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Factors associated with health insurance coverage among ever-married women in Somalia using 2020 health and demographic survey data

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Abstract

Background Achieving universal health coverage (UHC) requires effective financial risk protection mechanisms, with health insurance being a cornerstone. In Somalia's fragile and under-researched context, the factors influencing health insurance adoption remain poorly understood. This study aims to identify socio-demographic determinants of personal health insurance coverage among ever-married women in Somalia, utilizing the first comprehensive national health and demographic data available for the country. This demographic is crucial as they often serve as primary caregivers, and their financial protection is vital for household well-being.

Methods We analyzed data from the 2020 Somali Health and Demographic Survey (SHDS) for 1,626 ever-married women. A multivariable logistic regression model was used to identify factors associated with personal health insurance coverage.

Results The prevalence of personal health insurance coverage among ever-married women was notably low at 2.28% (95% CI: 1.55%, 3.01%). Multivariable logistic regression revealed significant associations between borrowing status, place of residence, region of residence, and personal health insurance coverage. Specifically, ever-married women in households that reported borrowing money demonstrated significantly elevated odds of possessing health insurance (AOR = 5.35, 95% CI: 2.52, 11.35), indicating the importance of access to credit and potential awareness of financial protection tools. Conversely, ever-married women residing in nomadic areas exhibited reduced odds of health insurance coverage relative to those in urban areas (AOR = 0.15, 95% CI: 0.03, 0.67). Ever-married women in the Bari region were less likely to have health coverage than those in the Awdal region (AOR = 0.095, 95% CI: 0.01–0.89), while women in the Bari region were less likely to have coverage, highlighting regional disparities linked to socio-economic and infrastructural challenges.

Conclusions With health insurance coverage for ever-married women in Somalia at just 2.28%, progress toward UHC is stalled. This study identifies borrowing status,



nomadic lifestyle, and geographic location as the most significant factors. These findings present an urgent policy roadmap: promote financial inclusion by linking insurance to credit, develop culturally-sensitive schemes for mobile populations, and actively reduce regional disparities. These targeted interventions are critical for increasing insurance uptake and ensuring equitable healthcare access in Somalia.

Keywords Ever-married women, Sustainable development goal, Universal health coverage (UHC), Health insurance, Somalia

1 Introduction

Health insurance is a cornerstone of modern health systems, designed to ensure that individuals can access necessary healthcare without suffering severe financial strain [1–4]. It functions through a risk-sharing mechanism where premiums from a large pool of individuals are used to cover the medical costs of the few who fall ill, a system essential for achieving Universal Health Coverage (UHC) [5, 6]. As a primary objective of global health policy and a key target within the Sustainable Development Goals (SDGs) [7], UHC aims to protect people from the impoverishing effects of out-of-pocket health expenditures [8]. In the absence of such financial protection, households may be forced to delay or abandon essential treatment, leading to deteriorated health outcomes and, in many cases, financial catastrophe [9, 10].

The architecture of health insurance varies globally. High-income nations often employ social insurance models (Bismarck) or tax-funded systems (Beveridge), but these are challenging to implement in low- and middle-income countries (LMICs) with large informal economies [11]. In these settings, Community-Based Health Insurance (CBHI) has emerged as a vital alternative, designed to be responsive to local needs [12–14]. Across sub-Saharan Africa, the path to expanding health insurance has been uneven. While nations like Ghana and Rwanda have made significant strides with national schemes, many others confront formidable barriers, including limited financial resources and inadequate health infrastructure [5, 15].

Somalia presents a particularly acute example of these challenges. Its healthcare landscape is a fragmented mosaic of public, private, and non-governmental services, heavily dependent on direct payments from patients. Decades of conflict and political instability have crippled the development of formal state-led systems, leaving formal health insurance schemes, whether public or private, largely nascent or non-existent [16–18]. Understanding how to build financial protection in such a fragile context is a critical first step toward health system reconstruction.

A substantial body of research has identified the multifaceted factors that influence an individual's decision to enroll in health insurance. These include socio-economic characteristics such as education level, age, and wealth status, as well as geographic factors like one's place of residence (urban vs. rural) [16, 19, 20]. Furthermore, an individual's knowledge, attitudes, and exposure to information through channels like television and radio—collectively termed media exposure—play a significant role in shaping enrollment decisions [4, 21, 22]. System-level issues, including a lack of trust in insurance providers and the complexity of enrollment processes, also act as significant deterrents [10, 23, 24]. Multilevel statistical analyses have further illuminated how these individual, household, and community characteristics interact to influence insurance uptake [1, 20].

