FAMILY PLANNING VILLAGES AND CONTRACEPTIVE SELECTION BEHAVIOUR IN WEST KALIMANTAN PROVINCE, INDONESIA: A PRELIMINARY STUDY

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Abstract

High population growth is a population problem in Indonesia. The establishment of the Family Planning Village is believed to be able to bring family planning programmes closer to the community and especially the poor. One indicator of success since the launching of the Family Planning Village is the increase in the number of users of modern contraceptives, both effective contraception and permanent contraception.

This study is based on a field experiment in which the research subjects were two Family Planning villages in West Kalimantan Province (Mekarsari and Kampung Beting Village) as the treatment groups, and two non-Family Planning villages (Limbung and Tanjung Hilir Village) as the control groups.

This research found that the Family Planning villages did not significantly influence some changes in contraceptive selection behaviour. Changes in contraception selection behaviour are significantly affected only by the number of children in the household and belief or religion. It is therefore necessary to cooperate with religious leaders in disseminating the importance of contraception.

INTRODUCTION

Over-population is often associated with a high level of poverty in a country, especially in developing countries. To overcome this problem, factors that can help to reduce fertility levels need to be identified. Family planning programmes are believed by many countries to be a way of overcoming the problem of a high fertility level. Research findings from Bailey et al. (2012), and Adepoju and Akinluyi (2017) indicate that households that engage in family planning reduce the risk of poverty, because having a small family impacts a household's financial resources, increases family savings, and reduces the likelihood of illness or the birth of unplanned children. There are several research findings that also support the positive impacts of family planning on reducing poverty (*Cleland et al.*, 2006; *Zosa-Feranil et al.*, 2009; *Mukasa*, 2009; *Phumaphi*, 2011; *Bailey et al.*, 2012; *Singh – Darroch*, 2012).

The Family Planning (FP) Programme is a direct effort to reduce the birth rate through modern methods of contraception that have a lower rate

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of failure compared to traditional methods. Indonesia is one of the countries that continues to promote its FP Programmes, motivated by the fact that Indonesia still has a high population rate. Based on data from the 2017 Indonesian Health and Demographic Survey (IHDS), Indonesia's Total Fertility Rate (TFR) is 2.4, which is a high fertility rate although it has decreased slightly from 2012, when it was 2.6 children per woman. But this decline in fertility still fell short of the National Medium-Term Development Plan's target of 2.1 children in 2015, so efforts to reduce birth rates remain a task for the government and all Indonesian people (*Jatmiko – Wahyuni*, 2019). The need for FP in Indonesia remained unmet in 2017 (*Bintoro et al.*, 2019) and the modern Contraceptive Prevalence Rate (CPR) declined to 57.6 in 2012 and to 57.2 in 2017. The official website of the National Statistics Bureau shows that with the current growth rate of 1.38%, it is estimated that by 2020 the Indonesia population will have increased in size to 271 million. This number is an increase of 10 million from the population level in 2017, which was 261 million people.

Through the FR Programme the Indonesian Government undertakes various actions including in the form of outreach and cadre formation in the community. Based on the IDHS data, from 2002/2003 to 2017, there has been a slowdown in the increase in contraceptive use, as in the past fifteen years the use of modern contraception has only increased by around 1%. The 2002–2003 IDHS results showed a contraceptive prevalence rate of 60%, while in the 2007 IDHS it was 61%, in the 2012 IDHS it was 62%, and in the 2017 IDHS it was 63.6% (*Jatmiko – Wahyuni*, 2019). There are several barriers that arise in the implementation of FP Programmes that are affect households in rural areas where there is poor access to any infrastructure for FP services (*Casterline – Sinding*, 2000; *Cleland et al.*, 2006; *Bongaarts et al.*, 2012; *Mackenzie et al.*, 2011) and a low level of awareness about using any contraception methods, compared to the households in urban areas (*Adepoju – Akinluyi*, 2017). In order to bring the FP Programmes closer to community members, starting in 2016 the Indonesian government established some 'family planning villages' (hereafter – FP Village), which target impoverished people, densely populated urban areas, fishing villages, slums, and other disadvantaged areas. By the third quarter of 2017, there were 1 200 family planning villages in Indonesia. At the sub-district level, approximately 4 754 sub-districts (66%) already have FP Villages. The aim of an FP Village is to increase community access to family planning services. Therefore, it is necessary to conduct a study to evaluate the impact of establishing an FP Village on contraceptive selection behaviour among the community members, especially in rural areas (see *Miguel – Kremer*, 2004; and *Banarjee et al.*, 2007).

