Early Implementation of Universal Health Coverage Among Hypertension Subjects in Sleman District of Yogyakarta

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ABSTRAK

Tujuan: *untuk mengevaluasi angka partisipasi jaminan kesehatan nasional (JKN) dan dampaknya terhadap subyek hipertensi di daerah pedesaan Kabupaten Sleman-Yogyakarta pada tahap implementasi awal.* ***Metode:*** *survei epidemiologi terkait implementasi JKN merupakan suatu studi potong lintang analitik cluster random sampling. Kriteria subyek umur 30-85 tahun, tidak sedang hamil, dan menandatangani informed-consent. Subyek dikelompokkan berdasarkan adanya jaminan kesehatan dan dianalisis menggunakan chi-square statistik untuk prevalensi, kesadaran, terapi, dan pengendalian hipertensi. Variabel tambahan BMI, pendidikan, pekerjaan, penghasilan, merokok, pengaturan diet, aktivitas fisik, dan fasilitas kesehatan dikelompokan menjadi data binomial dan dianalisis dengan chi-square berdasarkan adanya jaminan kesehatan.* ***Hasil:*** *dari 926 subyek sebanyak 602 (65,0%) memiliki jaminan kesehatan termasuk 9,2% JKN-BPJS. Kelompok dengan dan tanpa jaminan kesehatan tidak berbeda secara signifikan dalam prevalensi hipertensi, profil umur, tekanan darah, dan proporsi variabel tambahan (p>0,05) kecuali pada merokok dan aktivitas fisik. Pada subyek dengan tekanan darah tinggi (n=446), subyek tanpa jaminan kesehatan memiliki kesadaran dan terapi yang lebih rendah berturut-turut: p<0,02; OR:0,60 (CI95%:0,39-0,91): p<:0,03; OR:0,50 (CI95%:0,27-0,94): tetapi tidak berbeda dalam pengendalian tekanan darah (p>0,05).* ***Kesimpulan:*** *angka partisipasi JKN relatif rendah sebesar 9,2%. Pada sub-kelompok dengan tekanan darah ≥140/90mmHg, subyek tanpa JKN cenderung memiliki proporsi kesadaran dan terapi yang lebih rendah dibandingkan dengan yang memiliki JKN (p<0,05).*

Kata kunci: *jaminan kesehatan nasional, hipertensi, kesadaran, terapi.*

ABSTRACT

Aim: *to evaluate the participant rate of the new universal health coverage (UHC) and its impact on the hypertensive subjects from the rural area in the Sleman-District of Yogyakarta during the early implementation.* ***Methods:*** *this epidemiological survey of the new UHC implementation was included as an analytical cross-sectional study done with cluster random sampling. The subject criteria were aged 30-85 year, not in pregnancy, and signed the informed-consent. Subjects were grouped based on the health coverage disparity and analyzed with chi-square statistics for the hypertension prevalence, awareness, therapy, and control. The additional variables of BMI, education, occupation, income, smoking, diet control, physical activity, and health facilities were grouped into binomial data and analyzed based-on the health coverage disparity.* ***Results:*** *of 926 total subjects, 602 (65.0%) subjects had the health coverage including 9.2% of the new UHC. The groups of with and without health coverage were not significantly different in hypertension prevalence, the profile of age, blood pressure, and the proportion of the other variables (p>0.05) except for smoking and physical activities. In the high blood pressure sub-group (n=446), the subjects without health coverage had lower proportion of the hypertension awareness p<0.02; OR: 0.60 (CI95%:0.39-0.91) and therapy p<0.03; OR: 0.50 (CI95%:0.27-0.94), but not in*

the blood pressure control (p>0.05). ***Conclusion:*** *the participant rate of new UHC was relatively low at 9.2%. Among the subgroup with ≥140/90mmHg blood pressure, the subjects without health coverage were more likely to have lower hypertension awareness and suboptimal therapy than those with the health coverage program.*

Key words: *universal health coverage, hypertension, awareness, therapy.*

INTRODUCTION

General Assembly of United Nations declared a resolution to urge the universal health coverage (UHC) implementation in all countries in the end of 2012.[1] As a response to the resolution, on the first of January 2014 the UHC of BPJS (Badan Penyelenggara Jaminan Sosial or Social Security Administrative Body) was initiated in Indonesia. Besides the voluntary health insurance, various health coverage schemes administered by different government institutions were available for the certain group of population in Indonesia. The health coverage schemes will be merged into single UHC by the year 2019.[2]

