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Policy analysis of national health financing implementation on access and equity of healthcare services in rural communities

Suprapto Suprapto

Department of Nursing, Politeknik Sandi Karsa, South Sulawesi, Indonesia

Corresponding author:
Suprapto;
Department of Nursing, Politeknik Sandi Karsa, South Sulawesi, Indonesia
atoenurse@gmail.com

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ABSTRACT

Introduction: Healthcare inequities remain common in rural communities despite national health financing programs designed to achieve universal health coverage. Geographic barriers, limited healthcare services, and administrative challenges continue to affect access to healthcare.

Methods: A quantitative cross-sectional study was conducted in rural districts of Eastern Indonesia from January to April 2026, involving 348 respondents selected through multistage cluster sampling. Data were analyzed using chi-square tests and multivariate logistic regression with adjusted odds ratios (AOR) and 95% confidence intervals (CI).

Results: More than half of respondents (56.9%) experienced healthcare access difficulties despite active insurance enrollment. Limited availability of healthcare services was the strongest predictor of healthcare barriers (AOR = 3.46; 95% CI: 2.01–5.95; $p < 0.001$). Geographic distance, low income, transportation problems, and administrative complexity were also significantly associated with healthcare inequities.

Conclusion: National health financing policies have improved financial coverage but remain insufficient to eliminate rural healthcare disparities. Strengthening healthcare infrastructure, transportation systems, and governance mechanisms is necessary to improve equitable access to healthcare.

Keywords: Healthcare Access; Health Equity; Health Financing; Rural Health Services; Universal Health Coverage.

Highlight:

- National health financing policies play a critical role in reducing healthcare disparities among rural populations.
- Limited infrastructure, workforce shortages, and geographic barriers continue to hinder equitable access to healthcare in remote communities.
- Effective implementation of health financing improves service utilization, financial protection, and continuity of care for vulnerable populations.
- Administrative complexity and unequal resource distribution remain major challenges in achieving universal health coverage in rural settings.
- Strengthening governance, monitoring systems, and community-based healthcare strategies is essential to enhance equity and sustainability of national health financing programs.

INTRODUCTION

Achieving equitable healthcare access remains a persistent challenge in many developing countries despite the expansion of national health financing programs aimed at supporting universal health coverage [1]. Rural communities continue to experience substantial barriers in accessing essential healthcare services due to geographical isolation, limited health infrastructure, shortages of healthcare professionals, and unequal allocation of financial resources. In Indonesia and other low- and middle-income countries, national health insurance and public financing schemes have been introduced to reduce out-of-pocket expenditures and improve access to healthcare for vulnerable populations [2]. However, evidence suggests that financial protection alone does not automatically ensure equitable healthcare utilization, particularly among rural populations with complex socioeconomic and structural disadvantages [3].

The implementation of national health financing systems has become increasingly important because healthcare inequality contributes directly to preventable morbidity, delayed treatment, and poor population health outcomes [4]. Rural residents frequently face longer travel distances, transportation difficulties, limited referral facilities, and an inadequate distribution of the health workforce compared to urban populations [5]. These disparities may reduce the effectiveness of health financing programs even when insurance coverage is formally available. Several international reports have indicated that inequities in healthcare access are strongly associated with uneven policy implementation, weak governance mechanisms, and disparities in regional fiscal capacity [6]. Consequently, understanding how national health financing policies operate within rural contexts is essential for strengthening health system responsiveness and promoting social justice in healthcare delivery [7].

Previous studies have examined the relationship between health financing and healthcare utilization from multiple perspectives [8]. Existing evidence demonstrates that publicly funded health insurance programs can reduce catastrophic health expenditure, increase outpatient visits, and improve access to primary healthcare services. Research conducted in Southeast Asia, Sub-Saharan Africa, and Latin America has shown that national insurance expansion contributes positively to maternal health services, preventive care utilization, and chronic disease management [9]. In Indonesia, the implementation of the national health insurance system has been associated with increased healthcare utilization among low-income populations and expanded coverage for essential medical services [10].

Although these studies provide valuable insights, several limitations remain evident in the current literature. First, many previous investigations have primarily focused on insurance coverage rates and healthcare utilization indicators, without critically evaluating the policy implementation process in rural communities [11]. Quantitative assessments frequently emphasize financial outcomes while overlooking structural and administrative barriers influencing service accessibility. Second, existing studies often analyze the effectiveness of healthcare financing at the national or provincial level, which may obscure local disparities faced by remote and underserved communities. Third, previous research tends to examine healthcare access and equity separately rather than understanding how financing implementation simultaneously influences both dimensions [12]. As a result, there remains limited empirical understanding regarding how policy execution, governance practices, and contextual rural conditions interact to shape equitable healthcare delivery [13].

