

SOCIO-ECONOMIC INEQUALITIES IN MATERNAL AND REPRODUCTIVE HEALTH SERVICE UTILIZATION AMONG NATIONAL HEALTH INSURANCE SCHEME POLICYHOLDERS IN ZAMBIA

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ABSTRACT

BACKGROUND: Among the numerous initiatives launched in Zambia to address healthcare challenges and inequalities, the National Health Insurance Scheme (NHIS) stands out as a significant development. This study aims to assess socio-economic inequalities in Maternal and Reproductive Health Service Utilization Among National Health Insurance Scheme Policyholders in Zambia.

METHODS: The study employed a quantitative approach with a descriptive cross-sectional design. Using proportionate stratified simple random sampling, 385 National Health Insurance policyholders were selected from six hospitals across six regions. All six hospitals were accredited to provide maternal and reproductive health services under the scheme. Data were collected using a standardized, structured, self-administered questionnaire, analyzed using STATA 14.0, and presented as frequencies, percentages, and summary statistics in tables and figures.

RESULTS: The study found that respondents with high knowledge about the Scheme (54%) were more likely to use maternal and reproductive health services. However, despite their knowledge, a substantial proportion (64%) were less willing to contribute to the scheme. Meanwhile, respondents with good educational attainment were both willing to contribute to the scheme and use maternal and reproductive health services ($p = 0.005$). Furthermore, willingness to participate and use the maternal and reproductive health services was also noted to increase with higher income ($p = 0.001$), being married ($p = 0.047$), and larger family size ($p = 0.011$).

CONCLUSIONS: Willingness to contribute to and use the scheme was significantly associated with educational attainment, income, marital status, and family size. Despite relatively high knowledge of the scheme, willingness to contribute remained low, highlighting the need for targeted health education and awareness initiatives to improve participation and uptake of maternal and reproductive health services.

KEYWORDS: Health insurance, maternal health services, reproductive health services, health services utilization; socioeconomic factors, Zambia.

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INTRODUCTION

Maternal and reproductive health services serve as a critical benchmark for evaluating whether health financing reforms improve access to care and protect households from out-of-pocket costs. As countries pursue universal health coverage (UHC), particularly in low- and middle-income countries (LMICs), many are implementing health financing reforms to expand access to health insurance¹. These reforms aim to create more inclusive healthcare systems that protect individuals from financial risks associated with healthcare expenditures. Health insurance helps reduce financial barriers to essential medical care, thereby increasing the utilization of health services. They play a crucial role in achieving Universal Health Coverage by distributing the financial risks of healthcare costs and expanding access to essential health services.^{2, 3}

Zambia's 2024 Demographic and Health Survey estimated a maternal mortality ratio of 187 deaths per 100,000 live births for the seven years before the survey (95% CI: 119–255)⁴. Although public maternal services are generally intended to be free, women may still face costs for transport, food, accommodation, medicines or delivery supplies, as well as informal charges.⁵

Zambia's Ministry of Health aims to ensure equitable access to cost-effective, high-quality health services delivered as close to families as possible⁶. Since 1991, successive Zambian governments have prioritized efforts to address the country's healthcare challenges. Among the initiatives introduced, the National Health Insurance Scheme (NHIS) has emerged as a key intervention^{7, 8}. The scheme is being implemented in alignment with the United Nations Sustainable Development Goals (SDGs), particularly SDG 3, which focuses on ensuring healthy lives and promoting well-being for people of all ages. Specifically, Target 3.8 seeks to achieve universal health coverage, including coverage for people working in the informal sector, thereby improving access to healthcare for disadvantaged populations⁶.

The scheme's maternal and newborn health benefits in Zambia encompass antenatal care, normal and assisted deliveries, caesarean sections, postnatal care, neonatal services, obstetric and gynaecological interventions, as well as covered medicines, diagnostic investigations, and inpatient care services⁷. Despite the importance of these services, few rigorous studies have examined the influence of socioeconomic factors on the utilization of maternal and reproductive health services in Zambia. Such analyses are essential for assessing the effectiveness of health insurance in improving mothers' access to and quality of care^{8,9}.

