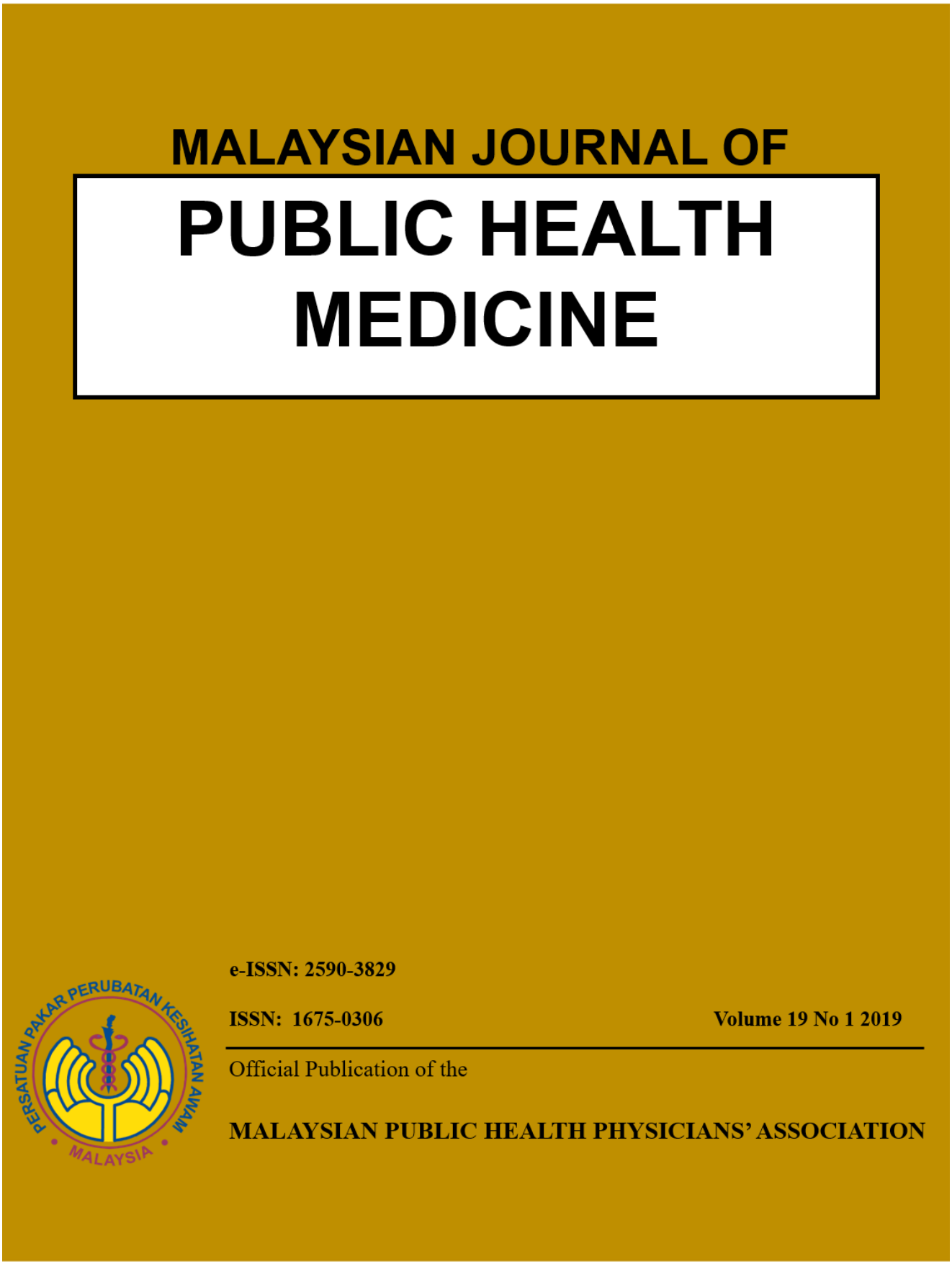

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ORIGINAL ARTICLE

REGIONAL DISPARITIES OF HEALTH CENTER UTILIZATION IN RURAL INDONESIA

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ABSTRACT

One indicator to see the quality of health system performance was to look at the disparity in the utilization of healthcare facilities. The research objective was to analyze the disparity between regions in the utilization of health centers in rural areas in Indonesia. The results of the 2013 Basic Health Survey (Riskesdas) were used as analysis material. The 2013 Riskesdas was designed a cross-sectional survey. Respondents obtained 388,598 using the multi-stage cluster random sampling method. Binary Logistic Regression Test was used to analyze data. Data is obtained through a structured questionnaire. The results showed that there were statistically significant disparities between regions. All regions showed better utilization than the Papua region as a reference. The best utilization was in the Sumatra region, which was 3.781 times more utilizing health centers than the Papua region (OR = 3.781; 95% CI = 3.580-3.993). The utilization of health centres that approached the Papua region was the Nusa Tenggara region (OR = 1.582; 95% CI = 1.490-1.679) and the Maluku region (OR = 2.175; 95% 1.999-2.366). All three regions are all in the Eastern part of Indonesia. The research concluded there was a disparity in health center utilization between regions in rural Indonesia. Regions in the western part of Indonesia tend to have better health center utilization in rural areas. Research results could be used as a reference for making policies that focus on equality of services to reduce existing disparities.

Keywords: *the health center, utilization, region disparities, rural, Indonesia.*

INTRODUCTION

Indonesia has implemented many improvements to people's access to health services. This condition has also been recognized as better than before[1]. Although in some cases the community still feels health services are not appropriate as expected[2,3]. Furthermore, the health status of the community as the outcome also varies greatly between regions[4].

One indicator to see the quality of health system performance is to look at the disparity in the use of healthcare facilities. The dimension in analyzing the disparity in the use of health services that is often used is the dimensions of urban-rural, gender, socioeconomic, education, employ status, racial and ethnic, geographic, and region[5-7].

Health development that has been running in Indonesia still shows disparities between urban and rural areas. Urban areas tend to have access to better health services. This condition was found because of the participation of private parties who prefer urban areas with denser population density conditions, making it more economically profitable[8-10]. This reason is the basis of the assumption that rural areas are more vulnerable than in urban areas.

