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Impact Evaluation of Program Keluarga Harapan (PKH):

Indonesia conditional cash transfer program on iron supplements consumption on pregnant women in Indonesia

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***Abstract*—Evaluation of the implementation of Millennium Development Goals (MDGs) in Indonesia still leaves some problems particularly related to the stagnation of maternal mortality rate. The Ministry of Health noted that the main cause of maternal mortality in Indonesia is anemia. In some populations, 80% of pregnant women experiencing anemia with the greatest risk to women from low socioeconomic (poor) and adolescent groups. PKH is implemented to improve the poor family's quality of life through behavior changes in education and health. As a form of maternal anemia mitigation from the poor, one of the commitments that PKH beneficiaries must meet is the obligation to conduct prenatal visits at least four times during pregnancy and receive iron supplementation at the nearest health facility. This study aims to determine the impact of PKH on the consumption of iron supplements in pregnant women beneficiaries and confirm the results of PKH impact evaluation by the World Bank in 2011 that found no significant evidence related to increased consumption of iron supplements in pregnant women of PKH beneficiaries although there was a significant increase in prenatal visits. This study analyzes the Indonesian Family Life Survey (IFLS) wave 5 data through the propensity score matching method. This study yielded empirical evidence that PKH significantly impacts on iron supplement consumption during pregnancy in pregnant women beneficiaries 96 tablets on average higher than pregnant women from non-beneficiaries of PKH.**

Keywords—impact evaluation; iron supplement; PKH; maternal anemia; propensity score matching

I. INTRODUCTION

Evaluation of the MDGs in Indonesia still leaves the problem particularly related to the Maternal Mortality Rate (MMR). Although there are quality improvements in some health indicators, but MMR in Indonesia is still very high. World Bank estimated for MMR in Indonesia reached 126 cases out of 100,000 live births by 2015. The high number of MMR becomes a hard work for the Government, especially with the MMR targeting on SDGs, which is less than 70 deaths per 100,000 live births in 2030 [1].

UNDP (2015) emphasizes that one of the causes of high MMR in Indonesia is the quality gap and access to health facilities in some areas. Efforts to equalize the quality gap and access to health facilities have been undertaken by implementing the social protection programs in order to achieve universal health coverage especially for low income groups [2]. One form of the programs is Program Keluarga Harapan (PKH). PKH has been implemented since 2007 and became a national program since 2013. PKH aims to improve the quality of life through education and health. In long term, it is expected to stimulate the social welfare of beneficiaries so that they can get out of poverty. As a Conditional Cash Transfer (CCT), PKH requires beneficiaries to fulfill their commitments in education and health. In the health sector, PKH beneficiaries who are pregnant women are required to have four times checkup at the health facility (K4) and get iron supplements during pregnancy. Maternity mothers should also be assisted by health personnel in health facilities and postpartum women should have a medical examination and receive birth control services at least three times after delivery.

Maternal health greatly affects the MMR in Indonesia. Indonesia's demographic and health survey in 2012 noted the main factors causing MMR in Indonesia were bleeding (37%), infection (22%), and high blood pressure during pregnancy (14%). Previous researchers analyzed the impact of CCT to the maternal health from some indicators. Through a behavioral analysis of micro-data of social security programs in Uruguay, Amarante *et al*. found empirical evidence that participation in CCT led to a decrease in birth rates of low birth weight infants [3]. Similar findings were also made by Glassman *et al*. from the systematic review of CCT studies in Honduras, India, Nepal, Mexico, Guatemala and Uruguay [4].

Maternal health is also supported by the frequency of prenatal care. Prenatal visits are aimed to optimize the mental and physical health of pregnant women, so they are able to deal with the labor, postpartum, preparation for breastfeeding, and a reasonable return of reproductive health. Chaudhury *et al*. stated that CCT encourages poor women in Philippines to use maternal and child health services such as prenatal care, postnatal care and regular growth monitoring [5]. Increased

prenatal visits were also found in Honduras based on UNDP (2008) research results. The study concluded that there was an increase of 18-20% of pregnant women who receive five or more prenatal care [6].