Another important limitation is the dominance of variable-centered approaches in health financing research. Most prior studies rely on linear statistical relationships between financing indicators and healthcare outcomes, assuming that policy implementation operates uniformly across regions [14]. In reality, rural healthcare systems are characterized by heterogeneous institutional capacities, cultural dynamics, transportation accessibility, and resource availability. Such contextual complexity may produce different patterns of healthcare access and equity

despite similar financing structures. Furthermore, evidence regarding the effectiveness of national health financing implementation in addressing multidimensional inequities among rural populations remains fragmented and insufficiently integrated.

This study addresses these gaps by critically analyzing the implementation of national health financing policies and their influence on healthcare access and equity in rural communities. Unlike previous studies that mainly focus on insurance participation or financial coverage, this research emphasizes policy implementation processes, governance mechanisms, and contextual barriers affecting equitable healthcare delivery. The study adopts an evidence-driven, problem-oriented perspective to evaluate how financing policies operate in real-world healthcare settings, particularly in underserved rural regions.

The novelty of this study lies in its integrated examination of healthcare access and equity within the context of national health financing implementation in rural communities. This research contributes to the literature by connecting policy implementation analysis with rural healthcare disparities, thereby providing a more comprehensive understanding of how financing systems influence service accessibility and fairness. In addition, the study highlights the importance of governance quality, institutional capacity, and local contextual factors in determining the effectiveness of health financing policies. The findings are expected to provide practical implications for policymakers, healthcare administrators, and public health institutions in designing more inclusive and equitable financing strategies.

Therefore, the purpose of this study is to analyze the implementation of national health financing policies and examine their impact on healthcare access and equity among rural communities. The study specifically seeks to identify structural barriers, governance challenges, and contextual factors that influence the effectiveness of health financing programs in improving equitable healthcare delivery in rural settings.

RESEARCH METHODOLOGY

Study Design

This study employed a quantitative cross-sectional analytical design to examine the implementation of national health financing policies and their influence on healthcare access and equity among rural communities. A cross-sectional approach was considered appropriate because the study aimed to evaluate relationships between policy implementation factors and healthcare outcomes within a defined population at a specific point in time. The design enabled the identification of disparities in healthcare accessibility, service utilization, and perceived equity associated with the implementation of health financing in rural settings. In addition, the quantitative approach facilitated objective measurement of policy-related variables and allowed statistical analysis of factors influencing healthcare access and equity.

Setting & Participants

The study was conducted in several rural districts located in Eastern Indonesia between January and April 2026. These areas were selected because they represent geographically remote communities with limited healthcare infrastructure and varying levels of national health financing implementation. The target population consisted of adults aged 18 years and above who had utilized primary healthcare services or public health facilities within the previous 12 months. Participants were included if they were registered residents of the selected rural areas, actively enrolled in the national health insurance program, and willing to participate voluntarily. Individuals with severe cognitive impairment, communication difficulties, or incomplete questionnaire responses were excluded from the study. A multistage cluster sampling technique was used to ensure a representative sample of participants across different rural regions.

The minimum sample size was calculated using the LEMESHOW formula for cross-sectional studies with a 95% confidence level, a 5% margin of error, and an estimated prevalence of healthcare access inequality of 50%. After accounting for potential non-response, the final minimum sample required was 320 participants. A total of 348 respondents completed the study questionnaire.

Variables & Measurement

The dependent variables in this study were healthcare access and healthcare equity. Healthcare access was operationally defined as participants' ability to obtain needed healthcare services without significant financial, geographic, or administrative barriers. Healthcare equity refers to the fairness and equal opportunity in obtaining healthcare services regardless of socioeconomic or geographical conditions.

The independent variable was national health financing implementation, which included dimensions such as insurance utilization, financial protection, service coverage, referral accessibility, and administrative efficiency. Sociodemographic variables, including age, sex, educational level, occupation, income, and distance to healthcare facilities, were also measured as control variables. Data were collected using a structured questionnaire adapted from previous public health financing and healthcare accessibility studies. Content validity was evaluated by three public health and health policy experts. Construct validity testing demonstrated factor loading values above 0.50. Reliability analysis showed Cronbach's alpha coefficients ranging from 0.78 to 0.91, indicating acceptable internal consistency. Primary data were obtained directly from participants through face-to-face interviews, while secondary data regarding healthcare facility distribution and insurance coverage were obtained from regional health office reports.

