Ecological Study of Healthcare Childbirth in Indonesia: Does Antenatal Care Matter?

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Abstract

The Indonesian government is encouraging childbirth in healthcare to reduce maternal mortality in Indonesia, which is still high.This study aims to conduct an ecological analysis related to the factors that affect Indonesia's healthcare childbirth.The researchconducted the ecological analysis using secondary data from the Ministry of Health of the Republic of Indonesia report in 2018. The study takes all provincesas samples. Apart from the proportion of healthcare childbirth, four other variables analyzed as independent variables were the proportion of antenatal care 1st visit, the proportion of antenatal care 4th visit, the ratio of health center per district, and the hospital per 100,000 population ratio. Data were analyzed using a scatter plot.The study results found a tendency for the proportion of healthcare childbirth to be lower in the eastern than other Indonesia regions. The study also found that the higher the antenatal care 1st visit in a province, the higher the proportion of healthcare childbirth in that province.Meanwhile, the higher the antenatal care 4th visit in a region, the higher the proportion of healthcare childbirth in that region. The higher the ratio of health centers per district in a province, the higher the proportion of healthcare childbirth in that province. Moreover, the higher ratio of health centers per district in an area, the higher the proportion of healthcare childbirth in that area.The study concluded that four independent variables were analyzed ecologically related to healthcare childbirthin Indonesia.

Keywords: *healthcare childbirth, ecological analysis, maternal health, health policy.*

Introduction

Maternal Mortality Rate (MMR) is one of the success indicators of maternal health programs because of its sensitivity to improving health services and is one of the SDG achieving targets[1]. The maternal mortality rate in Indonesia has tended to fall in the last three decades. The decline challenge has not yet reached the SDG target, namely 205 deaths per 100,000 live births in 2020. From 1991 to 2007, MMR decreased from 390 to 228 deaths per 100,000 live births. However, in 2012 there was an increase again to 359. The number of maternal deaths in 2018-2019 decreased from 4,226 to 4,221, with the most common cause of maternal death was bleeding[2,3].

In 2019, Provinces on Java Island dominated the high number of maternal deaths in Indonesia. West Java, East Java and, Central Java accounted for the most considerable maternal mortality rates of 684, 520 and, 416 maternal mortality. Meanwhile, the lowest number of maternal deaths was in North Kalimantan, with 21 maternal deaths. Provinces with archipelagic territories such as Bangka Belitung Islands, Riau Islands, Maluku and, North Maluku have the number of maternal deaths of 36, 41, 52 and, 47[2].

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MMR reduction target using the Average Reduction Rate (ARR) model with an average decrease of 5.5% per year. Thus MMR Indonesia is estimated to be 70 per 100,000 live births by2030[2,4]. One of the MMR programs reduction is to encourage every childbirth helped by trained health workers in health care facilities. Maternity coverage in healthcare facilities in 2019 was 88.7%, up from 86.28% in 2018. Besides, the government also implements the Maternity Planning and Complication Prevention Program (P4K). Maternity Planning and Complication Prevention Program involve the participation of families in planning childbirth. Health cadres, community, and health workers are also actively involved in the assistance of pregnant women[5,6].

Maternal health services must meet the minimum frequency in each trimester. Assessment implementation of maternal health services is seen from antenatal care first visit and antenatal care fourth visit coverage. From 2006 to 2018, antenatal care fourth visit coverage tends to increase. However, in 2019 the fourth antenatal care visit does not different from 2018 of 88.4% and 88.03%. This condition followed by a considerable gap between the highest and lowest provincial achievements in DKI Jakarta (103.6%) and Papua (36.7%)[2,7]

Indonesia is the largest archipelago with about 17 thousand islands with a diversity of topography on each island. This condition affects the affordability of public access to healthcare facilities[8]. The convenience of access and availability of healthcare number facilities is relatively more favorable for people in the west of Indonesia compared to the eastern region. Access to health facilities, both in primary healthcare and advanced healthcare, is one of the crucial factors in the success of MMR's decline[4,9]. Basic Health Survey data shows that urban access to hospitals and primary health centers is relatively easy, while rural communities still have difficulty accessing hospitals and primary health centers[10,11].Based on the background description, this study aims to conduct an ecological analysis of antenatal care visits and the ratio of health services to healthcare childbirthin Indonesia.

Materials and Methods

Study Design

The study carried out the design using an ecological analysis approach. Environmental analysis is based on a path that focuses on comparisons between groups, not individuals. In this study, aggregate data was provided at the provincial level. This study's ecological analysis objective was to draw ecological conclusions about the effects on groups (region)[12,13].

