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Regional disparities in hospital utilisation in Indonesia: a cross-sectional analysis data from the 2018 Indonesian Basic Health Survey

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ABSTRACT

Objectives Policymakers must ensure that the entire population has equal access to health services, and efforts to minimise inequalities are needed. This study aimed to analyse the regional disparities in hospital utilisation in Indonesia.

Design A cross-sectional study analysing secondary data from the 2018 Indonesian Basic Health Survey.

Setting National-level survey data from Indonesia.

Participants A total of 629 370 participants were included in the study.

Intervention
We employed no intervention

Primary and secondary outcome measures
The primary outcome was hospital utilisation. Aside from region, we utilise residence type, age, gender, marital status, educational level, occupation, wealth, insurance and travel time as control variables. We used binary logistic regression in the final analysis

Results The respondents in Sumatra were 1.079 times (95% CI 1.073 to 1.085) more likely than those in Papua to use the hospital. Furthermore, compared with the respondents in Papua, those in the Java–Bali region (1.075 times, 95% CI 1.069 to 1.081), Nusa Tenggara (1.106 times, 95% CI 1.099 to 1.113), Sulawesi (1.008 times, 95% CI 1.002 to 1.014) and Kalimantan (1.212 times, 95% CI 1.205 to 1.219) were more likely to use the hospital. However, those in Maluku were less likely than those in Papua to use the hospital (0.827 times, 95% CI 0.820 to 0.835). Six demographic variables (age, gender, marital status, educational level, occupation and wealth) and three other control variables (residence type, insurance and travel time to the hospital) were found to be associated with hospital utilisation.

Conclusions Our findings highlight the existence of regional disparities in hospital utilisation in Indonesia.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This cross-sectional study used secondary data obtained from the 2018 Indonesian Basic Health Survey, analysing a large amount of national-level data.
⇒ The research employed a weighted sample of 629 370 participants.
⇒ The survey used household and individual instrument interviews to collect data.
⇒ Limitations include the use of secondary data, which limits the variables that could be investigated (eg, other factors previously shown to be associated with hospital utilisation, such as travel cost, lifestyle and disease type, could not be included in the analysis).

INTRODUCTION

The health service referral systems implement health services and regulate the delegation of duties and responsibilities of reciprocal health services vertically and horizontally. Health service providers must refer patients when disease conditions or health problems require.[1] Such providers include all first-level and advanced-level referral health facilities, which work alongside the Social Security Administrator for Health.[2]

Results of studies indicate that the public has a good perception of health services and that information regarding referral flow is clearly conveyed. Referral requests and referral processes from public healthcare are straightforward. Patients get direct referrals for several visits to the hospital; thus, they do not need to frequently return to public healthcare.[3] Implementation of referral systems in public healthcare involves requirements based on administrative referral procedures to regulations and existing guidelines.[4] Referral services are among the types of complete services that the government must provide.

In Indonesia, regulation of the healthcare system indicates that everyone has equal access to healthcare resources, as well as to safe, quality and affordable health services. To prevent patients from bearing the burden of healthcare costs, health insurance is needed. Thus, health financing is borne jointly by all participants so that it is not burdensome.[5] Health insurance ensures health protection

so that participants receive healthcare benefits and safety in meeting primary health needs that were given to everyone—people who have paid dues or whose contributions are paid by the government.

Individual health service efforts are organised in health facilities.[2] A referral system is implemented when patients experience health problems that cannot be managed by first-level health facilities. Based on the 2020 performance accountability report of government agencies, the performance rate of referral and vertical hospitals with services that meet the standards is 59% (out of a target of 70%).[6]

Indonesia is a country with an archipelagic topography. Results of studies on health services in Indonesia indicate a correlation between feasibility of health service facilities rooms and topography, demography and geography. More health service facilities are located in the central/common areas than in remote areas, in non-border than border areas, in non-archipelagic than archipelagic areas, in areas with a population of 30 000 than in sites with a population of less than 30 000, and in urban than rural areas.[7] In general, the community believes that there are still perceived deficiencies with regard to accessibility of health services, especially in terms of physical access, due to poor facilities and infrastructure. Social access also seems to be lacking due to the less friendly behaviours displayed by health workers.[8] Other studies support that access to health services is related to Social Security Administrator membership,[9] whereas people's residence is also the one that affects their access to health services.[10]

