

# Changes in Determinants and Equity of Family Planning Utilization after the Implementation of a National Health Insurance Policy in Indonesia: A Secondary Analysis of The 2012-2016 National Socio-Economic Survey of Indonesia

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## Research article

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## Abstract

**Background:** The Indonesian government has been implementing the National Health Insurance Policy (*Jaminan Kesehatan Nasional*-JKN) since 2014. The utilization of family planning service is one of the programs to increase maternal and child health status that is included in the benefit package in JKN. This study aimed to describe determinants and to evaluate JKN based on equity indicators, especially in family planning services.

**Methods:** Data were obtained from the 2012-2016 National Socio-Economic Survey (SUSENAS) of Indonesia. Contraceptive Prevalence Rate (CPR) and Long-acting contraceptives (LACs) use were used as indicators to evaluate family planning utilization. Chi-square and logistic regression tests were used to analyze the data. Respondents were married women between 15 and 49 years of age.

**Results:** There was no progress in CPR after the implementation of JKN. At the national level, CPR decreased within five years (2012-2016). Decreasing in urban areas and in the group that does not have health insurance were more than in rural areas and in the group that has health insurance. Utilization of non-LACs, especially injection (56%-57%) and pill (21%-24%), were still high within 2012-2016. At the national level, LACs use increased 3.18% between 2012-2016 (15.54%-18.72%). Increasing in urban areas and in the group that has subsidized health insurance were more than in rural areas and in the group that does not have subsidized. In 2016, the geography factor (rural-urban) and household economic status associated negatively with the use of overall contraceptive methods ( $p < 0.05$ ). Conversely, all the determinants were positively associated with LACs use ( $p < 0.05$ ).

**Conclusions:** Up to 2016, the JKN program did not increase CPR. Conversely, the JKN program obtained only small increases in LACs use. LACs use in rural areas is less than in urban areas. JKN program can increase LACs use in the group that has subsidized health insurance. CPR and LACs coverage could increase through health system improvement, and the societal norms approach. Health system improvement is operationalized through improving supply-side and regulations, increasing coordination among multiple agencies in the family planning program.

## Background

In 2015, the Maternal Mortality Ratio (MMR) in Indonesia was reported 305 per 100,000 live births, while Infant Mortality Rate (IMR) was reported at 22.23 per 1000 live births [1]. This achievement is not yet in line with the target of the Millennium Development Goals (MDGs). The target of MMR in Indonesia is 110 per 100,000 live births in 2015, while IMR is 19 per 1000 live births [2]. After MDGs finished in 2015, all United Nations Member States adopted the 2030 agendas for sustainable development. To achieve the third goal in Sustainable Development Goals (SDGs) viz. every country reaches MMR less than 70 per 100,000 live births and IMR less than 12 per 1000 live births in 2030 [3], Indonesia has been implementing many programs that are related with maternal and child health.

The family planning program is one of the ways to increase maternal and child health. Ensuring access to contraceptive use contributes to the success of the family planning program. Contraceptive use through reduction of fertility reduces maternal and neonatal mortality [4,5]. Contraceptive use, especially Long-acting contraceptives (LACs) methods, prevents unintended pregnancy while reducing abortions, as shown by prior research [6].

The success of the family planning programs could be evaluated based on the Contraceptive Prevalence Rate (CPR) and LACs use. Beginning in 1976, when the role of the national population and family planning board (*Badan Koordinasi Keluarga Berencana Nasional*, or BKKBN) was powerful, the family planning program in Indonesia showed a significant success. During 1976-2002, CPR increased from 26% to 60%. After 2002, in the decentralization era, CPR increased very slowly and tended to stagnant between 2002-2012. Moreover, CPR tended to decrease after 2012 [1,7–10]. The target of CPR in the 2015-2019 Indonesian national development is 66%, while the target of LACs use is 23.5% [11]. One of the obstacles to accessing family planning programs is finances, especially for the poor. To reduce the financial barrier, the Indonesian government has been implementing a National Health Insurance Policy (*Jaminan Kesehatan Nasional*-JKN) since 2014 [12]. The family planning program is included in the benefit package in JKN [13]. JKN is a social health insurance and compulsory insurance that was implemented gradually to achieve universal coverage in 2019. In early 2014, 49% of the population had insurance coverage. In 2016, 66.46% of the population had insurance coverage. At the end of 2019, all Indonesian people are expected to be protected by health insurance [12–15]

One of the indicators used to assess the success of social health insurance is equity. It is consistent with one of the goals in SDGs, specifically to reduce the health gaps inside a country and between countries. Equity is defined as no number and/or difference of frequency of using health services based on socio-economic status [16]. In meeting this challenge, Indonesia, with 34 provinces confronts a wide diversity and divergence in maternal health status and maternal health service utilization.

Evaluation is needed to measure the influence of the JKN policy on utilization and equity progress of the family planning program. Data within five periods (2012-2016) enable us to analyze the progress of equity. Based on the National Socio-Economic Survey (*Survei Sosial Ekonomi Nasional*-SUSENAS) data, we aimed to investigate and describe the progress of utilization and equity in the family planning program. We describe the progress of contraceptive utilization before and after the implementation of the JKN. We analyze the equity of contraceptive utilization in difference of education, household economic status, and geography before-after the implementation of the JKN. We analyze the effect of the JKN on contraceptive utilization. To obtain the objectives, we use logistic regression in multivariable analysis. Health insurance ownership, education, household economic status, and geography factor (rural-urban and region) are determinants of contraceptive utilization (the use of overall contraceptive method and LACs use). We use the change of percentage and odds ratio during 2012-2016 to analyze the progress of utilization and equity in the family planning program. Findings from this study are expected to provide baseline information for Indonesia policymakers to improve JKN policy related to the family planning program.

