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Original Research

Expanding national health insurance coverage in Indonesia's remote areas: who should be prioritized?

AUTHORS

Wahyu Pudji Nugraheni[1] PhD, Senior Researcher [https://orcid.org/0000-0002-7129-809X]

Agung Dwi Laksono[1] PhD, Senior Researcher


Asep Kusnali[1] MEc, Junior Researcher * [https://orcid.org/0000-0002-5492-4116]

Leny Latifah[1] PhD, Senior Researcher

Irfan Ardani[1] MPH, Junior Researcher

Rofingatul Mubasyiroh[1] MPH, Junior Researcher [https://orcid.org/0000-0001-5416-9512]

Diah Yunitawati[1] MPH, Junior Researcher [https://orcid.org/0000-0001-7893-3810]

Tati Suryati Warouw[1] PhD, Senior Researcher

Tety Rachmawati[1] MSc, Senior Researcher [https://orcid.org/0003-0593-2483]

CORRESPONDENCE

*Mr Asep Kusnali asep059@brin.go.id

AFFILIATIONS

[1] National Research and Innovation Agency, Jakarta, Indonesia

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Abstract

Introduction: The objective of this study was to ascertain the target population for expanding National Health Insurance (NHI) coverage in remote areas of Indonesia.
Methods: This study used secondary data for 130,331 people from the 2023 National Socio-economic Survey, a nationally representative cross-sectional household survey conducted by Indonesian Statistics. NHI membership was used as a dependent variable. The study examined residence, age, gender, marital status, education, and occupation as independent variables. In the last phase, binary logistic regression was used.
Results: The NHI membership rate in disadvantaged regions of Indonesia was 74.5%. People in rural areas were 1.11 times more likely to be NHI members than those in non-rural areas (95%CI 1.06–1.16). Age was related to NHI membership. Married people were 1.29 times more likely than those never married to be NHI members (95%CI 1.25–1.34). Divorced/widowed people were 1.16 times more likely than those never married to be NHI members (95%CI 1.08–1.23). People at all other education levels than primary school education were more likely to be NHI members. Employed people were 1.36 times more likely to be NHI members than those who were unemployed (95%CI 1.31–1.40). The wealthier the people, the higher the likelihood of them being NHI members.
Conclusion: Based on the study's results, the target population includes non-rural residents in disadvantaged regions as well as never-married individuals, those with primary education or less, those who are unemployed, and the poorest wealth quintile, requiring interventions like mobile enrolment units and simplified registration protocols.

Keywords

disadvantaged areas, Indonesia, National Health Insurance, public health, Universal Health Coverage.

Introduction

The National Health Insurance Program (NHI) was introduced with the primary objective of providing broader and more affordable access to healthcare services for all Indonesian citizens. It aims to reduce disparities in healthcare access among different societal groups, enhance the quality of healthcare services, and protect the population from the financial risks associated with healthcare costs[1]. This aligns with the international commitment outlined in the UN Sustainable Development Goals, which mandate that every country be able to achieve Universal Health Coverage (UHC) by 2030[2].

The implementation of NHI commenced in 2014 with a focus on expanding membership coverage. Initially, the primary focus was on registration efforts and participant selection, including mapping participants based on socioeconomic status. Despite significant increases in the number of registered members in recent years, challenges persist in encompassing all segments of society, particularly in underserved areas. Based on health insurance statistics for 2016–2021, NHI membership status as of December 2021 had covered 235 million participants or 86.55% of Indonesia's population[3,4]. This figure falls short of the membership target set in the National Medium-Term Development Plan (RPJMN), which aims for 98.6% coverage of the population by 2025[5].

Underserved regions often face greater challenges in NHI registration and maintenance[6]. Factors such as limited access to information, inadequate infrastructure, and financial inability pose major obstacles to expanding NHI membership in these areas[7,8]. Additionally, public awareness and trust in the importance of NHI play a role in people's willingness to utilize NHI as healthcare assurance for themselves and their families[9,10].