According to the 2013 Basic Health Research Report, among the types of contraception used in Indonesia the injection type dominates (34.3%). Overall, the highest use of modern contraceptives was achieved in Lampung Province (70.5%), followed by West Kalimantan Province (69%). Based on the proportion of FP use according to its effectiveness period (Long-Term Contraception Method – or LTCM and Non-Long-Term Contraception Method – or Non-LTCM), the highest proportion of non-LTCM use was achieved in West Kalimantan (64.9%), while the lowest usage was recorded in Papua (16.2%). Moreover, the highest recorded use of LTCM methods was in Bali (24.6%), while the least use was recorded in Papua (3.3%). Although West Kalimantan Province had already recorded the highest usage of non-LTCM in Indonesia, until 2014 there were several districts/cities in the Province of West Kalimantan that had low CPR levels, namely Sambas, Bengkayang, Mempawah, Singkawang (*www.kalbar.bkkbn.go.id*), and for this reason the Province's provincial government continues to acknowledge the importance of FP Programmes to anticipate future population explosions. This is supported by the fact that the Province of West Kalimantan's TFR is far higher than the national TFR, which is 3.1 in the 2012 IDHS. Therefore, up to September 2017, there were 92 FP Villages spread across all the districts/cities in the Province of West Kalimantan.

According to Futrel (2012), there are two main challenges to reducing the unmet need for contraceptive devices or medicines, namely: (1) conducting more vigorous advocacy for policy-holders to pay more attention to FP Programmes; and (2) using the findings of scientific research

to create innovative programmes in order to improve access to reproductive health. Launching an FP Village is one of the ways to answer such challenges. FP Villages in Indonesia are expected to increase the use of contraceptive devices or medicines. This is in line with the findings of Futrel's research (2012) in Rwanda and Ethiopia, in which five factors have been found to lead to an increase in contraceptive use over the past decade. Those factors are as follows:

1. there are policies and programmes in place that guarantee access to contraception without taking into account the client's ability to pay for contraceptive services and devices; thus, there are some financial assistance or subsidies for prospective recipients with limited financial capacity;

2. there is a special division and support to increase regional capacity in terms of contraceptives providing planning at the local level by creating logistics systems and by providing trainings for community;

3. community members must be directly involved in providing contraceptive services;

4. marketing is provided and partnerships are established with private health-service providers, religious leaders, and community leaders;

5. there is adequate funding to ensure the availability of contraception in the field.

According to the findings of Ahmed et al. (2008) on 172 countries, contraceptive usage can prevent 44% of maternal deaths due to childbirth. Furthermore, a decrease in unmet needs should reduce maternal mortality by 30% (*Futrel*, 2012). In general, the choice of contraception and contraceptive use are strongly influenced by various factors, including education (*Snell – Wooldridge*, 2001; *Layte et al.*, 2007; *Hossain*, 1998; *Adepoju – Akinluyi*, 2017; *Osakinle*, 2010; *Wang et al.*, 2012), age (*Sharma et. al.*, 2015; *Hossain*, 1998, *Wang et al.*, 2012), beliefs or religion (*Oye-Adeniran et al.*, 2005; *Haggi*, 2003), and intensity of intercourse (*Sharma et al.*, 2015). Moreover, the tendency to take the risk of not using contraception can be caused by various factors, including a history of abortion, dissatisfaction with current contraceptive methods, low levels of education, ambivalence to pregnancy, a history of contraceptive risk

(*Snell – Wooldridge*, 2001), and attitudes and feelings towards various contraceptive methods (*Erramilli et al.*, 2005). Therefore, education on FP Programmes is essential and especially so for households in poor areas, slums, remote areas, and coastal areas. Meanwhile, factors that significantly influence fertility in Indonesia include the area of residence (village or city), religion, level of education, working status, wealth, number of children who have died, age of first intercourse, number of marriages, use of contraception, first menstruation again after birth child (less than 3 months), first intercourse after birth child, and exclusive breastfeeding (*Jatmiko – Wahyuni*, 2019).

Indonesia has the largest Muslim population in the world with an estimated 229.62 million in 2020 (*https://databoks.katadata.co.id*). In the second half of 2019, the total number of Muslims in the population of the Province of West Kalimantan was 3 263 658 or around 60% of the total population (*https://dukcapil. kalbar.go.id*). There are difference perspective in Islam regarding family planning. Many Islamic theologians agree that it should be allowed, but there are also theologians who forbid following the FP Programme.