## Methods

### Study design

In this research, a cross-sectional study was performed based on the national secondary database provided by SUSENAS. SUSENAS is one of the regular surveys conducted by the government of Indonesia through the Central Bureau of Statistics (*Badan Pusat Statistik*-BPS) every year. Interviewers collected data with a direct interview which used questionnaire. The BPS selects all the interviewers. The data contain information on the socio-economic conditions of society, including health conditions, education, fertility, family planning, and housing. SUSENAS surveys include, on average, 300,000 households every year that are spread over 34 provinces and 511 districts/cities in Indonesia. SUSENAS has been conducted since 1979. The sample design of the SUSENAS, which uses two stages one phase stratified sampling method, allows for the estimation of district-level coverage. Detailed information about the survey and the sampling design with census block allocation are available at <http://microdata.bps.go.id/mikrodata/index.php> (in Bahasa) [17].

### Study site

Indonesia consists of five main islands and 13,677 small islands. Until 2014, the number of provinces in Indonesia was 33 provinces. In 2015, Indonesia was divided into 34 provinces and 511 districts/cities. The five main islands in Indonesia are Sumatera, Java, Kalimantan, Sulawesi, and Papua. Sumatera, Java, Kalimantan are islands in the western areas of Indonesia. Sulawesi, Papua, and some small islands (Nusa Tenggara Timur, Nusa Tenggara Barat, Maluku) are islands in the eastern areas of Indonesia.

### PopulationSource population

The source population for this study was households that were included in the Indonesian National Socio-Economic Survey Data (SUSENAS) 2012-2016.

### Database population

Database population that was taken from SUSENAS 2012-2016 included households that had married woman (15-49).

### Study population

The study population included the married woman (15-49).

### Sample size

A national representative sample of 200,367 (2012), 195,092 (2013), 195,646 (2014), 193,245 (2015), 191,490 (2016) married woman (15-49) were selected for this study.

## Variables and definitions

Independent variables were health insurance ownership, education, household economic status, and geography factor. Dependent variables were the use of overall contraceptive method and LACs use by participants. Definition of the use of overall contraceptive method is the women aged 15–49 years, married, who are currently using, or whose sexual partner is using, at least one method of contraception, regardless of the method used. While, the definition of LACs use is the women aged 15-49 years, married, who are currently using, or whose sexual partner is using, at least one method of LACs methods, i.e. implant, intrauterine device (IUD), vasectomy, and tubal ligation. Definition of the CPR is the percentage of the use of overall contraceptive method.

Dependent variables in this research were dichotomous categorical form. In the use of overall contraceptive method, we used 0 for not a contraceptive user and 1 for a contraceptive user. In LACs use, we used 0 for not a LACs user and 1 for LACs user.

Health insurance ownership was scored as 1 for no health insurance or not having health insurance (reference), 2 for subsidized health insurance, and 3 for non-subsidized health insurance. The geography factor (rural-urban) was scored as 1 for household location in a rural area (reference) and 2 for household location in an urban area. The geography factor (region) was scored as 1 for household location in the Nusa-Maluku-Papua Region (reference), 2 for household location in the Sulawesi Region, 3 for household location in the Kalimantan Region, 4 for household location in the Sumatera Region, 5 for household location in the Java-Bali region. Respondents' education based on the ownership of the highest qualification. Score 1 referred to low education (illiterate-elementary school) (reference), 2 for moderate education (junior high school and senior high school), and 3 for high education (bachelor degree). Household socioeconomic status was measured using per-capita household expenditures (household expenditures in a month divided by the number of the household member). The household economics status was divided into five quintiles, from 20% the poorest until 20% the richest. The household economics status was scored as 1 for the poorest (reference), 2 for the poor, 3 for the moderate, 4 for the rich, and 5 for the richest.

## Statistical analysis

The analysis was done using Stata version 13.1. The bivariable analysis was performed with the chi-square ( $X^2$ ) test for categorical variables. The association between dependent and independent variables was measured using the odds ratio (OR), for which the 95% confidence interval (CI) was calculated. Variables with a significant association ( $p < 0.25$ ) were analyzed at the multivariable level. The multivariable analysis was performed with logistic regression with the determinant model. The Determinant model aimed to obtain a model consisting of all the independent variables that were considered best for predicting the occurrence of the dependent variable. In this modelling, all the independent variables were important and determinants.

## Ethics

The raw data of SUSENAS 2012-2016 were used for this study with permission from the Central Bureau of Statistics (BPS). Informed consent was obtained from all study participants by the BPS.

# Results

## The Trend in Contraceptive Used

The achievement in CPR during 2012-2016 has shown variation in every province. CPR in the eastern areas of Indonesia, especially Nusa Tenggara Timur, Papua Barat, Maluku, and Papua were less than in the western areas. After the implementation of the JKN in 2014, this situation did not change. In general, almost all the provinces decreased in CPR. At the national level, CPR decreased as much as 2.41%. (See Table 1).