Despite this extensive body of work, a significant literature gap persists for countries confronting unique and extreme challenges. This study addresses this gap by analyzing data from the 2020 Somali Health and Demographic Survey (SHDS), which marks the first time such comprehensive national health and demographic data has been produced in Somalia's recent history. Our analysis focuses specifically on ever-married women, a demographic chosen for several critical reasons. First, they are a primary unit of analysis in DHS surveys globally, allowing for robust comparisons. Second, they often serve as the primary family caregivers, making their health-seeking behaviors and financial protection profoundly influential. Consequently, their access to healthcare is a crucial indicator of overall household well-being.

This study, therefore, aims to illuminate the factors associated with personal health insurance coverage among this key demographic in Somalia. By examining the influence of demographic, socio-economic, and geographic variables, our findings will provide invaluable, evidence-based insights for researchers and policymakers. Ultimately, this research seeks to inform the design of effective, equitable, and context-specific health financing strategies that can advance financial risk protection for vulnerable populations and move Somalia closer to the goal of UHC.

2 Methods and materials

2.1 Study design, setting, and data source

This study employed a cross-sectional design, analyzing secondary data from the Somali Health and Demographic Survey (SHDS) 2020 (Reference ID: SOM-SNBS-SHDS-2020-v01) [25, 26]. This landmark survey, the first of its kind in Somalia, was conducted by the Somali National Bureau of Statistics (SNBS) with technical assistance from UNFPA Somalia. Data collection occurred between February 2018 and January 2019. The SHDS was designed to provide valid, reliable, and representative national and sub-national data on a wide range of demographic and health indicators, including mortality, fertility, maternal and child health, and nutrition.

The survey utilized a three-stage stratified cluster sample design in urban and rural areas and a two-stage design in nomadic areas to ensure a representative sample across Somalia's 18 pre-war administrative regions. The data was collected using three main instruments: the Household Questionnaire, the Ever-married Woman's Questionnaire, and the Never-married Woman's Questionnaire, which were adapted from the DHS Program's standard questionnaires (DHS-7) to the Somali context. Data collection was conducted using Computer-Assisted Personal Interviewing (CAPI) on mobile devices. The final, edited, and anonymized dataset for public distribution was accessed via the Somali National Data Archive (SoNADA) microdata catalog.

2.2 Study population

The target population for the SHDS 2020 included households, children under five, and women aged 15–49. The survey successfully interviewed 15,826 households, achieving a response rate of 99.7%. Within these households, a total of 11,884 ever-married women aged 15–49 were interviewed (SHDS 2020, Table 1.1).

For this analysis, we focused exclusively on this ever-married women sub-population. The initial sample for this study comprised all 11,884 ever-married women who participated in the survey. However, our multivariable regression analysis required a complete

set of data across the outcome variable (health insurance coverage) and all selected independent variables. Several key predictors, particularly those related to household financial behaviors such as borrowing status, were collected as part of specialized modules that may not have been completed by all respondents.

Consequently, a listwise deletion approach was employed to handle cases with missing data on any of the variables included in our model. This resulted in the exclusion of 10,258 cases (86.3% of the initial sample). This yielded a final analytic sample of 1,626 ever-married women with complete data across all variables of interest.

To assess the potential for selection bias introduced by this significant sample reduction, we conducted a comparative analysis of key demographic characteristics (age, education, wealth index, and place of residence) between the final analytic sample ($n = 1,626$) and the excluded cases ($n = 10,258$). No statistically significant differences were observed, suggesting that the final sample remains broadly representative of the total ever-married women population in terms of these core demographics. The implications of this sample size reduction are further discussed in the limitations section.

2.3 Study variables

The outcome variable was personal health insurance coverage. This was a binary variable (coded as “0 = No”, “1 = Yes”) derived directly from the SHDS question, “Are you covered by any health insurance?”.