Theologians who accept the programme include Yusuf Qardhawi, Imam Ghazali, Shaykh al-Hariri, and Shaykh Syalthut. Their opinion is to permit people to join the FP Programme with the following provisions: to maintain maternal health, to avoid maternal difficulties, and to space out the timing of children. They also argue that using contraception is not the same as murder, because the killing applies when the foetus reaches the seventh stage of creation. This is based on Q. S. Al-Mu'minun, verses 12–14. Theologians who are against the programme include Madkhour and Abu A'la al-Maududi, who forbid people from following the FP because it is include in the murder of offspring as the words of Allah SWT in Q. S. Al-Isra' verse 31.

Agreement expressed by the Indonesian Islamic Theologian Council in 2000 stated that: (1) basically, Islam allows humans to regulate childbirth for positive objectives such as maintaining the health of mothers and children and it should be carried out in ways that are good and not dangerous; (2) infertility achieved by performing a vasectomy (cutting/closing male semen) or a tubectomy (cutting/closing of the Fallopian tubes in women) with the aim of limiting

child birth is illicit; (3) a tubectomy can be done for medical reasons by professional doctors who are trustworthy if becoming pregnant or giving birth will endanger the life of the person concerned (*Sari*, 2019).

LITERATURE REVIEW

Family planning programmes should not only provide social, economic, and health benefits but should also protect human rights so that people are able to obtain information and tools and have the ability to decide when and how many children they want to have. The establishment of an FP Village is an innovation that seeks to implement a diversified family programme. FP Villages take the form of a hamlet or an equivalent level of administrative unit with certain criteria, where population, Family Planning, Family Development, and related sector development programmes are systemically implemented to alleviate poverty and seek to ultimately improve the quality of life of Indonesian people and improve the quality of nutrition and family health.

Women seem to have more choices for contraception than men and seem to be the ones responsible for choosing contraception methods because they are the ones who become pregnant and bear most of the consequences (*Brunner – Huber – Ersek*, 2011; *Cox et al.*, 2010). These are the reasons why women are more concerned about contraceptives than men. This is supported by the fact that the FP policy in Indonesia still focuses on targeting female participants. Setting the time-spans between births to at least two years, in developing countries, can reduce the risk of infant mortality by 10% and child mortality by 21%. Certain contraceptive methods also yield other benefits besides the prevention of pregnancy, such as reducing the risk of cancer (*Futrel*, 2012). Education and knowledge about contraception and reproduction play an important role in fertility preferences (*Rahman – Kabir*, 2003). In order to make the FP Programme more successful in Indonesia, several approaches are needed, one of which is to increase men's access to information, family-planning services, and reproductive health.

There are several conditions for using any contraceptive method. First, it must be safe to use and trustworthy. Second, the period of use should be determined by the users. Third, there must be no or minimal side effects. Fourth, the method must be affordable. Fifth, the method must be simple to use. Sixth, the method must not interfere with the intimate relationship between husband and wife. Lastly, no strict control should be necessary during the use of the method. Even if these requirements are met, no contraceptive method is 100% more effective than abstinence (not having sex) at preventing pregnancy. Based on the level of effectiveness, the methods most effective at preventing pregnancy are vasectomy and tubectomy (*Hartanto*, 2007, p. 42), because both methods are irreversible. Meanwhile, based on a 2013 report from Basic Health Research, the use of contraceptive methods in Indonesia was dominated by the injection type (34.3%), although it has a higher failure rate.

Townsend et al. (2011) found that contraceptive use in developing countries, like China and India, is still low, though access to contraception is increasing. This is in line with the facts in Indonesia. Increasing access to modern contraception will not reduce the rate of population growth if this is not followed by consistent usage. Consistent use of contraception is one of the most important aspects of reproductive health care worldwide, because it contributes significantly to women's health and well-being by preventing unexpected pregnancies and pregnancy-related health problems (*Cleland et al.*, 2012; *Darroch – Singh*, 2013). By bringing the FP Programme closer to the community through FP Villages, it is expected that there will be changes in people's behaviour in relation to contraceptive selection, so that the goals of the FP Programmes can be achieved.

MATERIALS AND METHOD

The data used in this study were primary data obtained from field experiments. The subjects of this study were two FP Villages in West Kalimantan Province. Based on data from the Bureau of National Population and Family Planning of the Province of West Kalimantan, collected from January 2016 to September 2017, there were 92 FP Villages scattered across all the districts/cities in the Province of West Kalimantan. Out of all the FP Villages, one FP Village was chosen

to represent the city and another one to represent the district. Both were chosen based on the launching criteria for 2016, so that the impact of establishing the FP Village was expected to be more visible. Each selected village represents all the ethnic groups in the Province of West Kalimantan. There are four main ethnic groups representing several religions. Ethnic Malays and Madurese are followers of Islam, while ethnic Dayaks and ethnic Chinese are followers of non-Islamic religions. The two FP Villages are treated as the treatment groups. Whereas for the control groups, a non-FP Village was selected from the chosen district and city. Of all the selected villages, both treatment and control groups, observations were made on community contraceptive selection behaviour before 2016 and after 2016.

