## Analysis of Access to Health Insurance Coverage in Uganda: A Secondary Data Analysis

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*Abstract:* - The association and relationship between socio-demographic, media and economic factors affecting the access to health insurance coverage in Uganda was considered. The obtained data and analysis went through data cleaning, manipulation, coding and statistical analysis using the SATA 15, sample survey weighted results, univariate analysis for mean, standard errors and confidence intervals, and Scot-Rao Adjusted Chi-square tests for bivariate analysis and complementary log-log regression model to examine the relationship of various study variables on access to health insurance. The study findings revealed that out of 18,506 respondents, 23.5% were aware of health insurance, of these 18.8% ever considered joining a health insurance scheme while, 1.4% of the respondents reported to be on a health insurance scheme. Demographic findings indicated that 43.7% were below 25 years, 60.6% were married and 40.2% were self-employed in agricultural sector. Similarly, obtained results revealed that access to health insurance increases with age.

Key-Word: - STATA 15, Bivariate Analysis, Demography, Health, Insurance.

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## **1** Introduction

Globally, the absence of health insurance among individuals and households stands as a significant barrier to accessing quality healthcare, [1]. Despite international encouragement for countries to ensure universal healthcare coverage for their citizens, a substantial portion of the population in underdeveloped countries remains uninsured, limiting coverage for treatment and prescriptions, co-payments, deductibles, and limited reimbursement leaving enough room for the development of commercial health insurance which can provide more options to meet people's needs, [2], [3], [4]. Similarly, [5], looked into accessing different types of health insurance influenced by various demographic, socioeconomic and media factors, with variations observed between men and women. [6], propose that exposure to information through television, radio, and newspapers plays a significant role in informing individuals about available health insurance plans, thereby increasing the access to health insurance, [7].

Community based health insurance has had generally disappointing results in Nigeria and other sub-Saharan African countries with reports showing that poorly targeted financial assistance is remains the bedrock of challenges, [8], [9]. Despite the existence of a remarkably clear consensus about its importance, the access to health insurance in Uganda has persistently remained low, with only 5% of the population being covered by health insurance, awareness about health insurance services stands at a meagre 11 percent, and only 42 percent of those who are aware would consider joining any health insurance scheme, [10]. The insurance market in Uganda exhibits high potential demand but relatively low real demand [11] examined factors influencing the demand for health insurance while, the socio-economic factors may contribute to this phenomenon, the reasons behind the disparity between potential and actual demand remain unclear. Furthermore, data from, [12], indicates that Uganda's out of pocket payment expenditures on health have been steadily rising, reaching a high of 53 percent as, government expenditure on health has remained low, averaging at 7.9% from 2012/13 to 2016/17, falling short of the health sector development plan 2015/16-2019/20 targeted at 9.8%, [13].

Although health insurance is increasingly recognized in Uganda as an effective means of protecting people against catastrophic health expenditures, [14], [15]. Exposure to information through television, radio, and newspapers has been suggested to positively influence access to health insurance coverage, [16], as lack of information can negatively affect demand, [17]. [18], focused on the broader impact of media exposure on health-related behaviors and their result suggested that individuals who frequently engage with health-related content through radio or other media platforms are more inclined to adopt health-promoting behaviors, such as seeking preventive care and accessing healthcare services when needed. A study conducted by, [19], found that exposure to radio health programs led to increased knowledge about maternal and child health issues and improved health-seeking behaviors among participants. Moreover, [20], examined the impact of a radio campaign on health insurance enrollment. They found out that areas with higher exposure to radio advertisements had higher rates of health insurance enrollment compared to areas with lower exposure. Television serves as a powerful

medium for disseminating health-related information, including messages about the importance of health insurance coverage and available options for obtaining insurance, [21].

Research on the impact of media exposure on health behaviors supports the notion that individuals who watch health-related content on television are more likely to engage in healthpromoting behaviors, including seeking preventive care and accessing healthcare services when needed, [22]. Study by, [23], found that exposure to health insurance-related commercials on television was associated with increased awareness and consideration of health insurance options among uninsured individuals. Similarly, the research result obtained by, [24]. demonstrated that viewers of health-related television programs were more likely to express interest in obtaining health insurance coverage compared to non-viewers.