Disparities in health services that occur between urban and rural areas contribute to the increase in the number of people suffering from chronic diseases in the countryside[11,12]. If allowed to continue, there will be a considerable opportunity lost that must be borne by the community and the government. In this position, the role of the Puskesmas (health center) as a gatekeeper is very important to screen patients at the basic service level[13-15].

The disparity in the utilization of health care facilities is allegedly not only in the urban-rural dimension but also between regions. This condition is likely to occur because of Indonesia's highly variable geographical conditions and an archipelago with more than 16 thousand islands[16]. Based on this background, the aim of this study is intended to analyze the disparity between regions in health center utilization in rural areas in Indonesia.

MATERIALS AND METHODS

The data used in this research analysis comes from the 2013 Indonesian Basic Health Survey (Riskesdas). Riskesdas was a national scale survey conducted in a cross-sectional by the Ministry of Health. Riskesdas sample was carried out by multi-stage cluster random sampling.

The sample framework used consists of two types, namely the sample frame for sampling the first stage and the sample frame for sampling the second stage. The first selection sample frame was the primary sampling unit (PSU) list in the sample master. The number of PSUs in the master sample was 30,000 which were selected by probability proportional to size (PPS) with the number of households resulting from the 2010 Population Census (PC2010). The PSU was a combination of several census blocks (CB) which were working areas of the PC2010 enumeration team. The PSU also features information on the number and list of names of household heads, address, level of education of the head of the household based on urban/rural area classification. The second selection sample frame was all census buildings in which there are ordinary households not including institutional household (orphanage, police/military barracks, etc.) resulting from the complete enumeration of PC2010 (PC2010-C1). Selected census buildings and households within the selected census building were updated. The update was carried out by the 2013 Riskesdas enumerator before starting to conduct interviews.

The sampling method used was a three-stage stratified sampling. The stages of this method were described as follows: The first step was to select the primary sampling unit (PSU) from the systematically selected PSU for each district/city according to the domain allocation. The second stage, from the selected PSU, 2 CB was selected by PPS with the number of households in the 2010 Population Census - Recapitulation of the number of households resulting from listing (PC2010-RBL1) in each district/city according to the domain allocation. Then one block randomly selected for Riskesdas and one census block for Susenas. The third stage, from each CB of Riskesdas, a number of census buildings (m = 25) were selected systematically based on the PC2010-C1 census building data.