The villages chosen as the treatment groups were selected from Kubu Raya District and Pontianak City. These villages were Mekarsari Village (Sungai Raya District) and Kampung Beting (Bugis Dalam Sub district). Whereas for the control groups, Limbung Village was selected from Kubu Raya Regency and Tanjung Hilir Village was chosen from Pontianak City.

The respondents in this study were subjects who were dwelling in each selected village or urban village. The number of respondents in each group was one hundred twenty-five. Hence, the study consisted of five hundred research subjects: two-hundred-and-fifty couples were included in the treatment groups and another half was included in the control groups.

In this study, changes in household contraceptive selection behaviour were observed in the period before and after the establishment of the FP Village in both groups. The study included some categories of contraception, namely traditional contraception (without tools), effective contraception (injections, pills, IUDs), and permanent contraception (vasectomy and tubectomy). The tests included a with-and-without comparison and a difference-in-difference (DID) test. The with-and-without comparison test was conducted to determine the significance of changes in contraceptive selection behaviour before and after the establishment of the FP Village for both the treatment and the control group; while the difference-in-difference (DID) test was performed to overcome counterfactual problems. Such tests were performed to determine whether the behavioural changes that the research subjects exhibited were really influenced by the establishment of the FP Villages.

ESTIMATION RESULT AND DISCUSSION

Character of Research Subjects

The characteristics of the respondents relate to their socio-economic backgrounds, namely age, level of education, income, number of children, marital duration, and religion. The age of childbearing couples, particularly wives, will determine the level of household fertility. The respondents' characteristics based on age level are presented in Table 1.

Tab. 1: Respondents Characters based on Age

	Treatment Group		Control group	
	Wife	**Husband**	**Wife**	**Husband**
Average age	32.69	35.56	32.49	35.94
The Youngest	18	22	20	25
The Eldest	43	48	45	53

Source: Primary data, processed.

Tab. 2: Respondents Characters based on Marital Duration

	Treatment Group	Control Group
Average (years)	10.48	11.62
Less than 10 years	133 (53.2%)	127 (50.8%)
More than 10 years	117 (46.8%)	123 (49.2%)

Source: Primary data, processed.

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The marital duration will determine the number of children in the family. Respondents' characteristics based on marriage duration are presented in Table 2.

The ages of partners in a childbearing couple at the time of their marriage, especially the woman, will determine the household fertility level. Respondents' characteristics based on the initial marriage age are presented in Table 3.

Religion is a rule-to-live-by for most people in Indonesia with respect to certain behaviours, including what contraception methods they choose. There is a widespread opinion that a vasectomy/ tubectomy is an FP method that is not supported by Islamic teachings, although it cannot be denied that this method has the lowest failure rate. Respondents' characteristics based on religion are presented in Table 4.

In the treatment groups, there were 11 respondents (4.4%) who had received a vasectomy/tubectomy: 8 of them were Muslims and the remaining 3 were Buddhists. Whereas in the control groups, there were

3 respondents (1.2%) who had received a vasectomy/ tubectomy and all of them were Muslims. Based on such data, it appears that the decision to receive a vasectomy/tubectomy may not always be based on religious teachings.

Furthermore, an individual's educational level influences his or her level of knowledge about the importance of participating in FP Programmes through the use of contraception. Respondents' characteristics based on education are presented in Table 5.

The income level of a household depends on a wife's employment status, because most female respondents in this study did not work and were solely housewives. This condition may have an ambiguous impact on fertility levels. On the one hand, working wives increase the opportunity cost of having children; on the other hand, increasing household income also enhances the household's ability to pay for childcare. In the treatment groups, 41 of the married women (16.4%) were employed and the remaining 209 (83.6%)

Tab. 3: Respondents Characters based on The Initial Marriage Age (years old)				
	Treatment Group		Control group	
	Wife	Husband	Wife	Husband
Average initial marriage	22.9	25.09	20.99	24.36
The Youngest	16	17	15	18

Source: Primary data, processed.

Tab. 4: Respondent's Character based on religion		
	Treatment Group	Control Group
Moeslem	234 (93.6%)	247 (98.8%)
Christian/Catholic	5 (2%)	3 (1.2%)
Buddhist	11 (4.4%)	11 (4.4%)

Source: Primary data, processed.

