**Factors associated with health insurance ownership among ever-married women of reproductive age: according to BDHS 2022**

**Abstract**

**Background:**

**Methods:**

**Results:**

**Conclusion:**

**Introduction**

As part of the most current Sustainable Development Goals, the World Health Organization has suggested that all United Nations members attain universal health coverage (UHC) status by 2030, given that half of the world's population still lacks access to basic health care (WHO). Furthermore, the presence of low-income individuals makes this situation even more uncertain, leading to disastrous financial strain and widespread poverty in Bangladeshi households (Mahumud et al., 2017; Khan et al., 2017). According to the Bangladesh Demographic and Health Survey (BDHS, fewer than 1% of women who have ever been married and are between the ages of 15 and 49 have health insurance. Additionally, people may have to pay out-of-pocket—also known as "out-of-pocket"—for their own medical bills if they do not have insurance. Because of this, significant expenses could discourage women from getting therapy or seeking medical attention. Their capacity for saving money and grow in other aspects of their lives may also be hampered by this financial load and adverse selection often results in the exclusion of the risk groups. Thus, the underprivileged are unable to pay for private insurance.

In Bangladesh, health insurance is an unusual idea. In Bangladesh, for example, the number of health insurance plans provided by insurance firms is extremely low. But this only makes up a small percentage of the population and makes up a tiny amount of the funding issues with this type of financing include minimal coverage because of high premium costs and the fact that it is frequently available to urban residents who work in the formal sector. Tallon & Block, (1988) mentioned that health care costs and utilization have risen dramatically in recent years, but an increasing number of people lack health insurance, making care more difficult to acquire. Given the makeup of the insurance market and other demographic considerations, women are more at risk.

NGOs and nearby hospitals are currently running a number of community-based programs at the local level. The schemes are integrated in that they function as both service providers and insurers. However, the programs' effectiveness is questionable in a small area, but overall, they make up little to nothing of the nation's spending.

Still, they are primarily based on small-scale samples, and findings are not comparable across the studies due to methodological and measurement heterogeneity. In the present study, we aimed to address this gap by analyzing data from Demographic and Health Surveys that use uniform instruments for data collection. Demographic and Health Surveys are also nationally representative, which means that the generated estimations will be more reliable, generalizable for the entire population, and comparable across the analysis settings. Insights developed from the present study are expected to inform population intervention programs that promote health insurance coverage by addressing the socio-demographic gaps. No study has occurred previously addressing this issue in Bangladesh. The present study aimed to explore the socio-demographic factors associated with health insurance coverage among women in Bangladesh.

**Literature Review**

Expanding health insurance coverage to people in the informal sector of the economy is a major challenge in most low- and middle-income countries (LMICs). This is due to large informal sector populations in these countries. According to International Labour Office (ILO), over 60% of the world’s employed population are in the informal sector of the economy. Many studies have been conducted on the determinants of NHIS enrolment in Africa (Jütting, 2004;Dong et al., 2008). Results from these previous studies revealed that factors such as age, education, place of residence, region of residence, marital status, ethnicity, employment status, household wealth, gender, household size, and exposure to media were predictors of enrolment in the NHIS.

Aregbeshola and Khan (2018) found that 97.9% of women were not covered by health insurance which means health insurance coverage among women of reproductive age in Nigeria is very low. Additionally, demographic and socio-economic factors such as age, education, geo-political zone, socioeconomic status (SES), and employment status were associated with enrolment in the NHIS among women (Aregbeshola and Khan 2018).

Of the reproductive-age women, 25% were uninsured at some point in the prior year which is found by Kozhimannil, Abraham, and Virnig (2012) the authors also added that 10 percent of [pregnant women](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/pregnant-woman) reported currently being uninsured, and 27% and 58% reported Medicaid coverage or [private health insurance](https://www.sciencedirect.com/topics/nursing-and-health-professions/private-health-insurance), respectively. Among women who were not pregnant, 19% were currently uninsured, 8% had Medicaid, and 68% had private coverage. From 2000 to 2009, an increasing percentage of reproductive-age women reported having gone without health insurance in the past year. Controlling for sociodemographic and health variables, the chances that a reproductive-age woman had been uninsured increased by approximately 1.5% annually (*p* < 0.001), and did not differ between pregnant women and those who were not pregnant (Kozhimannil, Abraham, and Virnig 2012).