Previous studies have demonstrated that disparities in hospital utilisation exist between regions in Indonesia. Such disparities are related to the complex factors of geographical barriers.[11] In Indonesia, there is a wide variation between districts in terms of health service utilisation. Cities have higher levels of utilisation than rural areas.[12] In Indonesia, there are still disparities in health development, especially in terms of the healthy family indicator. Provinces in eastern Indonesia with low-level healthy family indicators are Maluku, North Maluku, West Papua and Papua (cluster 4), while provinces with high-level healthy family indicators (cluster 3) are Riau Islands, Jakarta, Yogyakarta, Bali, East Kalimantan, North Kalimantan, South Sulawesi and Gorontalo.[13] A study on maternal and child health in Papua demonstrated that the e lack for midwives and doctors in Papua is extensive, and there is a very high variation between districts/cities in terms of input and performance.[14] Differences in urban–rural areas, travel time to the hospital and transportation costs predict hospital utilisation among outpatients in Papua.[15 16] Delay in the reporting of the performance of maternal and child health in Papua was due to difficult geographical access as well as heavy workload.[17] Furthermore, a previous study demonstrated that the disparities in maternal mortality were due to the medium factor gap between regencies/cities in Indonesia, with the risk of maternal mortality included.[18] Several areas still have limited access to essential public healthcare services. These obstacles can be seen from the minimal number of public healthcare and the gap in facilities between regions, the lack of various supporting factors, and the limited number of health workers, which affect public health outcomes.[19]

Policymakers must ensure equitable health services, and the government must have the policy to reduce disparities in health services in Indonesia.[20] In Indonesia, the existing policy is the National Health Insurance System, which is used by the government as reference for primary healthcare.[21] Furthermore, the social health insurance or the national health insurance ensures that the community has access to health services. Social health insurance provides comprehensive benefits at affordable premiums. It also applies the principles of cost and quality control, which means that participants can get adequate quality services at reasonable and controlled prices.[5] The government needs to establish a strategy to improve the dynamics of health as a policy to realise the sustainable development goal targets in the health service sector in the regions. The government needs to guarantee certainty through primary healthcare improvement to improve the region's public healthcare services.[19] Based on this background narrative, this study aimed to analyse the regional disparities in hospital utilisation in Indonesia.

METHODS

Study design and data source

This study used secondary data obtained from the 2018 Indonesian Basic Health Survey, which was a national-scale, cross-sectional poll by the Republic of Indonesia's Ministry of Health. The survey was conducted from May to July 2018, and information was collected through interviews with households and individuals.

The 2018 Indonesian Basic Health Survey population sampling frame includes all households in Indonesia. The survey used the sample framework of the 2018 National Socioeconomic Survey, which was conducted in March 2018. Moreover, the survey visited the target sample of 300 000 households from 30 000 census blocks of the 2018 National Socioeconomic Survey (run by the Central Statistics Agency).[22]

The survey employed the probability proportional to size (PPS) method and systematic linear sampling, with two-stage sampling. Stage 1 involved implicit stratification of all census blocks resulting from the 2010 Population Census based on welfare strata. PPS selected the sample survey as the sampling frame for selecting census blocks from the master frame of 720 000 census blocks from the 2010 Population Census and 180 000 census blocks (25%). The survey determined several census blocks using the PPS method in each urban/rural strata per regency/city to produce a census block sample list. The total number of selected census blocks was 30 000. Stage 2 involved selecting 10 000 households in each census block updated via systematic sampling, with the highest implicit stratification of educational level completed by the head of the household to maintain representation of diversity

value of household characteristics. Individuals sampled in the 2018 Indonesian Basic Health Survey were all household members in the selected household. The weighting in the 2018 Indonesian Basic Health Survey was according to the 2018 National Socioeconomic Survey. The survey carried out weighting by population frequency weight within the generalised least square method. The study used frequency weights to generate values that accurately reflect the national population. Finally, the survey collected data with a response rate of 93.20% for individual targets and 95.58% for household targets.[22]

The study included all adults (≥15 years old) in Indonesia. Using the sampling methods, a total of 629 370 respondents were analysed as a weighted sample.