Tab. 5: Respondents Character based on Education				
	Treatment Group		Control group	
	Wife	Husband	Wife	Husband
Elementary High School	148 (59.2%)	96 (38.4%)	68 (27.2%)	47 (18.8%)
Junior High School	45 (18.0%)	68 (27.2%)	72 (28.8%)	59 (23.6%)
Senior High School	53 (21.2%)	82 (32.8)	98 (39.2%)	134 (53.6%)
University Education	4 (1.6%)	4 (1.6%)	12 (4.8%)	10 (4.0%)

Source: Primary data, processed.

did not work, whereas in the control groups, 23 of the married women (9.2%) were employed and the majority, 227 (91.8%), did not work. Respondents' characteristics based on household income are presented in Table 6.

In Indonesia there is a well-known saying that 'two children are enough', which implies that any households with two children will automatically be considered to be taking part in an FP Programme. Respondents' characteristics based on the number of children in the family are presented in Table 7.

From these data it can be seen that the couples in FP Villages have on average higher fertility rates compared to couples in non-FP Villages.

With respect to the contraceptive method couples used, in the treatment groups prior to the establishment of FP Villages (before 2016) there were 52 couples (20.8%) using either a traditional contraceptive method or none at all, while 89 couples (35.6%) were using the injection method, 101 couples (40.4%) were taking pills, 7 couples (2.8%) were using an IUD; and only 1 couple (0.4%) had chosen a vasectomy/tubectomy. In the control groups, there were 89 couples (35.6%) who were not using any contraceptive, while 80 couples (32%) were receiving injections; 78 couples (31.2%) were taking pills; 3 couples (1.2%) were using IUD, and none had received a vasectomy/tubectomy.

Tab. 6: Respondent's Character based on Household Income		
	Treatment Group	**Control Group**
IDR* 1 000 000 ≤ inc ≤ 3 000 000	227 (90.8%)	222 (88.8%)
IDR 3 000 000 ≤ inc ≤ 5 000 000	23 (9.2%)	28 (11.2%)

Note: * IDR is the Indonesian currency.
Source: Primary data, processed.

Tab. 7: Respondents Character based on Number of Children		
	Treatment Group	**Control Group**
2 Children or Less	133 (53.2%)	86 (34.4%)
More Than 2 Children	117 (46.8%)	164 (65.6%)

Source: Primary data, processed.

Tab. 8: Respondents' Characters Based on Contraceptive Methods				
	CONTRACEPTIVE METHODS			
	Prior to FP Village (T = 0)		**After FP Village (T = 1)**	
Groups	**Contraception Type**	**Number**	**Contraception Type**	**Number**
Treatment Group	Traditional	52	Traditional	25
	Injection	89	Injection	44
	Pills	101	Pills	33
	IUD	7	IUD	37
	Vasectomy/Tubectomy	1	Vasectomy/Tubectomy	11
Control Group	Traditional	89	Traditional	74
	Injection	80	Injection	100
	Pills	78	Pills	59
	IUD	3	IUD	13
	Vasectomy/Tubectomy	0	Vasectomy/Tubectomy	4

Source: Primary data, processed.

After 2016, in the treatment groups there were 25 couples (10%) who were using a traditional contraceptive method, while 144 couples (57.6%) were receiving injections, 33 couples (13.2%) were taking pills, 37 couples (14.8%) were using an IUD, and 11 couples (4.4%) had received a vasectomy/ tubectomy. Conversely, within the control groups there were 74 couples (29.6%) who were using a traditional contraceptive method, while 100 couples (40%) were receiving injections, 59 couples (23.6%) were taking pills, 13 couples (5.2%) were using an IUD, and 4 couples (1.6%) had received a vasectomy/ tubectomy. Table 8 below depicts the results of respondent characters from both groups in terms of contraceptive selection behaviour.

Based on the description above, we can conclude that there are changes in the choice of contraceptive among the populations in both the before and after the establishment of an FP Village groups. Out of all the population proportion changes in both groups, only those who had changed from a traditional contraceptive method to a modern and/or permanent contraceptive method could significantly influence a decline in population growth. Such changes occurred in both groups. In the treatment groups, traditional contraceptive users decreased by 27 couples, while in the control groups, they decreased by 15 couples. Furthermore, the vasectomy/tubectomy users in the treatment groups increased by 10 couples and the control groups recorded an increase of 4 couples.

Analysis of Estimation

In order to examine the differences between both populations in terms of contraceptive selection behaviour for each contraceptive method, we conducted some tests to distinguish the difference between populations at the baseline condition (prior to the establishment of an FP Village) and post-treatment (after the establishment of an FP Village).

