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BRIEF REPORT

Understanding health insurance coverage and its socio-demographic associations among women in Bangladesh: Evidence from the 2022 Bangladesh Demographic and Health Survey

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Abstract

Health insurance is vital for healthcare financing and aligns with the 2030 Sustainable Development Goal agenda. Women of reproductive age face unique barriers to affordable care due to higher health risks and caregiving responsibilities. This study aims to estimate the proportion of women with health insurance coverage (HIC) and to identify factors associated with such coverage. Data were drawn from the latest round of the Bangladesh Demographic and Health Survey 2022, comprising a total sample of 19,987 women. Unadjusted odds ratios (UORs) with 95% confidence intervals (CIs) were reported. The median age of the women was 32.0 years (interquartile range: 25.0 – 39.0). Only 0.3% of respondents reported having HIC. The odds of having HIC were significantly higher among the women in the study who had an account with a bank or other financial institution (UOR: 2.27; 95% CI: 1.36 – 3.79), those with post-secondary education (either themselves or their husbands), those in the richest wealth quintile (UOR: 3.32; 95% CI: 1.45 – 7.60), and those with adequate media exposure (UOR: 2.78; 95% CI: 1.41 – 5.47). The study highlights the need for promoting higher education for both sexes, addressing wealth-based disparities, and leveraging mass media to increase the uptake of HIC.

Keywords: Health insurance; Women; Reproductive age; Bangladesh; Bangladesh demographic and health survey 2022

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1. Introduction

Health insurance is a key mechanism for financing healthcare globally and aligns with the Sustainable Development Goals (SDGs) agenda for 2030 (Kessy *et al.*, 2024). Universal health coverage, central to SDG target 3.8, underscores equitable access to essential health services as a fundamental right, free from financial hardship. Despite these global commitments, 2 billion people worldwide face significant financial challenges, with 1 billion incurring severe out-of-pocket expenditures and 344 million pushed further into financial distress due to healthcare costs (Kessy *et al.*, 2024). These persistent inequalities are exacerbated in low- and middle-income countries (LMICs), where demographic shifts, including ageing populations and rising burden of chronic diseases, further strain

the financial sustainability of health systems (Caley & Sidhu, 2011; Dowou *et al*., 2024).

Bangladesh exemplifies the financial barriers to healthcare commonly observed in LMICs. Approximately 26% of households experience catastrophic health expenditures during hospitalization annually, while out-of-pocket medical expenses accounted for 64.3% of the nation's total health expenditures in 2015, amounting to United States dollars 1.49 billion (HUQ *et al*., 2015). Alarmingly, <1% of the population benefits from social health protection, according to the government's statistics (Health Economics Unit and MoHFW, 2025).

Women of reproductive age face unique barriers to affordable healthcare, particularly in LMICs. They experience higher health risks and often bear caregiving responsibilities, further exacerbating their vulnerability (Kessy *et al*., 2024). In Bangladesh, limited evidence exists on the determinants of health insurance coverage (HIC) among women in this age group. This study seeks to address this gap by estimating the proportion of women of reproductive age with HIC and analyzing the factors influencing their access, using data from the National Demographic and Health Survey (DHS).

2. Methods

2.1. Data overview

We used data from the latest round of the Bangladesh Demographic and Health Survey (BDHS), conducted in 2022. The dataset is available upon request from the DHSs website (https://dhsprogram.com/). The analysis focused on women aged 15 – 49 years who were selected from households included in the BDHS 2022. The survey employed a stratified two-stage sampling method: enumeration areas were first selected using probability proportional to size, followed by random selection of households within each EA. Detailed sampling methods are available in the BDHS 2022 report (NIPORT & ICF, 2023). In total, 19,987 eligible women were included in the analysis. Additional methodological details of the BDHS 2022 can be found elsewhere (NIPORT & ICF, 2023).

2.2. Operational definitions

2.2.1. Outcome variables

HIC was considered the outcome variable in this study, categorized into two groups. Women who reported having any form of HIC at the time of survey were classified as "yes"; all others were classified as "no." According to BDHS definitions, HIC includes social security, employer-based insurance, mutual health organization or community-based insurance, privately purchased commercial insurance, and other forms of coverage (Croft *et al*., 2023).

2.2.2. Independent variables

The independent variables considered in this study included: age (in completed years), husband's age (in completed years), place of residence (urban/rural), sex of the household head (male/female), ownership of a bank or other institution account (no/yes), women's level of education (no education/up to primary/up to secondary/post-secondary), husband's level of education (up to primary/up to secondary/post-secondary), wealth index (poorest/poor/middle/rich/richest), present employment status (no/yes), women's empowerment (low/middle/high), and media exposure (poor/adequate).