Data Source

The study conducted using secondary data from the Indonesia Basic Health Survey Report 2018 and the Indonesia Health Profile 2018. Both stories were official reports from the Ministry of Health of the Republic of Indonesia. Moreover, the province was the unit of analysis in this study. The study analyzed all provinces in Indonesia have (34 provinces).

Table 1. The data source of thefactors related to healthcare childbirth in Indonesia, 2018

Source	Variables
The 2018 Indonesia Basic Health Survey	The proportion of healthcare childbirth
	The proportion of antenatal care 1st visit
	The proportion of antenatal care 4th visit
The 2018 Indonesia Health Profile	The ratio of health center/district
	The ratio of hospital/100,000 population

Data Analysis

The dependent variable in this study is the proportion of healthcare childbirth. Healthcare childbirth is a delivery carried out in all healthcare, both in health centers and hospitals, both managed by the government and the private sector[10]. There were four independent variables analyzed in this study.The four variables were the proportion of antenatal care 1st visit, the proportion of antenatal care 4th visit, the ratio of health center per district, and the hospital per 100,000 population ratio.

Data were analyzed by univariate and bivariate. The research performs a bivariate analysis using a scatter plot. Meanwhile, the study uses a fit-line to determine the relationship between healthcare childbirth and independent variables. The entire analysis process uses SPSS 22 software.

Ethical Approval

In this study, the review used secondary data from the official government reports released. For this reason, in implementing this report, the study did not require ethical clearance.

Results and Discussion

Table 2 shows the descriptive statistics of variables of the factors related to healthcare childbirthin Indonesia. Table 2 provides a very high variation between provinces. The lowest proportion of healthcare childbirth was 30.10%,recorded in Maluku Province, while the highest proportion was 98.50%, recorded inBali Province. This outcome of the descriptive study follows previous studies' findings informing the backwardness of health field growth in the east relative to other Indonesia regions[12,14].

Table 2. Statistics descriptive of variables of the factors related to the healthcare childbirth in Indonesia, 2018

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Healthcare Childbirth	34	68.40	30.10	98.50	71.7824	17.08215
Antenatal care first visit	34	30.90	63.50	94.40	81.6559	8.24368
Antenatal care fourth visit	34	46.40	43.80	90.20	67.2765	11.71699
Ratio of health center per district	34	6.57	0.73	7.30	1.5456	1.05118
Ratio of hospital per 100,000 population	34	1.50	0.70	2.20	1.2706	0.36971

Source: The 2018 Indonesia Basic Health Survey and The 2018 Indonesia Health Profile

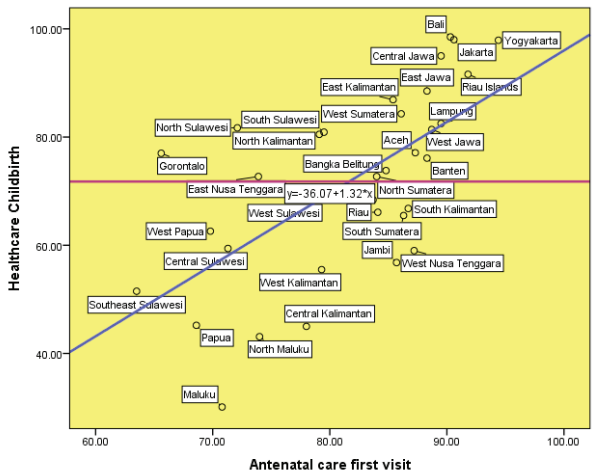

Figure 1. Scatter plot of the antenatal care 1st visit and the proportion of healthcare childbirth in Indonesia, 2018

Source: The 2018 Indonesia Basic Health Survey

Figure 1 is a scatter plot between the antenatal care 1st visit and the proportion of healthcare childbirth in Indonesia. The relationship between the two variables shows a positive trend. The scatter plot means the higher the antenatal care the 1st visit in a province, the higher the proportion of healthcare childbirth in that province.