The selection of independent variables was guided by their theoretical relevance in established health utilization models and their availability in the SHDS dataset [1, 4, 20]. These variables included:

- Respondent Characteristics: Age group, maternal education (categorized as ‘No education’, ‘Primary’, and ‘Secondary or higher’), and marital status.
- Household Characteristics: Sex of the household head, wealth index (categorized into quintiles: poorest, poorer, middle, richer, richest), household borrowing status (Yes/No), family member with a bank account (Yes/No), and other household member has insurance coverage (Yes/No).
- Geographic Factors: Place of residence (Urban, Rural, Nomadic) and region of residence.
- Media Exposure: The ‘media exposure’ variable was constructed as a composite binary indicator. Respondents were coded as ‘Yes’ if they reported listening to the radio (v158), watching television (v159), or reading a newspaper/magazine (v156) at least once a week, and ‘No’ otherwise.

2.4 Statistical analysis

Data management and statistical analyses were conducted using Stata version 16 (Stata-Corp, College Station, TX, USA). A critical first step was to account for the survey’s complex sampling methodology. All statistical analyses were weighted using the svyset command in Stata, applying the individual sample weight variable (v005) to ensure the results are nationally representative. A key step in data preparation involved handling missing values; a listwise deletion approach was employed, whereby cases with missing data on any of the selected predictor variables were excluded from the regression analysis. This resulted in the final analytic sample of 1,626 respondents, as detailed in the Study Population section.

The analytical strategy was implemented in sequential phases. Initially, descriptive statistics (frequencies and weighted percentages) were generated to profile the socio-demographic characteristics of the sample and determine the prevalence of health insurance coverage. Subsequently, bivariate analysis was performed using the Chi-square test to examine the unadjusted associations between each independent variable and the outcome. Variables with a p -value of <0.20 in the bivariate analysis were considered candidates for inclusion in the multivariable model.

Finally, a multivariable logistic regression model was developed to identify the factors significantly associated with health insurance coverage while controlling for potential confounders. To ensure the final model's validity and robustness, several diagnostic tests were conducted. Multicollinearity among the independent variables was assessed using the Variance Inflation Factor (VIF); a VIF value below 2.5 for all variables indicated no significant collinearity issues. Additionally, the model's goodness-of-fit was evaluated using the Hosmer–Lemeshow test, which confirmed the model adequately fit the data. The results of the regression are presented as Adjusted Odds Ratios (AORs) with their corresponding 95% Confidence Intervals (CIs). Statistical significance for the final model was set at a p -value of <0.05 .

2.5 Ethical considerations

Ethical approval for this specific study was not required as it is a secondary analysis of a publicly available, anonymized dataset. Access to the SHDS dataset was obtained through a formal process: the authors registered on the Somali National Bureau of Statistics (SNBS) microdata portal, submitted a research concept note, and were subsequently granted official permission to download and utilize the data for this research. The original SHDS study obtained informed consent from all participants and ensured confidentiality.

3 Results

3.1 Socio-demographic characteristics of the study participants

From a total of 1626 ever-married women participating in the survey, a small proportion, only 19 (1.17%), reported having any form of personal health insurance policy. A large portion of respondents, 1088 (66.91%), were in households headed by males, while 538 (33.09%) were in households headed by females. Regarding wealth status, the sampled ever-married women are distributed across categories, with the 'Lowest' wealth status comprising 285 (17.53%) and the 'Highest' category consisting of 270 (16.61%). A considerable majority of ever-married women, 1385 (85.18%), reported that their household did not borrow money, while 241 (14.82%) did. A substantial proportion of the respondents, 1322 (81.30%), are married, whereas 172 (10.58%) are widowed, and 109 (6.7%) are divorced. Regarding age, the 26–35 age group constitutes 441 (27.12%) and the 36–45 age group comprises 429 (26.38%) respondents while the 17–25 age group is the smallest group at 108 (6.64%). Finally, a little over one-third of respondents reported any media exposure at 582 (35.79%) while a majority 1044 (64.21%) reported they did not have any media exposure (* MERGEFORMAT Table 1).

Table 1 Socio-demographic characteristics of the study ever-married women in the study, Somalia 2020 ($n = 1626$)

