

Determinant of the Increased *Sectio Caesarea* Labor Rates of Indonesia in 2017

Hadi Ashar^{1,*}, Ina Kusriani¹

¹*Health Research and Development Center, Magelang, Jawa Tengah, Indonesia*

*Corresponding author. Email: hdi.gaki@gmail.com

ABSTRACT

Sectio Caesarea (SC) is a surgical procedure to excrete a conception result. SC is done based on the medical indication in order to save mothers, fetus or both. Data from Baseline Health Research 2010 showed proportion of SC was 15.3%, this higher than WHO recommendation for 5-15%. This study aimed is to identify characteristics of mothers that play a role in increasing the rate of SC, based on Indonesian Health Demography Survey (IHDS) 2017. The population and sample is women of childbearing age ranging of 15-49 years old, who give birth by SC with the rate of 17.784 people. Statistical analysis using *Chi Square* with the probability level of significances ($\alpha < 5\%$). The results show proportion of delivery method SC in Indonesia is 16.4%. The overview of mother characteristic were 19.7% done for the first child, 17.1% for the second child, 16.0% for the third child. SC was obtained in safe reproductive aged group 15.0% and potential highrisk of reproductive aged group 19.4%. It is respectively 12.2%, 15.85%, and 30.5% in the low, middle, and higher educational groups. 10.9% live in rural and 22.1% are in the urban. Those factors are contributed significantly by statistic $p=0,000$. It is concluded that the factors of age, rate of children, education and place of mothers play a role in increasing the rate of SC. Further study is required in the preparation of health care policies and education for women of childbearing age in choosing the delivery methods.

Keywords: *delivery methods, Sectio Caesarea*

1. INTRODUCTION

Sectio Caesarea (SC) is one of the surgical procedures mostly done in the world to excrete a conception result through the incision of the abdomen and uterus) [1][2]. The high rate of *Sectio Caesarea* procedure is associated with the increase of mothers and fetus morbidity. At first, *Sectio Caesarea* surgical procedure done with the consideration of medical indication such as the indication of fetus, mothers, or both [2]. The problem that often happens generally includes in his (power), birth way (passage), and fetus (passenger) [2], [3]. In another word, *Sectio Caesarea* surgical procedure can be done if it is necessary to save mothers, fetus or both from death threats.

WHO determines the *Sectio Caesarea* surgical procedure for the world in poor, developing and developed countries as much as 5-15%. The result of the previous study in China showed the rate of *Sectio Caesarea* for the population was above 15%. This rate is almost unjustified for medical perspective [4][5].

The increasing rate of *Sectio Caesarea* occurs in most countries, such as developed countries, developing countries and even poor countries, shows varying rates, even though the determinant of increasing rates is still controversial mainly in poor and developing countries. The result of systemic review held by eighteen countries by Vega et al in 2010, shows that there is an increasing

rate of *Sectio Caesarea* with an average of 45.2% [7]. Meanwhile Betran et al in 2016 did a study of trend analysis review in 1990 and 2014 in 121 countries, found that the average of *Sectio Caesarea* increase into 12.4% (from 6.7% to 19.1%) [8]. In some countries, it can be seen that *Sectio Caesarea* has been beyond the standard from WHO. Latin America and Caribbean have the highest rate of *Sectio Caesarea* 40.5% [8], followed by Latin America 32.8% [7], North America 32.3%, Oceania 31.1%, Australia 27.6%, England 25% [6], Europe 25%, Asia 19.2% and Africa 7.3% [8].

In Indonesia, the percentage of mothers giving birth by *Sectio Caesarea* tends to increase. Data from IDHS in 2007 shows 5% rate, in 2012 level up to 12% [9]. Another survey stated form *Baseline Health Research* in 2010 illustrates that there is 15.3%. Those rate has exceeded the WHO maximum limit of 15%. Data from IDHS 2012 elaborates the characteristics of women performing *Sectio Caesarea* are those who give birth in first birth order, live in urban area, highly educated and in highest wealth quintile [9].