Formal-sector employers and employees contribute a statutory premium equivalent to 1% of payroll, while self-employed individuals contribute 1% of their declared income to finance the scheme. Citizens below 18 years of age and those above 65 years are exempt from making contributions^{8,10}. In this context, the National Health Insurance Management Authority (NHIMA) seeks to reduce disparities in healthcare utilization, expand access to health services, maintain high standards of care within the scheme, and promote the equitable distribution of healthcare costs across socioeconomic groups by ensuring access to affordable, high-quality healthcare. For example, healthcare utilization has increased in rural districts such as Chirundu, where outpatient visits rose from 67,048 in 2019 to 74,686 by mid-2022¹¹. This increase suggests that financial protection may be contributing to greater healthcare utilization among Zambian citizens. Nevertheless, challenges persist in several areas, including the limited availability of accredited facilities, delays in claims processing, shortages of essential medicines, and difficulties in healthcare system management¹². Since the introduction of the National Health Insurance Scheme (NHIS) in Zambia, limited evidence has been available on the relationship between knowledge of the scheme, socio-economic factors, and the utilisation of maternal and reproductive health services in the country. Evidence from other settings may not fully reflect the Zambian context. Therefore, this study aims to

assess the association of NHIS knowledge and socio-economic factors with the willingness to contribute to the scheme and the utilisation of maternal and reproductive health services in Zambia

METHODS

Study Setting and Design

A descriptive cross-sectional study was conducted from January 2023 to December 2025 in Lusaka, Copperbelt, and Eastern provinces of Zambia. Six hospitals accredited by the National Health Insurance Management Authority (NHIMA) to provide maternal and reproductive health services were selected. These were Mwami Mission Hospital, Mtendere Hospital, Chilenje Hospital, Chifubu Level 1 Hospital, Ndola and University Teaching Hospital.

Study Population

The study population comprised women who had been enrolled in the National Health Insurance Scheme and sought maternal or reproductive health services at the six selected hospitals.

Inclusion and exclusion criteria

Women enrolled in NHIMA who sought antenatal or delivery services at the six selected NHIMA-accredited facilities were eligible for inclusion. Individuals with unstable health conditions, as indicated by vital signs such as blood pressure, pulse, or respiratory rate, were excluded.

Sample size determination and Sampling

The sample size was determined using Cochran's formula (1977) as below;

$$n = \frac{Z^2 \cdot p \cdot q}{e^2}$$

Where: n represents the desired sample size. Z represents the standard normal deviation at a chosen confidence level (set at 1.96 for a 95% confidence interval). Although a preliminary pilot study was conducted to pre-test the data collection tools and assess operational feasibility, the proportion (p) was

conservatively set at 0.50 (50%) to ensure maximum variance. q is the complementary probability representing the proportion of the population without the attribute (1-p=0.50). e represents the acceptable margin of error or level of precision (set at 0.05 or 5%).

Substituting these standardized scientific parameters into the equation yields a sample size of 384.16, rounded up to the nearest whole number of 385. Furthermore, respondents were selected using a proportionate stratified random sampling approach, with each of the six hospitals designated as an independent stratum. To ensure that the sample allocated to each facility was directly proportional to its patient volume, population proportions were derived from Health Management Information System (HMIS) maternal and reproductive health (outpatient and inpatient) attendance records over the preceding six-month period. The allocation of respondents per hospital was calculated using the proportionate allocation formula ($n_h = N_h / N \times 385$), where N_h is the facility target population, n is the overall sample size (n=385). The overall sampling frame comprised a total target population (N) of 3,850 individuals distributed across all six sites.

Proportionate Stratified Sampling Allocation n (385)

S/N	Hospital Name	Target Population (Nh)	Proportion (%)	Allocated Sample Size (nh)
1	Mwami Mission Hospital	650	16.9%	65
2	Mtendere Hospital	500	13.0%	50
3	Chilenje Level 1 Hospital	600	15.6%	60
4	Chifubu Level 1 Hospital	450	11.7%	45
5	Ndola Teaching Hospital	800	20.8%	80
6	University Teaching Hospital (UTH)	850	22.1%	85
	Total	3,850	100.0%	385

Data Collection and Instruments

Data were collected by the researcher and 2 trained assistants through a well-structured self-administered questionnaire from Respondents who accessed maternal and reproductive health services at the selected health institutions. The questionnaire's items were developed with full consideration of the reviewed literature.