Shao et al., (2022) revealed considerable cross-country variation in health insurance ownership: Gabon (57.9%), Kenya (6.1%), DR Congo (2.8%), Cameroon (1.1%), Burkina Faso (0.4%). In the multivariate regression analysis, women’s age, marital status, place of residency, educational level, household wealth status, employment, and media access were significant predictors of insurance ownership. The associations were generally similar across the five countries, with higher age, better educational level, and wealth status showing a consistently positive relationship with insurance ownership (Shao et al., 2022).

According to Jones & Sonfield, (2016), there were important differences in type of coverage according to poverty status and whether or not the woman resided in a state that had adopted the Medicaid expansion. Women at or below 138% of poverty showed substantial declines in the proportion of uninsured, 40.0% to 24.6%, due to increased Medicaid coverage. Among women at or below 138% of poverty residing in expansion states, the proportion of uninsured decreased as Medicaid coverage increased. In no expansion states, the proportion of women at or below 138% of poverty with private insurance increased. The proportion of uninsured women declined significantly for all but a few groups when looking at additional demographic characteristics. The exceptions were nonsignificant changes in the proportion of uninsured women aged 35–39, women without a high school degree, and Latinas. Still, substantial disparities in uninsurance remained in 2015, particularly for non-White women, those employed less than full time and those with lower levels of education Jones & Sonfield, (2016).

Wealth status, age, religion, birth parity, marriage, and ecological zone were found to have significantly predicted health insurance subscriptions among women of reproductive age in Ghana. Urban dwellers, nulliparous women, those with no or low levels of education, African traditionalists, and the poor were those who largely did not subscribe to the scheme. A major issue that continues to be of principal prominence in most countries across the globe entails the capacity of their health financing structures to provide adequate financial risk safeguard to all of their population against the costs of health care as they strive to achieve universal health coverage (Lagomarsino et al. 2012) (Carman et al.,2014).

Peru has introduced a tax-financed health insurance scheme called “Sistema Integral de Salud (SIS)”. However, out of the 33,168 women, 25.3% did not have any insurance coverage, 45.5% were covered by SIS and 29.2% were covered by a Standard Insurance scheme. Women in the SIS group were found to have lower educational levels, live in rural areas, and more likely to be poorer. Women in the Standard Insurance group were found to be more educated, more likely to be “Spanish”, and to be wealthier. Most uninsured women appeared to belong to the middle class, not poor enough to be eligible for SIS, but also not eligible for standard insurance (Ramos Rosas et al. 2020).

In East Africa, (Weldesenbet et al. 2021) examined that health insurance coverage among reproductive-age group (RAG) women was below ten percent. Educational status, working status, place of residence, wealth index, media exposure, visiting health facility within 12 months and being visited by field workers were significantly associated with health insurance coverage among RAG women in East Africa. Moreover, the odds of health insurance coverage were high among educated, currently working, and rich RAG women whereas it was low among rural residents. Besides, RAG women who have media exposure, visited by field workers, and visited health facilities have a higher chance of health insurance coverage.

The overall Community Based Health Insurance (CBHI) enrolment among reproductive-age women in Ethiopia was low. Of the 8,885 study participants, 3,835 (43.2, 95% CI; 42.1, 44.2%) of women had health insurance. Women aged 20–24 years, 25–29 years, and 30–34 years less likely to enroll in health insurance compared to their younger counterparts (15–19 years). Women living in rural areas, had greater than five family sizes, living with a female household head, and having more than five living children were negatively associated with enrollment in health insurance. Besides, health insurance enrollment among reproductive-age women is significantly affected by region and religious variation.

Bayked et al., (2021) mentioned that factors like demographic and socioeconomic factors, community participation, illness experience, benefit package, awareness level, previous out of pocket expenditure for health care service and health service status (quality, adequacy, efficiency and coverage), premium amount, self-rated health status and bureaucratic complexity were identified to determine the utilization of health insurance. In developing countries, healthcare accessibility remains limited as a result of financial and socio-cultural challenges. Out-of-pocket payments are among the main factors which prevent the majority of the people in these countries from accessing timely health care (van Doorslaer et al., 2006).