Table 1. Percentage of the use of overall contraceptive method in 2012-2016

<b>Province</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2012-2016</b>
Bangka Belitung	67.5	69.69	66.98	67.03	69.53	2.03
Kalimantan Selatan	69.92	69.36	70.12	70.55	69.38	-0.54
Lampung	67.86	69.22	68.38	67.8	69.29	1.43
Sumatera Selatan	68.89	68.69	68.06	69.35	68.95	0.06
Bengkulu	70.34	71.39	70.38	69.2	68.71	-1.63
Kalimantan Tengah	70.9	72.61	71.81	69.19	66.3	-4.6
Kalimantan Barat	69.11	67.45	68.74	65.91	66.04	-3.07
Sulawesi Utara	69.59	66.42	67.92	67.96	65.92	-3.67
Jambi	68.69	68.75	68.2	65.11	65.03	-3.66
Java Timur	65.97	66.02	65.64	64.26	64.5	-1.47
Gorontalo	65.24	65.76	67.17	66.78	63.2	-2.04
Bali	66.68	65.45	66.49	62.23	63.18	-3.5
Nusa Tenggara Barat	63.99	64.67	63.81	64.4	62.86	-1.13
Java Barat	65.76	64.81	64.62	64.16	61.3	-4.46
Java Tengah	64.84	64.41	63.65	62.11	61.05	-3.79
Banten	62.23	61.27	61.81	60.65	59.97	-2.26
Sulawesi Tengah	62.17	61.33	62.01	60.05	58.81	-3.36
DI Yogyakarta	59.75	62.18	60.18	59.89	57.96	-1.79
Riau	57.78	58.58	57	54.59	55.97	-1.81
Kalimantan Timur	61.86	61.8	59.52	57.47	55.41	-6.45
Kepulauan Riau	57.93	55.99	54.45	55.15	54.13	-3.8
DKI Jakarta	59.21	58.78	56.38	56.09	53.15	-6.06
Sulawesi Tenggara	52.22	54.04	53.54	49.28	52.66	0.44
Sulawesi Barat	53.1	50.19	50.3	49.75	51.82	-1.28
Maluku Utara	53.22	51.95	52.67	49.6	51.7	-1.52
Sumatera Barat	53.02	52.49	53.3	50.63	51.28	-1.74
Sulawesi Selatan	52.89	52.86	53.38	50.06	50.06	-2.83
Aceh	53.02	52.74	52.38	46.53	49.45	-3.57
Sumatera Utara	48.18	48.71	48.22	45.78	45.81	-2.37
Nusa Tenggara Timur	40.55	43.57	44.24	40.33	43.7	3.15
Papua Barat	40.5	40.47	41.11	38.73	41.56	1.06
Maluku	37.2	38.11	39.7	39.54	36.87	-0.33
Papua	25.32	23.54	25.83	22.17	22.76	-2.56
<b>Total</b>	<b>59.44</b>	<b>59.19</b>	<b>59.02</b>	<b>57.39</b>	<b>57.03</b>	<b>-2.41</b>

The data showed that CPR declined every year (2012-2016) in all the regions. The decline in urban areas was more than in rural areas between 2012-2016. The decline in the group that did not have health insurance was more than in the group that did. The decline in the non-subsidized health insurance group or the rich group was more than in the subsidized health insurance group or the poor group. In 2013, there was an increase in contraceptive use in the subsidized health insurance group. (See Table 3)

Preference of non-LACs methods was more common than LACs method. While there was only a small increase in LACs use during 2012-2016, preference of contraceptive methods was still dominated by the pill and injection.

On the contrary, the achievement in LACs use during 2012-2016 has shown an increase in every province except Sulawesi Tenggara. Bali had the highest LACs use within five years. The highest growth was in Papua. At the national level, LACs use increased as much as 3.18% during 2012-2016. There was a rising trend after the implementation of JKN in 2014. (See Table 2)