The questionnaire was reviewed by the supervisor and colleagues, whose feedback informed revisions to strengthen its validity; it was then piloted among 20 mothers who were receiving maternity and reproductive health services at Chilenje Level 1.

Operational Definitions

Knowledge about National Health Insurance Scheme

Respondents were tested on 10 operational questions on the National Health Insurance Scheme to determine their level of knowledge. A score less than 50% was considered to be low knowledge; a score between 50% and 75% was moderate knowledge, while 75% and above was high knowledge.

Policyholders

All respondents who had subscribed to the national health insurance policy were considered to be NHIMA policyholders

Statistical Analysis

Data analysis was performed using Stata 14.0. Descriptive statistics were employed to summarize the demographic characteristics of the study population and to identify key outcome variables. At the same time, chi-square tests were performed to examine the associations between variables.

Ethical Considerations

The study was conducted in compliance with ethical guidelines and received the necessary approvals from the National Health Research Authority (NHRA), the University of Lusaka Ethical Committee (Ref: FWA0003228-00606/24) and the relevant institutions. Respondents were assured of confidentiality, and they were given ample time to review the consent form before signing.

RESULTS

Sociodemographic Data

The majority (48%) of the study participants were in the age group of 30- to 40-years (Table 1). Those in the range of 20 to 30 years were 122(32%). Those aged 40 to 50 years accounted for 47(12%) of the study population. Married respondents were 267(69%), while the unmarried were 118(31%). Regarding residence, the urban-rural results indicated that 307(80%) of respondents lived in urban areas, while 78(20%) lived in rural areas. A majority 197(51%) reported having 1-3 children. In contrast, 155(40%) of respondents had more than 3 children, while 33(8%) had none.

Table 1: Sociodemographic information of NHIMA policyholders in Lusaka, Copperbelt and Eastern province (n=385)

Characteristics		
Age	Freq.	Percent
20 to 30	122	31.69
30 to 40	182	47.27
40 to 50	47	12.21
51 Years and above	34	8.83
Status		
Married	267	69.35
Single	118	30.65
Residence		
Rural Area	78	20.26
Urban	307	79.74
Children		
1 to 3 children	197	51.17
More than 3	155	40.26
None	33	8.57
Education		
No Education	26	6.75
Primary	40	10.39
Secondary	117	30.39
Tertiary	202	52.47
Income		
Above USD250	222	57.66
Less than USD250	163	42.34

Regarding educational attainment, 202 (52%) respondents had completed tertiary education, 117 (30%) secondary education, 40 (10%) primary education, and 26 (7%) had no formal education. In terms of income, 222 (58%) respondents reported earning more than USD 250, while 163 (42%) earned less than USD 250 per month.

Knowledge of the NHIS and Utilization of MRH Services

More than half of the respondents, 210 (54%), demonstrated a high level of knowledge, while 112 (29%) had moderate knowledge and 65 (17%) had low knowledge. Among respondents with Low Knowledge, only 17(27%) utilized MRH services, whereas a substantial 47(73%) did not. For those with Moderate Knowledge, service utilization increased to 65(58%), with 47(42%) not utilizing the services, while 172(82%) of respondents with High Knowledge utilized the service, leaving only 39(18%) who did not use the services.

Table 2: Association between socio-demographic characteristics and Willingness to Contribute to the Scheme among NHIMA policyholders in Zambia (n=385)

Willingness to pay for NHIMA	Education Levels				
	None	Primary	Secondary	Tertiary	Total
No	23	29	79	115	246
%	9.35	11.79	32.11	46.75	100
Yes	3	11	38	87	139
%	2.16	7.91	27.34	62.59	100
Total	26	40	117	202	385
	Parson Chi2 = 12.9998			Pr = 0.005	
	Monthly Income				
	Above K5000		Less than K5000		Total
No	127		119		246
%	51.63		48.37		100
Yes	95		44		139
%	68.35		31.65		100
Total	222		163		385
	Parson Chi2 = 10.1697		Pr = 0.001		
	Marital Status				
	Married		Single		Total
No	167		79		246
%	67.89		32.11		100
Yes	100		39		139
%	71.94		28.06		100
Total	267		118		385
	Parson Chi2 = 0.6875		Pr = 0.047		
	Number of Children				
	1 to 3		More than 3	None	Total
No	112		112	22	246
%	45.53		45.53	8.94	100
Yes	85		43	11	139
%	61.15		30.94	7.91	100
Total	197		155	33	385
	Parson Chi2 = 9.0442		Pr = 0.011		

A chi-square test was performed to assess the association between education and willingness to contribute to the scheme. The study revealed an increase in the rate of willingness to pay for the scheme with increasing levels of education, with 3(2%) for those without education, 11(8%) for primary, 27(38%) for secondary, and 87(63%) for tertiary. The study showed a significant association between educational level and willingness to pay for the scheme (p-value = 0.005).