Data Collection

Data collection was conducted by trained research assistants who received standardized training regarding interview procedures, ethical considerations, and questionnaire administration. Before data collection, a pilot study involving 30 respondents was performed to evaluate questionnaire clarity and procedural feasibility. Participants were approached at community health centers and village healthcare posts after receiving explanations regarding the study objectives and procedures. To maintain data quality, all completed questionnaires were checked daily for completeness and consistency by field supervisors. Double data entry procedures were implemented to minimize transcription errors. In addition, periodic monitoring and verification were conducted throughout the data collection period to ensure adherence to research protocols.

Data Analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and study variables. Bivariate analysis was conducted using chi-square tests and independent t-tests to identify associations between independent variables and healthcare access outcomes. Multivariate analysis was performed using binary logistic regression to identify factors independently associated with healthcare access and healthcare equity, controlling for potential confounding variables. Adjusted odds ratios (AORs) with 95% confidence intervals were reported to measure the strength of associations. Statistical significance was determined at a p-value of less than 0.05 ($\alpha = 0.05$).

Ethical Approval

This study received ethical approval from the Health Research Ethics Committee of the Indonesian Institute of Health Sciences with approval number: 112/KEPK/II/2026. All participants received detailed information regarding the study objectives, procedures, confidentiality, voluntary participation, and the right to withdraw at any time without consequences. Written informed consent was obtained from all participants before data collection commenced. Participant anonymity and confidentiality were strictly maintained throughout the research process, and all collected data were used solely for academic and scientific purposes.

RESULT

Table 1. Characteristics of Respondents (n = 348)

Variable	Category	Frequency (n)	Percentage (%)
Age	18–35 years	124	35.6
	36–55 years	156	44.8
	>55 years	68	19.5
Sex	Male	146	42.0
	Female	202	58.0
Education Level	Primary school	104	29.9
	Secondary school	171	49.1
	Higher education	73	21.0
Occupation	Farmer/Fisherman	138	39.7
	Private employee	96	27.6
	Unemployed/Housewife	114	32.7
Monthly Income	Below the regional minimum wage	216	62.1
	Above the regional minimum wage	132	37.9
Distance to Healthcare Facility	<5 km	127	36.5
	≥5 km	221	63.5
National Health Insurance Status	Active member	348	100
Difficulty Accessing Healthcare Services	Yes	198	56.9
	No	150	43.1

Most respondents were aged 36–55 years (44.8%) and predominantly female (58.0%). Nearly half of the participants had completed secondary education (49.1%), while the majority earned incomes below the regional minimum wage (62.1%). More than half of respondents (63.5%) lived at least 5 km from healthcare facilities, indicating geographical challenges in accessing healthcare services. Furthermore, 56.9% of respondents reported difficulties in obtaining healthcare despite being enrolled in the national health insurance program.

Table 2. Bivariate Analysis of Factors Associated with Healthcare Access Difficulties

Variable	Healthcare Access Difficulties n (%)	No Difficulties n (%)	p-value
Low Education	82 (78.8)	22 (21.2)	<0.001
Low Income	151 (69.9)	65 (30.1)	<0.001
Distance ≥5 km	156 (70.6)	65 (29.4)	<0.001
Administrative Complexity	143 (68.1)	67 (31.9)	0.002
Limited-Service Availability	162 (73.0)	60 (27.0)	<0.001
Inadequate Transportation	148 (71.2)	60 (28.8)	<0.001

Bivariate analysis demonstrated statistically significant associations between several sociodemographic and structural variables with healthcare access difficulties. Respondents with lower educational attainment and lower monthly income were more likely to report difficulties accessing healthcare services compared to their counterparts ($p < 0.001$). Geographic distance also showed a significant relationship, where participants living farther from healthcare facilities experienced greater barriers to care. In addition, administrative complexity, limited healthcare service availability, and inadequate transportation were significantly associated with healthcare access inequalities in rural communities.