Some studies in cardiovascular diseases (CVD) showed the advantages of health coverage or insurance. The Medicare program among the subjects >65years improved the control of hypertension, hyperlipidemia, and diabetes significantly. There was no difference within the variable of race, ethnicity, and socioeconomic status.[3] In the similar study, the subjects with insurance were more likely to receive antihypertensive medicine, to control the blood pressure, and to have higher visit to health professionals.[4]

Inversely, the uninsured 19-64 years old subjects received less therapy and achieved lower control of the risk factors, although the prevalence of hypertension and hyperlipidemia was similar between groups.[5] The outpatients with coronary artery disease but without insurance were less likely to obtain evidence-based therapy.[6] The uninsured subjects had also significantly higher incidence of stroke and mortality, less likely to have physical examination, more likely to be unaware of hypertension and hyperlipidemia, and to have uncontrolled blood pressure;[7] and less access to hypertension therapy induced the CVD risk and costly hospital admission.[8]

High prevalence and inadequate therapy of hypertension were found in Indonesian >40 year population.[9] As so-called "Rule of Halves" phenomena in hypertension, the prevalence of hypertension was a half of the population; a half of hypertensive population was unaware of the disease; a half of the aware population did not receive therapy; and a half of those with therapy had bad control of blood pressure.[10-11]

Based on the above description, the availability of UHC was more likely to have a positive role among hypertension subjects in rural areas. This study was aimed at evaluating the participant rate of the new UHC during the early implementation of the program and the impact of the UHC on the hypertensive subjects in rural area in the Sleman-District of Yogyakarta. The hypothesis was the health coverage significantly affected the hypertension prevalence, awareness, therapy, and blood pressure control on the hypertensive subjects.

METHODS

This study was done with analytical cross-sectional method in a rural area. The subjects were screened and grouped based on the ownership of health coverage. The demographic profiles, blood pressure, and proportion of prevalence, awareness, therapy, and control of hypertension were compared between groups. The survey was done in April to June 2015.

Subjects

The subjects with the age of 30-85 years and signed the informed-consent were included; meanwhile the subjects in pregnancy and inability to communicate verbally were excluded.

Sampling Method

The study sites were villages selected with multiple-stage random sampling in the Sleman-District of Yogyakarta. Of 17 sub-

districts (kecamatan), there were four sub-districts (23.5%) were randomly sampled within Sleman-district. In further stage sampling, each sub-district was randomly chosen two sub-sub-districts (kelurahan), and in final stage sampling, one study village and one substitute village were randomly picked from each sub-sub-district. The substitute villages would replace the study village, if the study villages were not applicable for the research. Two of eight study sites were from the substitute villages.

Sampling Size

The study observed the multi-steps of "rule of halves" in hypertension. The minimum sample size for evaluating hypertension control within the population received therapy was 97 subjects. The sample size was obtained with the formula applied for unknown proportion in the population, i.e. Zα2XPXQ)/d2; whereas Zα=0.05, P, Q, and d were 1.96, 0.5, 0.5, and 0.1 respectively.[12] The result was rounded to 100 subjects. Therefore, minimum sample size of 200, 400 (α=0.05; β=0.19), and 800 subjects were needed to observe the proportion of therapy, awareness, and prevalence respectively. The power value was calculated with PS program.[13] The 800 sample size was finally added with 10% to anticipate the potential sample dropout[14] and sample size became 880 subjects.

The subjects were selected with cluster random sampling using invitation to the eligible population. There were 250 invitations disseminated to the population in each village. The numbers were known from the preliminary survey as the median adult population in each village and a total of 2000 invitations had been disseminated within the eight villages.

Procedures

The study location, schedule, eligible population, and distribution of the invitation were arranged with the head of village. The interview instrument for socio-demographic data and standard operating procedure (SOP) of blood pressure, blood sugar, weight, and height measurement were prepared and tried to the volunteers. The field data collectors were trained with the instrument and SOP. The Stature-Meter 2M for height and Camry Mechanical Mode BR 9015B scale were calibrated. The digital sphygmomanometer (Omron HEM-7051-C12) was tested for the reliability. A booklet for hypertension prevention was prepared as the souvenir for the subjects.

