

# **Spatial Analysis of The Effect of Women's Autonomy on Fertility in Indonesia**

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## **ABSTRACT**

Gender equality which has become one of the national development goals is often described by the degree of women's autonomy. The absence of the RPJMN target in terms of fertility rates in Indonesia could be due to the current low autonomy of women. The purpose of this study is to determine the spatial analysis of the relationship between women's autonomy and fertility at the provincial level and to determine the effect of women's autonomy on fertility in Indonesia. The analysis method used in this research is the spatial analysis and binary logistic regression analysis. The spatial analysis will describe spatially the relationship between women's autonomy and fertility based on 34 provinces in Indonesia. Meanwhile, the logistic regression analysis will look at the influence of the female autonomy variable on fertility in Indonesia. The results of the spatial analysis show that most provinces in Indonesia still have high fertility rates and this pattern is followed by low women's autonomy. Meanwhile, the results of binary logistic regression analysis showed that 7 out of 11 independent variables consisting of female autonomy variables and other control variables significantly affected fertility. Where the independent variables that describe women's autonomy affect on fertility in Indonesia. So that increasing women's autonomy needs to be built in terms of supporting population control.

**Keywords:** Gender, women autonomy, fertility

## INTRODUCTION

Fertility tends to be described as the TFR figure which is based on the IDHS results which means the total fertility rate. The number of children a woman will have until the end of her reproductive period if she follows the current pattern of Age-Specific Fertility Rate (ASFR).<sup>17</sup> Fertility in Indonesia for 10 years remains at the TFR figure of 2,6 based on the 2002 IDHS data - 2012 IDHS. In Indonesia, a large population is not an asset because of the low quality of the population.<sup>8</sup> This is reflected in Indonesia's Human Development Index (HDI) in 2018 which still ranks 111th out of 189 countries in the world.<sup>9</sup> A high fertility rate will increase the population in a country, if a high population is not accompanied by good human resources, other resources will tend to be more directed towards consumption so that high population size cannot be an asset for development but will cause various social problems.<sup>8</sup>

One of the main themes in various international treaties and declarations is regarding gender equality and women's autonomy which is used as a development strategy in various fields such as decision making and policy implementation.<sup>1</sup> Gender equality has been recognized globally as one of the goals of achieving national development. According to Phan (2016) in developing countries, women's autonomy is an important indicator in social development.<sup>2</sup> The vision of national development regarding the issue of gender equality in Indonesia is "to create an Indonesia that is independent, advanced, just and prosperous" where the word fair is more to no boundaries/discrimination in any form, whether individual, region, or gender.<sup>3</sup> One of the targets for the achievement of various countries in the Millennium Development Goals (MDGs) is the issue of gender equality and women's autonomy which from this point can be shown the tendency of the smaller number of household members in a family.<sup>4</sup>

The decision to have children in the family certainly does not escape the desires, motivations, and relationships between actors in the household.<sup>5</sup> The development of a patriarchal culture in Indonesia that causes women to be in classes that have more limited access than men. Women are considered to have a weak position in the hierarchy of decision making regarding fertility.<sup>6</sup>

Meanwhile, the Gender Development Index "measures women's active participation in politics, decision-making, and economics" based on BPS.<sup>3</sup> It can be seen that even though there has been an increase in the IPG rate in Indonesia from 70.07 in 2012 to 71.74 in 2017, the Total Fertility Rate (TFR) in Indonesia

according to the 2017 IDHS data is still at 2,4 or has not met the RPJMN target. which should already be at 2,3.<sup>10</sup>

According to Hosseini and Bagi (2013), women's autonomy can affect fertility either directly or indirectly.<sup>22</sup> Is it true that women's autonomy affects fertility in Indonesia? The assumption used by the author is that the higher the autonomy of women, the lower the fertility rate. This study will look at the effect of women's autonomy which is reflected in several variables in the 2017 Indonesian Demographic Health Survey questions on fertility in Indonesia. Apart from that, we also want to see the pattern of the relationship between women's autonomy and fertility at the provincial level using spatial analysis.