Categories		Frequency	Percent (%)
Sex of household head	Male	1088	66.91
	Female	538	33.09
Marital Status	Married	1322	81.30
	Divorced	109	6.7
	Abandoned	23	1.41
	Widowed	172	10.58
Age group	17–25	108	6.64
	26–35	441	27.12
	36–45	429	26.38
	46–55	295	18.14
	56–100	353	21.71
Region of residence	Awdal	46	2.83
	Woqooyi Galbeed	109	6.7
	Togdheer	110	6.77
	Sool	88	5.41
	Sanaag	90	5.54
	Bari	91	5.6
	Nugaal	78	4.8
	Mudug	96	5.9
	Galgaduud	133	8.18
	Hiraan	137	8.43
	Middle Shabelle	69	4.24
	Banadir	271	16.67
	Bay	48	2.95
	Bakool	91	5.6
	Gedo	47	2.89
	Lower Juba	122	7.5
Place of residence	Urban	983	60.46
	Rural	496	30.5
	Nomadic	147	9.04
Family member with a bank account	Yes	60	3.69
	No	1566	96.31
Household members with health insurance policy	Yes	19	1.17
	No	1607	98.83
Number of household members with health insurance policy	1–10	1455	89.48
	11–30	171	10.52
Borrowing	Yes	241	14.82
	No	1385	85.18
Wealth index	Lowest	285	17.53
	Second	364	22.39
	Middle	384	23.62
	Fourth	323	19.86
	Highest	270	16.61
Media Exposure	Yes	582	35.79
	No	1044	64.21

3.2 Prevalence of health insurance in Somalia

The prevalence of personal health insurance coverage among ever-married women in Somalia is 2.28% [CI: 1.55%, 3.01%], indicating a very low proportion of ever-married women with health insurance coverage (* MERGEFORMAT Fig. 1).

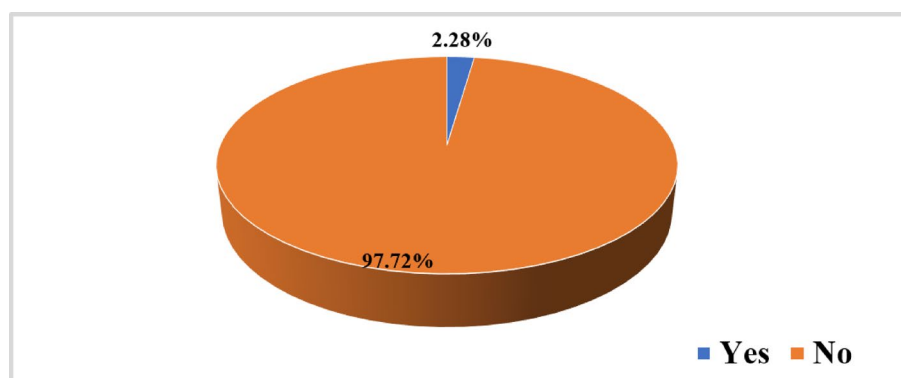


Fig. 1 Prevalence of health insurance coverage in Somalia, SDHS 2020

3.3 Health insurance coverage and its associated factors of the participants

From a total of 1626 ever-married women participating in the survey, a significant association was found between borrowing status of the household and the ever-married woman having any personal health insurance policy, as well as an association between the ever-married woman being covered by health insurance and whether other household members have a health insurance policy. Among ever-married women in households that borrowed money, 15 (6.22%) reported having a personal health insurance policy, compared to only 22 (1.59%) among ever-married women in households that did not borrow money, resulting in a chi-square value of 19.84 ($p < 0.001$). Similarly, among ever-married women in households where another member has health insurance, 2 (10.53%) reported that they themselves have a personal insurance policy, while 35 (2.18%) of those ever-married women in households that did not report other members with health insurance policy reported having a personal insurance policy themselves, with a chi-square value of 5.89 ($p = 0.0153$) (* MERGEFORMAT Table 2).

3.4 Multivariable logistic regression of factors associated with personal health insurance coverage among ever-married women in Somalia

In a multivariable logistic regression analysis (* MERGEFORMAT Table 3), borrowing status of the household, place of residence, and Bari region were identified as significant determinants of personal health insurance coverage among ever-married women in Somalia. Ever-married women in households that reported borrowing money had 5.35 times higher odds of having personal health insurance coverage compared to those in households who did not borrow (AOR=5.35, 95%CI: 2.522, 11.349, $p < 0.001$). Ever-married women residing in a nomadic place of residence had 0.15 times lower odds of having personal health insurance compared to those in urban residences (AOR=0.15, 95%CI: 0.034, 0.67, $p = 0.013$). Additionally, ever-married women in the Bari region had 0.095 times lower odds of having a personal health insurance policy compared to those in the Awdal region (AOR=0.095, 95% CI: 0.01, 0.888, $p = 0.039$) (Table 3). The overall model demonstrated good fit and it is included 1,626 observations.