Sectio Caesarea can be an alternative method of labor, but it should be understood that *Sectio Caesarea* is still considered as a surgical procedure performed based on the medical indications. Several studies prove that there is an increasing chance of problems in subsequent pregnancies in mothers and their babies [11]. This becomes a consideration for women who want give birth by *Sectio Caesarea*. An increase of *Sectio Caesarea* 2007-2017 occurred in Indonesia is the background of the importance

to know the distribution of characters of mothers who choose the method of delivery in *Sectio Caesarea*. The purpose of this study is to find out the characteristics of mothers using *Sectio Caesarea* delivery method based on data from IDHS 2017.

2. METHOD

2.1. Study Design

This study was conducted based on the secondary data from Indonesian Health Demography Survey (IDHS) 2017, which is a cross-sectional survey held in 34 provinces in Indonesia and 514 Regencies/Cities, 1,970 census blocks with household target of 49,250 with estimated rate of child bearing woman 59,100. The sample framework uses the census block mater at the 2010 population census (SP2010). While the household sample framework uses the list of updated regular household. The sampling design is *Two Stage Cluster Sampling*. In the first stage, the census block is chosen by *Proportional Probability Size (PPS)*, the second stage which is 25 households chosen systematically.

2.2. Population and Sample

The population of this study is the women of child bearing aged 15-49 years old, who become the respondents of IDHS 2017, living in Indonesia. While the sample is the women of child bearing age 15-49 years old who has given birth by *Sectio Caesarea* and they are the respondents of IDHS 2017. There are 17,748 women of child bearing with the inclusion criteria that they have given birth during a latest five years. The dependent variable is the choice of delivery methods, and the independent variable is the characteristic of mothers including the history of life, reproductive age, educational level, and resident.

2.3. Technique of Collecting Data

The collecting data held by professional enumerator with interview methods and uses the structural instruments and it has been studied before.

2.4. Techniques of Analyzing Data

The data quality used for this study has been through the stage of *cleaning* data with RSE level of < 25%. The data analyzed by using SPSS.21 software with the license owned by Health Research and Development Center of Magelang. Bivariate analyzes uses *Chi Square* test with the probability value (p value) of significances $\alpha < 5\%$ to see the relation between variables and to select the multivariate model. Multivariate analyzes done by logistic regression is to find out the characteristics of mothers who become the determinant in choosing *Sectio Caesarea* delivery method by controlling other variables.

3. RESULTS AND DISCUSSION

The total rate of pregnant women who are interviewed is 17,784 people. Those samples are in 34 provinces in Indonesia. There are 16.4% (2,916 people) mothers giving birth by *Sectio Caesarea*. The highest percentage is in big cities such as Jakarta and Bali. There is almost one third of total labor by *Sectio Caesarea* as stated in the Table 1.

Table 1. Distribution of labor processes for each province in Indonesia, 2017, IDHS

Province	Labor process			
	Per vaginal		<i>Sectio Caesarea</i>	
	N	%	N	%
Aceh	720	76.9%	216	23.1%
North Sumatera	769	77.7	221	22.3
West Sumatera	285	74.8	96	25.2
Riau	344	82.5	73	17.5
Jambi	179	77.2	53	22.8
South Sumatera	374	88.2	50	11.8
Bengkulu	221	80.4	54	19.6
Lampung	348	82.3	75	17.7
Bangka Belitung	223	82.9	46	17.1
Riau Islands	252	71.8	99	28.2
Jakarta	374	68.9	169	31.1
West Java	1459	86.0	238	14.0
Central Java	890	84.0	170	16.0
Yogyakarta	133	75.6	43	24.4
East Java	819	76.5	251	23.5
Banten	459	82.3	99	17.7
Bali	167	67.6	80	32.4
West Nusa Tenggara	436	87.6	62	12.4

