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Original Article

Factors Related to Hospital Inpatients among the Poor in Indonesia

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Abstract

Background: The poor are vulnerable when they fall seriously ill and require hospitalization. The study aimed to analyze the factors related to hospital inpatients among the poor in Indonesia.

Methods: We analysed the 2018 Indonesian Basic Health Survey data. This cross-sectional study examined 233778 respondents through stratification and multistage random sampling. We used seven independent variables age, gender, marital status, education, employment, and health insurance, in addition to the hospital inpatient, as a dependent variable. We employed binary logistic regression to evaluate the data.

Results: The poor in urban areas were 1.315 times more likely to be hospital inpatients than those in rural areas (95%CI 1.249-1.385). Age, gender, and marital status were related to the hospital inpatients. The better the education level, the higher the hospital inpatient proportion. Meanwhile, the employed were 40% less likely than the unemployed to be hospital inpatients (95%CI 0.565-0.634). Furthermore, the insured were 3.513 times more likely than the uninsured to be hospital inpatients (95%CI 3.264-3.780).

Conclusion: Seven variables were related to hospital inpatients among the poor in Indonesia: residence, age, gender, marital status, education, employment, and health insurance. Health insurance was the main factor associated with hospital inpatients among low-income people. The government must increase the subsidy quota for the poor's participation in National Health Insurance.

Keywords: Inpatients; Poverty; Socioeconomic; Public health

Introduction

Hospital inpatient care is a health service treatment and rehabilitation process by professional healthcare workers for sick patients. Patients are hospitalized or stay at least one day in a hospital for patients to get comprehensive health services (1). The availability of hospitalization is a primary concern for human health needs. The occupancy rate in an inpatient facility is a measure of the ability of the inpatient facility to function safely and effectively. Health efforts in hospitals are

aimed at curative and rehabilitative by not abandoning health promotion and disease prevention approaches. These efforts are carried out in a comprehensive, integrated, and irrational manner. The condition will be achieved if the ratio of hospital beds to needs is balanced (2).

According to WHO standards, the ratio of hospital beds to the population is one bed for 1,000 people. Meanwhile, the proportion of hospital beds in Indonesia from 2015 to 2020 is more than 1 per 1,000 population. The number of beds in Indonesia is sufficient and has reached the WHO minimum standard. However, there are three whose bed ratio does not meet WHO provincial standards, namely West Nusa Tenggara (0.9) and East Nusa Tenggara (0.9) (1). The situation is not much different from the ratio of beds in most states in Australia, which is close to the international average for developed countries. Meanwhile, there is still a severe shortage of beds in Tasmania. Deficiencies will affect the quality of health services and limit health professionals who are lacking and not following the workload received (3).

The population percentage requiring hospitalization due to illness in Indonesia has increased yearly since the government implemented National Health Insurance (NHI) in 2014. The significant population growth rate and public interest in NHI have made people flock to health service-level facilities (4–6). Changes in disease patterns, from infectious to degenerative diseases, have added to the burden on hospitals dealing with many patients seeking treatment (7). Ideally, a hospital bed that patients can use (Bed Occupancy Rate) is between 60%-85%. In comparison, occupancy rates above 85% tend to lead to the inability of health facilities to accommodate patients (8).

Several factors are related to the inpatient in the hospital. Previous studies informed the type of residence, age, marital status, education level, occupation type, health insurance ownership, wealth status, time travel to the hospital, service cost, disease kind, disease type, and disease severity related to hospitalization (9–11). Moreover, in Brazil, age is related to hospitalization, especially for older people with functional limitations in everyday life. The Elderly is a group that is vulnerable to various diseases. Besides age, poverty also makes the elderly susceptible to disease and vulnerable to hospitalization (12,13).