To fill the knowledge gap in Bangladesh, the current study sought to use nationally representative data to assess the factors associated with health insurance coverage among women of reproductive age in Bangladesh.

**Materials and Methods**

**Data Source**

The 2022 Bangladesh Demographic and Health Survey (BDHS) is the ninth national survey to report on the demographic and health conditions of women and their families in Bangladesh. The survey was conducted under the authority of the National Institute of Population Research and Training (NIPORT), Medical Education and Family Welfare Division, Ministry of Health and Family Welfare (MOHFW), Government of Bangladesh. Financial assistance was provided jointly by the Government of Bangladesh and the United States Agency for International Development (USAID). Mitra and Associates, a Bangladeshi research firm located in Dhaka, implemented the survey. Data collection took place from June 27 to December 12, 2022. ICF provided technical assistance through The Demographic and Health Surveys (DHS) Program, which is funded by USAID. The DHS Program offers financial support and technical assistance for population and health surveys in countries worldwide. The International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) also provided technical assistance during the survey, especially on the verbal autopsy questionnaires aiming to determine the causes of under-5 deaths.

**Sample Design**

The sampling frame used for the 2022 BDHS is the Integrated Multi-Purpose Sampling Master Sample, selected from a complete list of enumeration areas (EAs) covering the whole country. It was prepared by the Bangladesh Bureau of Statistics (BBS) for the 2011 population census of the People’s Republic of Bangladesh. The sampling frame contains information on EA location, type of residence (city corporation, other than city corporation, or rural), and the estimated number of residential households. A sketch map that delineates geographic boundaries is available for each EA. Bangladesh contains eight administrative divisions: Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet. Each division is divided into zilas and each zila into upazilas. Each urban area in an upazila is divided into wards, which are further subdivided into mohallas. A rural area in an upazila is divided into union parishads (UPs) and, within UPs, into mouzas. These administrative divisions allow the country to be separated into rural and urban areas. The survey is based on a two-stage stratified sample of households. In the first stage, 675 EAs (237 in urban areas and 438 in rural areas) were selected with probability proportional to EA size. The BBS drew the sample in the first stage following specifications provided by ICF. A complete household listing operation was then carried out by Mitra and Associates in all selected EAs to provide a sampling frame for the second-stage selection of households. In the second stage of sampling, a systematic sample of an average of 45 households per EA was selected to provide statistically reliable estimates of key demographic and health variables for urban and rural areas separately and for each of the eight divisions in Bangladesh. Eligible women in each household were asked a set of core questions on background characteristics and reproductive history. Thirty of the 45 households in each EA were randomly selected for the long individual questionnaire administered to all eligible women within the household; in the remaining 15 households, a short version of the questionnaire was administered to all eligible women. Half of the households (15 of 30 households) selected in the long questionnaire subsample were systematically selected for biomarker measurements (also known as the biomarker subsample), specifically height and weight measurements among children under age 5 and ever-married women age 15–49. In addition, about half (8 of 15) of the households selected in the biomarker subsample were systematically selected for anthropometric measurements among ever-married women age 50 and above, never-married women age 18 and above, and all men age 18 and above; and blood pressure and blood glucose measurements were taken for all women and men age 18 and above. Thirty-one listing teams, each consisting of two listers/mappers, were deployed in the field to complete the listing operation. In addition, 12 quality control officers were deployed in the field. Overall, 74 listers/mappers were deployed in the field to complete the listing work. Training for the household listers/mappers took place April 24–29, 2022. The household listing operation was carried out in two phases (each about 4 weeks in duration) in all selected EAs from May 25 to July 27, 2022.

A total of 30,330 households were selected for the 2022 BDHS sample, of which 30,149 were found to be occupied. Of the occupied households, 30,018 were successfully interviewed, yielding a response rate of almost 100%. In the interviewed households, 30,358 ever-married women aged 15–49 were identified as eligible for individual interviews. Overall, interviews were completed with 30,078 women. Among all interviewed women, 20029 ever-married women aged 15–49 shared the information on health insurance coverage (Figure 1).

