

# Antenatal Care Provider and Cesarean Section in Urban Areas in Indonesia

## Tenaga Kesehatan Pemeriksa Kehamilan dan Persalinan Sesar di Wilayah Perkotaan di Indonesia

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### Abstract

Trends of cesarean section trend in Indonesia (2007-2012) have doubled the risk of long-term and short-term health problems. This study was aimed to determine relation between antenatal care provider and cesarean section. This quantitative study used cross-sectional design with a total sample of 5,143 women aged 15-49 years who gave birth to the last child through cesarean section or not as in urban areas selected in samples of 2012 Indonesia Demographic and Health Survey. Logistic regression multivariate analysis was used to determine relation between antenatal care provider and section cesarean, which was controlled by maternal age, antenatal care facility, parity, and place of birth. Results showed that antenatal care at obstetrician was 6.6 times higher, while antenatal care at obstetrician and midwife was 2.1 times higher for cesarean section compared to women who had antenatal care at midwife after controlled by maternal age, antenatal care facility, parity, and place of birth. There is interaction between socioeconomic status and obstetrician for a cesarean section. Regulation on cesarean section by health authority, as well as protective and preventive labor applied towards on the high economic class community may reduce unnecessary cesarean section.

**Keywords:** Antenatal care, cesarean section, health provider, urban

### Abstrak

Tren persalinan sesar di Indonesia (2007-2012) mengalami peningkatan dua kali lipat berisiko pada munculnya masalah kesehatan jangka panjang maupun pendek. Penelitian ini bertujuan mengetahui hubungan tenaga kesehatan pemeriksa kehamilan dengan persalinan sesar. Penelitian kuantitatif ini menggunakan desain potong lintang dengan sampel penelitian 5143 wanita usia subur berusia 15-49 tahun yang melahirkan anak terakhirnya, baik melahirkan sesar maupun tidak di wilayah perkotaan yang terpilih dalam sampel Survei Demografi Kesehatan Indonesia tahun 2012. Analisis multivariat regresi logistik digunakan untuk mengetahui hubungan tenaga pemeriksa kehamilan dengan persalinan sesar, dikontrol oleh usia ibu, tempat periksa kehamilan, paritas, dan tempat melahirkan. Hasil penelitian menunjukkan bahwa pemeriksaan kehamilan pada spesialis kandungan 6,6 kali lebih tinggi, sedangkan pemeriksaan kehamilan pada spesialis kandungan dan bidan 2,1 kali lebih tinggi untuk melakukan persalinan sesar dibandingkan dengan ibu yang melakukan pemeriksaan kehamilannya di bidan setelah dikontrol usia ibu, tempat periksa kehamilan, paritas, dan tempat melahirkan. Terdapat interaksi antara spesialis kandungan dengan status sosial ekonomi untuk persalinan sesar. Implementasi peraturan dilakukannya persalinan sesar oleh institusi kesehatan, serta melakukan upaya protektif dan preventif persalinan pada kelompok masyarakat ekonomi tinggi dapat mengurangi terjadinya persalinan sesar yang tidak perlu.

**Kata kunci:** Pemeriksaan kehamilan, persalinan sesar, tenaga kesehatan, perkotaan

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## Introduction

Trends of cesarean section in Indonesia have increased by two-fold from 2007 to 2012.<sup>1</sup> In 2010, the cesarean section rate has also exceeded the standards World Health Organization.<sup>2</sup> High disparities in the population and in the health facilities causing more cesarean section in urban than rural areas. The number of elective cesarean section requests without medical indication whether from pregnant women or the influence of antenatal care provider.<sup>3</sup> This condition is in contrasts with the number of pregnant women who check at the health providers who should not perform a cesarean section, such as nurse, midwife, or village midwife.<sup>1</sup> Medicalization has increased the rate of cesarean section.<sup>4</sup> The impact of increase in demand for cesarean section is mother and infant mortality-morbidity rate.<sup>5</sup> Besides, problem with early breastfeeding initiation also implicated by of cesarean section.<sup>6</sup>