Outcome variable

The outcome variable for this study was hospital utilisation, which refers to an adult's access to outpatient or inpatient hospitals. The types of hospital utilisation were unused and used. In this study, outpatient hospitalisation was restricted to the previous month, while inpatient hospitalisations for the past year were determined. This limit was requested by the poll so respondents correctly recollect outpatient and inpatient incidents.[22]

Exposure variable

The study used region as an exposure variable and classified it into seven categories according to the largest islands: Sumatra, Java–Bali, Nusa Tenggara, Kalimantan, Sulawesi, Maluku and Papua.[11 23]

Control variables

This study used residence type, age group, gender, marital status, educational level, occupation, wealth status, health insurance and travel time to the hospital as control variables.

Residence type was categorised into urban and rural. Furthermore, the Indonesian Central Statistics Agency's provisions for urban–rural categorisation were used in the survey. Age was determined based on the respondent's last birthday and categorised into the following age groups: ≤17, 18–64 and ≥65 years. Gender was categorised into male and female, while marital status was categorised into never in a union, married/living with a partner and divorced/widowed.

Respondents' educational level was based on acknowledgement of their most recent diploma. Educational level was categorised into no education and primary, secondary and higher education. Occupation was categorised into no work, civil servant/army/police, private sector, entrepreneur, farmer/fisherman/labour and others.

The 2018 Indonesian Basic Health Survey used the wealth index formula to determine respondents' wealth status. The survey calculated the wealth index using the weighted average of a household's total spending. Meanwhile, the poll computed the wealth index using primary household expenditures, such as health insurance, food and lodging, among other things. Wealth index was divided into five categories: poorest, poorer, middle, richer and richest.[24] Health insurance type was categorised into uninsured, government-run insurance, private-run insurance, and government-run and private-run insurance. Travel time was categorised into ≤1 hour and >1 hour.

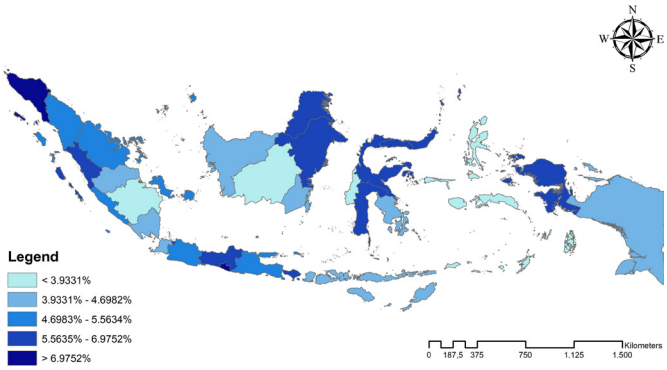

Figure 1 Regional distribution map of hospital utilisation by province in Indonesia in 2018.

Data analysis

In the first step, χ^2 test was employed to analyse bivariate comparisons. Collinearity test was used to ensure that the independent variables did not have a strong connection in the final regression model. The study also employed binary logistic regression. The last test was used to analyse the multivariate relationship between all independent variables and hospital utilisation. IBM SPSS V.26 was used in all statistical analyses. In contrast, the study used ArcGIS V.10.3 (ESRI, Redlands, California, USA) to map hospital utilisation in Indonesia in 2018. The Indonesian Bureau of Statistics submitted a shapefile of the administrative border polygons for analysis.

Patient and public involvement

There was no patient and public involvement in the study.