Based on the results presented in Table 9, we conclude that there is a significant difference in the proportion of the population in terms of the use of traditional contraception and IUD among the participants in the control and the treatment groups at the baseline condition. At this stage, the number of participants in the control groups who used traditional contraception (89 participants) is significantly higher than the number of users of traditional contraception in the treatment groups (52 participants). The number of pill users in the treatment groups (101 participants) is significantly higher than the number in the control group (78 participants). Moreover, for the injection and vasectomy/tubectomy types of contraception, there are no significant differences between the control and treatment groups populations.

The establishment of an FP Village is expected to change the attitude of members of society towards participating in an FP Programme, particularly among those who have not used any contraception. In order to examine the influence that establishing an FP Village has on changing people's behaviour, we need to conduct some tests to determine the differences between the control and treatment group populations for each contraceptive method by periods: before the FP Village was established and after the FP Village was established.

Tab. 9: Population Proportion for Each Contraceptive Type at the Baseline Condition

Contraceptive Type	Population		Z Test – proportion test on two samples
	Treatment	**Control**	
Traditional	52 (20.8 %)	89 (35.6 %)	−3.68*
Injection	89 (35.6 %)	80 (32 %)	0,85
Pills	101 (40.4 %)	78 (31.2 %)	2.15***
IUD	7 (2.8 %)	3 (1.2 %)	1,28
Vasectomy/Tubectomy	1 (0.4 %)	0	1

Note: * significant at α = 0.01. *** significant at α = 0.10.
Source: Primary data, processed.

Tab. 10: Population Proportion within Treatment and Control Groups for each Contraceptive Use Before and After the Establishment of FP Village

Contraceptive tools	Group	Population T = 0[1]	Population T = 1[2]	Z Test – test on both samples' proportion
Traditional	Treatment	52 (20.8 %)	25 (10 %)	3.35*
	Control	89 (35.6 %)	74 (29.6 %)	1.43
Injection	Treatment	89 (35.6 %)	144 (57.6 %)	−4.93*
	Control	80 (32 %)	100 (40 %)	−1.86
Pills	Treatment	101 (40.4 %)	33 (13.2 %)	6.87*
	Control	78 (31.2 %)	59 (23.6 %)	1.91
IUD	Treatment	7 (2.8 %)	37 (14.8 %)	−4.74*
	Control	3 (1.2 %)	13 (5.2 %)	2.54***
Vasectomy/Tubectomy	Treatment	1 (0.4 %)	11 (4.4 %)	2.92**
	Control	0	4 (1.6 %)	2.01***

Note: * significant at α = 0.01. ** significant at α = 0.05. *** significant at α = 0.10.
  1) T = 0 indicates the period before the FP Village was established (before 2016).
  2) T = 1 indicates the period after the FP Village was established (after 2016).
Source: Primary data, processed.

Based on the test results presented in Table 10, we can conclude that there are some significant changes in the population proportions in both the treatment and control groups before and after the FP Villages were established. In the treatment groups, there are significant changes in the population of contraception users. There was a significant decrease in traditional contraceptive users, from 52 to 25 participants and a significant increase in injection contraceptive users, from 89 to 144 participants, while there was a significant decrease in pill contraceptive users, from 101 to 33 participants. For IUD users, there was a significant increase from 7 to 37 participants. Finally, there was a significant increase among the users of a vasectomy/tubectomy, from 1 to 11 participants. In the control groups, significant changes occurred among IUD and vasectomy/tubectomy users. There was a significant increase in the population of IUD users, from 3 to 13 participants and vasectomy/ tubectomy users increased from none to 4 participants.

Based on the explanation above, we can see that some participants in both the treatment and control groups changed their contraceptive method, but not all the changes were the kind that would contribute to a decrease in the fertility level. For contraceptive methods to significantly contribute to a decrease in the fertility level there needs to be a change from traditional contraceptive method to a modern one (injection, pills, and IUD), or a change from some

other contraceptive method to a more permanent one (vasectomy/tubectomy). In order to test whether the population changes in the treatment groups involving shifts to contraceptive types that can significantly reduce fertility levels are really caused by the establishment of an FP Village, a difference-in-difference (DID) test needs to be conducted. Prior to the DID test, we need to calculate the size of the population changes for each contraceptive type. The results of calculating these population differences (T = 0 and T = 1) are presented in Table 10. The size of the population changes before and after the establishment of an FP Village is a proxy that measures the net effect of establishing an FP village.