4 Discussion

This study provides the first comprehensive analysis of the factors associated with health insurance coverage among ever-married women in Somalia, utilizing the inaugural 2020 Somali Health and Demographic Survey (SHDS). Our findings reveal a critically

Table 2 Personal health insurance coverage and its associated factors among ever-married women

Variable		Insurance		Chi-square	p-value
		Yes	No		
Sex of household head	Male	30 (2.76)	1058 (97.24)	3.43	0.0639
	Female	7 (1.30)	531 (98.70)		
Marital Status	Married	32 (2.42)	1290 (97.58)	1.35	0.8534
	Divorced	2 (1.83)	107 (98.17)		
	Abandoned	0 (0.00)	23 (100.00)		
	Widowed	3 (1.74)	169 (98.26)		
Age group	17–25	4 (3.70)	104 (96.30)	3.19	0.5265
	26–35	7 (1.59)	434 (98.41)		
	36–45	9 (2.10)	420 (97.90)		
	46–55	6 (2.03)	289 (97.97)		
	56–100	11 (3.12)	342 (96.88)		
Region of residence	Awdal	0 (0.00)	46 (100.00)	17.03	0.317
	Woqooyi Galbeed	3 (2.75)	106 (97.25)		
	Togdheer	1 (0.91)	109 (99.09)		
	Sool	1 (1.14)	87 (98.86)		
	Sanaag	2 (2.22)	88 (97.78)		
	Bari	5 (5.49)	86 (94.51)		
	Nugaal	3 (3.85)	75 (96.15)		
	Mudug	5 (5.21)	91 (94.79)		
	Galgaduud	2 (1.50)	131 (98.50)		
	Hiraan	2 (1.46)	135 (98.54)		
	Middle Shabelle	3 (4.35)	66 (95.65)		
	Banadir	7 (2.58)	264 (97.42)		
	Bay	0 (0.00)	48 (100.00)		
	Bakool	2 (2.20)	89 (97.80)		
	Gedo	0 (0.00)	47 (100.00)		
	Lower Juba	1 (0.82)	121 (99.18)		
Place of residence	Urban	21 (2.14)	962 (97.86)	4.65	0.098
	Rural	9 (1.81)	487 (98.19)		
	Nomadic	7 (4.76)	140 (95.24)		
Family member with a bank account	Yes	3 (5.00)	57 (95.00)	2.08	0.1493
	No	34 (2.17)	1532 (97.83)		
Household members with health insurance policy	Yes	2 (10.53)	17 (89.47)	5.89	0.0153
	No	35 (2.18)	1572 (97.82)		
Number of household members with health insurance policy	1–10	30 (2.06)	1425 (97.94)	2.84	0.0919
	11–30	7 (4.09)	164 (95.91)		
Borrowing	Yes	15 (6.22)	226 (93.78)	19.84	0.000
	No	22 (1.59)	1363 (98.41)		
Wealth index	Lowest	6 (2.11)	279 (97.89)	7.94	0.0937
	Second	9 (2.47)	355 (97.53)		
	Middle	3 (0.78)	381 (99.22)		
	Fourth	8 (2.48)	315 (97.52)		
	Highest	11 (4.07)	259 (95.93)		
Media Exposure	Yes	15 (2.58)	567 (97.42)	0.37	0.5423
	No	22 (2.11)	1022 (97.89)		

Table 3 Multivariable logistic regression of the factors associated with personal health insurance coverage among ever-married women in Somalia, 2020