The data was taken using a structured questionnaire[17]. The contents of the questionnaire consisted of information on individual characteristics (age, gender, marital status, education level, employment status, socioeconomic status, insurance, time travel, and transportation cost to health center) and health center utilization (outpatient and inpatient).

The population in this study were all adults in rural areas in Indonesia. The criteria of the respondents were residents aged 15 years and above. Respondents were considered adults at that age. The 2013 Riskesdas has been conducted with a sample of 1,027,763 individuals. The samples analyzed in this paper were based on a unit of analysis of Indonesian adults in rural areas with 388,598 respondents. Samples were selected with inclusion criteria ≥15 years old and willing to be interviewed.

The health center utilization was the use of outpatient or inpatient care to the Puskesmas. The criteria for outpatient were the utilization of the last month. While the criteria for inpatient were the utilization of the past year. This criterion was carried out assuming the respondent can still remember the occurrence of the utilization. The division of regions was grouped by the largest island. Divided into 7 regions, namely Sumatra, Kalimantan, Sulawesi, Java-Bali, Maluku Islands, Nusa Tenggara, and Papua[18].
T-tests were used for age variables which were categorized as continuous variables. Chi-Square is used to test dichotomous variables. There are 8 dichotomous variables tested, namely age, sex, marital status, education level, employment status, insurance ownership, travel time, and the transportation cost to the Puskesmas. These statistical tests were to assess whether there was a statistically significant relationship between the independent variables and the Puskesmas utilization as the dependent variable. Processing data using the help of SPSS v.21 software.

The 2013 Riskesdas has an ethical permit approved by the national ethical committee (ethic number: 01.1206.207). During data collection, informed consent was used. This is by considering the aspects of procedures for data collection, voluntary, and confidentiality.

RESULT

Table 1 explains descriptively the participants in this study. It appears that participants start from the age of 15 to 128 years. The mean age of participants is 40.18 years, with Standard Deviation 16.334.

Table 1 Descriptive Table of The Participants (n=388,598)

Variables	N	Percentage
Age	388,598	100%
Gender		
• Male (code=1)	188,596	48.5%
• Female (code=2)	200,002	51.5%
Marital status		
• Single (code=1)	82,276	21.2%
• Married (code=2)	277,720	71.5%
• Divorced (code=3)	28,602	7.4%
Education level		
• Primary school & under (code=1)	232,779	59.9%
• Junior high school (code=2)	77,177	19.9%
• Senior high school (code=3)	64,488	16.6%
• College (code=4)	14,154	3.6%
Employment status		
• Employed (code=1)	243,085	62.6%
• Unemployed (code=2)	145,513	37.4%
Socioeconomic status		
• Quintile 1 (code=1)	116,155	29.9%
• Quintile 2 (code=2)	98,949	25.5%
• Quintile 3 (code=3)	76,532	19.7%
• Quintile 4 (code=4)	54,969	14.1%
• Quintile 5 (code=5)	41,993	10.8%
Insurance		
• No insurance (code=1)	166,386	42.8%
• Managed by Gov. (code=2)	218,063	56.1%
• Others (code=3)	4,149	1.1%
Time travel		
• ≤ 10 minutes (code=1)	146,412	37.7%
• > 10 minutes (code=2)	242,186	62.3%
Transportation cost		
• ≤ IDR 10,000 (code=1)	295,090	75.9%
• > IDR 10,000 (code=2)	93,508	24.1%

Descriptive Result

Figure 1 explains that the main health center users are poor people. Those in the quintile 1 and 2 groups at the socioeconomic level are more likely to use health centers than other groups. This condition applies to all regions. This picture is more evident in regions in Eastern Indonesia, namely in Papua, Maluku Islands and Nusa Tenggara.

Based on Table 1, it can be seen that there is a significant difference between the region variables and all variables tested. Table 1 also explains that based on the proportion of people who use health centers, they are mostly in the Nusa Tenggara region (8.0%). Medium age variables have the youngest average in the Papua region (36.48) and the oldest in the Java-Bali region (43.28).

Based on gender, Table 1 shows that in all regions female dominate, except for the Papua region which is dominated by male (51.8%). Based on marital status, Table 1 shows all regions dominated by marital status of married. While based on the level of education, table 1 shows that in all regions it is dominated by society with a level of education of primary school and under.