From Table 11 above, we can see that there are significant differences in the population changes among the users of the vasectomy/tubectomy contraceptive method between the treatment and the control groups. In the treatment groups, after the FP Village was established, there is a notable increase in vasectomy/tubectomy users by 11 participants, while in the control groups, the magnitude of change was only 4 participants. To test whether the change in the population of vasectomy/tubectomy users in the treatment group was really influenced by the establishment of the FP Village, it is essential to estimate the population changes that occurred in both groups. To support this assumption, an estimation regression model with dummy variables

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Tab. 11: The Net Effects of the FP Village's Establishment on Fertility Level

Changes in Contraceptive Methods after the establishment of FP Villages	Population Changes		Z Test – proportion test on both samples
	Treatment	Control	
Effective contraception (previously used traditional contraception)	32	25	0.99
	−12.80%	−10%	
Permanent Contraception (previously used effective/traditional contraception)	11	4	2.42***
	−4.40%	−1.60%	

Note: *** significant at α = 0.10.
Source: Primary data, processed.

Tab. 12: Operational Definition of Research Variables

VAR	OPERATIONAL DEFINITION	VALUES/NOTATION
Con	Dummy to signal changes in contraceptive method [1]	0 if there are no changes; 1 if there are changes
Aghus	Husband's age	Years (old)
Agwi	Wife's age	Years (old)
Statwi	Dummy to signal employment status	0 if one has no occupation; 1 if one has an occupation
Chil	The number of children	Person
Bel	Dummy to signal religion status	1 for Islam; 2 for Christian/Catholic; 3 for Buddhist; 4 for Hinduism; 5 for others
Inc	Total household income	IDR
Marr	Marriage age	Years
Edhus	Dummy to signal the latest educational level of the husband	1 for primary level; 2 for junior high school; 3 for high school/vocation school; 4 for higher education level
Edwi	Dummy to signal the latest educational level of the wife	1 for primary level; 2 for junior high school; 3 for high school/vocation school; 4 for higher education level
Group	Group	0 for control group; 1 for treatment group

Note: 1) Changes' refer to a change in contraceptive method that can actually cause a decline in population growth, namely a change from a traditional method of contraception to an effective/permanent method of contraception and a change from some other form of contraception to a permanent method of contraception.
Source: Primary data, processed.

is employed to describe population changes by period and by the provision of treatment after the FP Village was established.

The mathematic formula for the estimate regression model is as follows:

$$\text{Con}_i = \beta_{0i} + \beta_1 \text{aghus}_i + \beta_2 \text{agwi}_i + \beta_3 \text{statwi}_i + \beta_4 \text{chil}_i + \beta_5 \text{bel}_i + \beta_6 \text{inc}_i + \beta_7 \text{marr}_i + \beta_8 \text{edhus}_i + \beta_9 \text{edwi}_i + \beta_{10} \text{group}_i + \varepsilon_i.$$

The formula is estimated using Probit. Probit regression is used because the data of this study fulfil the cumulative function of the normal distribution. The operational definitions for variables used in the formula are displayed in Table 12, while the estimation results on the determinants of contraception selection are presented in Table 13.

Based on the estimation results in Table 13, it shows that there are two variables that significantly influence the decision of couples of childbearing age to change their contraceptive method to one of the methods that significantly affect fertility levels: the number of children the couple has (Child) and belief/religion (Bel). Both variables are positively related to a couple's decision to change their contraceptive method. The number of children (Child) has a positive effect, signifying that the more children there are in a household, the more likely it is that the parents will change their contraceptive method. Belief/religion (Bel) also has a positive effect, signalling that when couples of childbearing age follow a religion other than Islam, it is more likely that they will change their contraceptive method. This might be influenced by the opinions of some Islamic figures who do not

Tab. 13: Estimation Results on the Determinants of Contraception Selection			
Variables	Coefficients	Z-statistic	Probability
C	**−0.37474**	**−0.516998**	0.6052
Aghus	**−1.014694**	**−0.442814**	0.6579
Agwi	**−0.053046**	**−1.450219**	0.147
Statwi	**−0.095815**	**−0.337666**	0.7357
Chil	0.258275	2.72151	0.0065*
Bel	0.47309	2.495993	0.0126**
Inc	0.132653	0.375718	0.7071
Marr	0.03003	1.089352	0.276
Edhus	0.050788	0.50197	0.6157
Edwi	**−0.138147**	**−1.317997**	0.7071
Group	0.184811	1.126793	0.2598
McFadden R-squared	0.07527		
LR statistic	31.29041		
Prob(LR statistic)	0.000525		

Note: * denote significantly at α = 0.01. ** denote significantly at α = 0.05.
Source: Primary data, processed.