The research proposal including the instrument for interview was submitted for ethical clearance to the Medical and Health Research Ethics Committee, Faculty of Medicine Sardjito Hospital Universitas Gadjah Mada. The study was initiated after the issue of EC approval.

Data Collection

The height and body weight were measured once; meanwhile the blood pressure was assessed in duplo with ≥2 minute interval. The subjects with blood pressure ≥140/90 mmHg were continued with peripheral random blood sugar measurement (Accucheck®). The data of health and socio-demography included age, gender, smoking education background, types of occupation, income; and life-style including diet control, physical activity, the ownership of health coverage, and the access of health facilities, the data were collected by interview.

The BMI value was derived from calculation of the body weight (kg) divided with height square (m^2) and grouped into the BMI of ≥25 and <25kg/m^2, i.e. the obesity cut-off based on the WHO classification for Asian population.[15] The subjects with random blood sugar >200mg/dl were attributed as diabetic subjects. Physical activities in this study were defined as minimal routine exercise once a week. Diet control was defined as favorable answer for ≥6 of 9 questions regarding the consuming of salt, additional salt on meal, instant food, home-made, fried-food, meat and high fat food, low-fat dairy, vegetables, and fruit consumption. Smoking was defined as both active and passive smoker.

Data Analysis

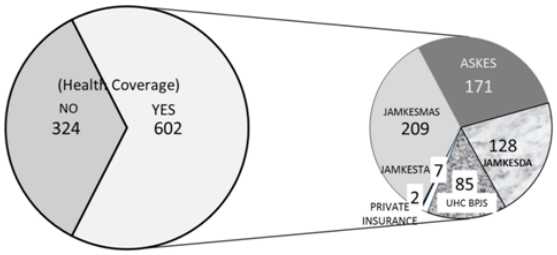
The variables were presented as binomial data. Framingham Score, the prediction 10-year risk of cardiovascular diseases in BMI version was calculated for the subjects with the excel program from Framingham heart study.[12]

The normality of age, blood pressure, and BMI data distribution was analyzed with Q-Q plot graph. Comparison of normally distributed

variables between groups was done with student T-test. The binomial data were analyzed with chi-square statistics. The proportion of the hypertension awareness, therapy, and control was analyzed with the chi-square statistics. The analyses of the hypertension awareness, therapy, and control were done only among the subjects with high blood pressure, because the variables were not applicable in normal blood pressure subjects. The statistical analyses were done with 95% confidence ($p<0.05$).

RESULTS

The health coverage database of the subjects in the study sites was not available, therefore simple random sampling and matching for groups were not able to be performed, and the cluster-random sampling method was applied instead. The total schemes of health coverage were found in moderately high proportion. Of the 926 subjects, there were more subjects with health coverage n=602 (65.0%) with the distribution as described in **Figure 1**.



UHC BPJS = Universal Health Coverage by Social Security Administrative.

Figure 1. Types of health coverage of the rural subjects in Sleman-district of Yogyakarta

Among all schemes of health coverage (**Table 1**), the previous schemes prepared for the poor and almost poor group of society, i.e. Jamkesmas, Jamkesda, and Jamkesta comprised of 37.1% subjects. The voluntary health insurance proportion was found in only two (0.2%) subjects; meanwhile the new UHC comprised of 85 (9.2%) subjects. In the next evaluation and discussion, the subjects were grouped into with and without health coverage. The new UHC included in the group with health coverage.

Age variable is the strongest determinant for blood pressure[14] and mean age in both groups was slightly younger than 60 years old. The mean value of age and other parameter related to cardiovascular diseases i.e. BMI, SBP/DBP, and pulse of subjects in groups of without (NO) and with (YES) health coverage were not significantly different (**Table 1**). The mean diastolic blood pressure, pulse, and peripheral random blood sugar variables were found in normal range; meanwhile mean BMI and SBP were slightly higher than normal value. The random blood sugar was only measured in high blood pressure at ≥140/90mmHg subgroup among 389 subjects because this sub-group was considered with higher CVD risk.