East Nusa Tenggara	963	93.3	69	6.7
West Kalimantan	326	90.1	36	9.9
Central Kalimantan	197	90.1	36	9.9
South Kalimantan	231	83.4	46	16.6
East Kalimantan	400	83.3	80	16.7
North Kalimantan	239	84.5	44	15.5
North Sulawesi	147	81.7	33	18.3
Central Sulawesi	373	85.9	61	14.1
South Sulawesi	515	85.1	90	14.9
South east Sulawesi	568	90.3	61	9.7
Gorontalo	183	81.3	42	18.7
West Sulawesi	566	88.6	73	11.4
Maluku	754	91.0	75	9.0
North Maluku	401	93.3	29	6.7
West Papua	225	88.9	28	11.1
Papua	292	91.5	27	8.5
TOTAL	14.832	83.6	2.916	16.4

The characteristic variables of mothers who performed *Sectio Caesarea* is the history of life, reproductive age, educational level and resident ($P < 0.05$) as seen in Table 2. The delivery process of a first child gets a little higher than of a second or third child. It can be seen from the reproductive age of mothers that there are 15.0% are in

safe reproducing group (aged < 20 years old/ > 35 years old). The mother' highly educational level is bigger than the lower educational level which is 30.5% and it can be seen from their resident that there are 22.1% higher for mothers living in urban than rural.

Table 2. The analysis of the characteristic relationship between mothers and fetus in *Sectio Caesarea*.

Variable	Labor Procees				P-value	PR ^a
	Per vaginal		<i>Sectio Caesarea</i>			
	N	%	N	%		
Life birth history					0.000	0.8
First child	3.810	80.3	932	19.7		
Second child	4.962	82.9	1.021	17.1		
Third child	3.051	84.0	583	16.0		
Reproductive age					0.000	1.7
Safe group	10.226	85.0	1.807	15.0		
Risk group	4.606	80.6	1.109	19.4		
Educational level					0.000	2.0
Low education	4.310	91.8	386	8.2		
Middle education	8.307	84.2	1.559	15.8		
High education	2.215	69.5	971	30.5		
Living place					0.000	1.9
Village	8.043	89.1	989	10.9		
City	6.789	77.9	1.927	22.1		

⁰: reference category

^a:logistic regression

DISCUSSION

Sectio Caesarea surgical procedure done based on the medical indications to save mothers, fetus of both from death threats. The medical indication is divided into three categories which are his (power), birth way (passage), and fetus (passenger). Mostly, the problem that is faced is umbilical cord prolapse/fetal distress, major antepartum bleeding, obstructed labor, high preeclampsia/eclampsia, transverse fetus, breech presentation, and rupture uteri⁽¹²⁾. *Sectio Caesarea* is the most common surgical procedure done worldwide. *Sectio Caesarea* has become a trend, the increase of *Sectio Caesarea* averaged in the world is 19.1%⁽⁸⁾ (a result of review analyzes in 2016). In

Indonesia, the rate of mothers giving birth by *Sectio Caesarea* increases sharply. Data from IHDS 2007 shows a 5% rate, in 2012 level up to 12%, and in 2017 become 16.4%⁽¹³⁾. Another surveys stated from Baseline Health Research 2010 shows a 15.3% rate. This figure has exceeded the maximum limit recommended by WHO which is 15%.

Percentage of *Sectio Caesarea* surgical procedure happens in big cities such as Jakarta and Bali, which is almost one to third done by *Sectio Caesarea*. It is mostly performed by those who live in the urban and highly educated [6], [14]. This figure is not much different from the result done by Riskedas survey in 2010 that 64.52% live in the urban, 48.72% are highly educated [10]. The further analysis done by Baseline Health Research in 2013 conducted by

Sihombing et al revealed that urban dwelling and high education affecting the occurrence of *Sectio Caesarea*. The same also happened in China [16], and other developing countries in Southern and Southeast Asia [17]. Another study shows that there is 54% *Sectio Caesarea* procedure in the world live in the urban area [6]. With these results, the future prediction with the high urbanization mobility and increased income per capita, there is a tendency for *Sectio Caesarea* rates will grow.

Another study results in China in 2014 shows that the level of *Sectio Caesarea* surgery in population that is above 10-15% is almost hardly justified in any medical terms. It cannot be avoided that the increase of *Sectio Caesarea* has a risk with the rate of mothers and babies morbidities. This will be especially felt if it occurs in the poor countries where typically they have inadequate health facilities.