Table 2. Percentage of LACs use in 2012-2016

<b>Province</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2012-2016</b>
Bali	39.59	36.38	37.62	39.84	39.89	0.3
Nusa Tenggara Timur	28.56	29.47	32.65	34.4	36.08	7.52
DI Yogyakarta	33.81	33.12	35.96	37.74	35.91	2.1
Gorontalo	30.79	29.38	30.68	32.49	32.01	1.22
Sumatera Barat	21.39	24.39	24.14	25.63	28.22	6.83
Sulawesi Utara	23.73	23.52	26.48	26.43	27.03	3.3
Java Tengah	21.24	22.54	22.94	24.06	24.87	3.63
Sumatera Utara	19.61	19.71	20.58	22.68	24.72	5.11
DKI Jakarta	19.09	21.71	21.94	24.82	24.32	5.23
Nusa Tenggara Barat	20.11	19.15	20.15	19.95	22.68	2.57
Java Timur	18.13	18.42	19.33	19.42	19.79	1.66
Bengkulu	17.31	17.55	17.92	19.57	19.2	1.89
Maluku Utara	12.54	16	16.21	13.62	18.9	6.36
Sumatera Selatan	11.57	11.44	13.46	14.79	17.51	5.94
Papua	9.58	9.63	9.66	11.73	17.16	7.58
Java Barat	15.32	14.64	14.81	17.23	16.86	1.54
Kepulauan Riau	11.35	14.45	12.33	13.08	15.35	4
Sulawesi Tenggara	14.71	14.96	15.96	12.74	14.54	-0.17
Sulawesi Tengah	10.67	13.51	14.91	13.42	14.53	3.86
Banten	11.01	12.16	11.73	12.13	14.36	3.35
Sulawesi Selatan	10.35	9.51	11.21	12.24	14.29	3.94
Maluku	12	13.44	13.48	16.02	14.05	2.05
Lampung	10.57	12.26	11.75	13.5	13.96	3.39
Kalimantan Timur	11.32	11.5	12.58	13.32	13.75	2.43
Riau	9.14	10.37	11.87	11.39	13.73	4.59
Papua Barat	6.88	8.94	10.08	11.27	12.66	5.78
Jambi	10.98	11.06	10.16	11.75	12.58	1.6
Sulawesi Barat	10.96	9.43	11.73	13.18	11.96	1
Aceh	5.82	5.9	6.75	8.43	9.65	3.83
Bangka Belitung	7.44	8.06	8.37	10.54	9.49	2.05
Kalimantan Tengah	6.38	6.13	6.51	7.02	8.98	2.6
Kalimantan Barat	6.39	6.94	8.38	7.01	8.78	2.39
Kalimantan Selatan	7.04	6.7	6.7	7.23	7.33	0.29
<b>Total</b>	<b>15.54</b>	<b>15.95</b>	<b>16.72</b>	<b>17.67</b>	<b>18.72</b>	<b>3.18</b>

Table 3. Bivariable Analysis: Factors determining the use of overall contraceptive method in 2012-2016

Variable	2012 (n=200.367)		2013 (n=195.092)		2014 (n=195.646)		2015 (n=193.245)		2016 (n=191.490)	
	% CU	p (sign.)								
<b>Health insurance ownership</b>										
No health insurance	60,12		58,65		59,16		58,42		57,83	
Subsidized health insurance	58,13	<0,001	60,47	<0,001	59,96	<0,001	57,89	<0,001	57,34	<0,001
Non-subsidized health insurance	59,07		58,11		57,00		54,47		55,62	
<b>Education</b>										
Low	58,06		60,86		57,89		57,59		48,14	
Moderate	62,21	<0,001	61,86	<0,001	61,58	<0,001	59,00	<0,001	61,61	<0,001
High	53,20		44,91		51,99		48,96		54,32	
<b>Household economic status</b>										
Very poor (q1)	59,98		60,57		61,11		59,61		60,04	
Poor (q2)	63,10		62,27		62,54		61,19		61,36	
Middle (q3)	61,99	<0,001	61,93	<0,001	61,70	<0,001	59,80	<0,001	60,15	<0,001
Rich (q4)	59,45		59,07		58,33		56,29		55,15	
Very rich (q5)	52,68		52,06		51,38		50,04		48,46	
<b>Geography (rural-urban)</b>										
Rural	59,21	0,016	59,04	0,14	59,27	0,005	58,25	<0,001	58,25	<0,001
Urban	59,75		59,37		58,64		56,19		55,32	
<b>Geography (Region)</b>										
Nusa-Maluku-Papua region	40,71		40,50		41,41		39,64		40,24	
Sulawesi region	58,34		57,75		58,36		56,10		55,89	
Kalimantan region	67,94	<0,001	67,77	<0,001	67,57	<0,001	65,81	<0,001	64,35	<0,001
Sumatera region	59,27		59,64		58,93		56,96		57,65	
Java-Bali region										
	64,88		64,46		64,03		62,75		61,67	

CU: Contraceptive user; sign.:significant.

LACs use in the eastern areas of Indonesia, and especially the Nusa-Maluku-Papua region indicated a rising trend during 2012-2016. LACs use in urban areas increased more than in rural areas during 2012-2016. LACs use in the group that has health insurance was more than in the group that did not. LACs use in the subsidized health insurance group showed a rising trend after the implementation of the JKN in 2014. (See Table 5)

Table 4. Multivariable Analysis : Logistic regression of factors determining the use of overall contraceptive method in 2012-2016

Variable	2012		2013		2014		2015		2016	
	<i>Coeff.</i>	OR(CI 95%)								
<b>Health insurance ownership</b>										
No health insurance (Ref.)										
Subsidized health insurance			0,08	1,08 (1,06-1,10)	0,05	1,05 (1,03-1,08)	0,03	1,03 (1,01-1,05)	0,04	1,04 (1,02-1,06)
Non-subsidized health insurance	0,08	1,09 (1,06-1,11)	0,18	1,20 (1,17-1,23)	0,06	1,06 (1,03-1,09)			0,06	1,07 (1,04-1,09)
<b>Education</b>										
Low (Ref.)										
Moderate	0,22	1,24 (1,22-1,27)	0,09	1,10 (1,07-1,12)	0,21	1,23 (1,21-1,26)	0,12	1,13 (1,11-1,15)	0,45	1,58 (1,53-1,62)
High			-0,44	0,63 (0,62-0,65)			-0,09	0,90 (0,87-0,93)	0,32	1,37 (1,33-1,42)
<b>Household economic status</b>										
Very poor (q1) (Ref.)										
Poor (q2)	0,03	1,03 (1,00-1,06)								
Middle (q3)	-0,05	0,94 (0,91-0,97)	-0,05	0,94 (0,91-0,96)	-0,08	0,92 (0,89-0,94)	-0,07	0,92 (0,90-0,95)	-0,08	0,91 (0,89-0,94)
Rich (q4)	-0,19	0,82 (0,80-0,85)	-0,18	0,83 (0,80-0,85)	-0,24	0,77 (0,75-0,79)	-0,23	0,79 (0,77-0,81)	-0,26	0,76 (0,74-0,78)
Very rich (q5)	-0,5	0,60 (0,58-0,62)	-0,45	0,63 (0,61-0,65)	-0,54	0,58 (0,56-0,59)	-0,45	0,63 (0,61-0,65)	-0,54	0,58 (0,56-0,59)