The classification of independent variables was informed by a review of relevant literature. The wealth index is based on the assumption that ownership of tangible assets, access to services, and the availability of household amenities are indicative of a household's relative economic status. This method offers an indirect yet effective estimate of economic standing without relying on explicit income or expenditure data (Al Fidah *et al*., 2024).

The Survey-based women's empowerment index (SWPER) was developed and validated using the DHS data from 34 African nations in 2017 (Ewerling *et al*., 2020). It provides a standardized, individual-level measure to compare women's empowerment across countries and over time. The SWPER encompasses three dimensions of empowerment, capturing the resources and agency of partnered women, whether married or cohabiting (Ewerling *et al*., 2020). Following Ewerling *et al*., participants in this study were categorized into three empowerment levels: low, middle, and high.

Media exposure was assessed using three indicators: reading newspapers, watching television, and listening to the radio. Responses were scored as 0 for "not at all," 1 for "less than once a week," and 2 for "at least once a week." Total scores were then categorized as 0 – 2 ("poor") and 3 – 6 ("adequate") (Al Fidah *et al*., 2025).

2.3. Data analysis

We analyzed data using appropriate statistical methods. For continuous variables, the median and interquartile range (IQR) were reported, while categorical variables were summarized using frequencies and percentages. The "Type of HIC" variable was visualized using a parliament-style chart. A bivariate binomial logistic regression model was developed, and unadjusted odds ratios (UORs) with their corresponding 95% confidence intervals (CIs) were reported. Due to the small number of outcome events, adjusted regression was not performed to avoid overfitting. According to the 20 events per variable rule, multivariable logistic models are considered unreliable when the number

of events is low (Peduzzi *et al.*, 1996). Statistical analyses were conducted using jamovi (version 4.6.13). A $p<0.05$ was considered statistically significant. *Post hoc* power analysis was conducted using G*Power (version 3.1.9.4, HHU, Germany). The predictors and values considered, along with the results, are presented in Table A1.

3. Results

A total of 19,987 women aged 15 – 49 years were included in this analysis. Figure 1 illustrates the types of HIC reported in the study. Private insurance was the most commonly reported form of coverage (35.4%), followed by coverage through mutual or community-based organizations (32.3%).

The median (IQR) age of the women was 32.0 (25.0 – 39.0) years, and for their husbands, 39.0 (32.0 – 47.0) years. Most women (64.9%) were rural residents, and only 14.5% belonged to households headed by females. The highest proportion of women (45.7%) and their husbands (40.8%) had attained education up to the secondary level. Only 0.3% of women reported having HIC (Table 1).

Table 1 also shows that the odds of having HIC were significantly higher among women who had an account with a bank or other financial institution (UOR: 2.27; 95% CI: 1.36 – 3.79; p=0.002). Similarly, higher odds of HIC were observed among women with post-secondary education (UOR: 5.61; 95% CI: 1.65 – 19.08; p=0.006), those whose husbands had post-secondary education (UOR: 2.85; 95% CI: 1.33–6.14; p=0.007), those belonging to the richest wealth quintile (UOR: 3.32; 95% CI: 1.45 – 7.60; p=0.005), and those with adequate media exposure (UOR: 2.78; 95% CI: 1.41–5.47; p=0.003).

4. Discussion

Health insurance is considered one of the key pathways to achieving the SDG target 3.8 by promoting Universal Health Coverage (Kessy *et al.*, 2024). Unfortunately, people in LMICs, especially women of reproductive age, are often at a disadvantage, as they have limited or no access to HIC (Kessy *et al.*, 2024). This study aimed to estimate the proportion of women in this age group with HIC and to analyze factors influencing their access using data from the National DHS. We found that only 0.3% of women reported having HIC, consistent with national estimates of <1% (Health Economics Unit & MoHFW, 2025). This low level of HIC prevalence may be attributed to the high cost of private insurance premiums and the virtual exclusion of rural populations and informal sector workers due to inaccessibility (Health Economics Unit & MoHFW, 2025).

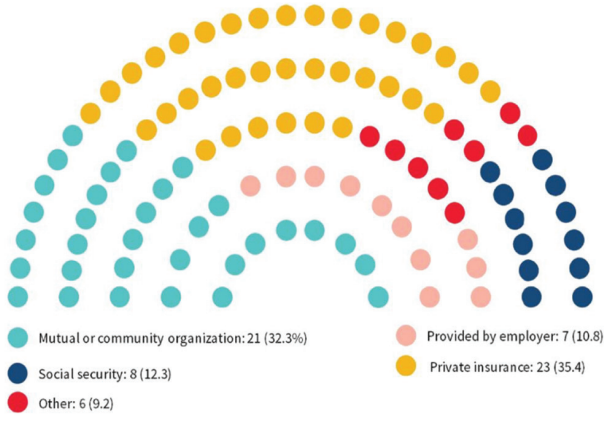

Figure 1. Type of health insurance (multiple response)