The study revealed that among Respondents who were willing to contribute to the scheme, 95(68%) earned more than USD 250 in a month, while 44(32%) earned less than USD 250. Chi-square test results indicated a statistically significant relationship between monthly income and willingness to pay (p-value = 0.001). The study also revealed that among respondents who expressed willingness to pay for the scheme, 100(72%) were married, while 39(28%) were single. A chi-square test confirmed statistical significance between marital status and willingness to pay for the scheme (p-value = 0.047).

A study found a correlation between the number of respondents’ children and their willingness to pay for the scheme, with a p-value of 0.011. Among respondents without children, 11(8%) were willing to pay for the scheme. In contrast, 85(61%) of those with one to three children expressed a willingness to pay, while 43(30%) of those who had more than three children were willing to pay for the scheme.

2020 and 2025 Maternal and Reproductive Health utilization

The review of hospital records across 6 selected facilities in Zambia in Table 5 indicates a remarkable increase in both antenatal bookings and hospital deliveries in 2025 compared to 2020, two years after the launch of the scheme. A total of 20,018 antenatal (ANC) bookings were recorded in 2020, and increased to 25,203 in 2025, showing an increase of 5,185 ANC bookings. On the other hand, the number of hospital deliveries increased from 26,372 in 2020 to 35,580 in 2025, resulting in a total increase of 9,208.

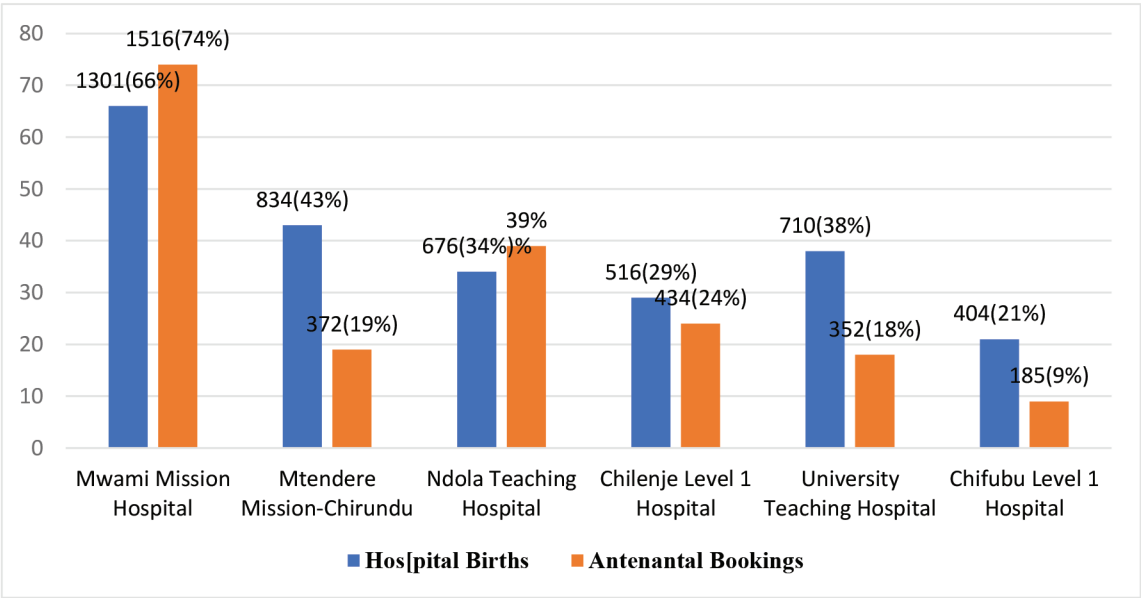


Figure 1: 2020 and 2025 Maternal and Reproductive Health utilization among NHIMA policyholders in Zambia (n=385)

DISCUSSION

The study demonstrated that respondents possessed a sound understanding of the key components of the National Health Insurance Scheme (NHIS), with 210 (54%) achieving high knowledge scores. This finding suggests that most community members were generally well informed about the scheme and is consistent with findings from previous studies^{12, 18}. When asked to identify specific NHIS benefits, 95% of policyholders demonstrated a high level of knowledge regarding the services covered. Moreover, among respondents with high knowledge scores, 69% reported utilizing maternal and reproductive health (MRH) services more than twice annually.