Poverty and health are interrelated, and this relationship will be difficult to change unless intervention is made on one or both, namely poverty or illness. In contrast to prosperous communities, poor groups are vulnerable to health problems. Many things that affect them include poor nutritional status, unhealthy lifestyles, ability to afford access to health services, poor living environment, and lack of knowledge and behavior (14,15). This situation includes their vulnerability in accessing health services, especially related to barriers to financing health services (16).

Efforts to provide health services to the poor require a comprehensive solution, and it is necessary to formulate a strategy and act to implement health services that care for them, including overcoming or minimizing the barrier to accessing hospital services. Therefore, policymakers need to know the factors affecting the poor's hospital access, especially for hospitalization as the last gate for curative and rehabilitative efforts. Based on this background, this study aimed to analyze the factors associated with inpatients in hospitals among poor communities in Indonesia.

Materials and Methods

Data Source

We looked at the results of the 2018 Indonesian Basic Health Survey. The survey was a cross-sectional one conducted at the national level by the Indonesian Ministry of Health. The study pooled data between May and July 2018, and interviews using household and individual instruments were for (17). The study's population was all poor adults (≥15 yr old) in Indonesia. The study described 223,778 respondents as a sample.

Setting

Indonesia's impoverished national societies served as the study's context. The survey employed the wealth index formula to estimate wealth status, using a family's total spending weighted average to generate the wealth index. The poll determined the wealth index using household expenses for food, housing, and health insurance. Furthermore, the study split wealth status into five classes: poorest, poorer, middle, richer, and richest (14,18), we included the poorest and the poorer as the poor.

Dependent Variable

Inpatients at hospitals served as the study's outcome variable, and the investigation determined inpatient hospitalizations in the previous year. With a one-year time limit, the survey asked participants to recall inpatient occurrences accurately. Two groups of hospital inpatients are No and Yes.

Independent Variables

The study used seven independent variables: the type of residence, age group, gender, marital status, education level, employment status, and health insurance. We chose the independent variable based on previous studies and the investigator's experiences (16,19).

The residence type comprises urban and rural. The study categorized age based on productivity period, including 15-64 and ≥65. We divided gender into male and female. We also classified marital status into never married, married, and divorced/widowed.

The most recent diploma that the respondent has earned serves as proof of their education. The study examines education at four different levels: none, primary, secondary, and higher education. On the other side, the employment status comprises unemployed and employed. Furthermore, the study splits health insurance into uninsured and insured.

Data Analysis

In the early stages, we utilized the Chi-Square test to analyze a bivariate comparison. Then, we utilized a collinearity test to ensure that the independent factors in the final regression model did not have a strong connection. In the last stage, we used a binary logistic regression (enter method). We used the previous test to analyse the multivariate relationship between all independent factors and hospital inpatients. Furthermore, we employed the IBM SPSS 26 application throughout the statistical analysis phase.

Moreover, we employed ArcGIS 10.3 (ESRI Inc., Redlands, CA, USA) to map the proportion of hospital inpatients among people with low incomes by the province. The Indonesian Bureau of Statistics provided a shapefile of administrative border polygons for this investigation.

Ethics approval

The National Ethics Committee granted the 2018 Indonesian Basic Health Survey (LB.02.01/2/KE.024/2018). Respondents have provided written approval for their involvement in the study.

Results

The analysis found that Indonesia's national average hospital inpatient among low-income people was 2.8% in 2018. Meanwhile, Fig. 1 displays the distribution map of the hospital inpatient proportion among people experiencing poverty in Indonesia. Regarding the maps, there is no particular tendency regarding the distribution, or the pattern is random. Moreover, Table 1 shows descriptive statistics of the poor demographic characteristics. Based on hospital inpatients, those in urban areas have almost half the proportion of hospital inpatients compared to those in rural areas.