RESULTS

The analysis revealed that Indonesia's national average of hospital utilisation in 2018 was 5.5%. Figure 1 presents the 2018 regional distribution map of hospital utilisation by province. It also shows the diverse variations in the scope of hospital utilisation in every region. The figure shows similar low coverage of hospital utilisation among provinces, except in Nusa Tenggara and Maluku.

Table 1 presents the descriptive statistics of the regions and the respondents' characteristics. With regard to hospital utilisation, respondents in Sulawesi had the highest hospital utilisation compared with those in other areas. For residence type, residents living in rural areas dominated all regions, except for the Java–Bali region, where majority of residents were living in urban areas. For age group, Papua had the highest number of respondents aged 18–64 years compared with the other areas.

With regard to gender, men dominated Sumatra, Kalimantan, Maluku and Papua. In contrast, women

Table 1 Descriptive statistics of regions and respondents' characteristics (n=629 370)

Characteristics	Region							P value
	Sumatra (n=188 111)	Java–Bali (n=227 337)	Nusa Tenggara (n=38 145)	Kalimantan (n=61 598)	Sulawesi (n=81 675)	Maluku (n=14 625)	Papua (n=17 879)	
Hospital utilisation (%)								<0.001
Unused	94.9	94.3	95.7	95.0	94.1	96.5	95.1	
Used	5.1	5.7	4.3	5.0	5.9	3.5	4.9	
Residence type (%)								
Urban	42.8	64.5	35.8	46.9	39.4	38.3	31.7	
Rural	57.2	35.5	64.2	53.1	60.6	61.7	68.3	
Age (mean) (%)								<0.001
≤17 years	7.9	6.7	9.0	7.5	8.1	9.5	6.4	
18–64 years	85.7	84.3	83.5	87.0	84.2	84.5	91.1	
≥65 years	6.4	9.0	7.5	5.5	7.8	6.0	2.5	
Gender (%)								
Male	50.3	49.6	48.0	51.5	49.2	50.2	52.6	
Female	49.7	50.4	52.0	48.5	50.8	49.8	47.4	
Marital status (%)								<0.001
Never in union	25.0	21.9	25.3	23.4	25.2	26.2	19.7	
Married/living with a partner	67.9	69.2	66.6	69.4	66.4	66.7	74.5	
Divorced/widowed	7.1	9.0	8.0	7.3	8.4	7.1	5.8	
Educational level (%)								<0.001
No education	3.6	6.0	10.1	5.2	5.7	2.8	17.7	
Primary	55.8	58.6	57.5	59.2	57.0	52.5	47.1	
Secondary	31.9	27.5	23.4	27.0	27.3	33.9	25.9	
Higher	8.6	7.9	9.0	8.5	10.1	10.7	9.2	
Occupation (%)								<0.001
No work	37.5	37.5	34.9	35.6	41.3	37.8	32.0	
Civil servant/army/police	3.5	2.2	3.8	4.3	4.1	6.9	6.6	
Private sector	6.1	12.5	5.4	11.9	5.1	3.6	5.8	
Entrepreneur	14.4	15.3	9.2	13.8	10.8	7.6	10.1	
Farmer/fisherman/labour	32.7	27.7	39.4	27.5	29.2	33.4	41.4	
Others	5.8	4.7	7.3	6.9	9.4	10.5	4.1	
Wealth status (%)								<0.001
Poorest	12.4	18.1	31.9	7.0	24.8	16.4	22.3	
Poorer	19.8	18.4	21.1	15.9	17.6	19.2	11.2	
Middle	22.4	18.2	18.4	22.4	18.2	23.3	12.8	
Richer	23.8	19.6	14.9	24.8	18.7	22.5	19.4	
Richest	21.7	25.7	13.6	29.8	20.7	18.6	34.4	
Health insurance (%)								<0.001
Uninsured	32.9	32.9	35.5	37.6	27.2	38.6	16.1	
Government-run insurance	63.5	62.1	63.6	57.4	70.9	60.8	82.3	
Private-run insurance	2.8	3.8	0.6	3.9	1.5	0.4	1.0	
Government-run and private-run insurance	0.8	1.3	0.3	1.1	0.4	0.1	0.6	
Travel time (%)								
≤1 hour	75.1	87.5	68.7	68.2	75.1	60.4	53.4	

