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## QUADRANT ANALYSIS OF TOTAL FERTILITY RATE AND CONTRACEPTIVE PREVALENCE RATE OF DISTRICT AND CITY IN EAST JAVA

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### ABSTRACT

One of the indicators determine the wellness of Family Planning Program is the high number of participants enrolling, or commonly known as the Contraceptive Prevalence Rate (CPR) and the number of children born known as the Total Fertility Rate (TFR) of a maximum of 2 children. There are several regions in East Java where the situation of TFR and CPR does not show the ideal conditions. This shows that there are problems in the current family planning program. This research was conducted to map districts and cities in East Java based on TFR and CPR data respectively in quadrant form. This type of research is on-reactive research which utilizes secondary data from Indonesia - National Socio-Economic Survey in 2015. The research method used is recapitulating data and classifying districts and cities in the form of quadrants by comparing to data on achievement of TFR and CPR in East Java using SPSS. The results of the study have mapped districts and cities in East Java which are described in quadrant form. The regions that need major attention from the government are regions in quadrants I and II. Quadrant III is included in an abnormal condition and quadrant IV is a quadrant that has an area where TFR and CPR conditions are ideal. The conclusions of this study are the areas in quadrant I, namely: Sampang (district), Blitar (city), Blitar (district), Tulungagung (district), Ponorogo (district), Madiun (city), and Pasuruan (city) are the priority in getting the FP program improvements. The advice that can be given is to evaluate the ongoing family planning program to find out the factors that cause the TFR and CPR conditions are not in line with government expectations.

**Keywords:** total birth rate, contraceptive use, quadrant analysis

### ABSTRAK

Salah satu indikator program keluarga berencana berjalan dengan baik adalah tingginya jumlah peserta program keluarga berencana atau biasa disebut dengan Contraceptive Prevalence Rate (CPR) dan jumlah anak yang dilahirkan yang dikenal dengan istilah Total Fertility Rate (TFR) maksimal 2 anak. Pada kenyataannya, ada beberapa daerah di Jawa Timur yang keadaan TFR dan CPR tidak menggambarkan kondisi ideal. Hal ini menunjukkan adanya masalah di dalam program KB yang berjalan. Penelitian ini dilaksanakan untuk memetakan kabupaten/kota di Jawa Timur berdasarkan data TFR dan CPR masing-masing dalam bentuk kuadran. Jenis penelitian ini merupakan penelitian non-reactive yang memanfaatkan data sekunder dari Susenas tahun 2015. Metode penelitian yang digunakan adalah merekapitulasi data dan menggolongkan kabupaten/kota dalam bentuk kuadran dengan cara membandingkan terhadap data capaian TFR dan CPR Jawa Timur menggunakan SPSS. Hasil dari penelitian telah memetakan kabupaten/kota di Provinsi Jawa Timur yang digambarkan dalam bentuk kuadran. Daerah yang perlu mendapatkan perhatian utama oleh pemerintah adalah daerah dalam kuadran I dan II. Kuadran III termasuk dalam kondisi yang tidak normal dan kuadran IV adalah kuadran yang memiliki daerah yang kondisi TFR dan CPR termasuk ideal. Simpulan dari penelitian ini adalah daerah yang terdapat di kuadran I yaitu: Kabupaten Sampang, Kota Blitar, Kabupaten Blitar, Kabupaten Tulungagung, Kabupaten Ponorogo, Kota Madiun dan Kota Pasuruan menjadi prioritas pertama dalam mendapatkan perbaikan program KB. Saran yang dapat diberikan adalah melakukan evaluasi terhadap program KB yang berjalan untuk mengetahui faktor-faktor yang menyebabkan kondisi TFR dan CPR tidak sesuai dengan harapan pemerintah.

**Kata kunci:** angka kelahiran total, angka pemakaian alat kontrasepsi, analisis kuadran

## INTRODUCTION

Quadrant analysis is an analysis tool that is quite often used. This analysis uses the two-axis which will be the dividing factor between quadrants. Then proceed with mapping the selected variables into each quadrant according to their respective quadrant categories (Nugraha, Selamat and Iriani, 2019).

Quadrant analysis is an analytical tool commonly used in the world of marketing, but can also be applied in other fields such as in health (Izadi et al., 2017). One example is TFR-CPR quadrant analysis. With this quadrant analysis, it can categorize each region according to existing conditions, so that it can be a tool for the government to make decisions related to the problem.

