TRENDS AND FERTILITY CONTROL
IN SOUTH SUMATERA PROVINCE
(FURTHER ANALYSIS OF IDHS 2017)

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ABSTRACT: Fertility is a demographic term that concerns the number of babies born alive. Fertility will continue to occur, but the findings of the 2017 IDHS fertility rate per woman (total fertility rate / TFR) in South Sumatra have decreased even though they have not reached the strategic plan targets. The general objective of this research is to find out the fertility picture in South Sumatra Province. The specific purpose of this study is to first analyze fertility trends in 1991-2017. Second, describe the achievement of fertility control. This research approach is quantitative descriptive by utilizing secondary data from the findings of the Demographic and Health Survey of Indonesia (IDHS) South Sumatra Province in 1991-2017. Treat fertility / TFR data to find out trends by analyzing three ways, namely linear trend models, quadratic trends, and exponential trends, whose calculations are assisted with Minitab software version 16. Whereas to find out the achievement of family planning control is to analyze the percentage of the use of modern and traditional family planning tools. The population and sample in this study refer to the 1991-2017 IDHS survey data with the main variables observed being the TFR rate and the use of Modern and Traditional Family Planning devices. The results of the research obtained for fertility trends in South Sumatra in three ways, namely linear trend models, quadratic trends, and exponential trends are showing trends in downtrend patterns with shins in certain ranges, there are extrem uptrens that form bell images, which means that at one time fertility experiences stagnant condition (unchanged), but then fertility has decreased after that. Birth control in South Sumatra is quite good, this can be seen by the adoption of modern family planning devices by 61% and traditional tools / methods by 6%, meaning that 77% of birth control is controlled. It is expected that the family participation rate will continue to increase and the TFR number will fall and be able to meet the national TFR target of 2.3 for the coming years.

Keywords: Trends, Control, Fertility, IDHS

1. INTRODUCTION

There are many population problems faced by developing countries in the world including Indonesia, including the problem of high birth rates for women of childbearing age which causes population growth to remain high. Population change is influenced by three demographic components namely birth (fertility), death (mortality), and migration [1] Especially due to the high fertility rate (births) and the decreasing mortality rate resulting in high population growth. Large population growth will have an impact on various aspects of life [2] Large population if not followed by an increase in the quality of human resources will be a burden on the State.

Birth rates in the past have influenced today's high fertility rates. A large number of births in the past accompanied by a decrease in infant deaths will cause these babies to live in numbers more than in previous years when infant mortality is still high, this is due to the better and the increasing number of health facilities, the economy of the population continues to increase, so that the health status increases and life expectancy is higher, but in a few years the baby girls will grow into fertile age groups that can give birth and can be a burden for government.

Fertility is one of the main components of population besides death and migration which causes population changes. Fertility concerns the number of children born alive born to women or a group of women. The number of children born is very closely related to the burden on the household. The greater the number of children, means the greater the responsibility of the head of the household in meeting the needs of his household members. For households with weak economic conditions, limiting the number of children is one way to achieve a prosperous family. In an effort to limit the number of children to be born, the female population at a certain age is the target, namely the age between 15-49 years. This is due to the possibility of women giving birth at this age quite large [3].

Population growth is a dynamic balance between forces that increase and forces that reduce the population. The population will be continuously affected by the number of babies born (increasing the number of residents) but will also be simultaneously reduced by the number of deaths that occur in all age groups. The current population issue has become an actual issue in Indonesia along with the increasing complexity and dynamics of global population. The population problems faced by Indonesia have driven the fundamental paradigm of population policy change in Indonesia. This can be viewed from various aspects, one of which is fertility.

The National Population and Family Planning Agency (BKKBN) is a Non-ministerial Government Institution that is under and is responsible to the President through the Minister of Health. The BKKBN has the task of carrying out governmental tasks in the area of population control and family planning. BKKBN is an agency that provides data, information that is accurate, valid, relevant and can be accounted for. However, the problem faced by BKKBN now is precisely the amount of accurate and actual data but it has not been maximally utilized [4-9]. BKKBN through the Indonesian Demographic and Health Survey (SDKI) has accurate information and data, one of which is the Total Fertility Rate (TFR) data which can be a reference source to see how fertility rates are in the Province of South Sumatra through the data of each survey year.

South Sumatra occupies the 9th position as the number of population in Indonesia. Based on the 2017 Indonesian Demographic and Health Survey (IDHS) the TFR rate in South Sumatra Province reached 2.6, this has decreased compared to 2007 and 2012, but when compared with national fertility the figure is still above the national TFR of 2.4. National TFR and South Sumatra Figures still do not meet the target of the 2015-2019 Strategic Plan which is 2.3.