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| Figure 1: Diagram illustrating the analytical study sample |

**Outcome variables**

The outcome variable was insurance ownership which was measured by asking the respondent about insurance ownership. The answer to this question was categorized as “Covered by health insurance” and “Not covered”. Several enabling and predisposing factors were chosen as the predictor variables based on their theoretical association with insurance ownership that was described

**Possible factors**

By the study's goals and because of the BDHS data's hierarchical structure, two-level independent variables were considered. We classified individual levels of independent variables in different groups such as socioeconomic, demographic factors, and child-related factors.

The socioeconomic and demographic factors are the respondent’s age (15-24, 25-34,35+), husband's age (15-29, 30-44, 45+), respondent’s and their husbands’ educational level (no education, primary, secondary, or higher), household heads’ occupation (not working, farmer/agriculture, businessman, skilled others), respondents’ current work status (yes, no), wealth index (poor, middle, rich), respondents’ exposure to the mass media (yes, no), the number of antenatal care visits made by the respondent (≥4, <4), whether taken any prenatal care service (yes, no), method of delivery (normal, cesarean), whether there exists any delivery assistance (yes, no), consuming iron tablet during pregnancy (yes, no), type of toilet facility (modern toilet. others), place of delivery (home, health facility), no. of household members (≥3, <3), household head’s sex (male, female).

Child-related factors contain the age of the child (0-11, 12-23, 24-35, 36-47, and 48-59 months), the child’s sex (male, female), a recent history of diarrhea (yes, no), a recent history of cough (yes, no), a recent history of fever (yes, no), birth order (1-3,4-6,7-10). On the other hand, division, and area of residence (urban, rural) are regional or secondary-level independent variables. Detailed information on these variables can be found in Table 1 to Table 4.

**3.3 Statistical Data Analysis**

Data were analyzed with Stata version 16 (College Station, TX: Stata Corp LP). All analyses were adjusted for the cluster design by using the ‘svy’ command. This command uses the information on sampling weight, strata, and primary sampling unit provided with the datasets. Sample characteristics were described as percentages with 95% confidence intervals.

**4.0 Results**

In Figure 1, the percentage of health insurance ownership among ever-married women in the divisions is as follows: Barisal (5.98%), Chittagong (18.75%), Dhaka (25.31%), Khulna (11.95%), Mymensingh (7.61%), Rajshahi (13.12%), Rangpur (11.43%), and Sylhet (5.85%).

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| **Figure: Division-wise Health insurance coverage in percentage** |

A total of 20029 ever-married women participated and gave their information on ownership of health insurance. Among them, 57.19% of ever-married women are from age group 35-49 years which is higher than the other age group 25-34 years (30.21%) and 15-24 years (12.59%) who has the ownership of health insurance. A highest percentage (43.81%) of ever-married women has the ownership of health insurance and secondary completed, followed by higher (27.20%), primary (22.16%), and no education (6.83%). Highest health insurance ownership (48.22%) noticed in 30-44 years husband/partner’s age ever-married women. The other age group 45 or above years of husband 33.50% of ever-married women had the ownership of health-insurance and a lowest 5.58% had ownership of health insurance of ever-married women whose husband is 15-29 years old. Geographic location (division)–wise distribution of prevalence presents that alone Dhaka has the ownership of 45.29% among total health insurance ownership and 54.71% own rest of the health insurance **(Table 1)**.