Variable	2012		2013		2014		2015		2016	
	<i>Coeff.</i>	OR(CI 95%)								
<b>Geography (rural-urban)</b>										
Rural (Ref.)										
Urban	-0,05	0,94 (0,92- 0,96)	-0,03	0,97 (0,95- 0,99)	-0,08	0,91 (0,89- 0,93)	-0,13	0,86(0,85- 0,88)	-0,15	0,85 (0,84- 0,87)
<b>Geography (Region)</b>										
Nusa-Maluku-Papua region (Ref.)										
Sulawesi region	0,7	2,02 (1,95- 2,09)	0,64	1,90 (1,84- 1,97)	0,68	1,98 (1,91- 2,05)	0,66	1,94 (1,88- 2,01)	0,59	1,80(1,74- 1,86)
Kalimantan region	1,21	3,37(3,24- 3,50)	1,17	3,22 (3,10- 3,35)	1,2	3,33 (3,21- 3,46)	1,18	3,26 (3,14- 3,39)	1,05	2,87 (2,76- 2,98)
Sumatera region	0,77	2,16 (2,10- 2,23)	0,76	2,13 (2,07- 2,20)	0,74	2,10 (2,04- 2,17)	0,73	2,09 (2,03- 2,15)	0,7	2,01 (1,95- 2,07)
Java-Bali region	1	2,74 (2,66- 2,82)	0,96	2,61 (2,54- 2,70)	0,97	2,65 (2,57- 2,73)	1,02	2,78(2,69- 2,86)	0,88	2,43 (2,35- 2,50)

Coeff. : Coefficient ; OR: Odds Ratio; CI:Confidence Interval; Ref.:Reference; q:quantile.

Table 5. Bivariable Analysis: Factors determining the LACs use in 2012-2016

Variable	2012 (n=119.096)		2013 (n=115.450)		2014 (n=115.454)		2015 (n=110.894)		2016 (n=109.207)	
	% LACs use	p (sign.)								
<b>Health insurance ownership</b>										
No health insurance	13,29		14,02		14,55		14,86		15,47	
Subsidized health insurance	15,34	<0,001	15,55	<0,001	16,28	<0,001	17,3	<0,001	19,09	<0,001
Non-subsidized health insurance	21,03		21,63		22,78		24,42		22,93	
<b>Education</b>										
Low	13,33		13,48		14,29		14,71		16,39	
Moderate	15,7	<0,001	16,36	<0,001	16,89	<0,001	18,14	<0,001	15,88	<0,001
High	27,68		24,93		28,99		30,83		23,1	
<b>Household economic status</b>										
Very poor (q1)	15,09		14,99		16,04		17,31		18,3	
Poor (q2)	13,39		13,92		14,73		15,23		16,24	
Middle (q3)	13,43	<0,001	13,84	<0,001	14,82	<0,001	15,62	<0,001	16,08	<0,001
Rich (q4)	14,58		15,06		15,5		16,67		18,03	
Very rich (q5)	22,18		23,04		23,62		24,67		26,44	
<b>Geography (rural-urban)</b>										
Rural	13,39	<0,001	13,77	<0,001	14,49	<0,001	15,07	<0,001	16,27	<0,001
Urban	18,47		19		19,92		21,4		22,33	
<b>Geography (Region)</b>										
Nusa-Maluku-Papua region	17,22		18,2		19,24		20,01		22,83	
Sulawesi region	15,84		15,8		17,61		17,59		18,43	
Kalimantan region	7,67	<0,001	7,68	<0,001	8,37	<0,001	8,52	<0,001	9,59	<0,001
Sumatera region	13,04		13,83		14,32		15,8		17,2	
Java-Bali region										
	19,57		19,87		20,4		21,62		21,98	

## Multivariable Analysis

All the determinants of the use of overall contraceptive method and LACs use showed the significance level ( $p$ ) < 0,25. It means all the determinants will be analyzed at multivariable analysis.

## Factors determining the use of overall contraceptive method

There was almost no difference in likelihood to the use of overall contraception method or family planning among groups that do not have health insurance, have subsidized health insurance, and that have non-subsidized health insurance. This phenomenon occurred before and after the JKN implementation (table 4).

Contribution of education level had increased to the use of overall contraception method after the implementation of the JKN. In 2016, groups with moderate education had the likelihood of the use of overall contraception methods or family planning of 1.58 times and 1.37 times compared to those with low education.