Continued

Table 1 Continued

Characteristics	Region							P value
	Sumatra (n=188 111)	Java–Bali (n=227 337)	Nusa Tenggara (n=38 145)	Kalimantan (n=61 598)	Sulawesi (n=81 675)	Maluku (n=14 625)	Papua (n=17 879)	
>1 hour	24.9	12.5	31.3	31.8	24.9	39.6	46.6	

dominated Java–Bali, Nusa Tenggara and Sulawesi. Based on marital status and educational level, in all regions, majority were married or lived with a partner and had primary education.

With regard to occupation, those who were not working dominated all regions, except in Nusa Tenggara and Papua. As for wealth status, the richest respondents dominated Java–Bali, Kalimantan and Papua. Meanwhile, the poorest respondents were mostly found in Nusa Tenggara and Sulawesi. With regard to health insurance, government-run insurance dominated all regions. With regard to travel time to the hospital, travel time of ≤1 hour was mostly observed in all regions.

Collinearity test was used in the analysis and indicated no strong association between the independent variables. The tolerance value for all variables was more significant than 0.10. On the other hand, the variance inflation factor value for all factors was less than 10.00. The results indicate that the regression model exhibited no signs of multicollinearity.

Table 2 presents the results of the binary logistic regression of hospital utilisation in Indonesia in 2018. At this stage, the study used 'unused hospital' as reference.

Table 2 presents the disparities in hospital utilisation between regions in Indonesia in 2018. The respondents in Sumatra were 1.079 times (95% CI 1.073 to 1.085) more likely than those in Papua to use the hospital. Moreover, those in Java–Bali (1.075 times, 95% CI 1.069 to 1.081), Nusa Tenggara (1.106 times, 95% CI 1.099 to 1.113), Sulawesi (1.008 times, 95% CI 1.002 to 1.014) and Kalimantan (1.212 times, 95% CI 1.205 to 1.219) were more likely to use the hospital than those in Papua. However, the respondents in Maluku were only 0.827 (95% CI 0.820 to 0.835) times as likely as those in Papua to use the hospital. With regard to hospital utilisation, Maluku had the lowest prevalence, followed by Papua, Sulawesi, Java–Bali, Sumatra, Nusa Tenggara and Kalimantan.

Table 2 also presents the six demographic variables related to hospital utilisation in Indonesia, namely age, gender, marital status, educational level, occupation and wealth status. The older the person, the higher his/her chances of using the hospital. With regard to gender, women had a higher probability of using the hospital than men. The study found that all the control variables were significantly related to hospital utilisation in Indonesia. People living in urban areas were 1.135 times more likely to use the hospital than those in rural areas (adjusted OR (AOR) 1.135, 95% CI 1.133 to 1.137).

With regard to marital status, respondents in all categories of marital status have a better chance of using the hospital than someone who was never in a union. With regard to educational level, those who had primary, secondary and higher education had a higher probability of using the hospital than those who did not have education. With regard to occupation, those who had occupation had a better chance of using the hospital than those who were not working. Moreover, according to wealth status, table 2 demonstrates that the richer the person, the higher the probability of him/her using the hospital.

With regard to health insurance, those with government-run insurance were 2.940 times more likely to use the hospital than the uninsured ones (AOR 2.940, 95% CI 2.934 to 2.945). Those with private-run insurance were 2.928 times more likely than the uninsured ones to use the hospital (AOR 2.928, 95% CI 2.918 to 2.938). Furthermore, those with government-run and private-run insurance were 5.096 times more likely than the uninsured ones to use the hospital (AOR 5.096, 95% CI 5.073 to 5.119).