The most common types of insurance reported were private insurance and coverage through mutual or community organizations. In Bangladesh, most insurance is provided by private companies, with only two state-owned insurers (Paul, 2024). Thus, the preference for private insurance is understandable. Moreover, several community-based schemes, organized by non-governmental organizations (NGOs) and hospitals operate at the local level (Health Economics Unit & MoHFW, 2025). These schemes function as both insurers and service providers, offering integrated healthcare coverage, which may explain the preference for mutual or community organization coverage. Community-based health insurance, often managed by NGOs or local hospitals, offers lower-cost services for poor or rural populations but with limited benefits. In contrast, private insurance is more expensive and mainly accessed by urban and formal sector populations (Health Economics Unit & MoHFW, 2025; Paul, 2024). These factors may explain why we did not observe a substantial difference in HIC between rural and urban women.

Previous studies have suggested that individuals with higher levels of education are typically more exposed to health-related information, which increases their health literacy (Chauluka *et al.*, 2022; Tsala Dimbuene *et al.*, 2022). As such, these individuals, especially women, tend to seek health insurance. Our study also found a similar association, where women with higher levels of education, or those whose husbands had post-secondary education, had higher odds of possessing HIC.

Socioeconomic status significantly influences health insurance ownership among women in developing countries. Studies indicate that women of reproductive age residing in wealthier households and advantaged neighborhoods have higher chances of owning health insurance compared to their counterparts in poorer households and disadvantaged neighborhoods (Shao *et al.*, 2022; Tsala Dimbuene *et al.*, 2022). We also found a similar association.

Table 1. Socio-demographic characteristics of the women included in the study

Variables	Total	Health insurance coverage		UOR (lower–upper)	*p*-value
		No (*n*=19,923; %=99.7)	Yes (*n*=64; %=0.3)		
Age (in completed whole years)[a]	32.0 (25.0 – 39.0)	32.0 (25.0 – 39.0)	25.0 (27.8 – 38.3)	1.02 (0.99 – 1.05)	0.247
Husband's age (in completed whole years)[a] (*n*=18.987)	39.0 (32.0 – 47.0)	39.0 (32.0 – 47.0)	40.0 (35.0 – 45.8)	1.01 (0.98 – 1.03)	0.585
Residence					0.147
Urban	7.007 (35.1)	6.979 (35.0)	28 (43.8)	1	
Rural	12.980 (64.9)	12.944 (65.0)	36 (56.3)	0.69 (0.42 – 1.14)	
Sex of the household head					0.794
Male	17.093 (85.5)	17.039 (85.5)	54 (84.4)	1	
Female	2.894 (14.5)	2.884 (14.5)	10 (15.6)	1.09 (0.56 – 2.15)	
Bank or other account					0.002
No	16.017 (80.1)	15.976 (80.2)	41 (64.1)	1	
Yes	3.970 (19.9)	3.947 (19.8)	23 (35.9)	2.27 (1.36 – 3.79)	
Women's level of education					
No education	2.721 (13.6)	2.718 (13.6)	3 (4.7)	1	-
Up to primary	5.207 (26.1)	5.194 (26.1)	13 (20.3)	2.27 (0.65 – 7.96)	0.201
Up to secondary	9.136 (45.7)	9.106 (45.7)	30 (46.9)	2.99 (0.91 – 9.79)	0.071
Post-secondary	2.923 (14.6)	2.905 (14.6)	18 (28.1)	5.61 (1.65 – 19.08)	0.006
Husband's level of education (*n*=14.943)					
Up to primary	5.306 (35.5)	5.296 (35.6)	10 (19.6)	1	-
Up to secondary	6.092 (40.8)	6.070 (40.8)	22 (43.1)	1.92 (0.91 – 4.06)	0.088
Post-secondary	3.545 (23.7)	3.525 (23.7)	19 (37.3)	2.85 (1.33 – 6.14)	0.007
Wealth index					
Poorest	3.588 (18.0)	3.581 (18.0)	7 (10.9)	1	-
Poor	3.914 (19.6)	3.903 (19.6)	11 (17.2)	1.44 (0.56 – 3.72)	0.450
Middle	3.989 (20.0)	3.980 (20.0)	9 (14.1)	1.16 (0.43 – 3.11)	0.773
Rich	4.149 (20.8)	4.140 (20.8)	9 (14.1)	1.11 (0.41 – 2.99)	0.833
Richest	4.347 (21.7)	4.319 (21.7)	28 (43.8)	3.32 (1.45 – 7.60)	0.005
Present employment status					0.094
No	13.812 (69.1)	13.774 (69.1)	38 (59.4)	1	
Yes	6.175 (30.9)	6.149 (30.9)	26 (40.6)	1.53 (0.93 – 2.53)	
Woman empowerment (*n*=17.027)					
Low	2.363 (13.9)	2.358 (13.9)	5 (8.8)	1	-
Middle	4.503 (26.4)	4.489 (26.5)	14 (24.6)	1.47 (0.53 – 4.09)	0.459
High	10.161 (59.7)	10.123 (59.7)	38 (66.7)	1.77 (0.70 – 4.50)	0.230
Media exposure					0.003
Poor	18.733 (93.7)	18.679 (93.8)	54 (84.4)	1	
Adequate	1.254 (6.3)	1.244 (6.2)	10 (15.6)	2.78 (1.41 – 5.47)	