Based on some literature, women's empowerment is often interpreted with different concepts from various sides such as autonomy, status, or agency.<sup>2</sup> This is reinforced by a statement on the research of Upadhyay et al<sup>4</sup> where there are various ways to describe women's empowerment, many previous studies have suggested that the calculation of women's empowerment variables can be different even though they have the same concept. Conceptual empowerment of women as the agency in Kabeer (2012) can be defined as individuals or groups who have empowerment if they can choose, control resources, are free in mobility, free from violence and their opinions can have an impact on group decision making.<sup>10</sup> Meanwhile, women's autonomy is more about women's ability to control or influence their families to make decisions in the household in terms of finance, health, tourism, spending, work, child care, etc.

There are four components of women's autonomy at the household level that exist within the theoretical framework recommended by previous research, namely the female labor participation rate, female household decision-makers, women using contraception, and women's education.<sup>2</sup> Women's status and autonomy can usually describe a woman's social position in making decisions.<sup>3</sup> According to Upadhyay et al<sup>4</sup> the most common basis for calculating women's autonomy is women's participation in making decisions in the household such as personal health problems, buying children's clothes, visiting family, and land ownership.

Based on a sample of married women aged 35 years or over, it is found that there is a relationship between several indicators of women's autonomy and the level of fertility they want.<sup>2</sup> Regarding women's autonomy and fertility, based on all previous studies, it was found a positive or negative relationship

depending on the research context used between several variables of women's autonomy and women's ability to make decisions about their fertility.<sup>4</sup>

The results of research by Upadhyay et al<sup>4</sup> states that the higher the autonomy of women for those who still have high fertility rates can be due to social norms in their environment because if seen based on their desires, those who fall into this category want a smaller number of families. Women themselves must realize the need for women's autonomy in terms of reproduction, which is a multidimensional family and social process.<sup>5</sup>

## METHOD

Sources of data used in this study come from shapefile map data of Indonesia by province and raw data from the 2017 Indonesian Demographic and Health Survey. This research uses the unit of analysis for women aged 15-49 years who are married and live together based on the results of the 2017 IDHS Survey sampling. Demography and Health of Indonesia in 2017 used multistage sampling with a total of 49,250 houses and 59,100 women aged 15-49 years. The concept and operational definition of the variables used in this study followed the concepts and definitions in the questions in the 2017 IDHS questionnaire. Descriptive analysis in this study used spatial analysis with ARC GIS 10.6.1 software from the variables studied. Descriptive analysis is an analysis that presents a summary of data clusters so that it can be easily understood where the summary in question is a summary of the data centering patterns or variations contained in the data.<sup>6</sup> Meanwhile, inference analysis used binary logistic regression analysis with data processing using STATA 13 software.

The logistic regression analysis model is looking for the best model that describes the relationship between the dependent variable and several independent variables where the

dependent and independent variables are categorical.<sup>7</sup> The probability of occurrence can be denoted by  $p_i$ , so that the logistic regression model formed for the n independent variables is written as follows:

$$\text{logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n \quad (1)$$

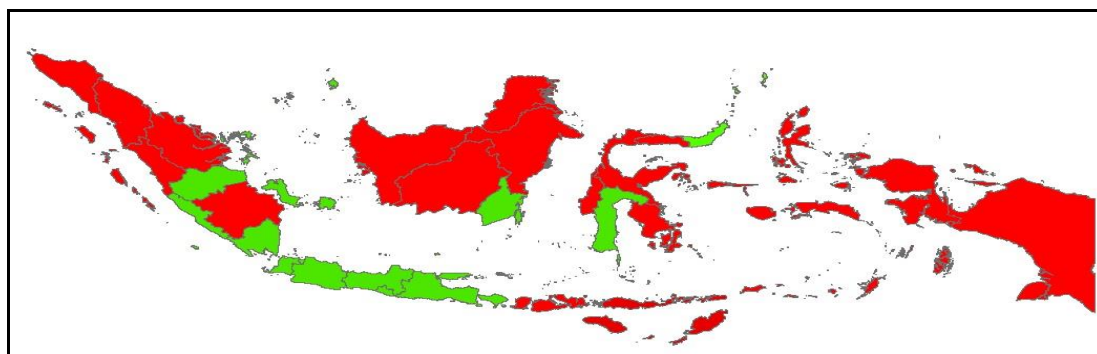
$$\text{So } p_i = \frac{1}{1 + e^{-\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n}} \quad (2)$$

If you want to know the probability of the occurrence of the Y category value (dependent variable) on the value of the independent independent variable, then the probability distribution function becomes:

$$\text{Pr}(Y_i = y | X_i) = \pi(x) = \frac{e^{(\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)}}{1 + e^{(\beta_0 + \beta_1 X_1 + \dots + \beta_n X_n)}} \quad (3)$$