NHI membership in Indonesia is influenced by several factors. A study using data from the 2018, 2019, and 2020 national socio-economic surveys in Indonesia identified several critical variables related to private health insurance membership. These variables include age, sex, education, economic status (measured by per-capita expenditure), employment status, marital status, household status, and location of residence[11]. A study on the elderly population (aged 60 years and over) in Indonesia found that NHI coverage for the elderly is already good, although there are still high disparities in some regions. The study showed that the NHI membership status of the elderly has a significant relationship with age, place of residence, education level, and wealth status[12]. These studies provide valuable insights into the factors influencing NHI membership in different demographic groups in Indonesia.

Cultural factors can also influence NHI membership in Indonesia. While specific studies focusing on cultural factors are limited, several sociodemographic factors that are often intertwined with cultural aspects have been identified. For example, in some cultures, younger people may be less likely to see the value in health insurance as they feel less vulnerable to health risks. Similarly, in rural areas, traditional beliefs and practices can influence perceptions of health and healthcare, affecting decisions to participate in NHI[13].

By 2020, 222.5 million individuals had signed up for NHI, equating to 81.3% of Indonesia's total population[14]. Despite these achievements, there are still significant disparities in NHI coverage across different regions, particularly in disadvantaged areas. These areas often face challenges in terms of healthcare access and quality, which can affect the enrolment of NHI. The government has made efforts to expand NHI coverage in these areas, exemplified by the issuance of Presidential Instruction Number 1 of 2022, which aims to optimize the implementation and sustainability of the NHI program while increasing access to quality health services. To increase participation in disadvantaged areas through this regulation, an affirmative policy of using the Village Funds Program, a national initiative that allocates state budget funds directly to villages for local development and welfare programs, is carried out to support the optimization of the implementation of the NHI program, especially in rural areas.

The government should guarantee UHC promotes equity and social justice by reducing disparities in healthcare access between different socioeconomic groups through programs like the NHI[15]. Guaranteeing access to healthcare services for everyone contributes to better public health outcomes. By providing timely and affordable healthcare services, especially preventive care, the government can reduce the burden of disease and improve overall population health. Lack of access to healthcare can push individuals and families into poverty due to high out-of-pocket healthcare expenses[16]. UHC, including the NHI program, helps protect people from catastrophic health expenditures and reduces the financial burden of health care, thereby contributing to poverty alleviation efforts. Distinct from Hasan et al's analysis of private insurance ownership using pooled 2018–2020 National

Socioeconomic Survey data[11], this study (1) focused exclusively on NHI enrollment gaps within government-designated disadvantaged regions (Presidential Regulation 63/2020: 'Determining underdeveloped regions for 2020–2024'), (2) utilized 2023 national data capturing post-pandemic equity challenges, and (3) identified precise priority groups for targeted enrollment expansion, addressing critical evidence gaps in accelerating UHC for underserved geographies.

Based on the narration, the study analyzed factors related to NHI membership to determine the target of expanding the number of NHI members in underprivileged areas in Indonesia.

Methods

Data source

Secondary data from the 2023 National Socio-economic Survey were utilized in the research. Concurrently, the research was a cross-sectional survey conducted at the national level by Statistics Indonesia. The survey gathered information throughout March 2023.

The 2023 National Socio-economic Survey encompasses the entire domestic population of Indonesia. The national survey covers a sample size of 345,000 households distributed among 514 districts/cities and 34 provinces in Indonesia. The present study analyzed a subset of this cohort, focusing exclusively on individuals from disadvantaged regions. The number of census block samples utilized in the survey was 34,500. Systematic sampling was employed to select 10 households from each block using probability-proportional-to-size sampling. In specific census blocks, stratification was performed at the household and census block levels to generate a representative sample. Explicit stratification is implemented in census blocks (for the 2020 Population Census, all residents are grouped into regular census blocks based on urban/rural classification). Implicit stratification is determined by the educational attainment of the chief of the household[17].

All Indonesian individuals aged 15 years or more residing in disadvantaged regions based on Presidential Regulation 63/2020 were included. After applying geographical filters, the final analytical sample comprised 130,331 respondents.