In Canada, mortality and morbidity rate due to cesarean section (2.7%) had impact three times higher than normal deliveries (0.9%).<sup>7</sup> Another study showed that mortality and morbidity rate of each section method increased to 9.2% in cesarean section and 8.6% in normal section.<sup>8</sup> America is the region with the greatest number of birth (38%) in the world than other regions.<sup>9</sup> One of countries in America region that has a high rate of cesarean section is Brazil. Trend from 1996 to 2012 always increases from 36% to 56%.<sup>10</sup> The attitude of antenatal care providers becomes issue in reducing the rate of cesarean section. Several studies have shown how systematic use is most effective for cesarean section.<sup>11</sup>

At present, the normal delivery is more herded toward medicalization, thus leading to pathologic labor. Information gaps about delivery and technology also occur between doctor and patients is used by the health care providers to perform moral hazard with a profit-seeking motive, in case of interference from patients.<sup>12</sup> A qualitative study in Vietnam showed that attention and hostility of the antenatal care provider with the decision of women in choosing health facility and delivery method. Performance and interaction between antenatal care provider and pregnant women during antenatal care and delivery has a strong relation.<sup>13</sup> The aim of this study was to determine relation of antenatal care provider with cesarean section.

## Method

This cross-sectional study used secondary data of Indonesia Demographic Health Survey (IDHS) 2012 which was conducted in 33 provinces in Indonesia. Dependent variable of the study was cesarean section (cesarean and non-cesarean), and independent variable was antenatal care provider consisting of midwife, obstetrician, or obstetrician-midwife. The potential con-

founder variables were maternal age, maternal education, maternal occupation, socioeconomic, insurance, antenatal care facility, antenatal care frequency, parity, birth size, place of delivery, and complications. The population of this study was all of women aged 15-49 years who gave birth to the last child through cesarean section or not in urban areas in Indonesia. The sample of this study was women aged 15-49 years who gave birth to the last child through cesarean section or not in urban areas selected in the sample of IDHS 2012 that were 5143 respondents selected through complex sample design. The sample obtained was through a stratification process of 1840 census blocks, and selected on primary sampling unit which was supplemented with information on the number of households resulted from the 2010 population census listing. Data were collected through put questionnaire from IDHS 2012. The exclusion criteria were women of childbearing age who gave birth to their twin children, two or more. Multivariate logistic regression analysis was also used in this study.

## Results

The results of characteristics of mothers who gave birth to the last child in urban areas in Indonesia were divided according to socio-demographic factors, antenatal care factors, birth records, and medical indications. The proportion of women who gave birth to the last child by cesarean section in urban areas in Indonesia had more of their pregnancies with obstetrician (39.5%) than in obstetrician and general doctor (10%). Women who had antenatal care only with the obstetrician had the highest odds of cesarean section compared to with the other antenatal care providers (Table 1).

In socio-demographic factors, women with higher education had the highest odds of cesarean section compared to the other educational background. Based on antenatal care factors, women whose antenatal care frequencies greater than or equal to 4 times had higher odds of cesarean section than women whose antenatal care frequencies 0-3 times. From birth records, especially based on size of birth, women with infant birth weight greater than 4000 grams had highest odds of cesarean section compared to the other baby size. Based on medical indication factors, women with complication had higher odds of cesarean section than no complication (Table 1).

In the first model of multivariable analysis, the selection of interaction variables that allegedly found substantial interactions included socioeconomic, insurance, antenatal care frequency, and complication. While in the final model analysis multivariable, the variable that proved to interact was the examiner of pregnancy with socioeconomic. Four variables shown to be confounder variables were maternal age, antenatal care facilities, parity, and delivery facilities (Table 2).