Table 1. The subject profiles based on the health coverage disparity

Variables	Health coverage	
	No (n=324)	Yes (n=602)
Age (years), mean (SD)	56.0 (12.2)	54.8 (11.5)
Body mass index (kg/m^2), mean (SD)	23.3 (4.6)	23.5 (4.2)
SBP (mmHg), mean (SD)	143.9 (23.9)	142.5 (24.3)
DBP (mmHg), mean (SD)	79.9 (13.1)	79.7 (12.8)
Pulse (x/min), mean (SD)	83.0 (12.5)	82.7 (11.8)
Peripheral random blood sugar (mg/dl)**, mean (SD)	117.7 (67.4)	114.4 (60.6)
Framingham score (%), mean (SD)	19.7 (9.2)	19.4 (9.4)

The subject profiles (**Table 2**) data including age, gender, blood pressure classification, BMI, education background, occupation, income, smoking, physical exercise, and diet control were presented in binomial (categorical) data. The results showed that the profiles were not-significantly different between groups, but the subjects without health coverage had significantly higher proportion of subjects without routine physical activity and lower proportion of smoking subjects.

The availability and the location of health facilities would probably affect the subject visit to the medical professionals. Both groups were not significantly different for the profile of health facility. Furthermore, there were 76 subjects

admitted that they had never visited health facilities due to their excellent health condition. The subjects without health coverage were less frequently visited the health facilities with p<0.01 OR 2.80 (95% CI: 1.73-4.51) than those with health coverage (**Table 2**). More frequent visits to the health facilities among the subjects with health coverage were more likely to have the interaction with health professionals, and the subjects received more information of healthy life-style (physical exercise) and had better awareness, and therapy accordingly (p<0.05).

Smoking variable in this study was including active and passive smokers due to same risk of CVD. Proportion of subjects with smoking was significantly lower in the group without health

Table 2. The proportion of the subjects based on the health coverage disparity

Variables	Health coverage		p value	OR (95% CI)
	No (n=324) n (%)	Yes (n=602) n (%)		
Age				
- ≥60 years old	124 (38.4)	199 (61.6)	0.11	1.26 (0.95-1.66)
- <60 years old	200 (33.2)	403 (67.3)		
Gender				
- Male	111 (36.0)	197 (64.0)	0.64	1.07 (0.81-1.43)
- Female	213 (34.5)	405 (65.5)		
Blood pressure				
- ≥ 140/90 mmHg	160 (35.9)	286 (64.1)	0.59	1.08 (0.82-1.41)
- < 140/90 mmHg	164 (34.2)	316 (65.8)		
Body mass index (BMI)				
- ≥ 25kg/m^2	111 (35.5)	202 (64.5)	0.83	1.03 (0.78-1.37)
- < 25kg/m^2	213 (34.7)	400 (65.3)		
Education Background				
- ≤ Junior high school	225 (34.9)	420 (64.7)	0.92	0.99 (0.73-1.32)
- > Junior high school	99 (35.2)	182 (64.8)		
Occupation				
- Indoor	176 (34.0)	342 (66.0)	0.50	0.91 (0.69-1.20)
- Outdoor	147 (36.1)	260 (63.9)		
Income				
- ≤ Regional standard	230 (36.3)	403 (63.7)	0.21	1.21 (0.90-1.62)
- > Regional standard	94 (32.1)	199 (67.9)		
Smoking				
- Yes	149 (31.0)	332 (69.0)	0.01	0.69 (0.53-0.91)*
- No	175 (39.3)	270 (60.7)		
Diet Control				
- No	240 (35.0)	445 (65.0)	0.96	1.01 (0.74-1.37)
- Yes	84 (34.9)	157 (65.1)		
Physical exercise				
- No	215 (37.7)	355 (62.3)	0.03	1.38 (1.04-1.82)*
- Yes	109 (30.6)	247 (69.4)		
Health facility (HF)				
- Outside the village	158 (32.0)	335 (68.0)	0.52	0.91 (0.68-1.21)
- Inside the village	122 (34.2)	235 (65.8)		(excl. never visiting HF)
- Never visiting HF	44 (57.9)	32 (42.1)	<0.01	2.80 (1.73-4.51)*