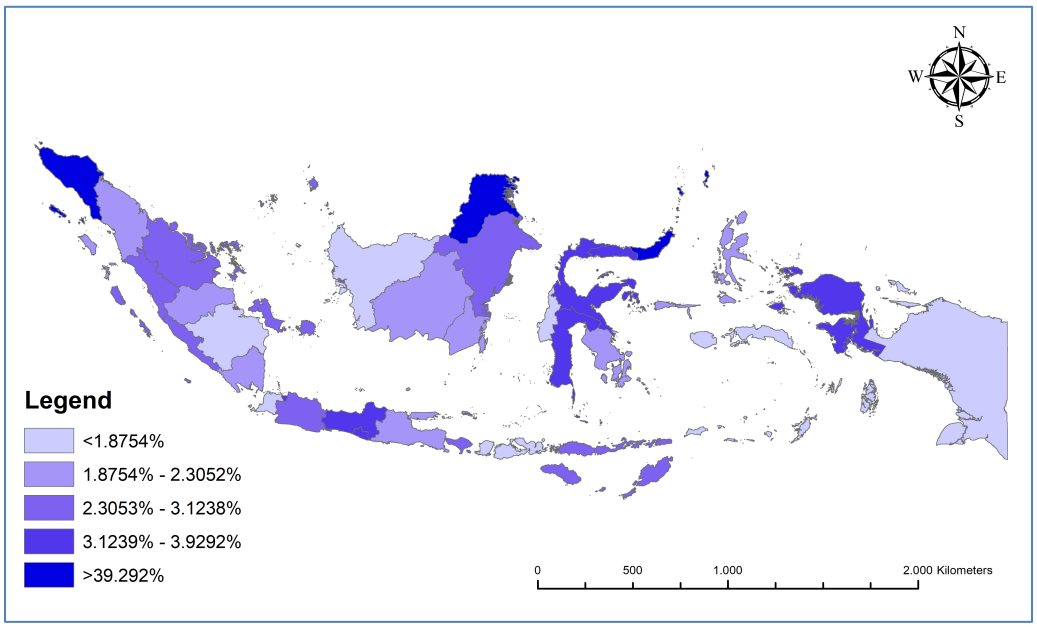

Fig. 1: Map of distribution of the hospital inpatients proportion among the poor in Indonesia

Table 1: Descriptive statistics of the poor in Indonesia (n=233,778)

Demographic Characteristics	***Hospital Inpatient***		***P-value***
	No (n=227,340) Percent	Yes (n=6,438) Percent	
The type of residence			< 0.001
Urban	96.6	3.4	
Rural	97.6	2.4	
Age (in years)			< 0.001
15-64	97.4	2.6	
≥ 65	95.9	4.1	
Gender			
Male	97.8	2.2	
Female	96.7	3.3	
Marital status			< 0.001
Never married	98.8	1.2	
Married	96.8	3.2	
Divorced/Widowed	97.1	2.9	
Education level			< 0.001
No education	97.4	2.6	
Primary	97.3	2.7	
Secondary	96.9	3.1	
Higher	96.4	3.6	
Employment status			< 0.001
Unemployed	96.5	3.5	
Employed	97.7	2.3	
Health Insurance			< 0.001
Uninsured	98.9	1.1	
Insured	96.4	3.6	

Based on age group, Table 1 indicates that the ≥ 65 has a higher proportion of hospital inpatients than the 15-64. According to gender, poor females do hospital inpatients half times more than males. Furthermore, regarding marital status, married people predominate in hospital inpatient groups. Higher education dominated hospital inpatients based on the education level category. According to employment status, the unemployed commit hospital inpatients half times more than those employed. Moreover, regarding health insurance, the insured poor have more than three times the proportion of hospital inpatients compared to those uninsured.

The second stage was a collinearity test. The test demonstrates that there is no strong association between the independent variables. The tolerance value for all factors is more significant than 0.10. Moreover, the variance inflation factor (VIF) value is less than 10.00 for all variables. Based on the test's decision-making foundation, we noted that the regression model exhibited no signs of multicollinearity. Moreover, all assumptions for binary regression analysis have been fulfilled.