Notes: [a]Data are expressed as median (interquartile range); [b]All other data are expressed as frequencies and percentages unless otherwise stated.
Abbreviation: UOR: Unadjusted odds ratio.

A study conducted in Ghana reports that women with greater exposure to media are more likely to take up health insurance than their counterparts (Kansanga *et al.*, 2018). It has been suggested that radio and television are more accessible for women, and providing information through these media can promote HIC. In addition, having an account with a bank or other financial organization is associated with a higher level of financial empowerment of

women (Field *et al*., 2021), which tends to influence their decision toward HIC.

The strength of this study lies in the use of nationally representative data, which makes the findings generalizable. In addition, this study explored HIC among women of reproductive age, providing much-needed insights into a largely neglected area. To assess the strength of our findings, we conducted a *post hoc* power analysis. With a total sample of 19,987 and a 0.3% prevalence of health insurance, the study had more than 80% power to detect the observed odds ratios: 5.61 for women with post-secondary education, 3.32 for being in the richest wealth quintile, 2.85 for husbands with post-secondary education, 2.78 for adequate media exposure, and 2.27 for owning a bank account. This confirms that our sample was sufficient to detect strong associations despite the low number of events. However, there are also some limitations. Health insurance uptake is often influenced by a range of socio-economic factors, many of which were not included in the study. As this was a cross-sectional survey, no causal relationships could be established. We also did not consider adjusted models due to the very low number of outcome events, which could make such models unstable. Future studies with more events should consider this. Alternative models, such as complementary log-log or Firth logistic regression could be more appropriate, though these were not considered in this study, as the main objective of this brief report was to explore the prevalence of HIC and its simple associations with socio-demographic factors. A more detailed analysis of other dimensions (such as access barriers) may be addressed in a future study. In addition, due to the nature of the data collection, more than one woman could belong to the same household, which was not accounted for in the analysis.

5. Conclusion

The present study highlights the extremely low prevalence of HIC among women of reproductive age in Bangladesh, with private and community-based insurance being the most common forms. It also emphasizes the importance of promoting education for both males and females, at least up to the post-secondary level, to facilitate greater uptake of HIC. In addition, targeted strategies are needed to address coverage inequalities across wealth index quintiles and to improve access to health insurance information through mass media.

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Conflict of interest

The authors declare that they have no competing interests.

Author contributions

Conceptualization: Md Fuad Al Fidah
Formal analysis: Md Fuad Al Fidah
Investigation: Md Ridwan Islam
Methodology: All authors
Writing – original draft: Md Ridwan Islam, Sharif Mohammad
Writing – review & editing: Md Fuad Al Fidah

Ethics approval and consent to participate

Ethical approval was not required for this study, as it is based on a publicly available, de-identified dataset.

Consent for publication

Not applicable.

Availability of data

The dataset used in this study is publicly available upon registration and can be accessed at: https://dhsprogram.com/methodology/survey/survey-display-584.cfm.

Further disclosure

This paper has been uploaded to medRxiv and is available at: https://doi.org/10.1101/2025.03.04.25323347.

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Appendix

Table A1. Results of *post hoc* power analysis for key predictors of health insurance coverage among women in Bangladesh (*n*=19,987)

Predictor variable	Unadjusted OR	Proportion with X=1 (π) (%)	*Post hoc* power (1−β)
Women with post-secondary education	5.61	14.6 (0.146)	>0.9
Richest wealth quintile	3.32	21.7 (0.217)	>0.9
Husbands with post-secondary education	2.85	23.7 (0.237)	>0.9
Adequate media exposure	2.78	6.3 (0.063)	0.8
Women who have a bank or other account	2.27	19.9 (0.199)	0.9

Notes: All tests were two-tailed; The prevalence of health insurance coverage was 0.3% (Pr [Y=1 | X=1]H0=0.003).
Abbreviation: OR: Odds ratio.