Fertility is a depiction of the condition of the total number of children born alive. Children who are born but deceased are not included. Only children who survive are the measure. Usually, this fertility becomes a measurement tool in seeing the magnitude of the number of live birth children found in a certain population (Syahbuddin and Nurhayati, 2016).

Measuring fertility is not as simple as just measuring the number of children born alive. Unlike the case with measuring mortality or mortality rates. A woman dies only once, this is a measurement of mortality. However, women can give birth to children more than once. There is even a woman who can give birth 16 times in her lifetime (Raharja, 2017).

It is complicated to measure fertility because it takes into account two individuals, both husband and wife. Existing fertility measurement problems, besides a woman, can experience high risk during pregnancy and childbirth, some women are divorced and the unmarried ones all her life (Wicaksono and Mahendra, 2016).

Some of these problems can be overcome by measuring fertility. Annual fertility measurements and cumulative fertility are the two types of fertility measurements that are available and can be applied in conditions according to need.

A woman who counts the number of children born alive throughout her life, this is an example of cumulative fertility measurements. An example of measuring annual fertility is to calculate the number of births that occur in a given year and compare it

to the number of people in the same area who are at risk of giving birth (Sari, 2017).

Total Fertility Rate (TFR) is one type of cumulative fertility measurement. TFR is the number of children born alive both women and men every 1,000 women up to the age of the end of the childbearing period. With the condition of the woman still alive before the childbearing period has been completed (Andini and Ratnasari, 2019).

Examples in the interpretation of the meaning of the TFR numbers are as follows, in the IDHS data from Central Bureau of Statistics, National Board of Population and Family Planning, and Indonesian Ministry of Health (2013), states that Indonesia has a TFR of 2.6. This figure means that the average woman of childbearing age in Indonesia gives birth to 2 to at most 3 children during her childbearing period.

Contraceptive Prevalence Rate (CPR) is the average number of EFAs that are family planning acceptors compared to the magnitude of all EFAs in a particular area (Sarindi, 2019). This figure shows how many participants in the family planning program.

In calculating the CPR number, data on the number of all women of childbearing age (15-49 years) is needed following their marital status. Then the data on the number of women of childbearing age who are using contraceptives (Triyanto and Indriani, 2018). CPR calculation is done by dividing the first data, namely the number of all women of childbearing age with the number of women of childbearing age who are using contraceptives, then the results are multiplied by 100 (Rizkianti, Amaliah, and Rachmalina, 2017).

Contraceptive Prevalence Rate, a measure of the success of the ongoing family planning program. CPR not only takes into account the number of couples included in the childbearing age category who decide to use one method of contraception but also looks at the source of the provision of contraceptives from all existing contraceptive methods (Purnama, 2017).

Total Fertility Rate and Contraceptive Prevalence Rate data have a close relationship. If a couple of childbearing age category chooses one method of contraception that usually has the purpose of regulating the number of birth or controlling birth spacing, then this can reduce the number of children born alive. But the value of the TFR can not

only be measured by only looking at the number of users of contraceptives. Many factors also have the possibility that can influence the miscarriage rate which is still high even though participants in the family planning program are equally high.

The description of TFR and CPR figures per district and city in East Java is very much needed, so research entitled titled is needed Analysis of Quadrant Total Fertility Rate (TFR) and Contraceptive Prevalence Rate (CPR) District and City of East Java Province. This research is expected to help in categorizing the area following the conditions of the TFR and CPR numbers owned and compared with the results of the achievement of TFR and CPR in East Java.

## METHODS

This research is a non-reactive research. Non-reactive research is research that does not directly involve research subjects. The research was conducted at the National Board of Population and Family Planning Representative Office in East Java Province, in the Field of Training and Development, Program and Cooperation Sub-Division. The address of the research location is located at Kalibokor Street Number 1, Surabaya.

The time of the study was conducted for 4 weeks in February 2018. The research data were obtained from secondary data on the 2015 National Socio-Economic Survey published in the Parameter Pocket Book by the East Java Provincial National Board of Population and Family Planning in 2017.

The data collection technique was done by recapitulating data and classifying it in quadrant form with the help of the scatter plot graph drawing obtained from the SPSS application. The research variables used are the number of TFR and CPR per District and City in East Java combined with East Java's TFR and CPR in 2015.