**Table 1: Percentage of ever-married women age 15–49 with health insurance ownership by sociodemographic characteristics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Status of health insurance** | | |  |
|  | **Yes**  **n (%)** | **No**  **n (%)** | **Total**  **n (%)** | **P-value** |
| **Age (in years)** |  |  |  |  |
| 15-24 | 7 (12.59) | 5011 (25.09) | 5018 (25.06) | 0.016 |
| 25-34 | 18 (30.21) | 6943 (34.76) | 6960 (34.75) |  |
| 35-49 | 33 (57.19) | 8017 (40.14) | 8050 (40.19) |  |
| **Education** |  |  |  |  |
| No education | 4 (6.83) | 2748 (13.76) | 2752 (13.74) | 0.046 |
| Primary | 13 (22.16) | 5201 (26.04) | 5214 (26.03) |  |
| Secondary | 26 (43.81) | 9333 (46.74) | 9359 (46.73) |  |
| Higher | 16 (27.20) | 2687 (13.46) | 2703 (13.50) |  |
| **Women currently working** |  |  |  |  |
| Yes | 22 (38.50) | 6389 (31.99) | 6412 (32.01) | 0.350 |
| No | 36 (61.50) | 13581 (68.01) | 13617 (67.99) |  |
| **Body Mass Index** |  |  |  |  |
| Underweight | 3 (5.94) | 979 (4.90) | 982 (4.90) | 0.494 |
| Normal weight | 10 (17.28) | 5311 (26.60) | 5321 (26.57) |  |
| Overweight | 10 (16.28) | 2832 (14.18) | 2842 (14.19) |  |
| Obese | 35 (60.50) | 10848 (54.32) | 10884 (54.34) |  |
| **Husband age** |  |  |  |  |
| 15-29 | 3 (5.58) | 3481 (18.32) | 3484 (18.28) | 0.033 |
| 30-44 | 34 (48.22) | 9156 (48.18) | 9190 (48.22) |  |
| 45 or above | 20 (33.50) | 6365 (33.50) | 6385 (33.50) |  |
| **Husband education** |  |  |  |  |
| No education | 11 (19.16) | 4072 (21.47) | 4083 (21.47) | 0.299 |
| Primary | 10 (17.48) | 5376 (28.35) | 5386 (28.32) |  |
| Secondary | 23 (38.99) | 6173 (32.55) | 6196 (32.57) |  |
| Higher | 14 (24.37) | 3342 (17.62) | 3356 (17.64) |  |
| **Husband occupation** |  |  |  |  |
| Not working | 0 (0.00) | 646 (3.41) | 646 (3.39) | 0.649 |
| Farmer/Agriculture | 11 (19.68) | 4425 (23.34) | 4436 (23.32) |  |
| Businessman | 11 (18.62) | 3749 (19.77) | 3760 (19.77) |  |
| Skilled | 28 (48.84) | 8081 (42.62) | 8109 (42.64) |  |
| Others | 7 (12.86) | 2061 (10.87) | 2069 (10.88) |  |
| **Residence** |  |  |  |  |
| Urban | 18 (31.36) | 5682 (28.45) | 5700 (28.46) | 0.689 |
| Rural | 40 (68.64) | 14288 (71.55) | 14328 (71.54) |  |
| **Division** |  |  |  |  |
| Dhaka | 26 (45.29) | 5054 (25.31) | 5080 (25.37) | 0.016 |
| Others | 32 (54.71) | 14916 (74.69) | 14948 (74.63) |  |
| **Religion** |  |  |  |  |
| Islam | 50 (85.52) | 18057 (90.44) | 18107 (90.43) | 0.302 |
| Others | 8 (14.48) | 1908 (9.56) | 1916 (9.57) |  |
| **Wealth index** |  |  |  |  |
| Poor | 17 (29.67) | 7593 (38.02) | 7610 (38.00) | 0.438 |
| Middle | 12 (20.32) | 4124 (20.65) | 4135 (20.65) |  |
| Rich | 29 (50.01) | 8254 (41.33) | 8283 (41.36) |  |
| **Household family members** |  |  |  |  |
| <4 | 13 (22.31) | 4705 (23.56) | 4718 (23.56) | 0.581 |
| 4-5 | 30 (51.87) | 9001 (45.07) | 9031 (45.09) |  |
| >5 | 15 (25.82) | 6264 (31.37) | 6279 (31.35) |  |
| **Number of living children** |  |  |  |  |
| 0 | 3 (5.96) | 2165 (10.84) | 2169 (10.83) | 0.516 |
| 1-2 | 37 (62.94) | 11702 (58.60) | 11739 (58.61) |  |
| 3+ | 18 (31.09) | 6103 (30.56) | 6121 (30.56) |  |
| **Exposure of television** |  |  |  |  |
| Yes | 41 (70.92) | 9850 (49.32) | 9891 (49.38) | 0.002 |
| No | 17 (29.08) | 10121 (50.68) | 10138 (50.62) |  |
| **Exposure of radio** |  |  |  |  |
| Yes | 1 (2.34) | 113 (0.56) | 114 (0.57) | 0.078 |
| No | 57 (97.66) | 19858 (99.44) | 19915 (99.43) |  |
| **Exposure of internet** |  |  |  |  |
| Yes | 19 (32.55) | 6010 (30.10) | 6029 (30.10) | 0.719 |
| No | 39 (67.45) | 13960 (69.90) | 14000 (69.90) |  |
| **Exposure of mass media** |  |  |  |  |
| Yes | 49 (37.85) | 12412 (16.01) | 12461 (37.79) | <0.001 |
| No | 9 (62.15) | 7559 (83.99) | 7568 (62.21) |  |
| **Total** | **58 (0.29)** | **19970 (99.71)** | **20029 (100.00)** |  |