Newspapers often serve as a source of healthinformation, related including articles. advertisements, and editorials discussing topics such as health insurance options, coverage eligibility, and the importance of obtaining insurance, [25]. Not all newspaper coverage of insurance may be health accurate or comprehensive, and readers may vary in their receptiveness to health-related messages, [26], [27]. Age is a fundamental demographic factor significantly influences individuals' that decisions regarding access to health insurance. Numerous studies have investigated the association between age and access to health insurance yielding diverse findings. Some studies have reported a positive correlation between increasing age and the likelihood of being insured.

Studies conducted in various low- and middleincome countries have consistently demonstrated gender disparities in health insurance enrolment, highlighting the need for targeted interventions to address barriers faced by women, [28], [29]. The educational level of respondents also plays a significant role in their access to health insurance. Numerous studies have highlighted the positive association between education level and access to health insurance. Individuals with higher levels of education are more likely to have health insurance coverage compared to those with lower education levels, [30], [31]. Marital status

significantly influences access to health insurance and healthcare services. Policy interventions should address disparities in coverage based on marital status and promote equitable access to health insurance for all individuals. [32]. Similarly, [33], demonstrated that disparities in health insurance coverage based on wealth status contribute significantly to inequalities in healthcare access. [34], demonstrated that individuals employed in full-time, permanent positions are more likely to have access to employer-sponsored health insurance compared to those in part-time or temporary positions. Workers in lower-paying or nonstandard employment arrangements, such as gig economy workers or those in seasonal jobs, may face challenges in obtaining affordable health insurance coverage, [35], [36], [37].

From existing literatures, young individuals and males exhibit higher access to health insurance, with education level being positively associated with economic challenges, such as reliance on out-of-pocket expenses, hinder healthcare access, but initiatives like communitybased health insurance and media campaigns aim to address these barriers. While previous research predominantly employs binary regression models, this study will leverage on data obtained from the Uganda Demography and Health Survey, [36], which contains information on the individual households both in rural and urban areas since it had information about health insurance knowledge, practices and awareness thereby addressing the gaps by exploring the determinants of access to health insurance coverage using log-log regression model to address skewness in the dependent variable.

## **1.1 Research hypothesis**

The research aimed at testing the following hypotheses;

- i.  $H_{01}$ : Education level is not significantly associated with access to health insurance.
- ii.  $H_{02}$ : Wealth status is not significantly associated with access to health insurance.
- iii.  $H_{03}$ : Occupation is not significantly related to access to health insurance.
- iv.  $H_{04}$ : Reading newspapers is not significantly associated with access to health insurance

v.  $H_{05}$ : Watching television is not significantly associated with access to health insurance.

## **1.2 Conceptual Framework**

This paper utilizes the conceptual framework adopted from, [11] and presented in Fig. 1 showing the underlying determinants categorized as demographic, media and economic factors which include household size, levels of education, place of residence, marital status, age, health status, listening to radio, watching television, reading newspapers, wealth status, household income and occupation. All these factors directly and indirectly influence the access to health insurance (dependent variable) with the person knowing about health insurance and considering to join being the mediating variable, [10].

## 2 Methodology

## 2.1 Data source and data description

A comprehensive secondary data and information from the 2016 Uganda Demographic and Health Survey, a nationally representative survey funded by the government of Uganda and international organizations was used with survey conducted by the Uganda Bureau of Statistics (UBOS) in collaboration with the Ministry of Health aimed to monitor and evaluate population, health, and nutrition programs. A cross sectional study was undertaken and a quantitative approach was used where all the study variables were selected and quantified for analysis [10].

## 2.2 Study population and Variables

The study covered all sampled households and the dependent variable was derived from these three dimensions; have I privately purchased health insurance, has employer provided health insurance, and has community provided health insurance to indicate whether people had or didn't have any provided health insurance. Meanwhile, the framework hypotheses that individual's access to health insurance depends on individual characteristics (age, gender, marital status, occupation and level education), household characteristics such as, wealth index and community characteristics such as rural-urban residence, media factors such as listening to radio, reading newspaper, watching television among others.