**Table 1. Relation of Antenatal Care Provider and Mother's Characteristic with Cesarean Section**

Variable	Category	Section				Total	OR	95%CI	p Value
		Non-cesarean		Cesarean					
		n	%	n	%				
Antenatal care provider	Midwife	2,669	85.2	465	14.8	3,134	Ref		
	Doctor	25	69.7	10	30.3	35	3.6	1.3 – 10.1	0.015
	Obstetrician	768	60.5	502	39.5	1,270	4.0	3.2 – 5.0	0.000
	Obstetrician and midwife	490	70.4	206	29.6	696	2.2	1.7 – 2.9	0.000
	Obstetrician and doctor	9	90	1	10	10	0.1	0.0 – 1.4	0.098
Socio-demographic factors									
Maternal age	≤ 20 years	344	89.4	41	10.7	385	0.3	0.2 – 0.5	0.000
	21-34 years	2,908	77.2	861	22.8	3,769	Ref		
	≥ 35 years	707	71.5	2	28.5	989	1.3	1.0 – 1.6	0.029
Maternal education	Primary	689	84.4	127	15.6	816	Ref		
	Secondary	2,510	79.4	652	20.6	3,162	1.5	1.1 – 1.9	0.009
	Higher	760	65.2	405	34.8	1,165	3.0	2.2 – 4.1	0.000
Maternal occupation	Unemployed	2,130	78.8	572	21.2	2,702	Ref		
	Employed	1,829	74.9	612	25.1	2,441	1.3	1.1 – 1.6	0.008
Socioeconomic	Quintile lower	856	84	163	16	1,019	Ref		
	Quintile middle	843	80.8	200	19.2	1,043	1.1	0.8 – 1.5	0.627
	Quintile upper	2,260	73.4	821	19.2	3,081	1.9	1.5 – 2.5	0.000
Insurance	No	2,225	80.9	526	19.1	2,715	Ref		
	Yes	1,734	72.5	658	27.5	2,392	1.6	1.3 – 2.0	0.000
Antenatal care factors									
Antenatal care facilities	Public	983	81.9	218	18.1	1,201	Ref		
	Private	2,976	75.5	966	24.5	3,942	1.3	1.0 – 1.7	0.070
Antenatal care frequency	0-3 times	197	86.0	32	14.0	229	Ref		
	≥ 4 times	3,762	76.6	1,152	23.4	4,914	2.1	1.2 – 3.5	0.005
Birth Records									
Parity	1	1,449	75.5	470	24.5	1,919	Ref		
	2	2,043	77.3	601	22.7	2,644	1	0.8 – 1.3	0.860
	≥3	467	80.5	113	19.5	580	0.9	0.7 – 1.2	0.518
Birth size	< 2,500 g	219	77.4	64	22.6	283	1.1	0.8 – 1.7	0.559
	2,500 - 4,000 g	3,634	77.5	1,054	22.5	4,688	Ref		
	> 4,000 g	106	61.6	66	38.4	172	1.9	1.2 – 2.8	0.004
Delivery facilities	Public	1,167	71.7	461	28.3	1,628	Ref		
	Private	2,792	79.4	723	20.6	3,515	0.6	0.5 – 0.7	0.000
Medical indication									
Complication	No	921	82.2	199	17.7	1,120	Ref		
	Yes	3,038	75.5	985	24.5	4,023	1.4	1.1 – 1.8	0.005

Notes:

n = Number of Sample, OR = Odds Ratio, CI = Confidence Interval

Table 2 shows that women with antenatal care at obstetrician were 6.6 times higher (95% CI = 3.2-13.7) for cesarean section compared to women with antenatal care at midwife after controlled by maternal age, antenatal care facilities, parity, and delivery facilities. While women with antenatal care at obstetrician and midwife were 2.1 times higher (95% CI = 1.0-4.3) for cesarean section compared to women with antenatal care at midwife after controlled by maternal age, antenatal care facilities, parity, and delivery facilities. From socioeconomic status, women in quintile lower who checked their pregnancy at obstetrician was 6.6 times higher (95% CI = 3.2-13.7) for cesarean section, at quintile middle was 2.6 times higher (95% CI = 1.5-4.6), and the quintile upper was 3.6 times higher (95% CI = 2.7-4.7) than checked at midwife. While women who checked their pregnancy at

obstetrician and midwife who were in quintile lower were 2.1 times higher (95% CI = 1.0-4.3) for cesarean section, in quintile middle was 2.8 times higher (95% CI = 1.5-5.0), and in quintile upper was 1.7 times higher (95% CI = 1.2-2.4) compared to women who antenatal care at midwife after controlled by maternal age, antenatal care facilities, parity, and delivery facilities.