## RESULT

The results of TFR and CPR figures per district and city in East Java can be seen from the summary in table 1. Bangkalan (district) has the lowest CPR achievement with 41.75. While the highest CPR achievement is owned

by Ngawi (district) with a figure of 73.92 higher than East Java's CPR achievement which is 52.74.

For the achievement of TFR, East Java reached 2.03. This is a very good achievement. TFR 2.03 means that every average woman of childbearing age in East Java gives birth to 2 children during her childbearing period.

**Table 1.** CPR and TFR per District and City in East Java Province

<b>District and City</b>	<b>CPR</b>	<b>TFR</b>
Pacitan	71.41	2.01
Ponorogo	52.60	2.13
Trenggalek	67.42	1.94
Tulungagung	56.97	2.34
Blitar	60.25	2.42
Kediri	65.55	2.40
Malang	68.55	2.31
Lumajang	69.91	1.85
Jember	67.34	2.05
Banyuwangi	65.62	2.22
Bondowoso	72.23	2.09
Situbondo	68.72	1.78
Probolinggo	70.91	2.04
Pasuruan	63.82	1.90
Sidoarjo	61.83	2.00
Mojokerto	67.94	2.20
Jombang	64.96	2.14
Nganjuk	65.70	2.28
Madiun	65.32	2.03
Magetan	66.86	2.22
Ngawi	73.92	2.10
Bojonegoro	69.89	1.98
Tuban	69.57	1.82
Lamongan	67.47	2.04
Gresik	66.64	2.12
Bangkalan	41.75	1.89
Sampang	53.02	2.45
Pamekasan	53.12	2.03
Sumenep	51.78	1.52
Kediri City	61.22	1.94
Blitar City	62.81	2.24
Malang city	54.01	1.78
Probolinggo City	69.44	2.42
Pasuruan City	58.82	2.05
Mojokerto City	64.12	1.87
Madiun City	56.34	2.06
Surabaya City	57.59	1.72
Batu City	61.12	1.96
<b>EAST JAVA</b>	<b>62.74</b>	<b>2.03</b>

Source: Indonesia – National Socio-Economic Survey 2015

**Kolmogorov-Smirnov Test**

The relationship between CPR and TFR can be revealed by doing the Pearson correlation test. In order to do the Pearson correlation test, you must first check the normality of the data.

Data can be known to have normal distribution when doing the Kolmogorov-Smirnov test. This test has the advantage that there are not many steps that must be done in the testing process, but it has accurate results (Pratama, 2017).

The Kolmogorov-Smirnov test in table 2 shows the result that the significance value of the TFR is 0.961. While the significance value of the CPR figure is 0.407. The Kolmogorov-Smirnov test has the following hypotheses:

H<sub>0</sub>: TFR and CPR are normally distributed

H<sub>1</sub>: TFR and CPR rates are not normally distributed

Both the significance values are more than the significance value  $\alpha = 5\%$ , it can be concluded that H<sub>0</sub> is accepted. This means that the TFR and CPR data are normally distributed.

**Table 2.** Kolmogorov-Smirnov Test for CPR and TFR data per District and City East Java

Variable	P.	Kolmogorov-Smirnov Z
TFR	0.961	0.505
CPR	0.407	0.890

Source: Kolmogorov-Smirnov Z Test Results Using SPSS

**Pearson Correlation Test**

Pearson Product Moment Correlation Test is a statistical test used to study the relationship between two variables. This test can be used if it has interval or ratio data scales and the data is normally distributed.

If the test results show that the two variables have weak or small correlation coefficient values, it does not mean they are not related to each other, but there is a possibility that the two variables have a close relationship but have a correlation coefficient value close to 0 (Bertan, Dundu, and Mandagi, 2016).

Table 3 shows the results of the Pearson correlation test from CPR and TFR data. Based on the Pearson test results, it can be seen if the

significance value of the relationship between TFR and CPR is 0.345. The Pearson Correlation Test has a hypothesis:

H<sub>0</sub>: There is no relationship between CPR and TFR

H<sub>1</sub>: There is a relationship between CPR and TFR

The significance value seen in table 3 has a value of 0.345, more than the value of  $\alpha = 5\%$ . It can be concluded that CPR and TFR are not related.