Setting

This study investigates the NHI membership in the underprivileged districts of Indonesia. Presidential Regulation 63/2020 establishes the boundaries of poor regions. According to the regulation, underdeveloped areas in Indonesia include 62 districts in 11 provinces (Table 1).

Dependent variable

NHI membership was incorporated as an outcome variable in the study. The study's scope of NHI included all forms of participation, including coverage provided by enterprises or with government support; mandatory enrolment for public servants, police, and army personnel; and coverage obtained through other means. In the survey, 'no' or 'yes' were the response options for NHI membership.

Table 1: Provinces and districts constituting underdeveloped areas in Indonesia

Province	District(s)
North Sumatera	Nias, South Nias, North Nias, West Nias
West Sumatera	Mentawai Islands
South Sumatera	North Musi Rawas
Lampung	West Pesisir
West Nusa Tenggara	North Lombok
East Nusa Tenggara	West Sumba, East Sumba, Kupang, South Timor Tengah, Belu, Alor, Lembata, Rote Ndao, Central Sumba, Southwest Sumba, East Manggarai, Sabu Raijua, Malaka
Central Sulawesi	Donggala, Tojo Una-una, Sigi
Maluku	West Maluku Tenggara, Aru Islands, West Seram, East Seram, Southwest Maluku, South Buru
North Maluku	Sula Islands, Taliabu Island
West Papua	Wondama Gulf, Bintuni Gulf, South Sorong, Sorong, Tambrauw, Maybrat, South Manokwari, Arfak Mountains
Papua	Jayawijaya, Nabire, Paniai, Puncak Jaya, Boven Digoel, Mappi, Asmat, Yahukimo, Bintang Mountains, Tolikara, Keerom, Waropen, Supiori, Great Mamberamo, Nduga, Lanny Jaya, Central Mamberamo, Yalimo, Puncak, Dogiyai, Intan Jaya, Deiyai

Independent variables

Seven independent variables were utilized in the research, and seven criteria were incorporated as components of those variables. The seven criteria were domicile, age, gender, marital status, level of education, employment status, and wealth status. Residence was reclassified as rural ('yes'/'no') using Indonesian Statistics Regulation 120/2020, which defines urban areas by population density (>1500/km^2), infrastructure coverage, and non-agricultural economic dominance.

Age was determined for this study by considering the respondent's most recent birthday. Gender was classified into two discrete categories in the survey: male and female. Marital status of respondents was classified into three distinct categories: never-married individuals, married individuals, and those who were divorced or bereaved. The respondent's education pertains to their most recent scholarly credential. Four levels of education are considered in the study: primary school, junior high, senior high, and collegiate. Employment status is categorized into two distinct groups: employed and unemployed.

The income status of participants was determined using the wealth index formula, using a weighted average of a household's expenditures. The formula considered essential household expenditures such as housing, food, and health care, among other components. Wealth status was divided into five distinct categories in the survey: impoverished, poorer, middle, wealthier, and most wealth[18].

Data analysis

In the preliminary stages of the sample, the research utilized the χ^2 test to compare the dichotomous variable across two variables. Concurrently, the research used the *t*-test to examine the continuous age variable. The study incorporated a collinearity test to ascertain the absence of significant correlation among the final

regression model's independent variables. Binary logistic regression was utilized to analyse the study's concluding findings. The research used a previously developed method to investigate the multivariate correlation between all independent factors and NHI membership in the survey. Statistical analysis was conducted using SPSS v26 (IBM Corp; https://www.ibm.com/products/spss-statistics).

Ethics approval

This investigation, utilizing secondary data, is exempt from formal ethical review according to the policies of the National Ethics Committee of the National Research and Innovation Agency, Indonesia.

Results

The inquiry ascertained that the mean NHI membership rate in disadvantaged regions of Indonesia in 2023 was 74.5%. The descriptive data of the participants are presented in Table 2. Rural areas dominated both NHI membership groups in terms of residence type. NHI members were older than non-NHI members, on average. Males were more numerous than females in both NHI membership types. Based on marital status, 'never married' dominated both NHI membership groups.