Fig. 1: Source: Adopted from (Musoke et al., 2022) and modified by the researcher

Variable	Codes	Measurements
Dependent variable		
Has health insurance /	1. Has insurance	Binary
Covered by	0. No insurance	
insurance/Access to		
insurance		
Mediating variable		
Know about health	1. Yes	Nominal
insurance	2. No	
Would you consider	1. Yes	Nominal
joining health insurance	2. No	
Independent variables		
Demographic factors		
Age	0. <25 years	Ordinal
	1. 26-40 years	
	2. 41+ years	
Gender	1. Male	Nominal
	2. Female	
Marital status	0. Never ever in union	Nominal

Table 1 Variable . .1

	1.	Currently married	
	2.	Single	
Total children ever born		•	Continuous
Level of education	0.	No education	Ordinal
	1.	Primary level	
	2.	Secondary level	
	3.	Higher level	
Residence	0.	Urban	Nominal
	1.	Rural	
Region	0.	Northern	Nominal
C	1.	Eastern	
	2.	Western	
	3.	Central	
	4.	Kampala	
Religion	0.	No religion	Nominal
0	1.	Anglican	
	2.	Catholic	
	3.	Muslims	
	4.	Other	
Economic factors			•
Occupation	0.	Not working	Nominal
-	1.	Professional/technical/managerial	
	2.	Clerical	
	3.	Sales	
	4.	Agricultural - self employed	
	5.	Household and domestic	
	6.	Services	
	7.	Skilled manual	
	8.	Unskilled manual	
Wealth index	0.	Poor	Binary
	1.	Rich	
Media factors			
Watching television	0.	Does not watch television at all	Binary
-	1.	Watches television	-
Reading news papers	0.	Does not read newspapers	Binary
	1.	Reads newspapers	2
Listening to radio	0.	Does not listen to radio not at all	Binary
6	1.	Listens to radio	2
Use internet	0.	Never	Binary
	1.	Uses internet	5

## 2.3 Data analysis methodology, quality control and interpretation

Data coding was carried out using STATA and R studio to obtain the most relevant variables for analysis. All the data analysis was done using STATA 15. Sample weights were applied to adjust for non-response, unequal proportional sampling and the analysis accounted for the effect of complex survey designs with a statistical significance set at 0.05 while, variables with missing data values were handled using the mean and maximum count estimation technique.

## Univariate analysis

Descriptive statistics were employed to understand the distribution of the selected study variables such access to different health insurance schemes, place of residence, region, occupation, wealth status, watching television and listening to radio, age category, gender among others. This was done through frequency distribution tables, means and confidence intervals.

#### **Bivariate analysis**

The adjusted Scot-Rao Chi-square tests were utilized to test for associations between variables, that is the association between access to health insurance and socio-demographic and economic factors, media factors and the mediating variables. The basic Chi-square test statistic before adjustment is given by;

$$X_{cal}^{2} = \sum_{i=1}^{r} \sum_{j=1}^{c} \left( \frac{(O_{ij} - E_{ij})^{2}}{E_{ij}} \right)$$
  
$$i = 1, 2, \dots, r; \quad j = 1, 2, \dots, c$$

where,  $O_{ij}$  is the observed value,  $E_{ij}$  is the expected value, r is the number of categories of the independent variable, and c is the number of categories of dependent variable.

#### Eligibility criteria for multivariate analysis

Further, access to health insurance was tested with each independent variable by fitting a simple complementary log-log regression model to identify potential predictors. The null hypothesis was that each independent variable in the simple complementary log-log regression model is not significant related to the outcome variable. The basic likelihood ratio test statistic before survey weighting is given by;

 $LRT = -2loge^{(\Lambda)}$ where,  $\Lambda = \frac{\max L(H_o)}{\max L(H_A)}$ ,  $maxL(H_o)$  is maximum of

the likelihood when the parameter satisfies  $H_o$ and  $maxL(H_a)$  is maximum of the likelihood when the parameter satisfies  $H_a$ .

## **3** Results and Discussion

## **3.1 Sample characteristics**

Table 2. Summa	ry statistics	of media	characteristics	(N =	= 18, 506
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#### Multivariate analysis

A nonlinear model that's is complementary loglog regression model was applied to investigate the odds of potential predictor variables on the access to health insurance.

#### Model specification

 $log(-log(p_i)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \cdots \beta_m X_m$ with,  $\beta_0$  as the intercept,  $\beta_i$  the slope/coefficient for  $Ev(X_i)$  i = 1, 2, ..., m, and  $X_i$  is the independent variable for i = 1, 2, ..., m.

#### **Regression diagnostics**

Diagnostic tests were performed to establish whether the complementary log-log regression estimation techniques hold by ensuring that its assumptions are not violated. The appropriateness of using complementary log-log regression model was assessed using the Hosmer-Lemeshow's test which was to determine the goodness of fit. A large value of the Chi-square indicates a poor fit and small Chi-squared value indicates a good model it.

$$HL = \sum_{j=1}^{n} \frac{(O_j - n_j \overline{\pi}_j)^2}{n_j \overline{\pi}_j (1 - \overline{\pi}_j)}$$

where  $n_j$  is the number of observations,  $O_j$  is the number of observed success and  $\overline{\pi}_j$  is the estimated success probability in the  $j^{th}$  Hosmer-Lemeshow's group.