Table 3. Multivariate Logistic Regression Analysis of Factors Associated with Healthcare Access Difficulties

Variable	Adjusted OR (AOR)	95% CI	p-value
Low Education	2.14	1.28–3.57	0.004
Low Income	2.87	1.71–4.82	<0.001
Distance ≥5 km	3.21	1.89–5.45	<0.001
Administrative Complexity	1.94	1.16–3.24	0.011
Limited-Service Availability	3.46	2.01–5.95	<0.001
Inadequate Transportation	2.42	1.43–4.10	0.001

Multivariate logistic regression analysis revealed that limited healthcare service availability was the strongest predictor of healthcare access difficulties among rural residents (AOR = 3.46; 95% CI: 2.01–5.95; $p < 0.001$). Respondents living at least 5 km from healthcare facilities had more than 3 times the odds of experiencing access barriers compared to those living closer to healthcare facilities. Low monthly income, inadequate transportation, low educational level, and administrative complexity also remained independently associated with healthcare access difficulties after controlling for confounding variables.

The findings of this study demonstrate that implementing national health financing policies alone has not fully eliminated healthcare access disparities among rural populations. Although all respondents were formally enrolled in the national health insurance program, more than half still experienced substantial barriers in accessing healthcare services. Geographic distance, limited healthcare service availability, transportation constraints, and administrative complexity emerged as major structural challenges affecting equitable healthcare utilization. The results further indicate that socioeconomic vulnerability continues to influence healthcare access despite financial coverage mechanisms. Respondents with lower educational attainment and lower income levels were significantly more likely to experience difficulties in obtaining healthcare services. Multivariate analysis confirmed that structural healthcare limitations, particularly inadequate service availability and long travel distances, had the strongest influence on healthcare inequities. These findings suggest that national health financing policies should be more closely integrated with rural health system strengthening strategies, including infrastructure expansion, transportation support, workforce distribution, and administrative simplification. Improving financial coverage without addressing contextual and structural barriers may limit the effectiveness of healthcare financing programs in achieving equitable healthcare delivery. The study highlights the importance of policy implementation quality and institutional capacity in reducing healthcare disparities within underserved rural communities.

DISCUSSION

The findings of this study demonstrate that the implementation of national health financing policies has contributed to expanding formal financial coverage among rural populations; however, substantial inequities in healthcare access remain evident. Although all respondents were registered within the national health insurance system, more than half continued to experience difficulties in obtaining healthcare services. This pattern indicates that healthcare financing alone is insufficient to guarantee equitable healthcare utilization when structural, geographical, and administrative barriers persist within rural healthcare systems. The results suggest that the effectiveness of national health financing policies depends not only on insurance enrollment expansion but also on the broader capacity of health systems to provide accessible, available, and responsive healthcare services [15].

One of the most important findings in this study is the strong influence of healthcare service availability and geographic distance on difficulties accessing healthcare. Rural residents who lived farther from healthcare facilities were significantly more likely to encounter barriers

to healthcare utilization despite possessing active insurance membership [16]. This finding reflects a fundamental limitation within many health financing systems in developing countries, where financial protection mechanisms are introduced without adequate parallel investment in healthcare infrastructure and workforce distribution [17]. Financial coverage may reduce direct medical expenditure, but it cannot fully overcome transportation limitations, inadequate facility availability, or shortages of healthcare personnel [18]. Consequently, health financing policies may unintentionally reproduce inequities when implementation occurs within structurally unequal healthcare environments [19].

The findings also reveal that socioeconomic vulnerability remains closely associated with healthcare access disparities. Respondents with lower income and educational levels experienced greater difficulty navigating healthcare services, administrative procedures, and referral systems [20]. This suggests that healthcare equity is influenced not only by financial affordability but also by health literacy, social capital, and institutional accessibility. Administrative complexity emerged as a significant predictor of healthcare access barriers, indicating that bureaucratic procedures may disproportionately disadvantage vulnerable rural populations with limited educational and informational resources [21]. From a policy perspective, these results highlight the importance of designing financing systems that are administratively inclusive and sensitive to contextual inequalities [22].

The present findings are consistent with previous studies reporting that universal health coverage initiatives frequently face implementation challenges in rural and underserved regions. Earlier research conducted in several low- and middle-income countries demonstrated that national insurance expansion can improve service utilization while simultaneously failing to eliminate regional disparities in healthcare access [23]. Studies from Southeast Asia and Sub-Saharan Africa have similarly shown that healthcare financing reforms often produce uneven outcomes because infrastructural limitations and workforce shortages remain unresolved. The current study extends this literature by emphasizing that the interaction between policy implementation quality and local contextual conditions is decisive in determining whether financial protection mechanisms translate into meaningful healthcare equity [24].