The sample predominantly comprised individuals who had completed primary education (Table 2). This group exhibited the lowest rate of National Health Insurance (NHI) enrolment. A discernible gradient is evident, whereby NHI participation rates increase consistently with higher levels of educational attainment, peaking among college graduates. A comparable positive socioeconomic gradient is observed in relation to wealth status: membership in the NHI scheme rises proportionally with household affluence. Although a larger proportion of the study population was unemployed, employed individuals showed a significantly higher rate of NHI membership.

We subsequently performed the collinearity examination. The results of the test suggest that there is no observable correlation among the independent variables. Each variable has a variance inflation factor value less than 10.00, whereas the tolerance value is more significant than 0.10. The absence of multicollinearity in the regression model was identified during the investigation, suggesting that the test's basis for deriving conclusions was strong.

Table 2 presents the binary logistic regression analysis results regarding NHI membership in underprivileged regions of Indonesia. Regarding residence type, people in rural areas are 1.11 times more likely to be NHI members than those in non-rural areas (95%CI 1.06–1.16). The adjusted odds ratio for age (0.65; 95%CI 0.65–0.66) indicates that each additional year reduces NHI enrolment likelihood by 35%. According to marital status, married people were 1.29 times more likely than those never married to be NHI members (95%CI 1.25–1.34). Divorced/widowed people were 1.16 times more likely than those never married to be NHI members (95%CI 1.08–1.23).

Table 3 indicates that, based on education level, people with all other education levels than primary school education were more likely to be NHI members. Employed people were 1.36 times more likely to be NHI members than those who were unemployed (95%CI 1.31–1.40). Regarding wealth status, the results indicate that the wealthier the people, the higher the likelihood of them being a NHI members.

Table 2: Descriptive statistics of study participants (*n*=130,331)

Characteristic	Variable	National Health Insurance membership				*p*-value
		No (*n*=33,198)		Yes (*n*=97,133)		
		n / mean	%	*n* / mean	%	
Rural	No	3080	24.0	9741	76.0	<0.001†
	Yes	30,118	25.6	87,392	74.4	
Mean age (years)		23.6		29.9		<0.001¶
Gender	Male	16,931	25.5	49,376	74.5	0.604
	Female	16,267	25.4	47,757	74.6	
Marital status	Never married	20,376	30.1	47,266	69.9	<0.001†
	Married	11,300	20.3	44,355	79.7	
	Divorced/widowed	1522	21.6	5512	78.4	
Education level	Primary school	24,519	28.1	62,887	71.9	<0.001†
	Junior high school	4152	21.9	14,831	78.1	
	Senior high school	3550	20.4	13,881	79.6	
	College	977	15.0	5534	85.0	
Employment status	Unemployed	22,131	29.9	51,994	70.1	<0.001†
	Employed	11067	19.7	45,139	80.3	
Wealth status	Poorest	16,131	30.4	37,000	69.6	<0.001†
	Poorer	7661	26.4	21,371	73.6	
	Middle	4533	23.2	15,025	76.8	
	Wealthier	2999	18.8	12,939	81.2	
	Most wealthy	1874	14.8	10,798	85.2	

† χ^2 test result
¶ *t*-test result

Table 3: Outcome of binary logistic regression analysis on National Health Insurance membership in disadvantaged areas in Indonesia in 2023 (*n*=130,331)

Predictor	National Health Insurance membership			
	p-value	Adjusted odds ratio	95%CI	
			Lower bound	Upper bound