The Odds Ratio (OR) value of the middle, rich and very rich economic status group compared to the very poor was <1. It explained that the higher level of household economy, the lower the likelihood of the use of overall contraception method.

The OR value of groups living in urban areas compared to rural areas was  $<1$ . It explained that groups living in urban areas had less likelihood of the use of overall contraception method than those living in rural areas. There was no gap in family planning services between urban and rural areas, even the coverage of family planning services in rural areas was increasing.

Likelihood of the use of overall contraception method was higher in the Sulawesi, Kalimantan, Sumatra, and Java-Bali regions ( $> 1$ ) compared to the Nusa-Maluku-Papua region. Likelihood of the use of overall contraception method in the Java-Bali region was 2.43 times compared to the Nusa-Maluku-Papua region. The most dominant factors influencing the use of overall contraception method were the geography factor (region) and education.

### **Factors determining the LACs use**

The contribution of health insurance ownership to LACs use had increased after the JKN implementation. Groups that had subsidized and non-subsidized health insurance had 1.31 and 1.36 times more likely to LACs use than groups that do not have health insurance.

The moderate-educated group had no difference likelihood to LACs use with the less educated group. Groups that had higher education had the likelihood to the LACs use 1.8 and 1.25 times compared to those with low education after the JKN implementation.

There was almost no difference in the pattern of LACs usage in groups with different economic status before and after the JKN implementation. The real difference in the use of LACs was indicated in the very poor and very rich groups. Before the JKN, very rich groups had the likelihood to LACs use of 1.40 and 1.62 times compared to the very poor. After the JKN, this phenomenon was almost the same, which was 1.46-1.44 times.

After the JKN implementation, the likelihood to LACs use in groups living in urban areas increased compared to those living in rural areas (1.16-1.18 times), while before the JKN it was 1.12 and 1.15 times.

Before the JKN, only the Java-Bali region had the OR  $> 1$  in LACs use compared to the Nusa-Maluku-Papua region. Other regions, namely Sulawesi, Kalimantan, and Sumatera, have a lower likelihood of LACs use (OR  $<1$ ) showed a declining trend after the JKN implementation. The Java-Bali region also showed a declining trend and had a lower likelihood than the Nusa-Maluku-Papua region after the JKN implementation.

Table 6. Multivariable Analysis: Logistic regression of factors determining the LACs use in 2012-2016

Variable	2012		2013		2014		2015		2016	
	Coeff.	OR(CI 95%)	Coeff.	OR(CI 95%)	Coeff.	OR(CI 95%)	Coeff.	OR(CI 95%)	Coeff.	OR(CI 95%)
<b>Health insurance ownership</b>										
No health insurance (Ref.)										
Subsidized health insurance	0,2	1,22 (1,17- 1,27)	0,19	1,21 (1,16- 1,26)	0,17	1,19 (1,15- 1,24)	0,21	1,23 (1,19- 1,28)	0,27	1,31 (1,26- 1,36)
Non-subsidized health insurance	0,27	1,32 (1,26- 1,37)	0,25	1,29 (1,23- 1,35)	0,26	1,30 (1,24- 1,36)	0,35	1,42 (1,36- 1,48)	0,3	1,36 (1,30- 1,41)
<b>Education</b>										
Low (Ref.)										
Moderate	0,08	1,08 (1,04- 1,12)	0,12	1,13 (1,09- 1,17)	0,1	1,11 (1,07- 1,15)	0,14	1,15 (1,11- 1,19)	-0,08	0,91 (0,86- 0,96)
High	0,55	1,74 (1,64- 1,85)	0,48	1,61 (1,53- 1,70)	0,58	1,8 (1,69- 1,91)	0,62	1,87 (1,76- 1,98)	0,22	1,25 (1,18- 1,32)
<b>Household economic status</b>										
Very poor (q1) (Ref.)										
Poor (q2)	-0,09	0,91 (0,87- 0,95)					-0,12	0,88 (0,83- 0,92)	-0,08	0,91 (0,87- 0,95)
Middle (q3)	-0,09	0,91 (0,87- 0,95)					-0,1	0,90 (0,85- 0,94)	-0,08	0,91 (0,87- 0,95)
Rich (q4)			0,078	1,08 (1,03- 1,13)			-0,07	0,92 (0,87- 0,97)		
Very rich (q5)	0,34	1,40 (1,34- 1,47)	0,48	1,62 (1,55- 1,70)	0,38	1,46 (1,40- 1,52)	0,21	1,23 (1,17- 1,3)	0,37	1,44 (1,38- 1,51)

Variable	2012		2013		2014		2015		2016	
	Coeff.	OR(CI 95%)								
<b>Geography (rural-urban)</b>										
Rural (Ref.)										
Urban	0,11	1,12 (1,08-1,16)	0,14	1,15 (1,11-1,19)	0,15	1,16 (1,12-1,20)	0,19	1,22 (1,17-1,26)	0,17	1,18 (1,15-1,23)
<b>Geography (Region)</b>										
Nusa-Maluku-Papua region (Ref.)										
Sulawesi region	-0,08	0,91 (0,85-0,97)	-0,13	0,87 (0,82-0,93)	-0,13	0,87 (0,83-0,91)	-0,19	0,82 (0,78-0,86)	-0,23	0,79 (0,74-0,84)
Kalimantan region	-0,95	0,38 (0,35-0,41)	-1,01	0,36 (0,33-0,39)	-1	0,35 (0,33-0,37)	-1,05	0,34 (0,32-0,37)	-1,03	0,35 (0,32-0,38)
Sumatera region	-0,31	0,73 (0,69-0,77)	-0,31	0,73 (0,69-0,77)	-0,39	0,67 (0,64-0,70)	-0,32	0,71 (0,69-0,74)	-0,34	0,70 (0,67-0,74)
Java-Bali region	0,14	1,16 (1,09-1,22)	0,1	1,10 (1,04-1,17)					-0,06	0,93 (0,88-0,98)