Indonesia's TFR figure actually decreased from previous years for the South Sumatra Provision in 2002 TFR 2.3 but in the following year it has increased until it finally dropped back in 2017 but has not been able to reach the 2002 TFR figure, for that researchers are interested in conducting studies insight into trends and fertility control in South Sumatra. The purpose of this study is to first analyze the fertility trends of 1991-2017. Second, describing the achievement of fertility control so that the TFR number that has decreased has not increased again as happened in 2007, it could even be a reference of the Steakholders to make programs and policies in reducing the amount of TFR.

2. METHOD

This research approach is quantitative descriptive by utilizing secondary data from the findings of the Demographic and Health Survey of Indonesia (SDKI) of South Sumatra Province in 1991-2017. Treat fertility / TFR data to find out trends by analyzing three ways, namely linear trend models, quadratic trends, and exponential trends, the calculation of which is assisted with minitab software version 16. Whereas to find out the achievement of KB control is to analyze the percentage of the use of Modern KB Tools and Traditionally as fertility control. The population and sample in this study refer to the 1991-2017 IDHS survey data with the main variables observed being the TFR rate and the use of Modern and Traditional Family Planning devices.

3. RESULTS AND DISCUSSION

This research was conducted in the province of southern Sumatra which is a lowland with an average altitude of + 79 meters above sea level, located in positions 1'-4 'South Latitude and between 102'-106 'East Longitude. The total area of South Sumatra is in the form of land area of 87,421.24 km2. Based on its geographical position, South Sumatra Province has boundaries: North - Jambi Province; South - Lampung Province; West - Bengkulu Province; East - Bangka Belitung Province.

South Sumatra consists of 17 regencies / cities, namely: Regencies: Ogan Komering Ulu, Ogan Komering Ilir, Muara Enim, Lahat, Musi Rawas, Musi Banyuasin, Banyuasin, South OKU, East OKU, Ogan Ilir, Empat Lawang, PALI, Musi Rawas Utara. - City: Palembang, Prabumulih, Pagar Alam, Lubuk Linggau. The population in the South Sumatra Province in 2016 reached 8.16 million. South Sumatra Province was chosen as the location of the study because it has a fairly high birth rate and occupies the 9th position with the largest population in Indonesia

Fertility Trends in South Sumatra

The fertility rate in South Sumatra shows a declining trend from 3.43 in 1991 to 2.3 in 2002-2003 but has increased again since the 2007 IDHS and fell to 2.6 in 2017. In comparison, nationally the total fertility rate has fallen from 3.0 children per woman in 1991 but has remained stable since 2002-2003 and has fallen to 2.4 in the 2017 IDHS. The IDHS itself is an extension of the Indonesian Demographic and Health Survey The IDHS survey is a survey carried out by the National Population and Family Board (BKKBN) once every 5 years.

Table 1. TFR Value of South Sumatra Province

Tahun	Nilai TFR
1991	3,43
1994	2,87
1997	2,6
2002-2003	2,3
2007	2,7
2012	2,8
2017	2,6

Sumber: SDKI, Provinsi Sumatera Selatan, 2020

In this study the authors looked at the 3 methods that will be used to observe how trends are in the province of South Sumatra. This was done to observe how the fertility trend in the province of South Sumatra precisely.

After forecasting trend analysis using linear model trends, quadratic trends, and exponential trends, to determine the most appropriate model used to predict TFR values, the mean square deviation/mean square deviation (MSD) is used. MSD is a method for evaluating forecasting methods. Each error or remainder is squared. Then added up and divided by the number of observations. This approach regulates large forecasting errors because forecasting errors are squared. The smallest MSD value indicates that the prediction is prepared close to conformity. According to Arsyad [5] the MSD formula is as follows:

$$MSD = \frac{\sum_{t=1}^{n}\left(Y_X - Y_X'\right)^2}{n}.$$

Based on trend analysis of the three models, it can be concluded as follows the values of MAPE and MSD.

Tabel 2. Comparison of Trend Analysis Results

Metode	MSD	MAPE
Linier	0,07148	8,15285
Quadratics	0,02811	5,77021
Exponential Growth	0,07010	7,83031

Based on the MSD and MAPE values, the MSD and MAPE values on the smallest Quadratics model so that the quadratics model is the most suitable model to use. The following shows the calculations using the quadratics model:

Tabel 3. Size Accuracy

MAPE	5.77021
MAD	0.15381
MSD	0.02811

Source: Primary Data Process, 2020

The results of the trend analysis above using the quadratic model according to the calculated size

accuracy and the trend equation obtained is Yt = 3,840 - 0.571 × t + 0.0601 × t ^ 2.