Rural: No (ref.)	–	–	–	–
Rural: Yes	<0.001***	1.11	1.06	1.16
Age	<0.001***	0.65	0.65	0.66
Gender: Male (ref.)	–	–	–	–
Gender: Female	0.546	1.07	1.04	1.10
Marital: Never married (ref.)	–	–	–	–
Marital: Married	<0.001***	1.29	1.25	1.34
Marital: Divorced/widowed	<0.001***	1.16	1.08	1.23
Education: Primary school (ref.)	–	–	–	–
Education: Junior high school	<0.001***	1.31	1.26	1.36
Education: Senior high school	<0.001***	1.22	1.17	1.27
Education: College	<0.001***	1.51	1.40	1.62
Employment: Unemployed (ref.)	–	–	–	–
Employment: Employed	<0.001***	1.36	1.31	1.40
Wealth: Poorest (ref.)	–	–	–	–
Wealth: Poorer	<0.001***	1.17	1.13	1.20
Wealth: Middle	<0.001***	1.35	1.30	1.41
Wealth: Wealthier	<0.001***	1.73	1.65	1.81
Wealth: Wealthiest	<0.001***	2.16	2.05	2.28

*$p<0.05$, **$p<0.01$, ***$p<0.001$
CI, confidence interval. Ref., reference value.

Discussion

The results of this study showed that people living in rural areas are more likely to be NHI members compared to non-rural people in disadvantaged areas. Disadvantaged areas in Indonesia are predominantly in eastern Indonesia. Research on health insurance in the province of Papua showed that there is a relationship between place of residence and primary healthcare utilization, with Papuans in rural areas and those aged over 65 years using primary health care more often than other groups[19]. The observed higher NHI membership in rural disadvantaged areas primarily reflects the government's targeted subsidy program (PBI/Jamkesda) for impoverished populations. However, membership does not inherently translate to service utilization, as geographical barriers, including provider shortages and transportation limitations, persistently constrain physical access to primary care facilities. While Wenang et al (2021) confirm basic services reach some remote communities[8], comprehensive healthcare access requires parallel infrastructure investments. Meanwhile, people who do not receive contribution assistance from the government and non-remote communities use more advanced health services. This situation shows that primary healthcare access points have been widely used by most of those who are poor and by people living in rural or remote areas[8]. This pattern of marginally lower NHI membership among rural populations contrasts with national-level studies[14,20,21] that reported higher non-rural enrolment rates in Indonesia's general population.

Contrary to patterns observed in Ghana and the US[22,23], this study identified a significant negative association between age and NHI enrolment in Indonesia's disadvantaged regions (Table 3). Each year of increased age corresponded to a 35% reduction in the likelihood of membership. Individuals with higher ages are more inclined to prioritize their health as they experience a higher utilization of healthcare services[23]. A study in Germany had a different result, stating that younger adults had a better willingness to pay for health insurance due to better financial capability[24]. The correlation between age and NHI enrolment can also be attributed to an individual's financial stability, which in turn influences their choice and opportunity of health insurance types and enrolment[25].

According to marital status, married and divorced/widowed people were likelier than those never married to be NHI members, with the highest odds for those with married status. Research in Zambia revealed that marital status (being married) was associated with increased health insurance membership exclusively among women[26], while studies in Jordan, South Africa, and Nigeria found the higher odds of insurance membership only significant for adults currently with married status[27,28]. The increased likelihood of higher health insurance membership among married couples can be attributed to their ability to combine resources and afford health insurance[26]. Persons with married status also had higher necessities for health insurance, for instance in relation to pregnancy, compared to unmarried individuals[29].

Those with all other levels of education compared to primary school education had a higher chance of becoming NHI members, and education level is positively correlated with the possibility of NHI membership. Individuals with low education often have barriers to knowledge and understanding of the principles of health insurance, which becomes a barrier to NHI membership. Conversely, those with higher educational status find it easier to understand the risks of spending related to health services, so they realize the importance of health insurance protection[30]. Another influencing factor is trust in the insurance scheme administrator and distrust related to past bad experiences. These findings reveal significant insurance coverage disparities disproportionately favoring socioeconomically advantaged groups, with higher educational attainment strongly predicting NHI membership. This research found that the lower the degree of education, the larger the barriers to becoming an NHI member. Another significant influence is that most people with limited education do not have work[14]. This study's findings are consistent with earlier studies on health insurance membership among women in specific countries in Sub-Saharan Africa. Other important indicators of insurance membership include age, marital status, place of residence, economic standing, employment, and media access[31].