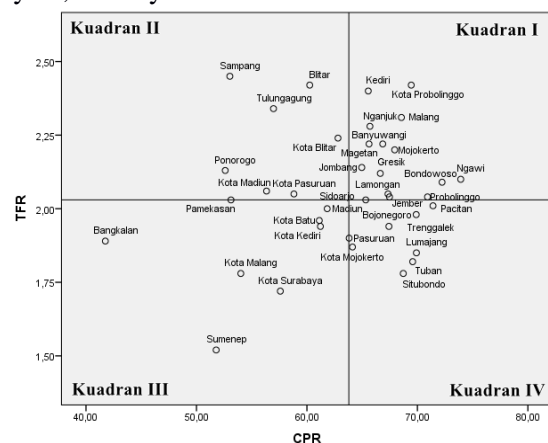
**Table 3.** Relationship of Total Fertility Rate (TFR) and Contraceptive Prevalence Rate (CPR)

Variable	CFR	
	P.	Pearson coefficient
TFR	0.345	0.157

Source: Pearson Coefficient Data Test Results Using SPSS

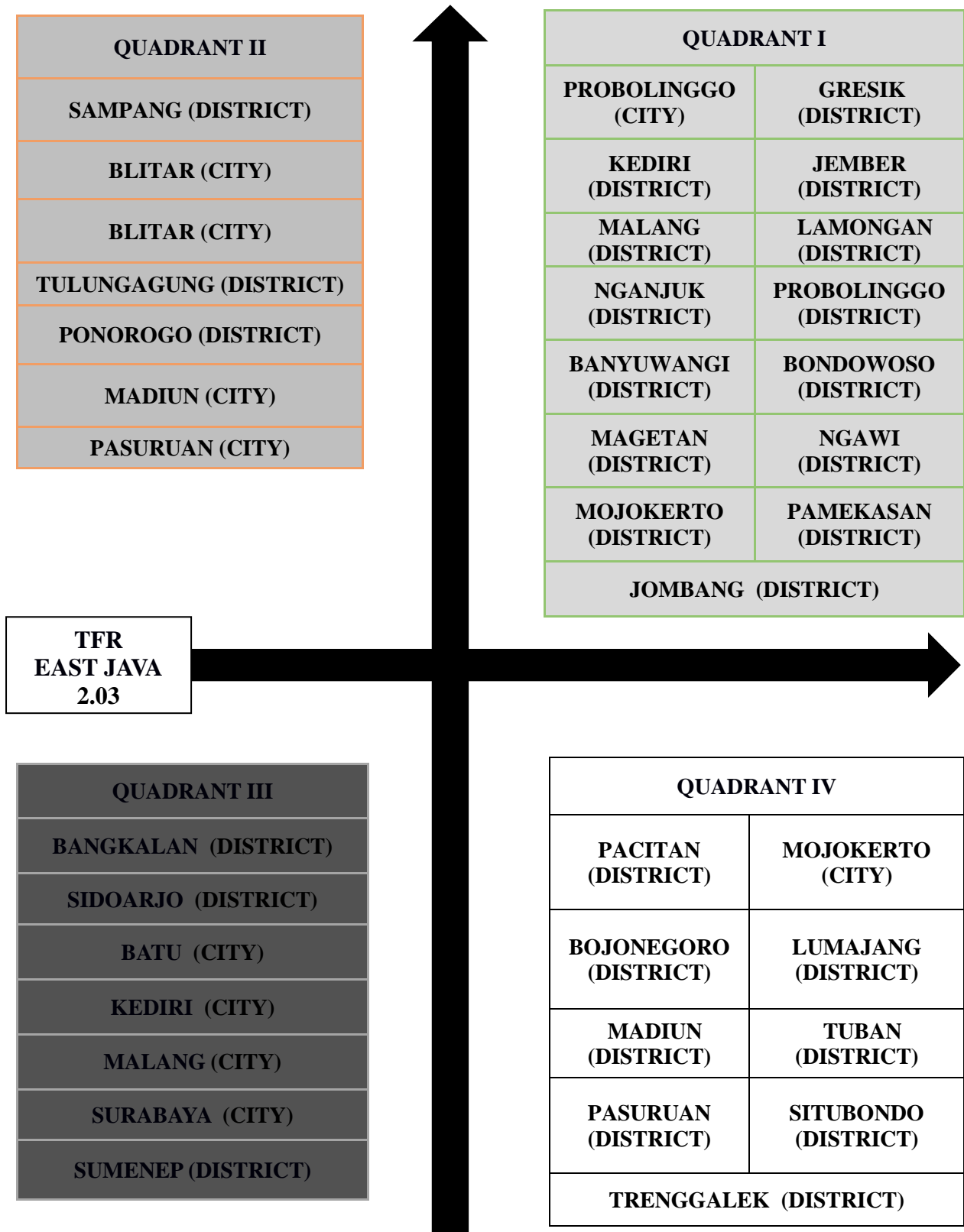
**Quadrant Analysis**

This research uses quadrant analysis to see the condition of CPR and TFR in the District and City in East Java. The first thing to do is to categorize all existing data into Quadrants I to Quadrants IV which have following the conditions in the area. Then the CPR number is placed on the X-axis and the TFR number is on the Y-axis. The dividing line between the quadrants is determined by the achievement of the TFR and CPR of East Java in the same year, namely 2015.



Source: Data Categorization Results Using SPSS Platter Scatter

**Figure 1.** Scatter Plot Analysis of TFR and CPR Quadrants Total Fertility Rate and Contraceptive Prevalence Rate of Regencies and Cities in East Java Province



Source: CPR / TFR Data Categorization Results by District and City Province in East Java

**Figure 2.** Analysis of District/City's Total Fertility Rate and Contraceptive Prevalence Rate in East Java

Based on the results of tests that have been done, a quadrant map can be drawn. Each quadrant shows how the TFR and CPR position is in each district and city in East Java.

## DISCUSSION

Pearson correlation test results between TFR and CPR that have been done, states that TFR and CPR have no significant relationship or attachment. But in the existing theory, these two variables should be related. The high number of family planning program participants can rationally reduce the total birth rate. This condition occurs when the FP program runs without significant obstacles. However, based on the test that has been done, there are factors that make the results of the Pearson correlation test not following existing theories. The possibility that this condition can occur because there are problems that arise when the family planning program runs. But this discrepancy can not be seen from one side.

Many other variables have a role in influencing TFR rates such as the level of education of childbearing age couples, the level of knowledge about family planning programs, the age of the couples getting married for the first time, and many other variables that are judged to be influential but not used as research variables in this study.

### Quadrant Analysis

Figure 1 shows the results of the distribution of CPR and TFR achievements in each district and city of East Java which is divided into four quadrants according to the conditions of CPR and TFR in each region. It can be seen that quadrant I have the most number of regions that fall into its category.