**Table 2: Factors Influencing Health Insurance Ownership Among Ever-Married Women of Reproductive Age Using Bivariable and Multivariable Logistic Regression**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **COR (95% CI)** | **P-value** | **AOR (95% CI)** | **P-value** |
| **Age (in years)** |  |  |  |  |
| 15-24 | 0.58 (0.25-1.31) | 0.188 | 0.82 (0.41-1.64) | 0.582 |
| 25-34 | 1.64 (0.90-2.98) | 0.105 | 3.14 (1.32-7.46) | 0.010 |
| 35-49 | Reference |  | Reference |  |
| **Education** |  |  |  |  |
| Higher | 4.08 (1.14-14.54) | 0.030 | 2.07 (0.45-9.46) | 0.346 |
| Secondary | 1.89 (0.53-6.69) | 0.323 | 2.95 (0.73-11.91) | 0.127 |
| Primary | 1.72 (0.45-6.59) | 0.431 | 7.23 (1.52-34.45) | 0.013 |
| No education | Reference |  | Reference |  |
| **Women currently working** |  |  |  |  |
| Yes | 1.33 (0.73-2.43) | 0.350 | 1.20 (0.66-2.18) | 0.556 |
| No | Reference |  | Reference |  |
| **Body Mass Index** |  |  |  |  |
| Underweight | 1.09 (0.32-3.75) | 0.892 | 1.55 (0.47-5.03) | 0.470 |
| Normal weight | 0.58 (0.29-1.18) | 0.135 | 0.62 (0.31-1.23) | 0.174 |
| Overweight | 1.03 (0.51-2.09) | 0.934 | 0.90 (0.43-1.88) | 0.788 |
| Obese | Reference |  | Reference |  |
| **Husband age** |  |  |  |  |
| 45 or above | 4.05 (1.39-11.82) | 0.011 | 1.40 (0.68-9.22) | 0.666 |
| 30-44 | 3.44 (1.13-10.44) | 0.029 | 2.51 (0.68-9.22) | 0.166 |
| 15-29 | Reference |  | Reference |  |
| **Husband education** |  |  |  |  |
| Higher | 1.55 (0.61-3.92) | 0.355 | 0.76 (0.24-2.36) | 0.632 |
| Secondary | 1.34 (0.58-3.12) | 0.493 | 1.06 (0.52-2.20) | 0.865 |
| Primary | 0.69 (0.24-1.96) | 0.487 | 0.63 (0.21-1.92) | 0.415 |
| No education | Reference |  | Reference |  |
| **Husband Occupation** |  |  |  |  |
| Others | 1.40 (0.54-3.62) | 0.484 | 1.51 (0.57-4.01) | 0.404 |
| Skilled | 1.36 (0.64-2.86) | 0.420 | 1.09 (0.50-2.40) | 0.829 |
| Businessman | 1.12 (0.48-2.61) | 0.799 | 0.82 (0.36-1.83) | 0.620 |
| Farmer/Agriculture | Reference |  | Reference |  |
| **Residence** |  |  |  |  |
| Urban | 1.15 (0.58-2.27) | 0.689 | 0.66 (0.28-1.56) | 0.689 |
| Rural | Reference |  | Reference |  |
| **Division** |  |  |  |  |
| Dhaka | 2.44 (1.15-5.18) | 0.016 | 2.75 (1.12-6.80) | 0.028 |
| Others | Reference |  | Reference |  |
| **Religion** |  |  |  |  |
| Islam | 1.60 (0.65-3.96) | 0.302 | 1.59 (0.61-4.17) | 0.343 |
| Others | Reference |  | Reference |  |
| **Wealth index** |  |  |  |  |
| Rich | 1.55 (0.76-3.18) | 0.231 | 0.94 (0.47-1.86) | 0.854 |
| Middle | 1.26 (0.56-2.83) | 0.573 | 1.01 (0.48-2.11) | 0.987 |
| Poor | Reference |  | Reference |  |
| **Household family members** |  |  |  |  |
| <4 | 1.15 (0.50-2.66) | 0.744 | 1.01 (0.39-2.59) | 0.998 |
| 4-5 | 1.40 (0.74-2.65) | 0.303 | 1.19 (0.63-2.24) | 0.596 |
| >5 | Reference |  | Reference |  |
| **Number of living children** |  |  |  |  |
| 0 | 0.54 (0.17-1.71) | 0.295 | 0.88 (0.25-3.17) | 0.848 |
| 1-2 | 1.06 (0.56-1.98) | 0.865 | 1.01 (0.46-2.21) | 0.982 |
| 3+ | Reference |  | Reference |  |