As for travel time to the hospital, those with travel time of ≤1 hour were 1.475 times more likely than those with >1 hour of travel time to use the hospital (AOR 1.475, 95% CI 1.471 to 1.478). The result indicates that shorter travel time increases the possibility of using the hospital.

DISCUSSION

The results of this study indicate that there were disparities in hospital utilisation between regions in Indonesia in 2018. Furthermore, the geographical differences in terms of access to health services were undeniable. As is known, Indonesia is a country consisting of islands with different geographical conditions, and the unequal population concentration between the regions worsens the situation. Thus, health service facilities need to be developed, including unevenly distributed hospitals.[11] Many hospitals or health facilities are built in densely populated areas for economic reasons. Thus, it is not surprising that they are located close to each other, making it easier for people to use them.[25]

Meanwhile, in sparsely populated areas, such as Papua, there are few hospitals and people must travel tens of kilometres to use them, with the conditions more difficult in hills and mountains.[14 15 26] In the USA, racial and ethnic minority populations experience health and healthcare differences arising from interacting factors, including

Table 2 Results of the binary logistic regression of hospital utilisation in Indonesia in 2018 (N=629 370)

Predictor	Hospital utilisation			
	AOR	95% CI		P value
		Lower bound	Upper bound	
Region				
Sumatra	1.079	1.073	1.085	<0.001**
Java–Bali	1.075	1.069	1.081	<0.001**
Nusa Tenggara	1.106	1.099	1.113	<0.001**
Sulawesi	1.008	1.002	1.014	0.009*
Kalimantan	1.212	1.205	1.219	<0.001**
Maluku	0.827	0.820	0.835	<0.001**
Papua	–	–	–	–
Residence type				
Urban	1.135	1.133	1.137	<0.001**
Rural	–	–	–	–
Age groups				
≤17 years	–	–	–	–
18–64 years	1.387	1.381	1.392	<0.001**
≥65 years	3.072	3.059	3.086	<0.001**
Gender				
Male	–	–	–	–
Female	1.200	1.198	1.201	<0.001**
Marital status				
Never in union	–	–	–	–
Married/living with partner	2.339	2.334	2.345	<0.001**
Divorced/widowed	1.948	1.942	1.954	<0.001**
Educational level				
No education	–	–	–	–
Primary	1.161	1.157	1.164	<0.001**
Secondary	1.111	1.108	1.115	<0.001**
Higher	1.190	1.186	1.194	<0.001**
Occupation				
No work	–	–	–	–
Civil servant/army/police	0.683	0.681	0.685	<0.001**
Private sector	0.580	0.579	0.582	<0.001**
Entrepreneur	0.658	0.657	0.660	<0.001**
Farmer/fisherman/labour	0.573	0.571	0.574	<0.001**
Others	0.837	0.835	0.839	<0.001**
Wealth status				
Poorest	–	–	–	–
Poorer	1.247	1.244	1.251	<0.001**
Middle	1.520	1.516	1.523	<0.001**
Richer	1.856	1.852	1.861	<0.001**
Richest	2.534	2.528	2.540	<0.001**
Health insurance				
Uninsured	–	–	–	–
Government-run	2.940	2.934	2.945	<0.001**
Private-run	2.928	2.918	2.938	<0.001**

Continued

Table 2 Continued

Predictor	Hospital utilisation			
	AOR	95% CI		P value
		Lower bound	Upper bound	
Government-run and private-run insurance	5.096	5.073	5.119	<0.001**
Travel time				
≤1 hour	1.475	1.471	1.478	<0.001**
>1 hour	–	–	–	–

*P<0.010, **P<0.001.
AOR, adjusted OR.

racism and discrimination, social factors, access to and quality of healthcare, individual behaviour, and biology.[27] Understanding the health system's culture, the behaviour and the elements that contribute to these disparities is necessary.[28]