The category in quadrant I is considered as a condition that is not following the ideal theory. Regions that have conditions for entry into this quadrant have a high level of participation in using contraceptives, but birth rates are also high in the area.

Quadrant I is filled by regions such as Probolinggo (city), Kediri (district), Malang (district), Nganjuk (district), Banyuwangi (district), Magetan (district), Mojokerto (district), Jombang (district), Gresik (district), Jember (district), Lamongan (district), Probolinggo (district), Bondowoso (district), Ngawi (district) and Pamekasan (district).

There are many factors that allow regions fall into this quadrant. For examples, high rates of early marriage, childbearing age couples who decide not to continue the contraceptive method they have chosen, menopause, couples who still wish to have more than 2 children.

Quadrant II has a condition where the CPR yield is still relatively low which results in a high TFR. Districts and cities that fall into this quadrant category are Sampang (district), Blitar (city), Blitar (district), Tulungagung (district), Ponorogo (district), Madiun (city), and Pasuruan (city). The regions included in this quadrant category need special attention because of the low participation in the FP program so that the birth rate that occurs is still relatively high.

Quadrant III has a condition where CPR and TFR are both low. This quadrant is also classified as a condition that is not following the theory that should be. Many factors that can trigger an area can be in this quadrant. More in-depth research to see the actual conditions in the regions included in quadrant III is needed to be able to prevent the continuation of this irrational condition. These quadrants are filled by regions such as Bangkalan (district), Sidoarjo (district), Batu (city), Kediri (city), Malang (city), Surabaya (city) and Sumenep (district).

Quadrant IV has a condition where CPR is high and has an impact on low TFR. This quadrant has conditions following the theory that it should. Because when the number of birth control participants increases, the birth rate will decrease. This condition is an expected condition because it can be an indicator of the success of the family planning program. Districts and cities included in this quadrant are Pacitan (district), Bojonegoro (district), Madiun (city), Pasuruan (district), Trenggalek (district), Mojokerto (city), Lumajang (district), Tuban (district), and Situbondo (district).

### Activity Priority

Areas that have been classified in quadrants I-IV have different priority activities that are suggested to improve or maintain the conditions of TFR and CPR that have been achieved.