Characteristics of mothers with first born child has greater percentage than the second and third child which is 19.7%, there is a slight shift if compared with the result from Baseline Health Research 2010, which is higher at the birth of second and third child, around 38% for first child/primipara. The consequence that must be accepted is for the birth of second child and so on. The probability of doing repeated *Sectio Caesarea* surgery gets higher around 25%. The result of another study said that the case of elective *Sectio Caesarea* is greater than emergency one. The biggest contribution in the elective *Sectio Caesarea* happened in nulliparous labor [18]. With this finding, it can be stated that the medically indicated limit becomes low.

Factors related to the *Sectio Caesarea* labor procedures including maternal age, parity, and anemia [19]. Another study stated that a lot of women ask to perform *Sectio Caesarea surgery*, related with the issues of care/beauty, health, race/ethnicity, and other characteristics [20][21]. Other motive for women in choosing *Sectio Caesarea* including: per anxiety of vaginal delivery, altered intercourse organ function, and labor pain [7]. However with ethics and provision in performing *Sectio Caesarea* based on medical indication, it can be used to refuse the request of mothers to perform *Sectio Caesarea*. In fact, conversely, there is an increase of *Sectio Caesarea* rate that cannot be evaded, and it seems that there is no one responsible for this case. The trend why the increase of *Sectio Caesarea* rate cannot be explained from the characteristics of mothers and pregnancy complication that needs to be faced. Therefore, it needs to be studied the decision making of performing *Sectio Caesarea* based on the principles of medical indications and health ethics [7] [12]. The result of another study stated that the increase of labor by *Sectio Caesarea* surgery does not directly contradict with medical indications, because there are some factors outside of medical indications, such as mother or baby factor causing *Sectio Caesarea* to be chosen by mothers or medical staff [22].

The result of study in nine developing countries in Southern and Southeast Asia such as Vietnam, India, Maldives, Timor-Leste, Nepal, Indonesia, Pakistan, Bangladesh, and Cambodian, shows that maternal age, maternal education, and the sequences of labor

significantly related with *Sectio Caesarea* labor. High education, living in urban area, maternal age and birth history are the initiating factor of performing *Sectio Caesarea* surgical procedure in Indonesia.

The advance of technology and medical knowledge (*Sectio Caesarea*) becomes not only a hope in increasing the human prosperity and health, but also a great responsibility for medical profession to use this advanced technology. *Sectio Caesarea* surgical procedure based on medical indication can save mother, fetus or both, but there is evidence in showing the benefits of *Sectio Caesarea* to those who does not have any medical indication [3][23].

4. CONCLUSION

The factor of age, rate of child, education and resident of mother play a role in increasing the rate of *Sectio Caesarea*.

5. SUGGESTION

It needs a further study in preparing the medical service policy and education related to the choosing of *Sectio Caesarea* labor method.

REFERENCES

- [1] Poole JH. Safe Prevention of the Primary Caesarean Delivery. *Am J Obstet Gynecol.* 2014;20(3):159.
- [2] NICE. *Sectio Caesarea*. 2nd editio. London: Published by the RCOG Press at the Royal College of Obstetricians and Gynaecologists, 27 Sussex 2 Place, Regent's Park, London NW1 4RG; 2011. 1-275 p.
- [3] Department of Reproductive Health and Research WHO. WHO Statement on Cesarean Section Rates. Human Reproduction Programme Switzerland; 2015 p. 1–8.
- [4] Ye J, Betrán AP, Guerrero Vela M, Souza JP, Zhang J. Searching for the optimal rate of medically necessary cesarean delivery. Vol. 41, *Birth* (Berkeley, Calif.). China; 2014. p. 237–44.
- [5] Betran AP, Torloni MR, Zhang J, Ye J, Mikolajczyk R, Deneux-Tharaux C, et al. What is the optimal rate of Sectio Caesarea at population level? A systematic review of ecologic studies. *Reprod Health.* 2015;12(1).
- [6] Vogel JP, Betrán AP, Vindevoghel N, Souza JP, Torloni MR, Zhang J, et al. Use of the Robson classification to assess Sectio Caesarea trends in 21 countries: A secondary analysis of two WHO multicountry surveys. *Lancet Glob Heal.* 2015;3(5):e260–70.
- [7] Vega ES, Casto S, Chamizo K, Flores Hernandez D, Landini V, Guillen A. Rising Trends of Cesarean Section Worldwide: A Systematic Review. *Obstet Gynecol Int J.*

2015;3(2).