* significantly different in chi-square analysis

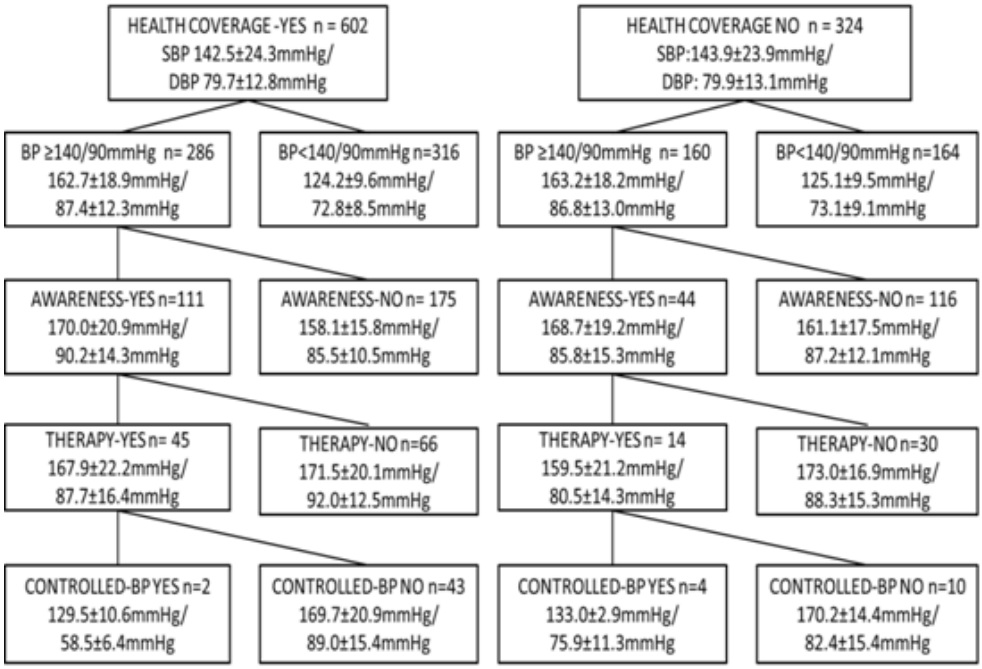
coverage. But exact correlation between smoking and health coverage was not known. The subjects with passive smoking were dominated with females and insignificantly more females in the group of with health coverage.

The subjects with the blood pressure 140/90 mmHg and above were categorized as high blood pressure. According to the Rule of Halves, the prevalence of hypertension was a half of the population, and the prevalence were similar to the rule among the subjects with and without health coverage, i.e. 49.4% and 47.5% respectively; p>0.05 (**Table 2**). The prevalence was higher and different from the previous studies that showed that without health coverage increased disease prevalence.[6,7]

Blood pressure level was the surrogate outcome in hypertension. In both with and without health coverage groups (**Figure 2**), the blood pressure was presented according to Rule of Halves[10-11], in first step the subjects were divided based on blood pressure level into ≥140/90mmHg (high) and <140/90 (normal); next step the high blood pressure subjects were distributed into subjects with (YES) and without (NO) awareness; after that the awareness subjects were distributed into YES and NO therapy, and finally into the YES and NO controlled blood pressure. Both groups were not significantly different of blood pressure level.

The hypertension awareness, therapy, and control variables were analyzed among the sub-group of ≥140/90mmHg subjects (n=446; **Table 3**) because it was not applicable for the normal blood pressure subjects. In both with and without health coverage subgroups, there were fewer subjects with hypertension awareness, therapy, and controlled blood pressure (<50%). The group with health coverage had significantly higher proportion in awareness and therapy of hypertension (p<0.05) than the group without health coverage, but both groups were not significantly different in blood pressure control.

The routine therapy was remarkably low and found only in 60 (13.5%) subjects among hypertension awareness subjects because of the therapy discontinuation. The blood pressure control were only 6 (1.3%) subjects among the subjects with therapy and not different between with and without health coverage groups (p>0.05).



p value >0.05 in each step of prevalence, awareness, therapy, control of hypertension between yes and no health coverage groups.

Figure 2. The blood pressure of the subjects based on the membership of health coverage

Table 3. The awareness, therapy, and control of hypertension among sub-group of hypertension subjects

Variables	Health coverage		p value	OR (95% CI)
	No (n=160) n (%)	Yes (n=286) n (%)		
Awareness of Hypertension				
- Yes	44 (28.4%)	111 (71.6%)	0.02	0.60 (0.39-0.91)
- No	116 (39.9%)	175 (60.1%)		
Therapy of Hypertension				
- Yes	14 (23.3%)	46 (76.7%)	0.03	0.50 (0.27-0.94)
- No	146 (37.8%)	240 (62.2%)		
Controlled Blood Pressure				
- Yes	4 (66.7%)	2 (33.3%)	0.11	3.64 (0.66-20.1)
- No	156 (35.5%)	284 (64.5%)		