Tabel 4. Model Summary

Time	Nilai TFR	Trend	Detrend
1	3.43	3.32881	0.101190
2	2.87	2.93786	-0.067857
3	2.60	2.66714	-0.067143
4	2.30	2.51667	-0.216667
5	2.70	2.48643	0.213571
6	2.80	2.57643	0.223571
7	2.60	2.78667	-0.186667

Source: Primary Data Process, 2020

Below is a picture of a trend line generated using a quadratic model with the value of the equation Yt = 3,840 - 0.571 × t + 0.0601 × t ^ 2.
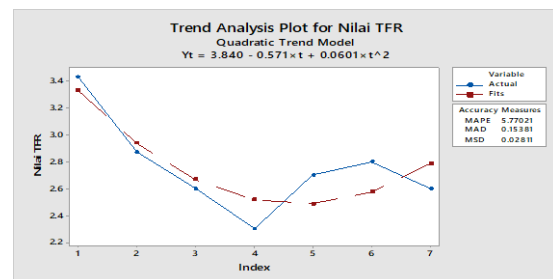

Fig 1. Trend Analysis Plot for Nilai TFR

Here is the Quadratics equation model: Yt = 3,840 - 0.571 × t + 0.0601 × t ^ 2. Then based on the equation, the value of the variable can be predicted as follows:

Table 5. Analysis Results

Years	Value TFR	FITS1	RESI1	FORE1
1991	3.43	3.32881	0.10119	3.117143
1994	2.87	2.937857	-0.06786	3.567857
1997	2.6	2.667143	-0.06714	4.13881
2002-2003	2.3	2.516667	-0.21667	4.83
2007	2.7	2.486429	0.213571	5.641429
2012	2.8	2.576429	0.223571	6.573095
2017	2.6	2.786667	-0.18667	7.625

Source: Primary Data Process, 2020

The FITS1 value in the table above is the predicted TFR value based on the quadratic equation Yt = 3,840 - 0.571 × t + 0.0601 × t ^ 2. Whereas RESI1 is the residual value, which is the difference between the actual TFR value and the predicted TFR value. And the value of FORE1 is the forecast value that is forecasting in the future.

Based on this, the TFR trend in South Sumatra shows a downtrend with a tendency in certain ranges, there is an extreme uptrend that forms a picture of a bell which means that at one time fertility experiences a stagnant condition (unchanged), but then fertility experiences a

downward condition thereafter. At the beginning of the survey year 1991-2002 TFR figures in the province of South Sumatra experienced a significant decrease, which means that in the province of South Sumatra the population growth rate has decreased. However, in the 4th and 5th year of the survey namely in 2002 and 2007 the TFR rate in the province of South Sumatra has increased. After exploring, it turns out that the poverty rate in the province of South Sumatra is relatively high, which indirectly affects the level of education and mindset of the community which can have a direct impact on fertility. two namely demographic factors and non-demographic factors. Demographic factors include age structure, marital structure, age of first marriage, parity and proportion of marriage. While non-demographic factors include, the economic situation of the population, the level of education, improvement of women's status, urbanization and industrialization. The variables above can affect fertility, there are also indirect effects. In South Sumatra, fertility is influenced by a number of demographic and non-demographic factors. In the vulnerable from 2002 to 2007 the number and rate of population growth in South Sumatra increased, namely in 2003 amounted to 1.32% and in 2005 amounted to 1.95%. for the age of first marriage at the age of 19-24 years the biggest percentage was in 2006 amounting to 47.09%. then for the use of family planning in vulnerable this year it is still very small, namely in 2006 amounting to 60.44% and in 2007 amounting to 61.98%.

Then in 2007 - 2012 the TFR rate experienced a stagnation in which the TFR figure did not experience a significant increase or decrease. In 2012 - 2017 the TFR rate has decreased, which means that in the province of South Sumatra succeeded in reducing the existing birth rates. For the level of poverty in the vulnerable this year in South Sumatra the poverty rate in the province of South Sumatra has decreased, which means that many people have prospered. That way the level of public education will be higher and the pattern of community thought will be more advanced and this will have a good impact on fertility levels. For the rate of population growth in vulnerable this year, the province of South Sumatra has decreased, namely in 2012 by 1.52%, in 2013 1.48% and continued to decline until 2015 by 1.40%. for the age of first marriage at the age of 19-24 years, the biggest percentage was in 2012 of 18.05% and continued to decline by 8.87%. then for the use of KB on vulnerable this year it has been quite large, namely in 2012 amounting to 67.85% and continuing to increase in 2015 amounted to 68.06%.