Table 2 indicates the result of the last stage, the binary logistic regression of hospital inpatients among the poor in Indonesia. In this final stage, we use 'hospital inpatient=yes" as a reference. Based on the type of residence, the poor in urban areas is 1.315 times more likely to be hospital inpatients than those in rural areas (95%CI 1.249-1.385). Regarding the age group, the poor ≥65 yr were 1.552 times more likely to be hospital inpatients than those 15-64 yr (95%CI 1.431-1.683). On the other hand, according to gender, poor females were 1.199 times more likely than males to be hospital inpatients (95%CI 1.130-1.272).

Table 2: The result of binary logistic regression (n=233,778)

Predictor	***Hospital Inpatient***			
	P-value	Adjusted Odds Ratio	95% Confidence Interval	
			Lower Bound	Upper Bound
Residence: Urban	<0.001	1.315	1.249	1.385
Residence: Rural	-	-	-	-
Age: 15-64 yr	-	-	-	-
Age: ≥ 65 yr	<0.001	1.552	1.431	1.683
Gender: Male	-	-	-	-
Gender: Female	<0.001	1.199	1.130	1.272
Marital: Never married	-	-	-	-
Marital: Married	<0.001	3.091	2.826	3.381
Marital: Divorced/Widowed	<0.001	2.202	1.941	2.497
Education: No Education	-	-	-	-
Education: Primary	<0.001	1.198	1.091	1.315
Education: Secondary	<0.001	1.516	1.361	1.688
Education: Higher	<0.001	1.790	1.512	2.120
Employment: Unemployed	-	-	-	-
Employment: Employed	<0.001	0.598	0.565	0.634
Insurance: Uninsured	-	-	-	-
Insurance: Insured	<0.001	3.513	3.264	3.780

Table 2 shows that based on marital status, married people are 3.091 times more likely to be hospital inpatients than those who never married (95%CI 2.826-3.381). Divorced or widowed are

2.202 times more likely than those who never married to be hospital inpatients (95%CI 1.941-2.497). Moreover, primary education is 1.198 times more likely to be hospital inpatients than no education (95%CI 1.091-1.315). Meanwhile, secondary education is 1.516 times more likely than no education to be hospital inpatients (95%CI 1.361-1.688). Moreover, higher education is 1.790 times more likely to be hospital inpatient than no education (95%CI 1.512-2.120).
According to employment status, the employed are 40% less likely than the unemployed to be hospital inpatients (95%CI 0.565-0.634). Furthermore, based on health insurance, the insured are 3.513 times more likely than the uninsured to be hospital inpatients (95%CI 3.264-3.780).