Along with the increase of prenatal care frequency, it is expected that CCT can also increase the health status of pregnant women through the consumption of certain vitamins and vaccines given during the visit. Okoli states that CCT in Nigeria causes a significant increase in the number of mothers who receive two or more tetanus vaccines during pregnancy [7]. Through discontinuity regression, Chaundhury concluded that CCT enhanced the acceptance of vitamin A and worm pills in pregnant women in the Philippines [5]. The conclusion is also shared by Glassman *et al*. that CCT programs in Honduras, India, Nepal, Mexico, Guatemala and Uruguay can increase prenatal visits and the use of tetanus vaccine for pregnant women [4].

Research from Titaley et al. confirmed that 20% of neonatal deaths in Indonesia are caused by deficiency of iron and folic acid supplements during pregnancy [8]. The prevalence rate of anemia in 15-49 years old of pregnant women in Indonesia is classified as moderate; with 30% of pregnant women in this age group have a hemoglobin concentration less than 110g/l [9]. Women with moderate anemia have a substantial decrease in work capacity, more susceptible to infection, more likely to give birth prematurely with higher risk of prenatal death and have a large proportion of maternal deaths due to ante partum, postpartum, hypertensive and sepsis bleeding [10]. The condition of anemia can be reduced through the consumption of iron supplements during pregnancy. Titaley *et al*. stated that the consumption of iron supplements during pregnancy empirically proven to reduce the risk of neonatal death by 47% in Indonesia [8].

Related the impact of CCT on iron supplements consumption, Barber and Gertler (2008) through the random effect method found evidence that CCT Oportunidades / Progresa can have a positive impact on the increase of birth weight, one of which is due to the improvement of the quality of prenatal care procedures in Mexico [11]. However, there were no significant differences in iron supplementation procedures between beneficiaries and non-beneficiaries of the program. World Bank provides more complete study results based on mix methods of micro-data of PKH in Indonesia. The results found that beneficiary's households did not demonstrate the increased use of recommended vitamins including iron supplements for pregnant women, although the likelihood of pregnant women doing four prenatal examinations was found by 13% above the level of pre-program. World Bank stated that the insignificant findings on the iron supplements consumption among pregnant women during pregnancy are due to insufficient stock [1].

In 2013 anemia occurs in 37.1% of pregnant women in Indonesia. As one of the government's attention to this phenomenon, the Ministry of Health stipulates the provision of 90 iron supplements as one component of prenatal mandatory basic service protocol at all health facilities in Indonesia. Although the coverage of iron supplementation in pregnant women in Indonesia is quite high (reaching 85.17%) and there are obligations for PKH beneficiaries related to iron supplementation, however it still found a high percentage of anemia incidence in pregnant women of PKH beneficiaries. The mandatory protocol of iron supplementation and the obligation of prenatal visit for PKH beneficiaries give an assumption that through PKH there will be an increase in the number of prenatal visits to health facilities that lead to increased consumption of iron supplements during pregnancy. Based on this background the authors are motivated to review the impact of PKH on maternal health in Indonesia by anemia prevalence indicator through the consumption level of iron supplement during pregnancy.

II. Literature Review

Previous studies had been analyzed the quality of pregnant women's health from some indicators, but few studies have measured the maternal health from anemia indicator through iron supplementation approach. Barber and Gertler through the random effect method found evidence that CCT Oportunidades/Progresa can have a positive impact on the increase of birth weight, one of which is due to the improvement of the quality of prenatal care procedures in Mexico [11]. However, there were no significant differences in iron supplementation procedures between beneficiaries and non-beneficiaries of the program. The study also did not examine the consumption compliance rates on supplementation received. As is known, supplementation policies are often constrained by distribution problems, stock availability and compliance.

World Bank provides more complete study results based on mix methods of micro-data of PKH beneficiaries and non-beneficiaries in Indonesia [1]. The results found that beneficiary's households did not demonstrate the increased use of recommended vitamins including iron supplements for pregnant women, although the likelihood of pregnant women doing four prenatal examinations was found by 13% above the level of pre-program. World Bank stated that the insignificant findings on the iron supplements consumption among pregnant women during pregnancy are due to insufficient stock [1]. Based on this background the authors are motivated to review the impact of PKH on maternal health in Indonesia by anemia prevalence indicator through the consumption level of iron supplement during pregnancy.

III. Method, Data And Analysis

A. Method and Data

This study modifies some of the research variables used by the World Bank in 2011 [1]. The main data in this research is micro data from IFLS wave 5 which is includes 50,148 individuals in Indonesia. The study also used data from Indonesia Central Bureau of Statistics (BPS), WHO, Ministry of Health, Ministry of Social Affairs and the World Bank in various publications.