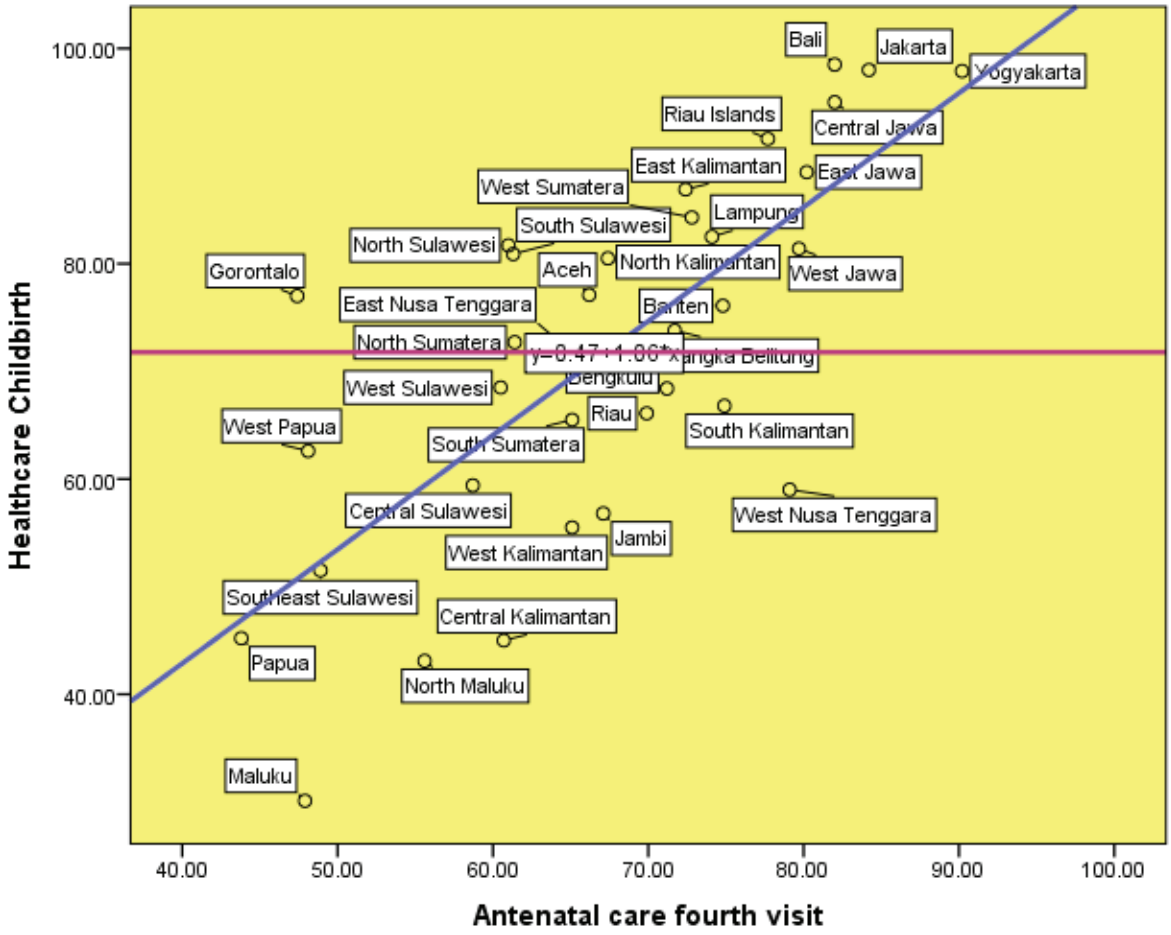

Figure 2. Scatter plot of the antenatal care 4th visit and the proportion of healthcare childbirth in Indonesia, 2018

Source: The 2018 Indonesia Basic Health Survey

Figure 2 is a scatter plot between the antenatal care 4th visit and the proportion of healthcare childbirth in Indonesia. The relationship between the two variables shows a positive trend. This analysis shows that the higher the antenatal care 4th visit in a province, the higher the proportion of healthcare childbirth in that province.

Figures 1 and 2 show the analysis results in line with the findings in several previous studies that showed a strong positive relationship between antenatal care and delivery performed in healthcare[15–17]. The complete antenatal care performed during pregnancy, the more likely it is to deliver delivery to healthcare[18]. This situation is because while pregnant women make antenatal care visits, midwives or other health workers have the opportunity to motivate delivery to health facilities. Meanwhile, the interaction between pregnant women and midwives during antenatal care visits can increase pregnant women's knowledge about the danger signs of pregnancy[19]. Moreover, healthcare for childbirth provides the chance to minimize the risk of difficulties or complications during labor[20].

Figure 3 is a scatter plot between the ratio of health centers per district and the proportion of healthcare

childbirth in Indonesia. The results of the scatter plot of the two variables show a positive trend. The study interpreted that the higher the ratio of health center per district in a province, the higher the proportion of healthcare childbirth in that province.