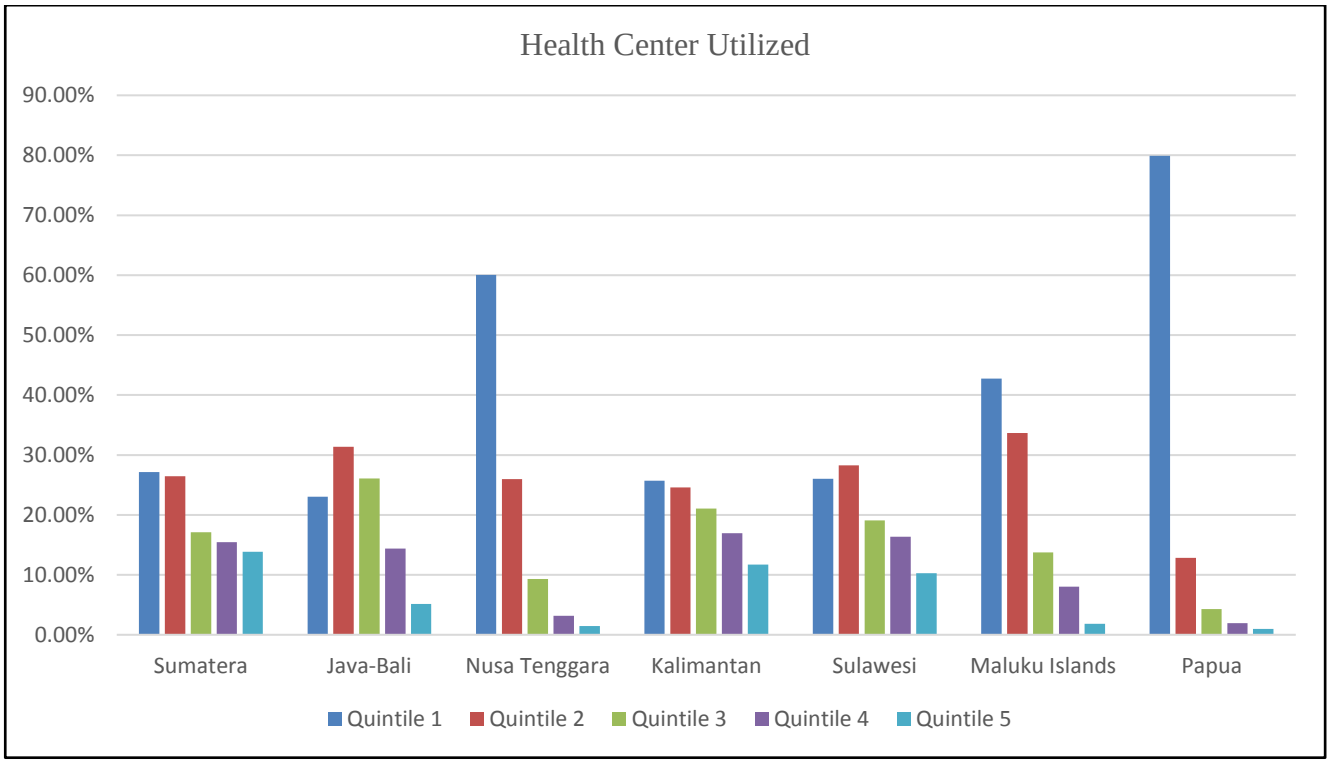

Figure 1 Distribution of health center utilized in rural Indonesia based on regions and socioeconomic status

Table 2a Descriptive Statistic of Health Center Utilization among Regions in Rural Indonesia (n=388,598)