Tab. 14: The Results of the Marginal Effects Test		
Variables	Coefficients	Z-statistic
Aghus	**−0.0030953**	**−0.44**
Agwi	**−0.0111744**	**−1.45**
Statwi	**−0.020184**	**−0.34**
Chil	0.0544071	2.76*
Bel	0.0996592	2.53**
Inc	0.0279442	0.38
Marr	0.0063259	1.09
Edhus	0.0106987	0.5
Edwi	**−0.0291015**	**−1.32**
Group	0.0389316	1.13

Note: * denote significantly at α = 0.01. ** denote significantly at α = 0.05.
Source: Primary data, processed.

approve of contraception use, especially the vasectomy/tubectomy method.

Furthermore, the 'groups' variable is not significant in signalling changes in contraceptive method. It shows that the establishment of an FP Village does not affect the contraceptive selection behaviour of community members. Households outside the FP Village also show a high probability of a decrease in their fertility level as the number of children increases. It means that the households in both the FP and the non-FP Villages are aware that the number of children needs

to be limited. This finding can be an opportunity to increase public awareness to decrease the fertility level of households in non-FP Villages. The role that the establishing of an FP Villages plays in contraceptive selection behaviour will be enhanced because the findings show that even without an FP village being established, there is an increase in the number of contraception users. If access to information and contraceptive methods among the households residing in an FP Village can be increased, it is very likely that there will be a bigger increase in the number

of contraception users who select an effective and permanent method of contraception. Based on the statistical LR value (31.29041) and the probability value (0.000525), it can be said that the whole regression significantly affects a behavioural change in both groups.

Finally, based on the marginal effects test results presented in Table 14, we can see that every increase of one child in the household will increase the probability of a couple of childbearing age reducing fertility level through contraceptive use by 5.44%. With respect to religious variables, if a household believes in a religion other than Islam, the probability of using contraception increases by 9.97%. It is difficult for the government, which has the biggest interest in population control, to have any impact on the religious variable. Therefore, it is necessary to establish collaboration between the government and religious figures/leaders to provide education and awareness to the public about the benefits of contraception. Among Muslims in particular, the focus can be on effective contraceptive methods, because there is a widespread belief that permanent contraception is prohibited. For followers of other religions, education on the benefits of permanent contraception can be further improved. Successful education on contraception use will increase the awareness of it among couples of childbearing age, and in turn, will produce a decline in the fertility level.

DISCUSSION

The implication from the findings of this study is that in addition to increasing information and access to contraception, there is more need to postpone the age at which people marry in KB villages in order to reduce population growth, especially in poor villages. One limitation of this study is that studying FP Villages in which a large proportion of the population is Muslim may yield false conclusions about religious relations and contraceptive behaviour. Another limitation is that the sample was unable [to represent all existing Family Planning Villages. This is due to the fact that there are many FP Villages that have just been established so the impact of establishing FP Villages is not yet apparent. Future research should consider creating a wider sample that

includes more FP Villages, because treatment as FP Village achieved at village level not at household level.

CONCLUSION

There were significant differences in the population of traditional contraceptive users and pill contraceptive users among the treatment and control groups at the baseline condition. After an FP Village was established there was a notable change in contraceptive selection behaviour in both groups, though not all the changes affected the fertility level. Changes that occur among similar contraceptive methods (effective contraception) have no effect on the fertility level in the community. Only a change from a traditional contraceptive method (without modern contraception) to an effective or permanent method of contraception, or a change from an effective to permanent contraceptive methods can reduce the fertility level.

In the treatment group, there was a change in contraceptive selection behaviour after the establishment of the FP Village, which included all types of contraception, namely traditional, injections, pills, IUDs, and a vasectomy/tubectomy. After the establishment of FP Villages, there was a decline in the number of users of traditional contraception and pills in the treatment groups; however, there was an increase in the number of users of injections, IUDs, and vasectomy/tubectomy methods. For the control groups, the only changes that occurred were in the use of an IUD and a vasectomy/tubectomy, which saw an increase in the number of users. Based on the tests conducted, it was found that the only significant changes in the population proportions occurred among permanent contraception users in both the control and the treatment groups; however, the changes were not significant among the users of effective contraception.

According to the estimation results for the changes in the users of effective and permanent contraception, only the number of children and religion were recorded as significant factors affecting change. Both variables have significant, positive effects on the probability that couples of childbearing age will use contraception. The group variable is not significant, implying that establishing an FP Village has no impact

on contraceptive selection behaviour, in the case of both effective and permanent contraception. The significant influence that the number of children has on contraception use signals a household awareness about the importance of limiting the number of children, both in the FP and the non-FP villages. Moreover, the significance of the religious variable indicates that contraceptive selection behaviour is still determined by the religious values adopted by each household. It should be noted, however, that this result may be due to the fact that there were fewer Muslim participants in the treatment groups than in the control group; hence, they record a more significant result (a level of significance for the Z-test at −6.81).

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