## RESULTS AND DISCUSSION

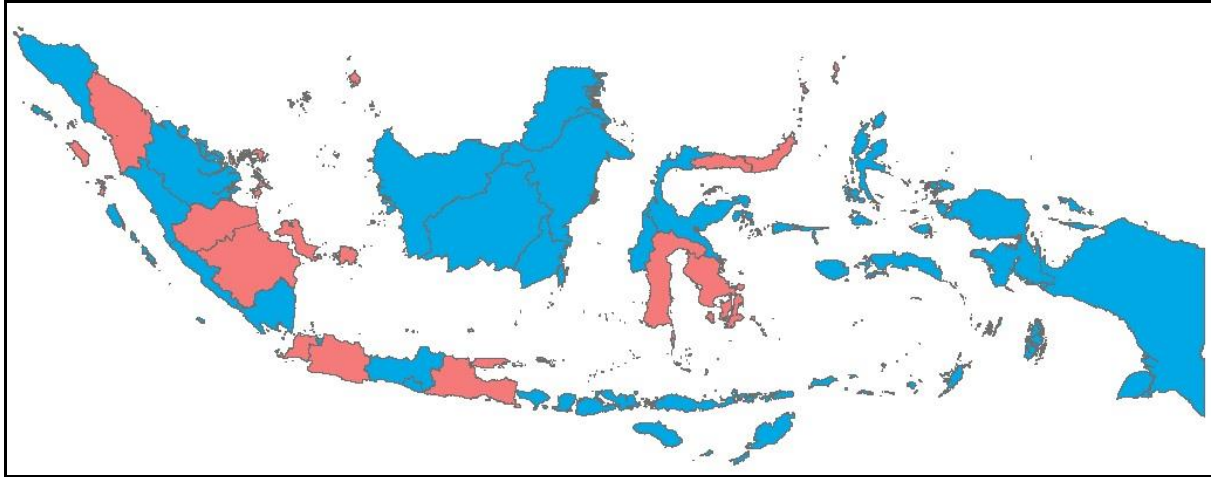
It is hoped that the spatial analysis can describe the pattern of fertility and autonomy of women at the provincial level in Indonesia.<sup>8</sup> Spatial analysis in research to see that geography can affect the pattern of fertility decline. The condition of fertility in Indonesia can be described by the Total Fertility Rate (TFR) which is "the number of children a woman will be born with until the end of her reproductive period if she follows the current pattern of Age-Specific Fertility Rate (ASFR)" according to the 2017 IDHS Report.<sup>17</sup> The results of the 2017 IDHS show that Indonesia's TFR is 2.4 so that the classification of TFR in the TFR mapping per province in Indonesia follows the classification into the green category, which means that the province has a TFR less than 2.4 and is included in the red category for provinces with its TFR is above 2.4. The figure 2.4 as the national TFR is a reference following previous research written by Andini and Ratnasari<sup>18</sup> which makes the TFR reference for East Java as the basis for the classification of TFR districts/cities so that they can be illustrated in the mapping.



Picture 1. Mapping of Total Fertility Rate (TFR) by Province in Indonesia  
 Source: 2017 IDHS results, processed

Based on Picture 1, it can be seen that of the 34 provinces in Indonesia there are 19 provinces or most of the provinces in Indonesia still have a TFR above 2.4 or above Indonesia's TFR. Provinces that have TFR numbers below or equal to the national TFR are partly near the