* the chi-square statistics in the sub-group of BP ≥140/90 mmHg (n=446) excluding normal BP (n=480)

DISCUSSION

From the profile description, the subjects could be considered as low socio-demographic status. They were mostly with the lower than regional standard income, lower than junior high school education, high smoking, low diet control, low physical exercise, and low access to health facilities. These profiles were unfavorable to hypertension. Physical exercise in most days in a week was not done regularly; most of the subjects even did not exercise at all. Most subjects (n=685; 74.0%) had no attention to healthy diet. The favorable variable related to hypertension was about 50% subjects working out-doors in the field as farmer with more physical activity.

At first, this study focused on the new UHC but the new UHC was found in relatively low proportion of subjects within the first year of establishment. The other existing schemes of health coverage administered by governmental institution will be united into a single system managed under BPJS in the following years. The subjects with those schemes will be automatically transferred into the new-scheme. Based on this fact, the subjects with all health coverage schemes in this study included in analysis and considered relatively high at 65% (**Table 1**). The figure was higher than the 2010 estimation at 56% in the era before the new UHC.[17] Though the proportion of health coverage was high, it was far enough from the BPJS target at 100% coverage.

Among those with the health coverage, 37.1% proportion were dominated by the previous schemes prepared for the poor and almost poor group of society, i.e. Jamkesmas, Jamkesda, and Jamkesta, meanwhile the voluntary health insurance proportion was very low at 0.2%. The findings were probably related to the subject profiles with relatively low socioeconomic status and the study location of the rural area (**Table 2**).

The hypertension therapy in this study was much lower than the other studies in references.[9,10] This was probably related to the low income of the subjects, most of them had even lower than the regional standard income. The subjects would be difficult to expense for the routine therapy for hypertension. The existing of the health coverage did not increase the routine therapy; however the hypertension subjects with the health coverage received significantly more routine therapy (**Table 3**) similar to the previous studies.[5-7]

Health coverage theoretically encouraged the higher visit to the health facilities and received more the routine-therapy, but the health coverage in this study did not improve blood pressure control among the subjects. Despite the moderately adequate health coverage, the proportion of subjects with therapy and blood pressure control were very low.

Within the high blood pressure subjects, it was found the significant lower proportion of awareness and therapy among the subjects

without health coverage subjects. Further study might be needed to confirm the role of the health coverage on the awareness and the routine therapy. Further study is also recommenced to explore why the subjects do not optimize the utility of the insurance for hypertension detection, therapy, and control.

Mean blood pressure of the total subjects in both groups was slightly above the target and not significantly different between groups. The study showed that the blood pressure in the subjects with awareness and routine therapy were high at Grade 2 hypertension based on ESC/ESH guideline.[18] An additional study will be beneficial to explore the reason of low awareness, therapy, and control of hypertension in the relatively high health coverage subjects e.g. issues of therapy persistence, availability and access to health facilities, and satisfactory rate with the UHC.

Health education to the subjects is suggested to be the most appropriate solution for the unfavorable findings, e.g. misperception of visiting health facilities only for serious illness not for disease detection or maintenance of health. Most subjects who never visit the health facilities proudly stated that they were healthy so that they did not need visit health facilities. Health education is also needed to reduce the unawareness of the high blood pressure risk and therapy persistence.

The hypothesis was accepted within the subgroup with blood pressure at ≥140/90mmHg, i.e. the subjects without health coverage were more likely to have lower hypertension awareness and therapy rate than those with the health coverage program ($p<0.05$). The analysis was done among the subjects with all types of health coverage including new UHC. Though the impact of health coverage was likely to be significant, a more comprehensive study is needed to be conducted for generalization of the result to the whole population of Sleman-District of Yogyakarta.

Limitation of Study

In this study, hypertension prevalence was determined from the blood pressure level ≥140/90mmHg measured in duplo in one occasion. The hypertension diagnosis in the actual clinical setting should be determined from the blood pressure measurement in ≥2 different periods. The high blood pressure among the unaware of hypertension subjects had the false positive potency.