This study found that those living in urban areas are more likely to use the hospital than those living in rural areas. This finding is consistent with the a research results on women in Sub-Saharan Africa accessing health services, indicating that women living in urban areas are 1.25 times more likely to use health services than those in rural areas.[29] This is also the case of a research conducted in China, where it was demonstrated that older people in rural areas have less access to health services than seniors in urban areas.[30] Other studies had similar results, indicating that people living in urban areas are more likely to access healthcare, undergo outpatient care or be hospitalised than those in rural areas.[31] The differences in the availability of healthcare facilities between urban and rural areas are undeniable. In urban areas, health service facilities are relatively adequate.[32] Meanwhile, in rural areas, these facilities are very limited and sometimes even non-existent. The lack or absence of health service facilities in rural areas leads people not to use health services.[33]

The results indicate that the older the person, the higher his/her chances of using the hospital. Furthermore, with regard to gender, women had a higher probability of using the hospital than men. Also, the older a person gets, the more likely he/she is to suffer from degenerative diseases, such as hypertension, heart failure, stroke, diabetes mellitus, kidney failure and other chronic diseases (eg, cancer, stroke). Thus, it is not surprising that the older one gets, the more likely he/she will use healthcare facilities for outpatient and inpatient care.[34–36] Contrary to the study results, research on the use of outpatient services in first-level and advanced-level health facilities demonstrated that outpatient services are used more by men than women.[37–39]

Respondents from all categories of marital status have a better chance of using the hospital than someone who was never in a union. In addition, those with primary, secondary and higher education are more likely to use the hospital than those with no education. Also, a person living without a partner is less likely to have a companion when going to a health facility than a person with a partner or is married. Thus, it is unsurprising that access to health facilities is much lower among people without a partner. Research specifically on women in Tanzania demonstrated that, apart from poverty, unemployment and increasing age, people with no partner have more problems accessing health services than those with a partner.[40–42] In addition, the higher a person's educational level, the better the knowledge level, including about health. Results of previous studies indicated that a good knowledge level of health is associated with increased visits to healthcare facilities, health checks and a person's health status.[43 44] Moreover, previous studies have found that education is a strong determinant of various performances in the health sector.[45–47]

Working people have a better chance of using the hospital than non-working ones. In addition, the richer the person, the higher the probability of him/her using the hospital. In general, the rewards/wages of working people are in the form of money, not goods (food, clothing, etc), and having work means that a person will have the money to use to meet his/her daily needs, including health services.[40 48] On the other hand, the costs of hospital care are relatively higher than the costs of services at primary health facilities, especially if hospitalisation is required. This condition is undoubtedly an obstacle for people who do not work, have no income or are poor, especially if they do not have health insurance.[49] Working people who have better economic status have a high probability of using the hospital.[50] Thus, it is not surprising that richer people are more capable of accessing health services at the hospital compared with the poor.

This study demonstrated that health insurance can increase hospital utilisation. The results of a study in the capital city of Iran, Tehran, indicated that some people do not use healthcare facilities and choose to do treatment at home either because they do not have sufficient funds or the cost of health services is high.[51] Improved access to healthcare facilities for both outpatients and inpatients, including increased routine care for chronic conditions and improved healthcare quality for low-income people, is associated with the expanded coverage of health insurance programmes.[52] In addition,

the health financing scheme assistance provided by the government can increase the use of health services for the rural poor.[53] Results of previous studies indicated that barriers to access and financing are related to the use of health services; mothers with health insurance and of higher economic status have more excellent opportunities to take advantage of health services.[54 55]

With regard to travel time to the hospital, people with 10 min travel to the hospital are more likely to use it than those with >10 min travel. It is undeniable that distance significantly affects utilisation of healthcare facilities and that short distance increases the possibility of people accessing healthcare facilities should they experience health problems. On the other hand, long distance makes a person reluctant to access health services, especially with inadequate transportation, lack of public transportation and poor road conditions.[56] Thus, the disadvantage for people living in rural areas in accessing healthcare facilities is the long travel time.[57] The results of this study confirm the results of previous studies that short distance to hospitals increases repeat visits among inpatients.[58 59]