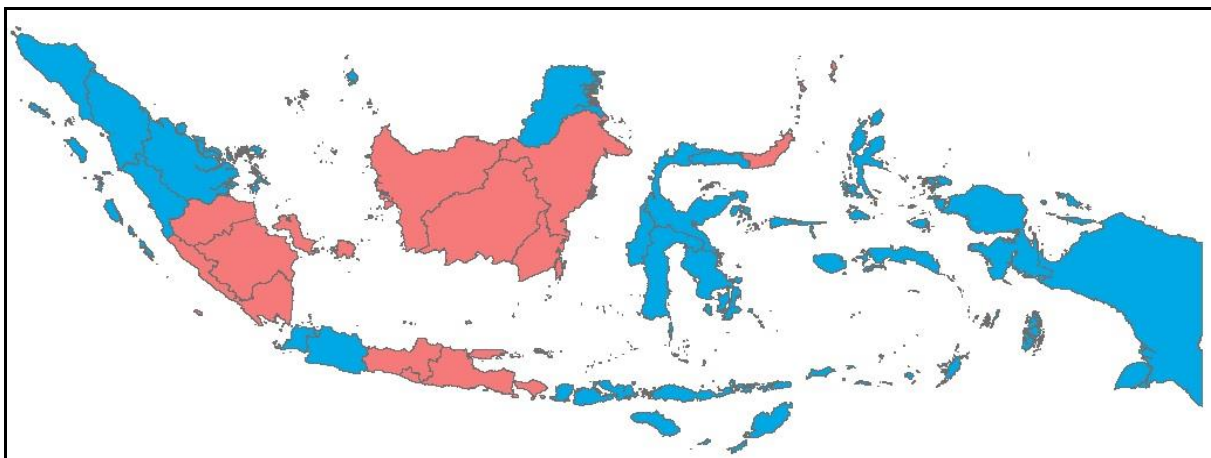
state capital DKI Jakarta and are on the islands of Sumatra and Java. Although there are 3 provinces located on the island of Kalimantan (South Kalimantan) and 2 on the island of Sulawesi (South Sulawesi and North Sulawesi).



Picture 2. Mapping Control of Wife's Income by Provinces in Indonesia  
 Source: 2017 IDHS results, processed

One of the variables that can describe women's autonomy is the control of married women on their income. According to Haque et al (2011), several indicators that can affect women's empowerment/autonomy can be divided into three, namely economic decision making, household decision making, and physical movement, one of which is reflected in women's autonomy in controlling household expenses related to finances.<sup>20</sup> Still the same as the basis for classification in the TFR, the national figure is used as a reference where the national figure for control of married women

over their income is 48%. The pink color indicates that the percentage of currently married women in the province who has control over their income is equal to or more than 48%. Meanwhile, the blue color indicates that the percentage of currently married women in the province who has control over their income is less than 48%. Based on Picture 2, it can be seen that most of the provinces in Indonesia or 22 out of 34 provinces in Indonesia are included in the blue category or women are not the main people who have control over their income.



Picture 3. Mapping of Women Using Family Planning by Provinces in Indonesia  
 Source: 2017 IDHS results, processed

The national TFR figure is used as a reference where the national figure for currently married women using family planning is 63.6%. The classification is included in the pink color category if the province has a percentage of currently married women who use family planning more than 63.6%. Meanwhile, it is included in the blue color category if the province has a percentage of women using family planning that is less than 63.6%. Based on Picture 3, it can be seen that most of the provinces, namely 20 out of 34 provinces in Indonesia, are included in the blue category or the percentage of women using family planning is still below 63.6%

If we look and compare between Picture 1 which explains the fertility pattern with Picture 2 and 3 which reflects the pattern of women's autonomy, it can be seen that there is almost the same pattern or it can be said that there is a similar correlation between several provinces that are green and those that are pink. Provinces in green in figure 1 indicate a low fertility rate, while provinces in pink in Figures 2 and 3 are provinces with a high level of women's autonomy. The decline in fertility in an area can affect the fertility conditions of the area that is close to it, this can be explained through spatial models.<sup>16</sup> So that if a province has low fertility, it is estimated that it will be followed by provinces that are close to it, this could be due to almost the same culture, or similar developments in technology and information. In this case, it can be interpreted that the higher the autonomy of women in the province, the lower their fertility will be. In

developing countries, the ability of a woman in socioeconomic status, employment status, education level, household management, marital relations, and the involvement of women in making decisions is a reflection of women's autonomy, which is an important factor that can affect the decline in fertility rates.<sup>19</sup>

The binary logistic regression analysis method is used because the dependent variable in this study is categorical which is divided into two, namely the number of children born alive less than equal to 2 and the number of children born alive more than 2. There are 11 independent variables used to determine their effect on the dependent variable in this research.