COR = Crude Odds Ratio, AOR = Adjusted Odds Ratio, CI= Confidence Interval

According to crude logistic regression model in Table 2, women aged 15-24 years had 42% (COR: 0.58, 95% CI: 0.25–1.31) lower health insurance ownership than the women aged 35-49 years. In addition, women aged 25-34 years had 1.64 times (COR: 1.64, 95% CI: 0.90–2.98) higher health insurance ownership than the women aged 35-49 years. Women with higher educational status had 4.08 times (COR: 4.08, 95% CI: 1.14–14.54) higher health insurance ownership than the women with no educational status. In regards of BMI, women who were normal weight had 42% (COR: 0.58, 95% CI: 0.29–1.18) lower health insurance ownership than the women who were obese. Respondents husband aged 45 or above years and 30-44 years had 4.05 times (COR: 4.05, 95% CI: 1.39–11.82) and 3.44 times (COR: 3.44, 95% CI: 1.13–10.44) higher health insurance ownership than the respondents husband age 15-29 years, respectively. In addition, women from Dhaka division had 2.44 times (COR: 2.44, 95% CI: 1.15–5.18) higher health insurance ownership than the women from other division.

According to adjusted logistic regression model, women aged 25-34 years had 3.14 times (AOR: 3.14, 95% CI: 1.32–7.46) higher health insurance ownership than the women aged 35-49 years. Women with secondary and primary educational status had 2.95 times (AOR: 2.95, 95% CI: 0.73–11.91) and 7.23 times (AOR: 7.23, 95% CI: 1.52–34.45) higher health insurance ownership than the women with no educational status, respectively. In regards of BMI, women who were normal weight had 38% (AOR: 0.62, 95% CI: 0.31–1.23) lower health insurance ownership than the women who were obese. Respondents husband aged 30-44 years had 2.51 times (AOR: 2.51, 95% CI: 0.68–9.22) higher health insurance ownership than the respondents husband age 15-29 years. In addition, women from Dhaka division had 2.75 times (AOR: 2.75, 95% CI: 1.12–6.80) higher health insurance ownership than the women from other division (Table 2).

All variables were included in the multivariable logistic regression model because the VIF values of each variable were less than 4.00, means no multicollinearity in the model (Table 3).