TABLE I. LIST OF RESEARCH VARIABLES

No	Variable Name	Description (unit)
1	Iron	Consumption of iron supplements during pregnancy (tablets)
2	PKH	Membership Status of PKH (PKH beneficiaries = 1, PKH non-beneficiaries = 0)
3	Urban	Residential location (Urban=1, Rural=0)
4	Edu	Years of education (years)
5	Health_exp	Healthcare expenditure over the past year (Rupiah)
6	Female	Gender of the head of household (Female=1, Male-laki=0)
7	Poor	Social status which is the composite value of some BPS poverty indicators which are: 7.1. The main source of drinking water 7.2. Location defecation 7.3. The availability of electricity 7.4. The widest type of floor 7.5. The widest type of outer wall 7.6. Floor area per capita 7.7. The main fuel of cooking 7.8. The highest education of the head of the family 7.9. Consumption of meat in one week For each indicator is a dummy with category for Poor = 1 and Not Poor = 0

Source: World Bank, 2011 (modified) [1]

Impact evaluation studies based on micro data confront obstacles in the event of selection bias [12]. Selection bias occurs when two individuals with similar characteristics have different opportunities in receiving a treatment Rosenbaum in Sulistyaningrum [13]. The matching approach is one of the quasi experiments that provide solutions in eliminating the selection bias [12].

This research uses Propensity Score Matching (PSM) method because it is assumed there are differences on the characteristic between PKH beneficiaries and non-beneficiaries. PSM is part of a quasi-experiment aimed at constructing a control group by identifying various possible characteristic similarities between the control and the treatment group based on the propensity score approach.

Referring to Caliendo and Kopeinig, the main model in this study consisted of family, treatment (PKH membership) and potential outcome (consumption level of iron supplement during pregnancy) [12]. For each i-th family, Yi is the level of iron intake during pregnancy from pregnant women in the i-th family due to a treatment Di = 1 if the i-th family receives PKH, Di = 0 if the i-th family does not receive PKH. Treatment effect (ri) for i-th family can be formulated as:

$$ri = Yi\ (1) - Yi\ (0) \tag{1}$$

Since it is not possible to observe a family while treated and when not treated at the same time, the treatment effect estimation is performed through an average treatment effect on treated (ATT) defined as:

$$\begin{aligned} rATT &= E\ (Yi\ (1)\text{-}Yi\ (0) \mid Di=1)\ rATT = E\ (ri \mid Di=1) \\ rATT &= E\ (Yi\ (1) \mid Di=1\text{-}E\ (Yi\ (0) \mid Di=1) \end{aligned} \tag{2}$$

With E (Yi (1) |Di=1) is the level of iron consumption during pregnancy of pregnant women in i-th family who receive PKH (treatment group). While E (Yi (0) | Di=1) is the level of iron intake during pregnancy of pregnant women from the treatment group when not receiving PKH, and this data is counterfactual that cannot be observed.

To estimate the amount of E (Yi (0) | Di=1) is by using the data of iron consumption level during pregnancy of pregnant women from the control group (not receiving PKH), i.e. E (Yi (0) | Di=0), so equation (2) can be derived into:

$$rATT = E\ (Yi\ (1) \mid Di=1)\text{-}E\ (Yi\ (0) \mid Di=0) \tag{3}$$

Model selection to estimate propensity score can be done by binary logit, binary probit, multinomial logit, conditional logit and multinomial probit. Model selection is not crucial for binary treatment cases [12]. In this study the treatment was binary cases. Propensity score in this research is determined by binary logit method with propensity score model estimation as follows:

$$ln\left(\frac{p_i}{1-p_i}\right) = \alpha_0 + \alpha_1 poor_i + \alpha_2 urban_i + \alpha_3 edu_i + \alpha_4 health\_exp_i + \alpha_5 female_i + \varepsilon_i \tag{4}$$

notation:

p	: probability of receiving PKH
Poor	: social status
Urban	: dummy of residential location
Edu	: years of school (years)
Health_exp	: health expenditure
Female	: gender of the head of household
ε_i	: error term, for i = 1,2, ..., N
α_j	: coefficients, for j = 0,1, ..., 5

B. *Analysis*

Based on the sample data, it is known that the head of household in Indonesia is dominated by men with a portion of 82.05%. Most families live in urban areas with a percentage of 60.18%. The highest level of educational attainment attained by heads of majority families came from elementary school (33.56%), senior high (14.90%) and junior high school (13.72%). The data shows that 30.11% of households at least meet one of the nine BPS poverty criteria. While the percentage of households with nine poverty criteria is only found at 0.01%.