The output results with data processing using STATA 13 with a significance level of 5% and value  $\chi^2 = 1819,98$  prob  $\chi^2 < 0.05$  so it can be said with a 95% confidence level the model is suitable to explain the data. Based on table 1, it is found that of the 11 independent variables only 7 independent variables significantly affect the dependent variable (ALH), namely wife's income, control of own income, decision making in purchasing large goods, decision making on family planning, use of family planning, classification of residential areas. and age at first marriage. The R-square value of 62.7% means that 62.7% of the independent variables in this study have been able to explain the number of children born alive and the rest can be explained by other variables outside the model.

$$\ln\left(\frac{p_1}{p_0}\right) = -2,364 + 0,119UKP + 0,068HASIL + 0,1427STRI - 0,131KBRT + 0,187KKB - 0,527KB - 0,123DAERAH \quad (4)$$

Table 1. Binary Logistic Regression Output Results

Variable Characteristics	Coef. (B)	Exp (B)	Sig.
<b>Dependent Variable</b>			
Children Born Alive			
>2			
0-2			
<b>Independent Variable (Female Autonomy Variable)</b>			
Type of Wife's Income	0.068	1.070	0.033
Control over own income (women)	0.143	1.154	0.000
control over husband's income	0.028	1.028	0.420
the amount of respondent's income	-0.043	0.958	0.329
decision maker for large expenses in the household	-0.131	0.877	0.004
respondent health decision maker	-0.044	0.957	0.169
decision maker to visit family	-0.073	0.930	0.084
Decision maker for family planning	0.187	1.206	0.000
Use of KB	0.527	1.694	0.000
<b>Independent Variable (Control Variable)</b>			
Age of First Marriage	0.119	1.126	0.000
Residence classification	-0.123	1.131	0.000

Referring to Table 1 of the value-based odds ratio analysis (exp B) in the model for variables describing women's autonomy, the probability of women having the number of children born alive less than equal to 2 compared to women who have the number of children born alive more than 2 is higher by 1.070 times for women who receive income than for women who do not. The probability of women having live births less than equal to 2 compared to women having more than 2 live children was 1.154 times higher for women who had control over their income than women whose income was controlled by their husbands or other people. In line with research from Gudbrandsen (2013), it is stated that women who have more influence tend to have fewer children because women who tend to be decision-makers in the household can determine their fertility decisions.<sup>21</sup> The probability of women having live births less than equal to 2 compared to women having more than 2 live children was 1.024 times higher for women who were decision-makers in using FP compared to women who were unable to make decisions about using FP. The probability of women having the number of live birth children less than equal to 2 compared to women having more than 2 live children is 0.590 times lower for women who use FP compared to women who do not use FP. In the research of Rahman et al (2014) also found that the existence of women's autonomy in the wife in a household can allow the wife to become important decision-makers in the household, one of which is about fertility and this is also used as a process in making policies regarding fertility in Bangladesh.<sup>22</sup>

The probability of women having the number of children born alive less than equal to 2 compared to women having more than 2 children born alive is lower by 0.877 times for women who are decision-makers in purchasing large household goods compared to women who cannot make decisions about large household purchases. It appears that women who have greater economic autonomy and household decision-making are more likely to limit their births by allocating a budget for contraception.<sup>21</sup> Most of the variables that are expected to show the effect of women's autonomy on fertility have a positive significant effect and are in accordance with the initial assumption that the higher the autonomy of women, the lower the fertility, except for the female variable as the decision-maker for large expenses in the household.

The probability of women having live births less than equal to 2 compared to women having more than 2 live births increases 1.126

times if the age of first marriage increases by 1 year. Following Pratiwi's research (2014) which states that developing countries generally have a low average age at first marriage accompanied by high fertility, so it can be said that the age at first marriage has a strong enough effect on fertility rate of a woman.<sup>18</sup> The probability of women having the number of children born alive less than equal to 2 compared to women having more than 2 children born alive was 1.131 times higher for women living in urban areas than those living in rural areas. For urban residents, the average age of first marriage for women is usually higher than that for rural women, besides that, access to education is easier in urban areas.<sup>5</sup>

## CONCLUSION

Spatially, the relationship between women's autonomy and fertility at the provincial level in Indonesia can be seen, while at the individual level, women's autonomy and several control variables have also been shown to significantly affect the fertility rate in Indonesia. Increasing women's autonomy needs to be built in terms of supporting population control. It is also recognized that women's autonomy in Indonesia is heavily influenced by a culture that has been rooted for a long time. The author realizes that there are still many deficiencies in this study, in further research, other variables can be added that can describe women's autonomy and other variables that can affect fertility so that they can enrich the results of the analysis.

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