Strengths and limitations

This research examines a large-scale data source to provide information on a national scale. However, as the study was based on secondary data, the variables evaluated were limited to acceptable ones. Other factors linked to hospital utilisation that have been established in previous studies, such as supplier-induced demand, cost of travel to the hospital and disease type, could not be investigated.[15 32 60 61]

CONCLUSION

Based on the results, it can be concluded that regional disparities in hospital utilisation exist in Indonesia. With regard to hospital utilisation, Maluku had the lowest prevalence, followed by Papua, Sulawesi, Java–Bali, Sumatra, Nusa Tenggara and Kalimantan. Moreover, six demographic variables were found to be related to hospital utilisation in Indonesia, namely age, gender, marital status, educational level, occupation and wealth status, as well as three other control variables, namely residence type, health insurance and travel time to the hospital.

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Contributors ADL developed the proposal and analysed and interpreted patient data. ADL is guarantor for the article. RDW was a significant contributor in conducting the study, interpreting the data and writing the manuscript. NR, RR and TT contributed substantially to conducting the research and writing the manuscript. All authors read and approved the final manuscript.

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Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study involves human participants and the National Ethics Committee granted ethical clearance to the 2018 Indonesian Basic Health Survey (LB.02.01/2/KE.024/2018). The survey removed the names of all respondents from the database. No ethics approval was required for the present secondary analysis; the authors have obtained permission to use data for this analysis. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data may be obtained from a third party and are not publicly available. The authors cannot publicly share the data because a third party and the Ministry of Health of the Republic of Indonesia, who owns the data, do not give permission to share it. The 2018 Indonesian Basic Health Survey data set is available from the web (http://www.litbang.kemkes.go.id/layanan-permintaan-data-riset/) for researchers who meet the criteria to access confidential data.

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GERMAS

PERSETUJUAN AMANDEMEN PROTOKOL

PROTOCOL AMENDMENT APPROVAL

No. : LB.02.01/2/KE.024/2018

Ref. : Persetujuan/Approval no : LB.02.01/2/KE.267/2017 tanggal 28 Juli 2017

Komisi Etik Penelitian Kesehatan, Badan Penelitian dan Pengembangan Kesehatan (KEPK-BPPK) dengan berdasarkan Deklarasi Helsinki, telah melakukan telaah, pembahasan dan penilaian melalui proses **expedited.**
memutuskan amandemen protokol penelitian yang berjudul :
Health Research Ethics Committee, National Institute of Health Research and Development (HREC-NIHRD), in accordance with Helsinki Declaration, has conducted a thorough expedited review of research protocol amendment entitled :

"Riset Kesehatan Dasar (RISKESDAS) 2017-2018"

yang akan mengikutsertakan manusia sebagai partisipan/subyek penelitian; dengan Ketua Pelaksana/Peneliti Utama :
in which will involve human participant(s), with Principal Investigator :

drg. Agus Suprapto, M.Kes.

dapat diberikan persetujuan amandemen sesuai surat pengantar no. LB.02.03/1/406/2018 tanggal 16 Januari 2018. Masa berlaku surat persetujuan etik ini adalah :
*has hereby declared the amendment is **approved** for implementation. This letter is valid from/to*

24 Januari 2018 s/d **28 Juli 2018**

Jika ada perubahan protokol (amandemen) dan/atau perpanjangan penelitian, Ketua Pelaksana/Peneliti Utama harus mengajukan kembali protokol versi terbaru untuk kaji etik penelitian. Pada akhir penelitian, laporan pelaksanaan penelitian juga harus diserahkan kepada KEPK-BPPK.
Should there be any modification (amendment) and/or extention of the study, the Principal Investigator is required to resubmit the latest version of protocol for approval. The final summary reports should also be submitted to HREC-NIHRD.

Chair of HREC-NIHRD :

Jakarta, 24 Januari 2018
Ketua
Komisi Etik Penelitian Kesehatan
Badan Litbang Kesehatan,

Prof. Dr. M. Sudomo