**Table 3: Variance Inflation Factor (VIF) of Multivariable Logistic Regression**

|  |  |
| --- | --- |
| **Variables** | **VIF Value** |
| Age (in years) | 2.74 |
| Education | 2.56 |
| Women currently working | 1.83 |
| Body Mass Index | 1.79 |
| Husband age | 1.59 |
| Husband education | 1.47 |
| Husband Occupation | 1.20 |
| Residence | 1.09 |
| Division | 1.08 |
| Religion | 1.05 |
| Wealth index | 1.05 |
| Household family members | 1.02 |
| Number of living children | 1.01 |
| **Mean VIF** | 1.50 |

The Table 4 shows goodness of fit of multivariable logistic regression model. The lower AIC, and BIC values indicate a better fitting the model. In multivariable model, the AIC estimates showed a lower value (838.96) and BIC (1049.88) (Table 4). The areas under the AUROC curve were 71.05% (95% CI: 64.24–77.87) (Table 4 and Figure 1). These values indicate that the model was well fitted and could differentiate between the two groups of health insurance ownership. So, without any doubt, the multivariable model is better suited in BDHS 2022 surveys.

**Table 4: Goodness of fit of multivariable logistic regression model**

|  |  |  |  |
| --- | --- | --- | --- |
| **AIC** | **BIC** | **AUROC (95% CI)** | **P-value** |
| 838.96 | 1049.88 | 71.05% (64.24-77.87) | <0.001 |

|  |
| --- |
|  |
| **Figure: Area Under ROC curve of the adjusted model** |

**5.0 Discussion**

This study aims at the factors that influence women's ownership of health insurance in Bangladesh and shows that health insurance ownership among women aged between 15–49 years and its sociodemographic factors have some significant correlations. The results demonstrate existence of greater disparities in the percentage of insurance ownership among women in Bangladesh and descriptive statistics shows women belonging from Dhaka-division, the city of capital, owns higher percentage of health insurance ownership among all which is in line with findings of (Kimani et al. 2014). In addition to that, the relationship of sociodemographic factors with health ownership is supported by Shao et al., (2022). Furthermore, it can be noted that findings revealed insignificant urban-rural disparity, however, which is inconsistent with Shao et al., (2022)where disparity in urban-rural in terms of insurance ownership found significant.

According to multivariate regression analysis, insurance ownership by women of reproductive age 15-49 is influenced by the sociodemographic differences. More specifically, women’s age, education, their husband’s age and division were found significantly associated with the ownership of insurance. These results are consistent with earlier research that demonstrated positive relationship between insurance ownership and socioeconomic factors (Amu et al., 2018; Kirigia et al., 2005)

Table-1 revealed that Individuals with higher age tend to have more investments in health insurance to get financial security and consistency found in the findings of Grossman et al., (1972). He mentioned that it is expected that aged people will make larger investments in health than the young group, as the health stock depreciation rate rises with age, Moreover, Insurance ownership is significantly affected through the level of education, such as women with no educations possess the least percentage of insurance ownership and this is significantly associated with the insurance ownership of women due to lack of awareness about their expected or potential expenditure related to their health and inability for taking health insurance policies. However, women with secondary education holds highest percentage of insurance ownership among all, which is in line with the existing evidence that uneducated women are severely at disadvantage phase in terms of insurance ownership and this finding is supported by Liu & Chen, (2002); Kimani et al., (2014). As one's household wealth index rises, likelihood of having insurance also goes up. This result is in line with earlier research that indicated wealthier households were more likely to have insurance(Kumi-Kyereme et al., 2013; Sarpong et al., 2010)

There are a number of noteworthy advantages, e.g., the datasets are nationally representative and had a sizable sample size. Consequently, the results can be applied to the whole female population. However, Limitations include that analyses cannot ensure a causal association between the outcome and explanatory factors because the study was based on cross-sectional surveys. The variables were chosen based on their availability in the datasets because the surveys are secondary. Moreover, because of lack of information on respondents' health status (such as the frequency and existence of illnesses), it was impossible to evaluate the relationship between health status and health insurance coverage. Health status is a significant predictor of health insurance coverage, according to earlier research (Dong et al., 2009). Another drawback is the inability to evaluate the relationship between the level of insurance coverage and health insurance ownership as the questionnaire did not gather information on the scope of insurance coverage, such as the services covered.

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