Characteristic	Region							All	P-value
	Suma-tera	Java-Bali	Nusa Tenggara	Kaliman-tan	Sulawe-si	Malu-ku	Papua		
Health Center Utilization									<0.001*
• Utilized	3,730	4,412	2,231	1,512	3,442	770	2,805	18,902	
	3.0%	4.4%	8.0%	3.9%	5.9%	5.6%	12.1%	4.9%	
• Not utilized	122,167	95,860	25,654	37,483	55,350	12,878	20,304	369,696	
	97.0%	95.6%	92.0%	96.1%	94.1%	94.4%	87.9%	95.1%	
Age (mean)	125,897	100,272	27,885	38,995	58,792	13,648	23,109	388,598	<0.001*
	(38.58)	(43.28)	(40.53)	(38.86)	(40.65)	(39.29)	(36.48)	(40.18)	
Gender									<0.001*
• Male	62,187	47,534	13,216	19,282	27,930	6,473	11,974	188,596	
	49.4%	47.4%	47.4%	49.4%	47.5%	47.4%	51.8%	48.5%	
• Female (Ref.)	63,710	52,738	14,669	19,713	30,862	7,175	11,135	200,002	
	50.6%	52.6%	52.6%	50.6%	52.5%	52.6%	48.2%	51.5%	
Marital status									<0.001*
• Single	31,921	16,641	6,531	7,840	12,520	2,893	3,930	82,276	
	25.4%	16.6%	23.4%	20.1%	21.3%	21.2%	17.0%	21.2%	
• Married	85,728	73,938	19,780	28,492	41,625	10,037	18,120	277,720	
	68.1%	73.7%	70.9%	73.1%	70.8%	73.5%	78.4%	71.5%	
• Divorce (Ref.)	8,248	9,693	1,574	2,663	4,647	718	1,059	28,602	
	6.6%	9.7%	5.6%	6.8%	7.9%	5.3%	4.6%	7.4%	

Table 2b Descriptive Statistic of Health Center Utilization among Regions in Rural Indonesia (n=388,598)

Characteristic	Region							All	P-value
	Suma-tera	Java-Bali	Nusa Tenggara	Kaliman-tan	Sulawe-si	Malu-ku	Papua		
Education level									<0.001*
● Primary sch. & under	64,969	68,676	18,840	24,042	34,137	7,294	14,821	232,779	
	51.6%	68.5%	67.6%	61.7%	58.1%	53.4%	64.1%	59.9%	
● Junior high sch.	29,192	17,433	4,305	7,689	11,696	2,991	3,871	77,177	
	23.2%	17.4%	15.4%	19.7%	19.9%	21.9%	16.8%	19.9%	
● Senior high sch.	26,779	11,678	3,774	5,855	10,244	2,728	3,430	64,488	
	21.3%	11.6%	13.5%	15.0%	17.4%	20.0%	14.8%	16.6%	
● College (Ref.)	4,957	2,485	966	1,409	2,715	635	987	14,154	
	3.9%	2.5%	3.5%	3.6%	4.6%	4.7%	4.3%	3.6%	
Employment status									<0.001*
● Employed	79,050	64,697	19,057	25,357	31,637	7,866	15,421	243,085	
	62.8%	64.5%	68.3%	65.0%	53.8%	57.6%	66.7%	62.6%	
● Unemployed	46,847	35,575	8,828	13,638	27,155	5,782	7,688	145,513	
	37.2%	35.5%	31.7%	35.0%	46.2%	42.4%	33.3%	37.4%	
Socioeconomic status									<0.001*
● Quintile 1	29,269	20,609	15,760	10,847	17,185	6,118	16,367	116,155	
	23.2%	20.6%	56.5%	27.8%	29.2%	44.8%	70.8%	29.9%	
● Quintile 2	30,017	28,907	7,119	9,773	15,265	4,106	3,762	98,949	
	23.8%	28.8%	25.5%	25.1%	26.0%	30.1%	16.3%	25.5%	
● Quintile 3	24,978	25,751	2,935	7,878	11,326	2,126	1,538	76,532	
	19.8%	25.7%	10.5%	20.2%	19.3%	15.6%	6.7%	19.7%	
● Quintile 4	20,339	16,717	1,448	5,759	8,686	1,016	1,004	54,969	
	16.2%	16.7%	5.2%	14.8%	14.8%	7.4%	4.3%	14.1%	
● Quintile 5 (Ref.)	21,294	8,288	623	4,738	6,330	282	438	41,993	
	16.9%	8.3%	2.2%	12.2%	10.8%	2.1%	1.9%	10.8%	
Insurance ownership									<0.001*
● No insurance	56,741	51,068	9,191	19,296	18,029	5,637	6,424	166,386	
	45.1%	50.9%	33.0%	49.5%	30.7%	41.3%	27.8%	42.8%	
● Managed by Gov.	67,294	48,640	18,605	18,801	40,544	7,965	16,214	218,063	
	53.5%	48.5%	66.7%	48.2%	69.0%	58.4%	70.2%	56.1%	
● Others (Ref.)	1,862	564	89	898	219	46	471	4,149	
	1.5%	0.6%	0.3%	2.3%	0.4%	0.3%	2.0%	1.1%	
Time travel									<0.001*
● ≤ 10 minute	45,372	33,028	9,805	17,144	23,847	7,285	9,931	146,412	
	36.0%	32.9%	35.2%	44.0%	40.6%	53.4%	43.0%	37.7%	
● > 10 minutes	80,525	67,244	18,080	21,851	34,945	6,363	13,178	242,186	
	64.0%	67.1%	64.8%	56.0%	59.4%	46.6%	57.0%	62.3%	
Transportation cost									<0.001*
● ≤ IDR 10,000	91,231	83,146	20,716	27,321	46,638	9,458	16,580	295,090	
	72.5%	82.9%	74.3%	70.1%	79.3%	69.3%	71.7%	75.9%	
● > IDR 10,000	34,666	17,126	7,169	11,674	12,154	4,190	6,529	93,508	
	27.5%	17.1%	25.7%	29.9%	20.7%	30.7%	28.3%	24.1%	