Variable		Insurance		COR [95% CI]	P-value	AOR [95% CI]	P-value
		Yes	No				
Sex of household head	Male	30	1058	Ref			
	Female	7	531	2.151 [.939, 4.929]	0.07	1.915 [.648, 5.656]	0.24
Marital Status	Married	32	1276	Ref			
	Divorced	2	107	1.342 [.317, 5.675]	0.69	.961 [.167, 5.537]	0.964
	Abandoned	0	23	1 (omitted)			
	Widowed	3	169	1.413 [.428, 4.664]	0.571	1.06 [.24, 4.676]	0.939
Age group	17–25	4	104	Ref			
	26–35	7	434	2.385 [.685, 8.298]	0.172	3.08 [.791, 11.987]	0.105
	36–45	9	420	1.795 [.542, 5.942]	0.338	2.761 [.725, 10.517]	0.137
	46–55	6	289	1.853 [.513, 6.695]	0.347	2.469 [.595, 10.242]	0.213
	56–100	11	342	1.196 [.373, 3.835]	0.764	1.39 [.377, 5.122]	0.621
Region of residence	Awdal	0	46	Ref			
	Woqooyi Galbeed	3	106	.292 [.03, 2.85]	0.29	.347 [.033, 3.673]	0.38
	Togdheer	1	109	.901 [.056, 14.577]	0.941	1.382 [.079, 24.012]	0.824
	Sool	1	87	.719 [.044, 11.653]	0.816	.875 [.05, 15.273]	0.927
	Sanaag	2	88	.364 [.032, 4.074]	0.412	.577 [.047, 7.104]	0.668
	Bari	5	86	.142 [.016, 1.238]	0.077	.095 [.01, .888]	0.039
	Nugaal	3	75	.207 [.021, 2.023]	0.176	.304 [.027, 3.425]	0.336
	Mudug	5	91	.15 [.017, 1.31]	0.086	.162 [.017, 1.519]	0.111
	Galgaduud	2	131	.541 [.048, 6.046]	0.618	.503 [.042, 6.03]	0.588
	Hiraan	2	135	.558 [.05, 6.23]	0.635	.48 [.04, 5.782]	0.564
	Middle Shabelle	3	66	.182 [.019, 1.783]	0.143	.166 [.016, 1.762]	0.136
	Banadir	7	264	.312 [.038, 2.561]	0.278	.409 [.045, 3.743]	0.428
	Bay	0	48	.719 [.044, 11.653]	0.816	.875 [.05, 15.273]	0.927
	Bakool	2	89	.368 [.033, 4.119]	0.417	.867 [.069, 10.963]	0.912
	Gedo	0	47	.541 [.048, 6.046]	0.618	.503 [.042, 6.03]	0.588
	Lower Juba	1	121	.901 [.056, 14.577]	0.941	1.382 [.079, 24.012]	0.824
	Urban	21	962	Ref			
	Rural	9	487	1.181 [.537, 2.599]	0.679	.933 [.364, 2.389]	0.885
	Nomadic	7	140	.437 [.182, 1.046]	0.063	.151 [.034, .67]	0.013
Family member with a bank account	Yes	3	57	Ref			
	No	34	1532	2.372 [.707, 7.95]	0.162	1.874 [.449, 7.817]	0.389
Household members with health insurance policy	Yes	2	17	Ref			
	No	35	1572	5.284 [1.176, 23.752]	0.03	4.559 [.707, 29.389]	0.111
Number of household members with health insurance policy	1–10	30	1425	Ref			
	11–30	7	164	.493 [.213, 1.141]	0.098	.473 [.186, 1.204]	0.116
Borrowing	Yes	15	226	Ref			
	No	22	1363	4.112 [2.102, 8.046]	0	5.35 [2.522, 11.349]	0
Wealth index	Lowest	6	279	Ref			
	Second	9	355	.848 [.298, 2.412]	0.758	.359 [.078, 1.645]	0.187
	Middle	3	381	2.731 [.677, 11.015]	0.158	1.48 [.243, 9.029]	0.671
	Fourth	8	315	.847 [.29, 2.47]	0.761	.4 [.083, 1.93]	0.254
	Highest	11	259	.506 [.185, 1.389]	0.186	.302 [.058, 1.578]	0.156

Table 3 (continued)

Variable		Insurance		COR [95% CI]	P-value	AOR [95% CI]	P-value
		Yes	No				
Media	Yes	15	567	Ref			
Exposure	No	22	1022	1.229 [.632, 2.388]	0.543	1.075 [.443, 2.61]	0.872

low prevalence of health insurance at just 2.28%. This figure stands in stark contrast to coverage rates in other Sub-Saharan African (SSA) nations, which range from 8.7% in Mauritania to as high as 49% in Tanzania [1, 2, 4, 27], underscoring the nascent stage of Somalia's health financing system and the formidable challenge ahead in achieving Universal Health Coverage (UHC).

A key finding is the strong positive association between household borrowing and health insurance coverage. Women in households that reported borrowing money had over five times the odds of being insured. This suggests that engagement with formal or informal credit systems may correlate with a greater awareness of financial planning tools, a higher degree of financial literacy, or a more acute recognition of the need for risk protection. This finding diverges from research in other urban SSA contexts where borrowing was not a significant predictor [1, 4], possibly reflecting Somalia's unique environment where any interaction with financial mechanisms signifies a distinct level of economic activity and foresight.