Discussion

The findings most important was the health insurance effect. The insured were more likely than the uninsured to be hospital inpatients. Participation in health insurance can increase hospital inpatient use among poor communities. Participation in insurance is more effective than not having insurance in increasing hospital utilization among people with low incomes in Indonesia (18,19). All Indonesian people realize the Universal Health Coverage (UHC) achievement through participation in the NHI program. Based on the Unified Database, the local government registers poor and disadvantaged people, paid by the Regional Government as Contribution Fee Assistants (4).
Those in urban areas were more likely to be hospital inpatients than those in rural areas among people experiencing poverty in Indonesia. The study can explain that accessibility to hospitals from both location and economic aspects in urban areas are better than in rural areas in Indonesia. The study aligned with previous studies demonstrating a disparity between urban and rural hospital utilization. Urban areas show better utilization of both outpatient and inpatient care (10,20). Previous research on the elderly group explained that the better the socioeconomic status, the better the hospital utilization (7,21). Disparities in hospital utilization between regions in Indonesia are related to complex factors ranging from individual characteristics to geographical barriers (5,22).
Based on age group, those ≥65 yr were more likely to be hospital inpatients than those 15-64 yr among people with low incomes in Indonesia. The age group ≥65 yr of poor in Indonesia underwent more hospitalization than the age group 15-64 yr. As we know, age is a risk factor for health (12). In Papua Province, Indonesia, there were nine predictor variables for hospital utilization (outpatient and inpatient): age, urban-rural area, gender, education, work, socioeconomic, insurance ownership, travel time, and transportation cost (23). Aged ≥65 yr are at risk of degenerative diseases and are often hospitalized (24).
Females were more likely than males to be hospital inpatients among low-income people in Indonesia. The study explains that more women use hospital inpatients in poor communities in Indonesia. In contrast, previous studies demonstrated that inpatient health services increased the fastest in the elderly male group, without a significant increase in the elderly female group (12)(25).
Marital status is related to hospital inpatients among people experiencing poverty in Indonesia. Marital status can affect decisions regarding the use of hospital inpatients. Previous research demonstrates that partners can provide psychological and financial support when someone is going to be treated at the hospital (26).
The better the education level, the higher the proportion of hospital inpatients. The higher a person's education level, the better the utilization of hospital inpatients in poor communities in Indonesia. Previous studies demonstrated that education positively correlates with patient literacy, accelerating recovery and improving health status (27).
The results showed that the employed were less likely than the unemployed to be hospital inpatients. More people who work take advantage of hospital inpatients compared to people who do not work in poor communities in Indonesia. Pre-

vious studies have concluded a relationship between socioeconomic status and the use of hospitals for female workers in Indonesia. The better the social economy, the better the hospital's use (28).

The study examines big data to present facts about the impoverished nationally. On the other hand, because the survey analyzes secondary data, it restricts the variables it looks to appropriate ones. In previous studies, it is impossible to investigate additional factors, such as journey duration, hospital transportation costs, and disease type, linked to hospital utilization (5,11,22).

Implication

The findings of this study have several policy implications. First, regarding financing, those with insurance feel safer regarding medical expenses when deciding to be hospitalized. However, when hospitalizing, the patients and their families consider many things, especially those related to costs. In addition to medical expenses that have been covered by insurance, other costs that are taken into consideration are transportation costs and food costs for patient caretakers. Therefore, policymakers need to consider making policies related to costs outside of treatment costs for the poor and vulnerable to poverty.

Second, the housing factor, poor people who live in urban areas have access to better health facilities in line with development in urban areas. Therefore, a policy is needed to spread inpatient health facilities that reach more people in rural areas. Third is the age factor; those who are elderly or of unproductive age access more hospitalization, related to various diseases they suffer, primarily degenerative diseases. Therefore, increasing public awareness of all age groups is necessary to live a healthy life.

Fourth, those with good health literacy and knowledge tend to be hospitalized. The condition implies that we need policies to improve health literacy involving all sectors, from society, government, and the private sector. The findings uniqueness of this study is that people with low incomes who do not work, more are hospitalized, with the logic of critical thinking that those who do not work do not have the burden of losing revenue when they have to be unemployed due to hospitalization. The policy consequence of this is that it is necessary to develop policies so that the government can guarantee the continuity of people's income when they have to be hospitalized. Mechanisms in the form of social protection from the government or self-help movements looking after community members can be carried out as an example of the success of the "*Jogo Tonggo*" program in handling COVID 19 in Central Java.

Recommendation

Establishing policies for people with low incomes with limited inpatient services is necessary to reach hospital inpatient services. The central and regional governments focus on implementing national health insurance, especially in more impoverished and remote areas. The central government needs to ensure better investment in health personnel, facilities, and equipment in less developed areas to ensure equity in access to services.

Conclusion

The study concluded that seven variables related to hospital inpatients among people with low incomes in Indonesia. The seven were residence, age, gender, marital status, education, employment, and health insurance.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Availability of data and materials

The author 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 have 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 for access to confidential data.

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Conflict of interest

The authors declare that there is no conflict of interests.

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