Note: Chi-Square test was used for dichotomous variables, and T-test for continuous variables; *Significant at level 95%.

Table 2a shows that based on working status is dominated by those who have jobs, with the largest proportion in the Nusa Tenggara region (68.3%). Based on socioeconomic conditions, those who live in the East are more dominated by the poor (quintile 1 and 2), especially in the Papua region, Maluku and Nusa Tenggara. Table 2b shows that based on insurance ownership is dominated by those who have insurance managed by the government (Askes, Jamkesmas, Jamkesda, Jamsostek), except Java-

Bali and Kalimantan regions which are dominated by those who do not have insurance.

Table 2b shows based on the time needed to reach the health center dominated by the category "> 10 minutes". However, based on the transportation costs needed to reach the health center, it was dominated by the "cost of IDR 10,000" transportation cost category. The biggest proportion is in the Java-Bali region (82.9%).

Multivariate Regression Analyses

Table 3 Binary Logistic Regression of Health Center Utilization among Regions in Rural Indonesia (n=388,598)

Predictor	Health Center Utilization			
	Sig.	OR	Lower Bound	Upper Bound
Region: Sumatera	<0.001*	3.781	3.580	3.993
Region: Java-Bali	<0.001*	2.773	2.627	2.927
Region: Nusa Tenggara	<0.001*	1.582	1.490	1.679
Region: Kalimantan	<0.001*	2.832	2.648	3.030
Region: Sulawesi	<0.001*	2.254	2.133	2.382
Region: Maluku	<0.001*	2.175	1.999	2.366
Age	<0.001*	0.994	0.992	0.995
Gender: Male	<0.001*	1.341	1.297	1.387
Marital Status: single	<0.001*	1.737	1.603	1.882
Marital Status: married	0.083	1.050	0.994	1.109
Education: under primary school	0.262	0.952	0.873	1.038
Education: junior high school	0.286	0.952	0.869	1.042
Education: senior high school	0.558	0.973	0.888	1.066
Employment status: Employed	<0.001*	1.091	1.054	1.129
Socioeconomic: quintile 1	<0.001*	0.698	0.654	0.745
Socioeconomic: quintile 2	<0.001*	0.743	0.696	0.793
Socioeconomic: quintile 3	<0.001*	0.808	0.756	0.864
Socioeconomic: quintile 4	<0.001*	0.820	0.764	0.879
Insurance ownership: No insurance	0.966	0.996	0.812	1.221
Insurance: Managed by Gov.	<0.001*	0.482	0.393	0.590
Travel time: ≤ 10 minutes	<0.001*	0.917	0.889	0.945
Transportation cost: ≤ IDR 10,000	<0.001*	0.551	0.528	0.574

Note: The reference category is “Not Utilized”; 95% Confidence Interval for OR; *Significant at level 95%.

Table 3 represents the results of a binary logistic test. The results express that there are statistically significant disparities between regions. All regions show better utilization than the Papua region as a reference. The best utilization is in the Sumatra region, which is 3.781 times more utilizing health centers than the Papua region (OR = 3.781; 95% CI = 3.580-3.993). The utilization of health center which was slightly different from the Papua region was the Nusa Tenggara region (OR = 1.582; 95% CI = 1.490-1.679) and the Maluku region (OR = 2.175; 95% 1.999–2.366). All three regions are all in the Eastern part of Indonesia.