Based on IFLS wave 5, it was recorded PKH beneficiaries are mostly from urban households (50.77%) with dominance of male family heads reaching 78.85%. The percentage of high PKH membership in urban areas is linear with the phenomenon of urban poverty in Indonesia that fluctuates with high growth from year 2014 to 2015. Since September 2014 urban poverty in Indonesia rose 2.51% from 10.36 million to 10.62 million in September 2015 (BPS, 2016). In terms of education, the largest percentage of PKH beneficiaries in Indonesia is the family with the highest education level of head of household from elementary level reaching 48,3%.

TABLE II. PERCENTAGE OF PKH BENEFICIARIES IN INDONESIA

PKH Membership	Residential Location		Total Percentage of PKH Membership
	Rural	Urban	
Non-beneficiaries	39,25	60,75	90,04
Beneficiaries	49,23	50,77	9,96
Total Percentage of Households	39,82	60,18	100,00

Source: calculated from IFLS wave 5

1) Iron supplements consumption during pregnancy: Maternal anemia is a crucial problem faced in developing countries. Despite the downward trend, maternal anemia in Indonesia is still quite high compared to surrounding countries. The data on the amount of iron supplements consumed by individuals in IFLS wave 5 is based on interviews of 16,291 female heads of household and/or adult female family members in the age over 15 years, on the record of pregnancies that are or have been experienced.

The average consumption of iron supplements during pregnancy in adult females in the rural area was recorded lower than in the urban area. In rural areas, the average consumption of iron supplements by adult females is 89 tablets during pregnancy, whereas in very high counts the urban area reaches an average of 126 tablets during pregnancy. The low consumption of iron supplements during pregnancy in rural area supports an existing prevalence of anemia data. Ministry of Health states that anemia occurs in 36.4% of pregnant women in urban areas, lower than the prevalence of anemia in rural women who reached 37.8% [14].

Based on survey data, the percentage of pregnant women who consumed at least 90 iron supplements during pregnancy was quite high at 61.64% with 60.74% pregnant women living in urban areas. The survey also found that the major percentage of pregnant women in rural areas consumed iron supplements of less than 90 tablets during pregnancy. Only 39.26% of pregnant women in rural areas obey the minimum consumption rule of iron supplementation during pregnancy.

2) Prenatal visit: The IFLS wave 5 data shows that pregnant women beneficiaries of PKH largely fulfill the commitment of prenatal visits to the health facilities at least four times during pregnancy (K4). The percentage of K4 for pregnant women from PKH beneficiaries was quite high at 81.48% (see Table 3). This is in line with the average percentage coverage of prenatal K4 service nationally, which is 87.48% in 2015, up from 2014 which is only at 85.7%.

TABLE III. PERCENTAGE OF PRENATAL VISIT DURING PREGNANCY

PKH Membership	Less than four times visits	At least four times visits
Non-beneficiaries	26,18	73,82
Beneficiaries	18,52	81,48

Source: calculated from IFLS wave 5

Along with the increase of prenatal care visit, it is expected that through PKH the health status of pregnant women will also increase through the consumption of certain vitamins and vaccines given during the visits. An increased frequency of prenatal visits will linearly lead to increased consumption of iron supplements in pregnant women, although the effect is indirect.

3) Consumption of iron supplements: Based on the survey data it is known that although there is still maternal anemia occurrence in PKH beneficiaries at 11.11%, but the percentage is lower than in non-beneficiaries group which reach 16.75%. This can be an indication that the supplementation of 90 iron tablets at prenatal visits which is one of the mandatory requirements of PKH has an effect on the achievement of low maternal anemia incidence in the beneficiary group. The low percentage of anemia incidence in pregnant women of PKH beneficiaries is supported by data on compliance level of iron supplement consumption which is quite good.

Based on the survey data, as many as 77.42% of adult women in PKH beneficiary families consume at least 90 tablets of iron supplement during pregnancy. Of the total percentage, the largest consumption (28.33%) is done by adult women with the highest education level from elementary school. This indicates that although with a low level of education, PKH beneficiaries in Indonesia have a good awareness and knowledge of the importance of iron for the fetus development and the health of the mother during pregnancy.