Four confounder variables influence cesarean section. Women aged ≥ 35 years was 1.4 times higher (95% CI= 1.1-1.9) for cesarean section compared to women aged 21-34 years, while women aged ≤ 20 years was 0.4 times lower (95% CI=0.2-0.6) for cesarean section compared to women aged 21-34 years after controlled by antenatal care facilities, parity, and delivery facilities. Women who checked their pregnancy in private facilities was 1.8 times higher (95% CI = 1.3-2.5) for cesarean section

**Table 2. Final Model of the Relation of Antenatal Care Provider with Cesarean Section**

Variable	Category	$\beta$	OR	SE	95% CI	p Value*
Antenatal care provider	Midwife	Ref				
	Obstetrician	1.9	6.6	2.5	3.2 – 13.7	0.000
	Obstetrician and midwife	0.7	2.1	0.8	1.0 – 4.3	0.051
Mother's age	≤ 20 years	-0.9	0.4	0.1	0.2 – 0.6	0.000
	21-34 years	Ref				
	≥ 35 years	0.4	1.4	0.2	1.1 – 1.9	0.012
Socioeconomic	Quintile lower	Ref				
	Quintile middle	-0.0	1.0	0.2	0.7 – 1.5	0.953
	Quintile upper	0.3	1.4	0.2	1.0 – 1.9	0.069
Antenatal care facilities	Public	Ref				
	Private	0.6	1.8	0.3	1.3 – 2.5	0.000
Parity	1	Ref				
	2	-2.6	0.8	0.1	0.6 – 1.0	0.037
	≥ 3	-3.6	0.7	0.1	0.5 – 0.9	0.016
Delivery facilities	Public	Ref				
	Private	-0.9	0.4	0.0	0.3 – 0.5	0.000
Interaction	Obstetrician by quintile lower	1.9	6.6	2.5	3.2 – 13.7	0.000
	Obstetrician by quintile middle	0.9	2.6	0.7	1.5 – 4.6	0.001
	Obstetrician by quintile upper	1.3	3.6	0.5	2.7 – 4.7	0.000
	Obstetrician and midwife by quintile lower	0.7	2.1	0.8	1.0 – 4.3	0.051
	Obstetrician and midwife by quintile middle	1.0	2.8	0.8	1.5 – 5.0	0.001
	Obstetrician and midwife by quintile upper	0.5	1.7	0.3	1.2 – 2.4	0.002

Notes:

\*as interaction variables, <sup>a</sup> compared to midwife, SE= Standard Error, CI= Confidence Interval

compared to women who checked their pregnancy in public facilities after controlled by maternal age, parity, and delivery facilities. Women with parity of two children was 0.8 times lower (95% CI = 0.6-1.0) for cesarean section than women with parity of one child after controlled by maternal age, antenatal care facilities, and delivery facilities. Women with parity of ≥ 3 children was 0.7 times lower (95% CI = 0.5-0.9) for cesarean section than women with parity of one child after controlled by maternal age, antenatal care facilities, and delivery facilities. Women who gave birth in private facilities was 0.4 times lower (95% CI = 0.3-0.5) for cesarean section compared to women who gave birth in public facilities after controlled by maternal age, antenatal care facilities, and parity.

**Discussion**

Description of cesarean section in urban areas in Indonesia in this study was 1,207 deliveries from 5,239 total deliveries with cesarean rate at 23%. The cesarean rate was higher than national cesarean rate in Indonesia (16.8%) by IDHS 2012 report.<sup>1</sup> The difference occurred because in this study, it was only in urban areas and only women who gave to the last child. This study also added several confounder variables to control independent variable. The missing data was excuse to reduce bias, so that it was the same with the study objectives.