Table 3 indicates that male had 1.341 times better utilization than female (OR = 1.341; 95% CI = 1.297-1.387). Those who have the marital status of singles have health center utilization 1.737 times better than those divorced. While based on the level of education, no significant differences were found between levels of education in communities in rural Indonesia.

Table 3 shows that those who were employed 1.091 times were more likely to use health centers than those who were unemployed. Based on the socioeconomic level, no group has better health center utilization than the richest (quintile 5) group in rural Indonesia. Those in the poorest group (quintile 1) used the health center 0.698 times the richest group (OR = 0.698; 95% CI = 0.654-0.745).

DISCUSSION

The results of the study show that there are gaps between regions in the utilization of Puskesmas in

rural Indonesia. The geographical conditions of Indonesia and the disparity in urban-rural development are indeed very possible for disparities in the use of health centers. Geographical conditions in the form of islands make some small and remote islands very difficult to reach. This is also influenced by the availability of regular transportation to these remote islands[10,19]. Several other studies on spatial health service disparities in several countries were also found to have the same conclusions[20--23]. Geographical conditions have proven to contribute significantly to the disparity between regions.

The results showed that the utilization of health centers in the West tends to be better than in the East. This condition is directly proportional to economic development in Indonesia, which indeed shows inequality between the West and East. Development in the East region tends to lag behind other regions (24)(25)(1), including health development[4,26].

As a single variable, low socioeconomic status (quintile 1 and 2) has the dominant proportion of health center utilization (see Figure 1), while in a multivariate manner, a group with high socioeconomic status (quintile 5) actually has better health center utilization. This shows that high socioeconomic groups are more aware of utilizing their health rights because they have relatively better knowledge[4]. Rich people who are knowledgeable are smarter in taking advantage of opportunities. The results of this study are in line with several studies related to socioeconomic in developing countries[27], and also other countries, namely USA[28], Bangladesh[29], Lao People's Democratic Republic[30], and in several European countries[31].

Those who need more time to the health center (> 10 minutes) and more expensive transportation costs (> IDR 10,000; around $1) have better health center utilization. This result is the impact of the low service tariff policy at the Puskesmas. Even in some regions, the local government actually frees the community to utilize the Puskesmas as a basic service[2,32,33].

Limitations in this study can only detect disparities that occur between regions only superficially. Further studies are needed that can detect how these disparities can occur.

CONCLUSIONS

Based on the research results and discussion it can be concluded that there is a proven disparity in health center utilization between regions in rural Indonesia. Regions in the western part of Indonesia tend to have better health center utilization in rural areas. The disparity in health center utilization is also found in other categories, namely gender, marital status, employment status, socioeconomic level, insurance ownership, travel time and transportation costs to the health center. Structured policies are needed to reach rural communities. The results of this study can be used as a reference for making policies that focus on equality of services to reduce existing disparities.

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DECLARATION OF CONFLICTING INTERESTS

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PERSETUJUAN AMANDEMEN PROTOKOL

Ref : Protokol Penelitian No. 01.1206.207

Komisi Etik Penelitian Kesehatan Badan Litbang Kesehatan telah melakukan telaah dan menyetujui amandemen protokol yang berjudul :

"Riset Kesehatan Dasar (Riskesdas) 2013 "

dengan ketua pelaksana : **Atmarita, MPH., Dr.PH.**

Perubahan protokol pada pengurangan kuesioner dan mekanisme pengumpulan sampel biomedis, sesuai dengan surat pengantar no. LB.02.01/I.4/187/2013 tertanggal 8 Januari 2013. Persetujuan ini berlaku sejak tanggal ditetapkan sampai dengan batas waktu pelaksanaan penelitian seperti tertera dalam protokol.

Pada akhir penelitian, laporan pelaksanaan penelitian harus diserahkan kepada KEPK-BPPK. Jika ada perubahan protokol dan / atau perpanjangan penelitian, harus mengajukan kembali permohonan kajian etik penelitian (amandemen protokol).

Jakarta, 25 Januari 2013

Ketua
Komisi Etik Penelitian Kesehatan
Badan Litbang Kesehatan,

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