[8] Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The increasing trend in Sectio Caesarea rates: Global, regional and national estimates: 1990-2014. *PLoS One*. 2016;11(2):1-12.

[9] Badan Pusat Statistik, Badan Koordinasi Keluarga Berencanaan Nasional, Departemen Kesehatan. *Survei Demografi dan Kesehatan Indonesia 2012*. Sdki. 2012;16.

[10] Balitbangkes. *Riset Kesehatan Dasar 2010*. Jakarta; 2010.

[11] Kallianidis AF, Schutte JM, van Roosmalen J, van den Akker T. Maternal Mortality after Cesarean Section in the Netherlands. Vol. 229, *European Journal of Obstetrics and Gynecology and Reproductive Biology*. Netherlands; 2018. p. 148-52.

[12] Chungani M. Sectio Caesarean Safety & Quality: The South Asian Context. *Commentary*. p. 1-30.

[13] BKKBN, BPS, Kementerian Kesehatan RI. *Survei Demografi dan Kesehatan*. Jakarta; 2017.

[14] Roberts CL, Nippita TA. International Sectio Caesarea rates: The rising tide. *Lancet Glob Heal* [Internet]. 2015;3(5):e241-2. Available from: [http://dx.doi.org/10.1016/S2214-109X\(15\)70111-7](http://dx.doi.org/10.1016/S2214-109X(15)70111-7)

[15] Sihombing N, Saptarini I, Putri DSK. The Determinants of Sectio Caesarea Labor in Indonesia (Further Analysis of Baseline Health Research 2013). *J Kesehat Reproduksi* [Internet]. 2017;8(1):63-75. Available from: http://ejournal.litbang.depkes.go.id/index.php/kespro/article/view/6641/pdf_2

[16] Suryati T. Persentase Operasi Caesaria Di Indonesia Melebihi Standard Maksimal, Apakah Sesuai Indikasi Medis? *Bul Penelit Sist Kesehat*. 2013;15(4 Okt):331-8.

[17] Mohan DR. Prevalence and Determinants of Sectio Caesarea in South and South East Asian Women. *J Med Sci Clin Res*. 2019;7(2).

[18] Cunningham G, Leveno K, Bloom S, Spong C, Dashe J, Hoffman B, et al. *Williams Obstetrics*. 24Th Editi. United States; 2014. 1-1376 p.

[19] Mulyawati I, Azam M, Ningrum D. Faktor Tindakan Persalinan Operasi Sectio Caesarea. *KESMAS - J Kesehat Masy*. 2011;7(1):14-21.

[20] Chhabra S. Increasing Cesarean Births, Cause for Concern. *Int J Gynecol Obstet Neonatal Care*. 2015;2(3):13-9.

[21] Mylonas I, Friese K. Indications for and Risks of

Elective Cesarean Section. *Dtsch Arztebl Int*. 2015;112(29-30):489-95.

[22] Ayuningtyas D, Oktarina R, Misnaniarti, Sutrisnawati N. Etika Kesehatan pada Persalinan Melalui Sectio Caesarea Tanpa Indikasi Medis. *J MKMI*. 2018;14(1):9-16.

[23] Souza JP, Gülmezoglu AM, Lumbiganon P, Laopaiboon M, Carroli G, Fawole B, et al. Sectio Caesarea without medical indications is associated with an increased risk of adverse short-term maternal outcomes: The 2004-2008 WHO Global Survey on Maternal and Perinatal Health. *BMC Med* [Internet]. 2010;8(1):71. Available from: <http://www.biomedcentral.com/1741-7015/8/71>