Coeff. : Coefficient ; OR: Odds Ratio; CI:Confidence Interval; Ref.:Reference; q:quantile.

## Discussion

The JKN policy did not increase the use of overall contraception methods, but the JKN policy could increase LACs use. The influence of health insurance ownership, socio-economic status, and geography factor, on the use of overall contraception method and LACs use, indicated some contrary results. A negative correlation between socio-economic status and the use of overall contraception method was found, while in LACs use was a positive correlation. There was a tendency to increase the use of overall contraception method in rural areas after the implementation of the JKN. On the contrary, LACs use increased more in urban areas than in rural areas after the implementation of the JKN. The results of this research showed that the JKN did not increase CPR at the national level, and it also did not increase equity in family planning use among regions, especially the eastern areas of Indonesia.

This research had some limitations, which need to be considered when interpreting the results. First, not all the variables that should be considered exist in the secondary data. Some variables that could have influenced CPR and LACs use are not available in SUSENAS data, such as availability of health facilities and contraceptives, and the distance of health facilities from the locality of residence. We only identified four determinants that contribute to the use of overall contraception method or CPR and LACs use. Second, we only used a before-after approach with a cross-sectional design to measure equity of family planning utilization. It is one of the standard methods used in health impact assessment. Third, this study only measured equity in utilization of the use of overall contraception method and LACs use. Equity in health financing could not be measured because of data limitations.

Even though our study has some limitations, data with large samples in 2012-2016 were able to measure the change of equity every year and the change of socio-economic determinants and the geography factor that influence the use of overall contraception method or CPR and LACs use.

One of the objectives of the national health insurance implementation is to ensure all people get access to health services. Reducing the financial barriers to access health services will increase health services utilization. The JKN has not increased the use of overall contraception method that are included in the benefit package in JKN. Moreover, there was a decreasing trend of the use of overall contraception method who have health insurance after the implementation of the JKN. Research by Teplitskaya et al. supports this finding [7]. After 2002, CPR tended to decrease in the decentralization era because of the reduction in funding of family planning

and the diminishing role of BKKBN as the leading service provider [10]. The problem continues after implementation of the JKN since there are now multiple agencies that have a lack of coordination. BKKBN, the Ministry of Health (MOH), the National Health Insurance Agency (*Badan Pelaksanan Jaminan Sosial-Kesehatan or BPJS-K*), local government are agencies that have a role in the family planning program. In other words, there is fragmentation among multiple agencies [18].

The central and local governments provide drugs and contraception, while BKKBN has the role in fulfilling and distributing it in health service centers. BPJS finances the tariff of family planning services in health service centers based on the laws of the Indonesian Health Ministry [12,13,19–21]. Besides the lack of coordination among multiple agencies, the reducing trend of CPR after the implementation of the JKN can occur because of the weak regulations. Some regulations related to family planning programs in JKN must be evaluated. Some of them are Non-capitation tariff for IUD and sterilization is assumed too low, no limitation to births, no claim for IUD in hospital, and no guarantee for sterilization after delivery [22]. When the government implemented childbirth insurance, called *Jaminan Persalinan-Jampersal*, in 2011, there were some provisions to encourage the participants enrolled in *Jampersal* to join in post-partum family planning. This law did not continue in the JKN era [23].

The JKN policy did not increase equity in contraceptive use among regions. The achievement of CPR in the eastern areas of Indonesia was still lower than in the western areas of Indonesia. However, LACs coverage in the eastern areas of Indonesia increased more than in the western areas of Indonesia. The new policy that encourages LACs use coverage in eastern Indonesia can be a solution to increase CPR in the eastern areas of Indonesia. To achieve it, the government must strengthen the quality and equitable distribution of the supply side. Gaps in infrastructure, health facilities, and health workers between the western and eastern areas of Indonesia have already been observed in the first year of the implementation of the JKN [18]. This problem continued to occur after the implementation of the JKN.

Some countries that had implemented maternal health insurance for deliveries and mothers' postpartum care through universal health coverage agenda showed different results. Mauritania had implemented the obstetrical risk insurance scheme (ORI) in 2002, but the effects of the ORI exhibited decreasing use of family planning [24]. The implementation of universal health coverage (UHC) in Latin America showed that m-CPR has continued to increase in the majority of Latin America Countries. However, disparities remain, especially for marginalized groups [25]. In the United States (US), the implementation of Affordable Care Act (ACA) indicated a significant result in increasing of use of overall contraceptive, in the use of Long-Acting Reversible Contraceptives (LARCs), in decreasing of the births, in reducing of the proportion of births from unwanted pregnancies, and in reducing an inequality among insured women [6,26–35].