Population dynamics is a change in the condition of the population where the changes are influenced by several things. The population can change from time to time ie increasing or decreasing. Population dynamics or changes in population are influenced by 3 (three) factors, namely fertility, mortality, and migration. Here the author is interested in examining fertility because fertility is the factor that most influences population dynamics, in addition it is also the most difficult fertility factor to control because in addition to the data that are often invalid due to lack of public awareness to report birth events, it is different from mortality and community migration. will consciously report events of death and migration. In South Sumatra Province, the fertility rate in the last year of the survey in 2017 showed 2.6, which means that in a thousand women of childbearing age they gave birth to 2-3 children. If the fetility rate increases every year, it can cause a population explosion where the population explosion is a rapidly increasing population growth in a relatively short period of time. Population explosions usually occur because birth rates are very high, while mortality rates have dropped dramatically.

The government needs to anticipate this condition as an effort to reduce fertility rates to prevent population explosion. If the population explosion is not controlled, it can cause very many negative impacts, namely: Poverty rates are increasing because rapid population growth is not matched by economic growth, food shortages as a result of population growth that is not balanced with the amount of land to produce food, the emergence of settlements or areas slums in urban areas as a result of high land and house prices, the Government has difficulty providing community needs such as education facilities, health facilities, and housing because the location is already dense by residential settlements and large amounts of funds, the imbalance between the need for employment and population growth which if left unchecked will cause other social problems, such as poverty, conflicts between residents, and increasing crime. Therefore the authors hope that with the research conducted the results of this study can be useful as a source of learning, especially in the field of population.

In the long run, the success of fertility control is very much influenced by people's awareness of the importance of family planning. Matters relating to efforts to raise public awareness must be maximally pursued through various activities for more optimal socialization, education, guidance, monitoring and service delivery, Socialization of the importance of maturing marriage age and providing life skills to young women especially those who are married and Sharpening segmentation the target of using FP devices / methods with a focus on young couples with low parity and using more FP methods / methods long-term such as the IUD / Implant / Implants, and it is time for the role of population institutions to be

autonomous in accordance with the mandate of Law No. 52 of 2009, not combined with other institutions so that the programs and activities will be more focused in dealing with various population problems and their associated impacts.

Fertility Control

This study is to look at the achievement of fertility control used by married women of childbearing age referring to the 2017 IDHS data by looking at how women of childbearing age control fertility referring to data on the participation of women of childbearing age in family planning, the type of family planning used. As we know, family planning will not succeed without a deep awareness of the importance of fertility control. Therefore an in-depth analysis of fertility control is needed for women of childbearing age.

The participation of married women aged 15-49 years in the use of family planning tools/ methods is 61 percent using modern methods/ methods and 6 percent using traditional tools or methods. This means that 77 percent use birth control methods both modern and traditional and 23% do not use birth control methods. Most of the married women have controlled birth using birth control devices, according to Letamo and Letamo research [7] showed a decrease in fertility is influenced by the use modern contraception and delaying the age of first marriage, the use of family planning devices in South Sumatra is good enough this indicates that the community has begun to realize the importance of controlling birth. still influenced by the level of the economy and the level of education of women of childbearing age. But over time the influence of the level of education and the family's economy no longer has any influence or has weakened a weak relationship [8].

The use of modern family planning methods in married women increases with age, from 53 percent at age 20-24 to 73 percent at age 35-39. However, after that it dropped to 65 percent at age 40-44 and 47 percent at age 45-49. The participation of married women aged 20-24 in using FP is relatively low compared to other age groups this is because at that age is the ideal age for childbirth, in addition the findings in the field get that many married couples of productive age who do not use family planning devices either modern or traditionally because they have not had children even though they have been married for a long time, this directly affected the decline in TFR in South Sumatra, although the number of family planning participation was stagnant in 2012-2017 while the TFR rate dropped.

How to control births in South Sumatra is good enough, it is hoped that the family participation will continue to bind and the TFR will decrease and

meet the national TFR target of 2.3 for the coming years, one of the efforts in birth control is to provide understanding and awareness to the younger generation. regarding factors that cause rapid population development. Population development has a close relationship with development programs. For this reason, young people are expected to have awareness about the causes and consequences of families and families [9].

There are several ways that women of childbearing age can do to control births, including birth control. The use of long-term contraceptives such as implants, IUDs, is an effective way of controlling births. One effort to reduce the adoption of TFR in South Sumatra in the coming years is to increase awareness of married couples of age the importance of controlling births by using long-term birth control tools such as MOP, MAW, IUD, and implant KB.

4. CONCLUSIONS

The results of research obtained for fertility trends in South Sumatra from three ways, namely linear trend models, quadratic trends, and exponential trends are showing the tendency of downtrend patterns with sisipin in certain ranges, there are extremuptrens that form bell images, which means that at one time fertility experiences stagnant conditions (not changing), but then fertility experienced a decline in conditions thereafter.

Birth control in South Sumatra is quite good, this can be seen from the adoption of modern family planning devices by 61% and traditional tools / methods by 6%, meaning that 77% of birth control is controlled.

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