Compared with previous studies, this research contributes a more integrated perspective by simultaneously examining healthcare access difficulties, administrative barriers, geographical inequality, and institutional service limitations within a single analytical framework. Many earlier investigations have primarily focused on financial indicators, such as insurance coverage rates or reductions in healthcare expenditure [25]. While such indicators remain important, they may inadequately capture the multidimensional nature of healthcare inequity experienced by rural populations. This study demonstrates that healthcare financing should be understood as part of a broader governance and health system ecosystem rather than as an isolated financial intervention [26].

The study also contributes conceptually by reinforcing the argument that universal health coverage cannot be evaluated solely based on enrollment statistics or aggregate service utilization rates. Formal participation in insurance programs may mask inequalities in physical accessibility, transportation infrastructure, distribution of the healthcare workforce, and bureaucratic complexity [27]. Therefore, policy evaluation frameworks should incorporate multidimensional equity indicators that can identify structural disparities affecting rural communities. The findings support a systems-oriented approach in which financing reform, infrastructure development, healthcare workforce strengthening, and governance improvement are addressed simultaneously [28].

Despite its contributions, this study has several limitations that should be considered carefully. First, the cross-sectional design limits the ability to establish causal relationships between health financing implementation and healthcare access outcomes. The observed associations reflect conditions within a specific period and may not capture long-term policy impacts or temporal changes in healthcare utilization patterns. Second, the study relied partly on self-reported perceptions of healthcare access difficulties, which may be influenced by recall bias or subjective interpretation. Third, the research was conducted within selected rural districts,

potentially limiting the generalizability of findings to other regions with different healthcare infrastructures or governance capacities.

Another limitation concerns the lack of qualitative exploration of patient experiences and institutional decision-making processes. Although quantitative findings identified significant predictors of healthcare inequity, a deeper understanding of community perceptions, cultural influences, and local governance dynamics would provide richer insight into how health financing policies are implemented at the operational level. Future studies may therefore benefit from mixed-methods approaches that integrate statistical analysis with contextual and experiential perspectives.

Future research should also investigate the long-term effectiveness of health financing reforms using longitudinal designs that evaluate changes in healthcare utilization, financial protection, and population health outcomes. Comparative studies between urban and rural settings may further clarify how contextual differences influence policy effectiveness and equity outcomes. In addition, future investigations should examine the roles of digital health systems, transportation support mechanisms, and decentralized governance models in improving healthcare accessibility in geographically isolated communities.

Overall, this study highlights that achieving healthcare equity requires more than expanding insurance coverage alone. Effective implementation of national health financing policies depends on healthcare systems' ability to address structural disparities, strengthen institutional capacity, and ensure that rural populations can access healthcare services without geographical, administrative, or socioeconomic barriers. Integrating financing reform with broader health system strengthening strategies remains essential for promoting equitable and sustainable healthcare delivery in rural communities.

CONCLUSION

This study demonstrates that implementing national health financing policies has improved formal financial coverage among rural populations; however, significant inequities in healthcare access remain unresolved. Geographic distance, limited healthcare service availability, administrative complexity, inadequate transportation, and socioeconomic vulnerability were identified as major barriers influencing healthcare accessibility and equity in rural communities. The findings indicate that financial protection mechanisms alone are insufficient to ensure equitable healthcare utilization when structural and institutional limitations persist. The study highlights the importance of integrating national health financing reforms with broader rural health system strengthening strategies. Policy interventions should prioritize the equitable development of healthcare infrastructure, the redistribution of healthcare workers, transportation support, and the simplification of administrative procedures in rural healthcare settings. Strengthening governance capacity and monitoring systems is also essential to improve implementation effectiveness and reduce regional disparities. Future policy approaches should adopt a more integrated, context-sensitive framework to ensure that universal health coverage initiatives achieve meaningful, sustainable healthcare equity for underserved rural populations.

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ETHICAL CLEARANCE

This study received ethical approval from the Ethics Committee of Politeknik Sandi Karsa under approval number B-590/PT19.2.1/PP/VI/2025. All research procedures were conducted in accordance with established ethical principles and institutional guidelines. Written informed consent was obtained from all participants before data collection, and confidentiality of participant information was strictly maintained throughout the study.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to ethical and privacy considerations.

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AUTHORS' CONTRIBUTIONS

Suprapto contributed to the study conception and design, data collection and analysis, manuscript drafting, and final approval of the version to be published.

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