4) Hypothesis testing

a) Propensity score estimation: The propensity score in this study was estimated using binary logit model based on equation (4). Caliendo and Kopeinig suggest that to meet the Conditional Independence Assumption (CIA), the propensity score estimates should be satisfied [12]. Furthermore, Heckman, Ichimura and Todd in Sulistyaningrum suggest only including variables that simultaneously affect the determination of a treatment [13]. The propensity score estimation yields satisfactory balancing properties and meets CIA assumptions through the satisfactory estimation include variable Rural and the categorical variable Poor consisting of eight categories with the following as shown in Table 4.

TABLE IV. LOGISTIC REGRESSION RESULTS

Treatment Variabel: PKH	Coefficient	Odds Ratio
Urban	0,1373** (0,0599)	1,1472** (0,6881)
Poor1	0,8192*** (0,1240)	2,2686*** (0,2812)
Poor2	1,3074*** (0,1237)	3,6967*** (0,4572)
Poor3	1,5382*** (0,1282)	4,6561*** (0,5971)
Poor 4	1,8342*** (0,1341)	6,2602*** (0,8397)
Poor 5	1,9488*** (0,1503)	7,0201*** (1,0548)
Poor 6	2,3703*** (0,1740)	10,7008*** (1,8616)
Poor 7	2,3416*** (0,2640)	10,3982*** (2,7442)
Poor 8	2,0951*** (0,7907)	8,1264*** (6,4255)
Constant	-3,5992*** (0,1187)	0,0273*** (0,00345)

The asterisks indicate significance level of * 10%, ** 5%, *** 1%
Figures in parentheses indicate the standard error
Source: calculated from IFLS wave 5

At the level of significance of 1% there is at least one independent variable that affects the likelihood of PKH membership. Urban variable is significant at 5% level while the Poor categorical variables are significant at 1% level respectively. It indicates that the constants and all independent variables are partially significant have influence on likelihood of PKH membership.

Based on the result of propensity score estimation, it is known that the average probability of individuals obtaining PKH benefit is 9.01%. Individuals in poor and very poor families in urban areas have the potential to become PKH beneficiaries 1.15 times greater than individuals in poor and very poor families in rural areas. These results are consistent with PKH distribution allocations that since the beginning of implementation had a larger portion of urban poor families. This is based on the consideration that urban areas have sufficient health and education facilities that are expected to accommodate the needs of PKH beneficiaries in meeting the CCT requirements. World Bank argues that there are indications that PKH is capable of providing a strong impact on improving family health behaviors in "supply-side ready" locations with substantial health facilities and human resources, where in Indonesia the regions are mostly in urban areas [1].

Individuals in families with increasingly poor social status tend to have a greater likelihood of becoming PKH beneficiaries. The results are consistent with the findings of the World Bank that stating that PKH beneficiary households are poorer, less well-educated and more often participating in other social safety net programs [1].

b) Selection of matching algorithms: In this study the matching algorithm was chosen by the Nearest Neighbor (NN) method with replacement, as there was a considerable difference between the propensity score of the treatment and the control group. Caliendo and Kopeinig suggest that NN matching algorithms with replacement may improve the average of matching results and reduce bias [12].

The assumption of common support is fulfilled because there are overlap regions between the propensity score density of the treatment and control group. Thus, the propensity score estimation in this study meets all assumptions required in the PSM that are CIA and common support.

c) Assessment the matching quality: Rosenbaum and Rubin in Grilli and Rampichini suggest that for a good balancing score, the standard bias after matching should be less than 5% [15]. Result from this research indicates that the resulting matching estimate is good. All independent variables after matching is not significant. Only the Iron variable has a p-value smaller than the 1% significance level. This is as expected, since it is generally indicated that there is no significant difference between the average propensity score in the PKH beneficiary group and the control group. The only difference occurs in the dependent variable which is the amount of iron supplements consumed during pregnancy. Generally, it can be concluded that the control group formed has characteristics that tend to be the same as the PKH beneficiary group (see Table 5).

