previous cesarean). Associations were less evident for the three "referred case" groups where sample sizes were smaller.

Adjusting for all the measured demographic determinants, logistic regression analysis was used as a model for each of the six groups. Odds ratios were calculated. The strongest determinants for cesarean section were found to be religion, residence, age group, education level and occupation.

DISCUSSION

The major finding of this study is that non-Islamic mothers had a higher cesarean section rate than Islamic mothers. This may be due to their religious beliefs, life style or their socioeconomic status.

Older mothers had higher cesarean section rates. This finding agrees with findings by Gomes *et al* (1999), Leeb *et al* (2005), Lin and Xirasagar (2005), and Choobun and Tintara (2000). It can be explained by the fact that older mothers tend to have more complications and more of them cannot give birth by vaginal route. Interestingly, this age factor might explain why Nisenblat *et al* (2006) found that the risk of major complications increased with repeated (multiple) cesarean sections.

It was found that completion of a higher education level led to greater likelihood of cesarean section, there is no obvious reason why this is so. The same association was reported by Koc (2003), but in the study of Khawaja and Nsour (2007) no such association was found.

Occupation, was found to be associated with of cesarean section for only two groups (Group 1:1st New, Group 3:2+NoCNew). This finding is consistent with that reported by Zhang *et al* (2008) who found that a woman's occupation was associated with a higher rate of cesarean delivery on maternal request. Lee *et al* (2005) found that maternal occupation was associated with cesarean section and Simoes *et al* (2005) found that both women who were in high salaried positions and those who were unskilled workers had high rates of surgical deliveries in Germany.

Four of the groups contained some residential areas where there was a higher risk of cesarean section, and all the residential areas were associated with cesarean section with at least one group. The only statistically significant association for a city area in Pattani City for Group 4:2+NoCRef. Far from the city center, specialist clinical care and the hospital are the residential areas of Pattani East and Pattani South. They were significantly associated with cesarean section for three groups; however, their association with cesarean section was in contrast with the findings of Chen *et al* (2008) that greater urbanization is associated with greater cesarean section rates.

There was only a small association between budget year and cesarean section, with the rate ranging from 30.5% to 38.8%. There was a trend of a slight increase from 1997, with a peak in 2002 and a decreasing trend after that. In 2004 Pattani Hospital set up a campaign to reduce the cesarean section rate. This may have contributed to the decreases in 2004 and 2005. The cesarean section rate in Pattani Hospital increased marginally among older mothers and non-Islamic mothers during the period 1997-2005, despite fluctuations in the overall rate at the hospital.

The results from this study may be use-

ful in establishing plan and policies for reducing unnecessary cesarean section deliveries.

The mixed results for the residential area in this study and for the extremes with the occupational status of mothers in the Simoes *et al* (2005) study, suggest that further studies should be concerned with equity in health care and cesarean sections among mothers from different socioeconomic statuses. There appears to be no available data regarding cesarean delivery initiated by maternal request, but knowledge of the ability to request a cesarean section and a knowledge of how to access specialist care at the clinic and so avoid the need for a cesarean delivery may be relevant.

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