In quadrant I, which is the main concern by the government because the TFR and CPR conditions are equally high, has several proposed activity priorities as follows; First,

strengthening the education of family planning programs, suggesting that 2 children are enough. Second, guide active family planning program participants to be able to consistently use contraception. Third, the provision of information and education to candidates or active FP participants that do not use long-term contraceptives method (LTCM) to use the LTCM. Fourth, emphasizing the target of couples who are in the category of childbearing age who are young or new to have one or two children to immediately use or become active participants in family planning. Fifth, an increase in family planning services for postpartum women. Sixth, increasing the effectiveness of family planning programs that target young people for the provision of knowledge for reproductive health and maturity of marriage.

Quadrant II is the quadrant that becomes the next concern after quadrant I. Conditions in this quadrant are low CPR and high TFR, then the recommended activities are; First, strengthening the familiarization of family planning programs, places the suggestion that 2 children are better. Second, cooperation with religious leaders or local community leaders who are considered to have a major influence on the delivery of information about contraception or family planning programs. Third, evaluate the local family planning services. Fourth, make improvements or improve services and facilitate access to obtain contraceptives or consultations about family planning programs. And fifth, giving informed choices to prospective family planning participants as an additional knowledge of all contraceptive methods, risks regarding side effects that might be caused, where the users should get help in the event of side effects that are considered harmful.

Providing informed choice to prospective family planning participants can increase the number of active family planning memberships and reduce the number of participants who decide to stop using contraception. This knowledge is important to provide because it can make understanding to prospective users not to be confused and panic if side effects occur when using contraception. The users will have thoughts that the side effects that occur are not dangerous if the users know where they should check his condition.

Quadrant III has a condition that is considered quite odd considering the TFR and

CPR are equally low. It is hoped that more in-depth research can be carried out on the regions that fall into this quadrant to be able to find out what factors make this odd condition possible. Therefore, it is necessary to implement activities such as evaluating local family planning services, improving or improving services, and facilitating access to contraception or consulting family planning programs.

Conditions that are approaching the ideal quadrant are the regions in quadrant IV. Even though it has been said to be quite ideal does not mean that no further supervision is needed. The suggested activities in regions that are included in this quadrant are intended to maintain the condition of regions that have good TFR and CPR. Like focusing more targets on EFAs who have decided to use the LTCM. Coaching active FP participants to be able to consistently use contraception. As well as education to adolescents about the effects of early marriage to be able to increase the age of marriage.

## CONCLUSIONS AND SUGGESTIONS

### Conclusion

The conclusions obtained based on the analysis of results and discussion are that there is no relationship between TFR and CPR. The regions included in quadrant I include Probolinggo (city), Kediri (district), Malang (district), Nganjuk (district), Banyuwangi (district), Magetan (district), Mojokerto (district), Jombang (district), Gresik (district), Jember (district), Lamongan (district), Probolinggo (district), Bondowoso (district), and Ngawi (district) and Pamekasan (district).

Regions include quadrant II: Sampang (district), Blitar (city), Blitar (district), Tulungagung (district), Ponorogo (district), Madiun (city) and Pasuruan (city). Regions included in quadrant III: Bangkalan (district), Sidoarjo (district), Batu (city), Kediri (city), Malang (city), Surabaya (city) and Sumenep (district).

Districts and Cities included in quadrant IV: Pacitan (district), Bojonegoro (district), Madiun (city), Pasuruan (district), Trenggalek (district), Pasuruan (district), Mojokerto (city), Lumajang (district), Tuban (district), and Situbondo (district).

The priority in getting improvements to the current family planning program in the area

included in Quadrant II. Then followed by the region in Quadrant I.

### Suggestion

Suitable suggestion to be delivered based on the research conclusions include evaluate the family planning program to analyze the causes of regions that have high TFR conditions even though family participation increases. More in-depth research and evaluation are needed in regions in quadrant III that have abnormal conditions where CPR is low and TFR is also low.

The intensification of family planning program education can be done through social media. Nowadays social media can reach all regions and make it easy for prospective acceptors to access the required information quickly. The information provided can be as stated in informed choice to facilitate prospective family planning participants in determining the method of contraception to be used with the risk of side effects.

Regular monitoring of family planning programs that are already underway is also considered very important to be able to maintain areas that have good TFR and CPR results. This is prevention so as not to increase the area that will be shifted into quadrants that have bad or abnormal conditions.

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