Not only health insurance ownership but also socio-economic status and the geography factor contributed to the use of overall contraception method. Household economic status showed a significant result, but the association was a negative correlation. It means the higher household economic status, the less contraceptive use. These results contrast with the prior research that used the 2002-2003 and 2007 of Indonesia Demographic and Health Survey (IDHS) Indonesia and some other studies. The 2002-2003 and 2007 of IDHS indicated that better-off women were more likely to use family planning than were the poor women [9,10]. The conflicting results in two periods, between 2002-2007 and 2012-2016, indicated that there is a significant transformation in the society. We assumed that there is a shift of values in the society in Indonesia, but this assumption must be proved through further qualitative research. The same results were shown by studies in Bangladesh and Cameroon [36–38]. However, the studies in North Ethiopia and Malawi showed that education contributes significantly to the use of overall contraception method [39,40]. The gap between urban and rural areas in use of overall contraception method decreased after the implementation of the JKN. Moreover, in 2016, the result showed that married women in rural areas were more likely to the use of overall contraception method than were married women in urban areas. In other words, the JKN contributed to decreasing inequity in use of overall contraception method between urban and rural areas. However, an inequity gap between provinces in the western areas and the eastern areas of Indonesia has remained.

On the contrary with determinants of the use of overall contraception method, the influence of health insurance ownership, socio-economic status, and geography factor, on LACs use indicated significant results, which were a positive correlation. The JKN policy could increase LACs use, especially in the group who has subsidized health insurance and the Nusa-Maluku-Papua region, but an inequity has remained between urban and rural areas. Most studies indicated that health insurance had made a significant contribution to increasing of LACs use [6,26–30,32–35,41–46]. The contribution of LACs use in the success of the family planning

program is very crucial, but until 2016, LACs use coverage in Indonesia was only 18.72%. To increase contraceptive use, especially LACs use, the Indonesian government must evaluate the prior policies related to family planning policies.

Health system improvement related to family planning programs must be prioritized. Some specific actions must be done. First, the government must strengthen the quality and equitable distribution of the supply side for the family planning program, especially in the rural and eastern areas of Indonesia. Second, strengthening of the role and coordination among multiple agencies in the family planning program must be implemented. Third, improving regulations is needed related to family planning programs in the JKN, for example, increasing of non-capitation tariff for IUD and sterilization; providing of IUD service in hospital; and encouraging of family planning after post-partum. Some studies had also suggested increasing family planning among postpartum women [47,48]. Besides improving the health system, the shift of values in the Indonesian society that encourages acceptance of family planning must be evaluated. The social approaches based on values and norms in the society are needed to increase contraceptive use, especially LACs use.

The married women between 15 and 49 years of age who are covered by National Health Insurance (NHI) must be ensured to get the optimal services of family planning. Therefore, the supply-side of family planning programs, ability to manage by multiple agencies in family planning programs and the regulations related to family planning in NHI must be properly prepared before and during the implementation of NHI. Every kind of health service that is included in the NHI package has a unique problem in its implementation. As a result, every health service must have appropriate regulations that are suitable to overcome the problem.

## Conclusions

NHI called the JKN, that has been implemented in Indonesia since 2014 did not increase the use of overall contraception methods or CPR. Instead, the use of overall contraception methods had a decreasing trend after the implementation of the JKN. On the contrary, JKN could increase LACs use, although only slightly, while there was a significant association of all determinants with LACs use which was a positive correlation.

Health system improvements and implementation of innovative social approaches provide some solutions to increase both the use of overall contraception methods and LACs use. Integrating health system improvements through the strengthening of supply-side, coordinating multiple agencies in family planning program, and enacting effective regulations and policies are needed. The success of the family planning implementation in Indonesian society cannot be separated with values and norms in society, so the societal norms approach must become one of the policies for the success of family planning programs.

## Abbreviations

NHI: National health insurance; MMR: Maternal mortality ratio; IDHS: Indonesia Demographic health survey; SUSENAS: Survei sosial ekonomi nasional; JKN: Jaminan Kesehatan Nasional; BPS: Badan Pusat Statistik; LACs: Long-Acting Contraceptives; CPR: Contraceptive Prevalence Rate; IUD: Intra-Uterine Device.

## Declarations

### Ethics approval and consent to participate

We used secondary data. The raw data of SUSENAS 2012-2016 were used for this study with permission from the Indonesian Central Bureau of Statistics (*Biro Pusat Statistik*-BPS). Informed consent was obtained from all study participants by BPS. Participants were married women between 15 and 49 years of age. The Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine Gadjah Mada University, Indonesia states that documents (the research protocol) do not need approval letter of The Medical and Health Research Ethics Committee (MHREC) (Ref: KE/FK/1151/EC/2017).

### Consent for publication

Not applicable

### Availability of data and material

The data that support the findings of this study are available from the Indonesian Central Bureau of Statistics (BPS) but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of the Central Bureau of Statistics (BPS).

### Competing interests

The authors declare that they have no competing interests.

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### Authors' contributions

SKN and LT conceptualized the study. SKN prepared the first draft of the manuscript. SKN acquired the raw data for analysis. YM played a major role in structuring arguments and smoothing out the text. LT contributed to conceptualizing and conceived the idea for the paper. All authors read and approved the final manuscript.

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