CONCLUSION

The subjects with health coverage comprised of 65.0% including the new universal health coverage 9.2%. The subjects with and without health coverage were not different in hypertension prevalence. Among the high blood pressure subgroup, the subjects without health coverage had lower hypertension awareness and received fewer items of anti-hypertension therapy, but were similar in blood pressure control than those with health coverage.

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REFERENCES

1. United Nations. United Nations General Assembly resolution on Global health and foreign policy A/67/L3:Resolution adopted by General Assembly on 12 December 2012. Available online on http://daccess-dds-ny.un.org/doc/UNDOC/LTD/N12/630/51/PDF/N1263051.pdf?OpenElement. Accessed on 4 July 2015.
2. The national team for the acceleration of poverty reduction. Jamkesmas. Available online on http://www.tnp2k.go.id/en/programmes/programmes/dprogram-jamkesmas/. Accessed on: 29 June, 2015.
3. McWilliams JM, Meara E, Zaslavsky AM, Ayanian JZ. Use of Health Services by Previously Uninsured Medicare Beneficiaries. N Engl J Med. 2007;357:143-53.
4. Bleich SN, Cutler DM, Adams AS, Lozano R, Murray CJL. Impact of insurance and supply of health professionals on covarage of treatment for

hypertension in Mexico: Population based study. BMJ. Available online on http://www.bmj.com/content/335/7625/875.full.pdf. Accessed on April 30, 2015.
5. Brooks EL, Preis SR, Hwang SJ, Murabito JM, Benjamin EJ, Kelly-Hayes M, Sorlie P, Levy D. Health insurance and cardiovascular disease risk factors. Am J Med. 2010;123(8):741-7.
6. Smolderen KG, Spertus JA, Tang F, Oetgen W, Borden WB, Ting HH, Chan PS. Treatment differences by health insurance among outpatients with coronary artery disease. J Am Coll Cardiol. 2013;61(10):1069-75.
7. Fowler-Brown A, Corbie-Smith G, Garret J, Lurie N. Risk of cardiovascular events and death-does insurance matter? Soc Gen Intern Med. 2007;22:502-7.
8. Wagner AK, Valera M, Graves AJ, Lavina S, Ross-Degnan D. Costs of hospital care for hypertension in an insured population without an outpatient medicines benefit; an observational study in Philippines. BMC Health Services Research. 2008;8:161.
9. Setiati S and Sutrisna B. Prevalence of hypertension without anti-hypertensive medications and its association with social demographic characteristics among 40 years and above adult population in Indonesia. Acta Med Indones. 2005;37(1):20-5.
10. Scheltens T, Bots ML, Numans ME, Grobbee DE, Hoes AW. Awareness, treatment, and control of hypertension: the"rule of halves" in an era of risk-based treatment of hypertension. J Hum Hypertens. 2007;21:99-106.
11. Kayima J, Wanyenze RK, Katamba A, Leontsini E, Nuwuha F. Hypertension awareness, treatment and control in Africa: a systematic review. BMC Cardiovasc Disord. 2013;13(1):54.
12. Dahlan S. Besar sampel dan cara pengambilan sampel. Jakarta: Salemba Medika; 2013. p. 41.
13. Dupont WD, Plummer WD. Power and sample size calculations version 3.1.2. Available online at http://biostat.mc.vanderbilt.edu/wiki/Main/PowerSampleSize. Accessed on Dec 14, 2015.
14. Sakpal TV. Sample size estimation in clinical trial. Perspect Clin Res. 2010;1(2):67–9.
15. WHO. Global data on body mass index. BMI classification. 2006. Available online at http://apps.who.int/bmi/index.jsp?introPage=intro_3.html. Accessed on Dec 14, 2015
16. Framingham Heart Study. Cardiovascular disease (10-year risk). 2015. Available online on https://www.framinghamheartstudy.org/risk-functions/cardiovascular-disease/10-year-risk.php. Accessed on 13 April 2015.
17. Franken J. Universal health coverage (BPJS) analysis Indonesia: The health of the nation. 2011. Available online at http://www.thejakartapost.com/news/2011/05/02/analysis-indonesia-the-health-nation.html. Accessed on July 01, 2015.
18. Mancia G, Fargard R, Narkiewicz K, et al. 2013 ESH/ESC guidelines for the management of arterial hypertension. The task force for the management of arterial hypertension of the of hypertension (ESH) and of the European European Society Society of Cardiology (ESC). J Hypertens. 2013;31:1281–357.