Antenatal care providers in this study were categorized into five groups, namely midwife, doctor, obstetrician, obstetrician and midwife, obstetrician and doctor.

Antenatal care by doctor was only limited to general examination (blood pressure and weight). Antenatal care by midwife was by Leopold's maneuvers. The purpose of Leopold's maneuvers of pregnancy is to determine the fetus' position and location of uterus, so as to ensure the gestational age. Inspection techniques use the hands of midwife to detect fetus' position. In obstetrician, more detailed examination use ultrasound which can detect more the condition of pregnant women. Based on these differences, the division of health personnel of pregnancy examiner cannot be synchronized.

This study had similar results with those by Meiyetriani,<sup>12</sup> that mothers in Jakarta with antenatal care in obstetrician tend to have cesarean section 7 times higher (95% CI = 3.5-14) compared to mothers who performed antenatal care in other health providers after controlled by maternal age, maternal education, socioeconomic status, parity, records of complications, hypertension records, bleeding records, and pregnancy failure records.

In Shanghai, China, cesarean section proposed by a doctor increases 20 times higher (95% CI = 3.8-107.1) compared to other pregnancy examiners. The results also suggest that cesarean section is proposed by obstetrician during labor providers OR = 26 (95% CI = 6.26-105.8) after controlled by maternal age, education, and income. Moreover, the rate of cesarean with medical indications is only 17%, while without medical indication is higher reach 40%. In Shanghai, cesarean section suggested by doctor has become a common.<sup>3</sup>

Similar result was shown by Andree,<sup>14</sup> that the higher the economic status of the respondents, the higher the chances of undergoing cesarean section (dose response relationship). The lower the socio-economic status of the mother, the lower the chances of having a cesarean section.<sup>14</sup>

Attention and discomfort of the antenatal care is related to decision of the women in choosing health facilities and method of delivery. Performance and interaction between pregnant and maternity during antenatal care and delivery has a strong relation.<sup>15</sup> Quality of counseling about hazard and benefits of cesarean section is also necessary when pregnant women perform a pregnancy check-up. The target of many patients every time the practice of making a pregnancy check up performed by an obstetrician is done in just a very short time. If pregnant women do not take the initiative to ask about pregnancy, then important information is not given. Study in Ireland finds that provision of personal counseling during pregnancy evidently has significant effect on reducing cesarean section.<sup>15</sup>

The increasing rate of cesarean section is also due to the medicalization of labor. The development of technology, the use of antibiotics in medicine especially obstetrics, and change in skill of health personnels cause a pattern of health care in process of delivery from natural birth to cesarean section.<sup>4</sup>

Regulations from health institution is one effort to reduce unnecessary cesarean section in Brazil. Regulations in health institutions need to be established, so that obstetrician convey information about risk of cesarean section, and ask the mother to sign the consent first. The obstetrician should also provide the reason for need for a cesarean section by filling out a form about the section process that will occur, and explain the steps to be taken. Each mother also receives a medical document containing her pregnancy records information clearly, so that it can be carried around when the doctor switches the examiner of pregnancy.<sup>16</sup> Increased risk of cesarean section by obstetricians is not caused by a single cause. This study explains that cesarean section is also caused by maternal age, pregnancy checkpoint, parity, and place of delivery.

## Conclusion

Cesarean section occurs higher among women with antenatal care at obstetrician and obstetrician-midwife compared to women with antenatal care at midwife after controlled by maternal age, antenatal care facilities, parity, and delivery facilities. There is an interaction between antenatal care providers with socioeconomic status that cause the different effect in each level of socioeconomic levels. Implementation of rules was a cesarean section by health institutions, as well as efforts made to pre-

vent cesarean section in high economic communities in aim to reduce the occurrence of unnecessary cesarean section.

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