Conversely, this study identified profound geographic and lifestyle-based disparities. Women living a nomadic lifestyle had significantly lower odds of being insured compared to their urban counterparts, a finding consistent with literature highlighting the immense challenges of extending services to mobile populations [4, 22]. Furthermore, the regional disparities, particularly the significantly lower coverage in the Bari region, demand contextual explanation. Decades of conflict, political instability, and fragmented governance in Somalia have crippled the development of formal health systems and social protection schemes. This institutional vacuum has likely contributed to the extremely low insurance coverage observed, particularly in historically marginalized or conflict-affected regions where state presence is minimal and trust in formal institutions is low [28].

The extremely low insurance coverage, coupled with these identified determinants, indicates that a multifaceted approach is required. While the SHDS data is invaluable, it does not differentiate between public and private insurance schemes, meaning our findings reflect overall coverage. This is a limitation, and future research should aim to disaggregate these data to inform more targeted policy design. Nonetheless, our results strongly indicate that strategies to promote financial inclusion, develop culturally sensitive insurance products for nomadic groups, and address deep-seated regional inequities are critical for advancing women's access to health insurance and progressing toward UHC in Somalia.

4.1 Strengths and weaknesses of the study

4.1.1 Strengths

The primary strength of this study is its use of data from the first nationally representative SHDS, providing a robust and comprehensive snapshot of the situation in a severely under-researched context [29]. Furthermore, the use of a standardized DHS

questionnaire enhances the reliability of our findings and allows for comparability with similar studies conducted in over 90 other low- and middle-income countries.

4.1.2 Limitations

The study is subject to several limitations. First, its cross-sectional design makes it impossible to establish causality between the identified factors and health insurance coverage. Second, the SHDS dataset did not collect detailed information on the different types of health insurance (e.g., public, private, community-based), nor did it capture data on informal risk-sharing mechanisms within clans, which may influence the demand for formal insurance. Based on these limitations, we suggest that future research should employ qualitative methods to explore the specific barriers, cultural perceptions, and decision-making processes related to health insurance uptake, particularly in underserved regions like Bari and among nomadic communities.

5 Conclusion

With health insurance coverage for ever-married women in Somalia at just 2.28%, progress toward UHC is stalled. This study identifies borrowing status, a nomadic lifestyle, and geographic location as the most significant factors. These findings present an urgent policy roadmap: promote financial inclusion by linking insurance to credit, develop culturally-sensitive schemes for mobile populations, and actively reduce regional disparities. For instance, our results show that respondents in the Bari region were less likely to enroll in health insurance, highlighting the need for targeted interventions. These evidence-based strategies are critical for increasing insurance uptake and ensuring equitable healthcare access in Somalia.

Abbreviations

AOR	Adjusted odds ratio
CBHI	Community-based health insurance
CI	Confidence interval
DHS	Demographic and health survey
EAs	Enumeration areas
LMICs	Low- and middle-income countries
NGO	Non-governmental organization
NHIS	National health insurance scheme
PPS	Probability proportional to size
PSUs	Primary sampling units
SDGs	Sustainable development goals
SHDS	Somali health and demographic survey
SSA	Sub-Saharan Africa
SSUs	Secondary sampling units
UHC	Universal health coverage
VIF	Variance inflation factor
WHO	World health organization

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Author's contribution

MMA conceived and designed the study, performed the data extraction, and drafted the initial manuscript. EID contributed to the data analysis and the writing of the discussion and conclusion sections. HAA was involved in data analysis and manuscript editing. MHD contributed to the methodology section. AHM supervised the research, reviewed, and edited the final manuscript. All authors read and approved the final version of the article for publication.

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Data availability

The dataset supporting the conclusions of this article is available in the Somalia National Bureau of Statistics (NBS) repository. Access was granted following a standard user registration process and submission of a research concept note via the following URL: [<https://microdata.nbs.gov.so/index.php/catalog/50>].

Code availability

Not applicable.

Declarations**Ethics approval and consent to participate**

Ethical board review was not specifically required for the present analysis due to its nature as a secondary analysis of publicly accessible data from the Somalia Health and Demographic Survey (SHDS). Access to the requisite data was formally requested by the authors and subsequently approved by the SHDS program administrators.

Consent to publication

Not applicable.

Competing interests

The authors declare no competing interests.

Informed consent

Informed consent was obtained from all participants during the original SHDS data collection.

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