TABLE V. BIAS REDUCTION

Variable	Matching	% Bias	t	P>|t|
Iron	Before	-8,50	-3,04	0,002***
	After	31,6	11,23	0,000***
Urban	Before	-13,2	-4,86	0,000***
	After	0,0	0,00	1,000
Poor1	Before	-21,7	-7,59	0,000***
	After	0,0	0,00	1,000
Poor2	Before	5,3	1,97	0,049**
	After	0,0	0,00	1,000
Poor3	Before	13,7	5,29	0,000***
	After	0,0	0,00	1,000
Poor4	Before	21,0	8,63	0,000***
	After	0,0	0,00	1,000
Poor5	Before	17,5	7,41	0,000***
	After	0,0	0,00	1,000
Poor6	Before	19,1	9,04	0,000***
	After	0,0	0,00	1,000
Poor7	Before	10,1	4,74	0,000***
	After	0,0	0,00	1,000
Poor8	Before	2,4	1,06	0,228
	After	0,0	0,00	1,000

Asterisks indicate statistical significance level * 10%, ** 5%, ***1%

Source: calculated from IFLS wave 5

Results from this research also shows that simultaneously there is no characteristic difference between control and treatment group. The significance of the test results of this Hotelling (see Table 6) supports partial test results that have been described earlier.

Generally, it can be concluded that the control group constructed through PSM in this study has the same characteristics as the treatment group either partially or simultaneously. This is an indication that matching results are of good quality and can be used as a basis for measuring the impact of PKH on beneficiary groups and control groups.

TABLE VI. HOTELLING TEST

Variable	Treatment	Mean	Standard Deviation
Iron	Control	0, 51703	0, 5150892
	PKH Beneficiaries	0, 51703	0, 4998802
Urban	Control	0, 2145777	0, 4231636
	PKH Beneficiaries	0, 2145777	0, 4106689
Poor1	Control	0, 2370572	0, 4383662
	PKH Beneficiaries	0, 2370572	0, 4254226
Poor2	Control	0, 1852861	0, 400487
	PKH Beneficiaries	0, 1852861	0, 3886619
Poor3	Control	0, 150545	0, 3686106
	PKH Beneficiaries	0, 1505450	0, 3577266
Poor4	Control	0, 0851499	0, 2876944
	PKH Beneficiaries	0, 0851499	0, 2791997
Poor5	Control	0, 0517711	0, 2283836
	PKH Beneficiaries	0, 0517711	0, 2216401
Poor6	Control	0, 0156676	0, 1280077
	PKH Beneficiaries	0, 0156676	0, 1242281
Poor7	Control	0, 0013624	0, 0380207
	PKH Beneficiaries	0, 0013624	0, 0368981
Poor8	Control	0, 51703	0, 5150892
	PKH Beneficiaries	0, 51703	0, 4998802

F statistik : 0.0000; Prob > F: 1.0000 (Source: calculated from IFLS wave 5)

d) Sensitivity analysis: The sensitivity analysis results show that up to gamma 2 at a significance level of 1% the

estimation of Hodges-Lehman on treatment effect recorded at 45-130. The results of treatment effect estimation in this study proved very good because up to gamma 2 estimation of treatment effect is not sensitive to hidden bias. Up to gamma 2 the results of this study are excellent in explaining the differences in PKH impact on iron supplement consumption during pregnancy between PKH beneficiary and control group (see Table 7 below).

TABLE VII. SENSITIVITY OF ATT ESTIMATION RESULTS

Gamma	Sig^+	Sig^-	$t\text{-}hat^+$	$t\text{-}hat^-$
1	0,0000***	0,0000***	72,0	87,5
1,1	0,0000***	0,0000***	65,0	92,5
1,2	0,0000***	0,0000***	62,0	97,0
1,3	0,0000***	0,0000***	60,0	104,0
1,4	0,0000***	0,0000***	55,5	106,0
1,5	0,0000***	0,0000***	55,0	110,0
1,6	0,0000***	0,0000***	51,0	115,0
1,7	0,0000***	0,0000***	50,0	120,0
1,8	0,0000***	0,0000***	47,5	125,0
1,9	0,0000***	0,0000***	46,0	127,5
2	0,0000***	0,0000***	45,0	130,0

Asterisks show statistical significance levels *10%, **5%, ***1%

Source: calculated from IFLS wave 5

e) Average treatment effect on treated: Testing the main hypothesis in this study is based on the results of the average treatment effect on treated (ATT) as shown in Table 7. This study uses NN matching algorithm with replacement. However, for robustness check the researchers also included the results of ATT estimation by other algorithms i.e. Kernel (normal) and NN without replacement with Caliper (0.25). From Table 8 it can be seen that the three matching algorithms result in almost equal estimation of ATT.