Employed people were more likely to be NHI members than those who were unemployed. Several conditions can explain these findings: in many countries with NHI systems, including Indonesia and its NHI program, employers are required by law to enroll their employees in the national health insurance scheme and contribute to their premiums[1,32]. This means that individuals who are

employed are automatically enrolled in NHI through their workplace, whereas unemployed individuals may need to actively seek membership. Employed individuals typically have a stable source of income, making it easier for them to afford health insurance premiums[33]. In contrast, unemployed individuals may face financial constraints that make it difficult for them to pay for health insurance, even if subsidized by the government. Employees often receive information about NHI enrollment and benefits through their employers or workplace channels. This exposure to information may increase their likelihood of being aware of and participating in the NHI program. In some cases, unemployed individuals may be covered under the NHI program as dependents of family members who are employed[32]. However, this coverage may be less common or comprehensive compared to being directly enrolled as an employee.

The study results indicate that the wealthier the people, the higher the likelihood of being NHI members. Wealthier individuals generally have higher incomes and greater financial resources, making it easier for them to afford health insurance premiums[34]. They are more likely to be able to allocate a portion of their income to pay for health insurance without experiencing financial strain. Wealthier individuals are more likely to be employed in formal sectors where mandated health insurance benefits increase their likelihood of NHI enrolment, leading to higher membership rates among this group. Also, wealthier individuals often have better access to information about the benefits of health insurance and the enrolment process. There is a stigma associated with not having health insurance among wealthier individuals, who may view health insurance as a symbol of social status and financial stability[35,36]. This societal pressure or expectation may lead them to prioritize enrolment in NHI to maintain their social standing.

These findings yield critical operational implications for accelerating Indonesia's progress towards UHC. First, a precision targeting framework should prioritize five groups exhibiting the lowest enrolment rates: rural residents, never-married adults, populations with only primary education or less, those who are unemployed, and the poorest wealth quintile. For these groups, tailored interventions are warranted such as mobile enrolment units with pictorial forms for low-literacy communities, and digital campaigns emphasizing individual financial protection for young singles. Second, policy integration should leverage existing instruments, particularly by allocating 20% or more of village funds (per Presidential Instruction 1/2022) to last-mile enrolment drives, which are targeted outreach initiatives such as mobile registration units and community-based awareness campaigns designed to reach remote, underserved, and hard-to-enrol populations. These efforts should be measured through clearly defined registration key performance indicators. Concurrently, integrating NHI registration with the Unified Database for Social Welfare (DTKS) would automate premium subsidies for eligible households. Third, accountability must be strengthened through public district-level dashboards tracking enrolment disparities by wealth/education quintiles, and by linking village fund disbursements to equity targets. Embedding these approaches within Indonesia's village governance structures offers a pragmatic pathway to achieving 98.6% NHI coverage by 2025 while redressing systemic inequities.

Limitation

The data used in this study were processed from an earlier cross-sectional survey. The authors could not verify the temporal correlation between the exposure variable and the result. The investigation did not investigate several well-established variables, such as income, smoking habit, and history of chronic illness, found in other studies that looked into the determinants of health insurance membership[20,37,38].

Conclusion

Based on the findings outlined, it is evident that numerous pivotal factors impact NHI membership in deprived regions of Indonesia, encompassing residence type, age, marital status, level of education, employment status, and wealth status. These findings underscore the intricate interaction of socioeconomic elements in shaping NHI membership, thereby spotlighting significant enrollment disparities across demographic strata particularly affecting rural residents, never-married individuals, and low-education groups in disadvantaged regions. Addressing these inequities through precision targeting is paramount for achieving Indonesia's UHC targets. Remedying these inequalities is paramount for attaining equitable healthcare coverage and realizing the objective of universal health provision. It is imperative to acknowledge limitations such as the inability to establish temporal correlation and the exclusion of certain variables like income and chronic illness history, which could offer further insights into the determinants of NHI membership.

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Conflicts of interest

The authors declare no conflicts of interest.

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