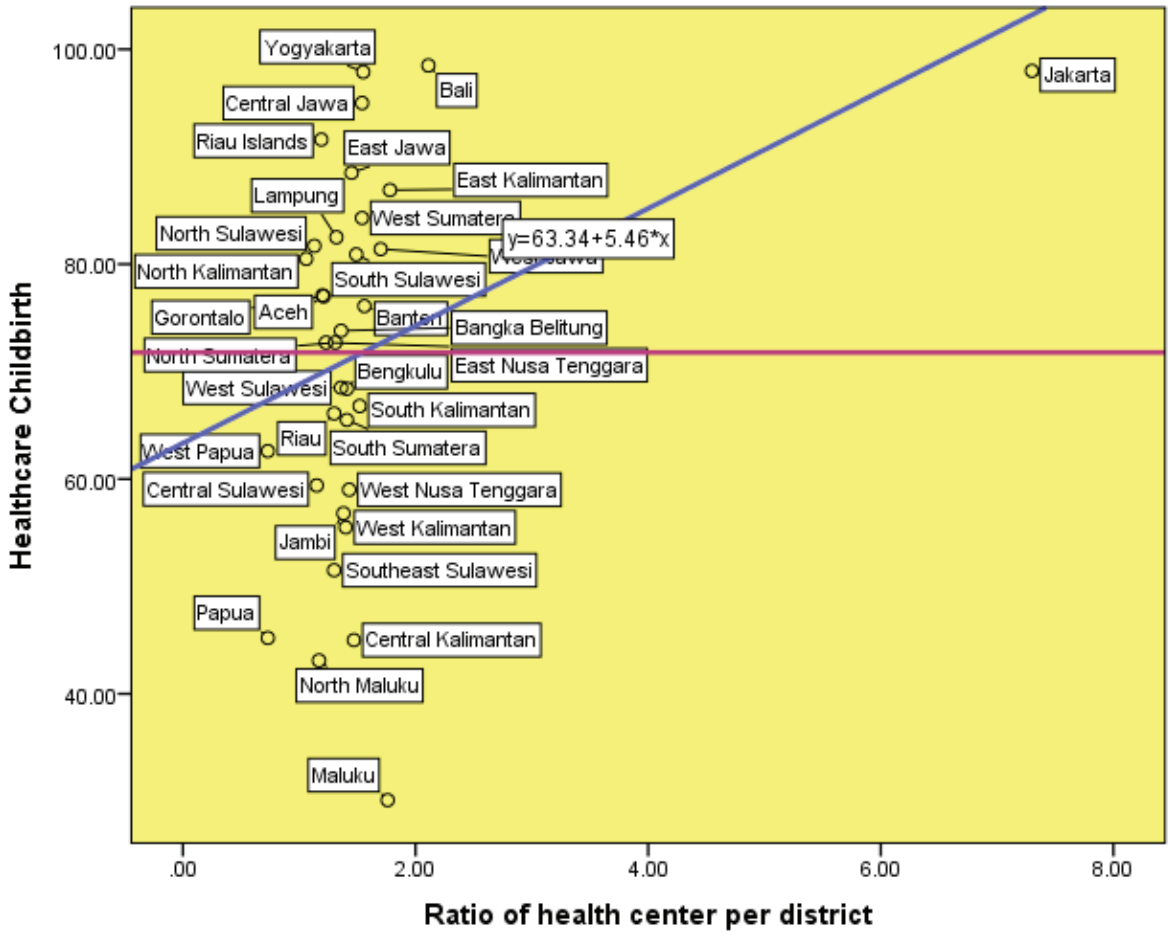

Figure 3. Scatter plot of the ratio of health center per district and the proportion of healthcare childbirth in Indonesia, 2018

Source: The 2018 Indonesia Basic Health Survey and The 2018 Indonesia Health Profile

Moreover, Figure 4 is a scatter plot between the ratio of health centers per district and the proportion of healthcare childbirth in Indonesia. In bivariate terms, the two variables show a positive trend. This situation indicates that the higher the ratio of health centers per district in a province, the higher the proportion of healthcare childbirth in that province.