TABLE VIII. ROBUSTNESS CHECK

Algorithm	ATT	t-statistic
NN with replacement	96,8978	6,38***
Kernel (normal)	95,0565	6,13***
NN without replacement with Caliper (0.25)	98,0981	11,83***

Asterisks show statistical significance levels * 10%, ** 5%, ***1%

Source: calculated from IFLS wave 5

This study found empirical evidence that PKH has a positive effect on the consumption of iron supplementation among beneficiary groups. With a t-stat result of 6.38 indicates that the impact of PKH on beneficiary groups is significant at 1% level of significance. The findings in this study differ from those of World Bank [1]. Through this research, PKH was shown to have an impact on the consumption of iron supplements during pregnancy in pregnant women in PKH beneficiary families on average by 96 tablets higher than pregnant women from non PKH beneficiaries.

The World Bank conducts research based on survey results conducted from October to December 2009. The PKH is only implemented in June-August 2007. The relatively short time of impact evaluation of the program implementation can result an underestimate measurement to the role of the program itself. In the World Bank study, this is one indication of the cause of the insignificant findings on the consumption of iron supplements during pregnancy [1].

It is stated in the research that early stages of PKH implementation still encountered several problems such as delayed distribution of funds, less effective socialization, human resources, health facility and education units that are not ready to implement and management information systems that have not operate well. In that period, 10% of puskesmas did not have adequate supplies of vaccine, supplements and vitamins [1]. Limitations of iron supplement stocks in health facilities justify the World Bank for the insignificant impact of PKH on the level of iron supplement consumption during pregnancy.

This study used survey data conducted from September 2014 until August 2015. In that year, PKH has been implemented for more than seven years, exceeding the business process period specified in the PKH guideline, which is six years. Thus the impact evaluation can produce measurements that do not underestimate the role of PKH.

Referring to World Bank research results, since 2012 the implementation of PKH has been improved. Better readiness is seen from the budget side. Government expenditures by the Ministry of Social for poverty alleviation through PKH are budgeted at 6.7 trillion rupiahs in the 2014 APBNP and grow 20.9% to reach 8.1 trillion rupiahs in APBN 2015. Budget adequacy ensures availability of iron supplements throughout the health facilities serving PKH. Up to the fourth quarter of 2016 there are 882 units of puskesmas in Indonesia providing iron supplements. This number grew 10.39% compared to 2015 (799 units). The availability of adequate health facilities in PKH target areas will increase the likelihood of increased prenatal visits by beneficiaries. The high implementation of the prenatal visits commitment is consistent with the high level of compliance of iron supplement consumption by beneficiaries which reached 77.42%.

The description above becomes the supporting data of empirical evidence found in this study. With the increasing consumption of iron supplements in pregnant women from PKH beneficiaries, it is hoped that it will trigger the decrease of maternal anemia, especially for poor people in Indonesia, so that it can support the achievement of SDGs target related to the decrease of MMR nationally.

IV. CONCLUSION

This study provides empirical evidence that PKH has an impact on the consumption of iron supplements during pregnancy in pregnant women who are PKH beneficiaries an average of 96 tablets higher than the total consumption of iron supplements of pregnant women who are non-beneficiaries.

The successful implementation of PKH is the responsibility and role of many parties. Therefore, tiered coordination, design innovation followed by periodic monitoring and evaluation through an integrated system is a mandatory requirement that must be improved from year to year. The creation of healthy living behavior through PKH can anticipate pregnancy disorders especially maternal anemia in beneficiaries. The decrease in the incidence of maternal anemia is expected to minimize the occurrence of BBLR, neonatal death and maternal mortality, so that in the long term can support the achievement of SDGs target related to MMR in Indonesia.

V. LIMITATION AND SUGGESTION

Because of the limitations of the variables found in wave IFLS 5, further research can consider the following points.

- Add potential outcome variables in the form of classification of anemia in pregnant women (mild, moderate, severe) so that the impact of PKH can be measured in more detail in each prevalence of anemia that occurs in pregnant women in Indonesia.
- Adding the poverty indicator control variable in the form of the amount of savings and consumption of clothing in one year originating from own income, in order to better represent the characteristics of the family in obtaining the possibility of becoming PKH beneficiaries.

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