The study revealed that utilization of maternal and reproductive health (MRH) services increased with respondents' level of understanding of the scheme. Among the 210 respondents (54%) who demonstrated high knowledge levels, 172 (82%) reported utilizing MRH services. In contrast, only 65 (17%) of the 17 respondents (27%) with low knowledge levels reported using these services. These findings suggest that participation in the scheme was higher among individuals with a better understanding of its provisions. This observation is consistent with a previous study¹³, which reported that higher levels of knowledge were associated with improved healthcare utilization decision-making. However, a high level of knowledge alone did not translate into willingness to contribute to the scheme. This was demonstrated by the 246 respondents (64%) who expressed unwillingness to contribute, despite a substantial proportion possessing high levels of knowledge about the scheme¹³.

The chi-square test indicated that educational attainment significantly influenced both respondents' willingness to contribute to the scheme and their utilization of maternal and reproductive health services ($p = 0.005$). This finding is consistent with a previous study¹⁴, which reported that more educated respondents were more willing

to participate in and contribute to the scheme. This association may be attributed to greater awareness of health-related issues and a stronger appreciation of the value of publicly financed healthcare services provided through the scheme.

In addition, the study found that appreciation of the scheme and willingness to contribute increased with the number of children respondents had ($p = 0.011$). Consistent with these findings, a previous study¹⁵ identified a significant association between the number of children and NHIS utilization, reporting higher levels of utilization among married individuals.

The study found that financial status significantly influenced both respondents' willingness to contribute to the scheme and their utilization of maternal and reproductive health services ($p = 0.001$). A previous study¹⁶ similarly reported that higher-income households utilized the scheme more frequently than lower-income households. In addition, married respondents demonstrated greater appreciation of the scheme and a higher willingness to contribute than unmarried respondents ($p = 0.047$), possibly because they utilized the scheme's services more frequently. Consistent with these findings, another study¹⁷ reported that the estimated coefficients were positive and statistically significant across all income categories, indicating that willingness to contribute increased as household income rose.

Overall, the study identified significant associations between several socioeconomic factors, including income, marital status, number of children, and educational attainment, and respondents' willingness to participate in the scheme. These findings are consistent with evidence from previous studies conducted in the African region. For instance, study¹⁷ reported that willingness to participate in and contribute financially to the scheme was positively and significantly associated with place of residence, number of children, educational attainment, and income.

The observed increase in service utilization was further substantiated by the rise in antenatal care (ANC) bookings and facility-based deliveries recorded across the six selected hospitals in Zambia. Between 2020 and 2025, ANC bookings increased by 5,185, while hospital deliveries increased by 9,208. These trends provide further evidence of the role of socioeconomic factors in influencing the utilization of maternal and reproductive health services.

Limitations of the study

A key limitation of this study was the lack of prior local research or baseline studies examining the direct impact of the Zambian scheme on maternal and reproductive health services, which limited comparisons with historical data.

CONCLUSION

The study found that awareness of the National Health Insurance Scheme (NHIS) was high among respondents. However, this awareness did not necessarily translate into a willingness to contribute. Married respondents and those with more children, higher incomes, or higher levels of education demonstrated greater willingness to contribute, possibly reflecting a stronger appreciation of the value of publicly funded healthcare services. Targeted awareness campaigns should therefore be sustained to translate knowledge into active participation, while educational initiatives should be strengthened to improve understanding of the scheme's benefits. Further research is also warranted to examine how Zambia's evolving economic conditions influence participation in the NHIS. In addition, prioritizing rural areas in the expansion of the scheme could promote a more equitable distribution of services and help address disparities in access to maternal and reproductive healthcare.

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