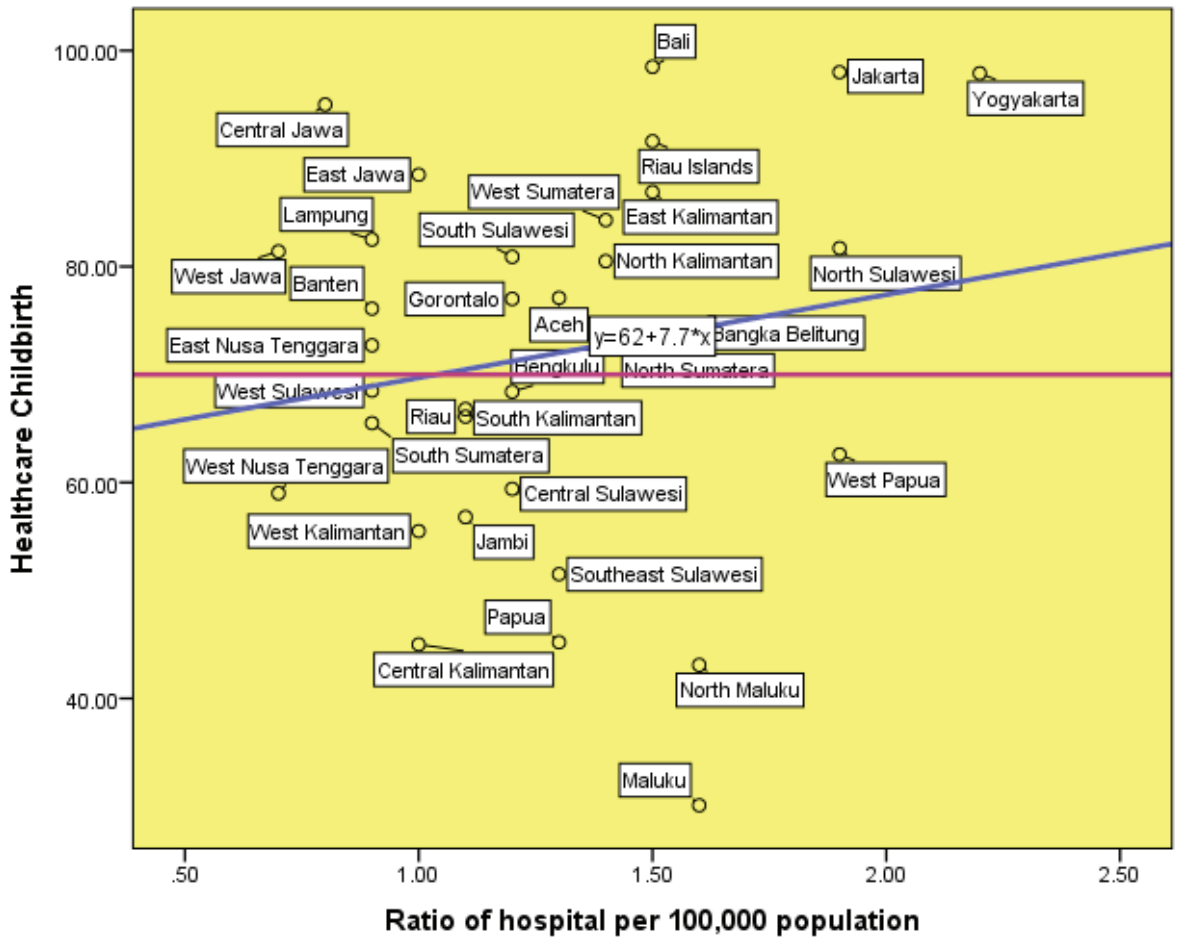

Figure 4. Scatter plot of the ratio of hospital per 100,000 populations and the proportion of healthcare childbirth in Indonesia, 2018

Source: The 2018 Indonesia Basic Health Survey and The 2018 Indonesia Health Profile

Ecologically, health service facilities (both health centers and hospitals') availability is closely related to childbirth healthcare. This finding is in line with previous research in Indonesia, which informs the same conclusion[21]. The higher the availability of health service facilities in an area, the more options or alternatives for delivery. This situation will encourage a better proportion of childbirth healthcare[22,23].

The authors carried out the study with an ecological analysis approach to capture the superficial phenomena needed by policymakers to encourage healthcare childbirth improvement in Indonesia. However, this study cannot capture Indonesian territory's very extreme characteristic phenomena. The situationis related to the archipelago, underdeveloped areas, borderline, and outermost areas[24–26]. On the other hand, the authors conduct the study from the provider side, which could be different from the community's view as consumers[27]. For this reason, we need more specific research that considers the characteristics of the region.

Conclusion

The research result concludes that the four independent variables analyzed ecologically were related to Indonesia's proportion of healthcare childbirth. The four variables were the proportion of antenatal care 1st visit, the proportion of antenatal care 4th visit, the ratio of health center per district, and the hospital per 100,000 population ratio.

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analysis in this manuscript.

Source of Funding: Self-funding

Ethical Clearance: The study was conducted by utilizing secondary data from published reports. For this reason, the study not required ethical clearance in the implementation.

Conflicting Interests: Nil

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