#### Testing for individual parameters

The Wald test statistic was used to test the significance of the individual independent variables. This was to help identify the potential variables that are adding something to the model. The survey suite commands in STATA V15.0 were used.

Variables	Variable labels	Mean	Standard	95% (	Confidence
			Error	In	terval
Use of internet	Never use internet	.901	.002	.898	.906
	Uses internet	.098	.002	.094	.102
Watching	Not at all	.674	.003	.667	.681
television	Watches television	.326	.003	.319	.333
Listening to radio	Not at all	.258	.003	.252	.264
	Listens to radio	.742	.003	.736	.748

Reading	Not at all	.766	.003	.760	.772
newspapers or	Reads newspapers and	.234	.003	.228	.240
magazines	magazines				

Results from Table 2 indicated that only 9.8% respondents ever used internet. 32.6% watched television,74.2% listened to radios and only 23.4% read newspapers or magazines. The results revealed that there is as significant association between media factors and the access to health insurance. Individuals who reported more frequent engagement with diverse media platforms, including television (63.6%) and radio (90.0%), demonstrated a significantly higher propensity for being covered by health insurance.

This aligns with contemporary research highlighting the pivotal role of media in shaping health-related behaviors, [38]. Further results revealed that the use of internet was significantly associated with high odds (AOR=2.412, SE=0.533) of an individual being covered by health insurance. Moreover, our findings underscore the potential of targeted media campaigns to raise awareness and promote understanding of health insurance options, particularly among marginalized communities.

Table 3. Summary	statistics of	demographic and	economic factors	(N = 18, 473)	)
		U I			/

Variables	Variable labels	Mean	Standard	95% Co	nfidence
			Error	Inte	erval
Age	Below 25 years	.437	.004	.430	.444
	2640 years	.411	.004	.404	.418
	Above_41 years	.152	.003	.147	.157
Gender of	Male	.663	.003	.656	.700
household head	Female	.337	.003	.330	.344
Marital status	Married	.606	.004	.599	.613
	Never in union	.258	.003	.252	.265
	Single	.135	.003	.130	.140
Number of childre	en ever born	3.08	.022	3.04	3.123
Place of	Urban	.267	.003	.261	.274
residence	Rural	.733	.003	.726	.739
Highest	No education	.096	.002	.092	.100
education level	Primary	.574	.003	.567	.581
	Secondary	.251	.003	.245	.257
	Higher	.079	.002	.075	.083
Region	Northern	.191	.003	.186	.197
	Eastern	.264	.003	.257	.269
	Western	.249	.003	.242	.255
	Central	.241	.003	.235	.247
	Kampala	.055	.002	.052	.059
Religion	No religion	.001	.0003	.001	.002
	Anglican	.312	.003	.310	.319
	Catholic	.396	.004	.390	.403
	Others	.290	.003	.284	.297
Wealth index	Poor	.367	.004	.360	.373
	Rich	.633	.004	.627	.640
Occupation	Not working	.217	.003	.212	.223
	Professional technical	.064	.002	.061	.070

Variables	Variable labels	Mean	Standard	95% Confi	idence
			Error	Interv	al
	Clerical	.004	.0005	.003	.005
	Sales	.083	.002	.079 .	.090
	Self-employed/	.402	.004	.395	.410
	Agricultural				
	Household domestic	.016	.001	.014 .	.017
	Services	.049	.002	.046	.052
	Skilled manual	.132	.002	.127	.136
	Unskilled manual	.033	.001	.030	.035

Results from Table 3 presented that most of the respondents; 43.7% were below 25 years of age, 15.2% were above 41 years, 66.3% were male headed households and there are large variations in regional distribution with Kampala having 5.5% of the sample. Results indicate that 13.5% of the households had respondents who were either widowed/separated or divorced and 60.6% of the households had married respondents.

In addition, it was presented that 73.3% of the households were from rural areas, there was regional distribution of respondents with Kampala having the least (5.5%). 63.3% households were observed to either belong to the middle, richer or richest wealth quintile. The majority of the respondents were self-employed in agricultural sector (40.2%), not working

(21.7%) and with only 4% in services. The findings showed that individuals aged between 26 and above years exhibited high odds of health insurance coverage (AOR= 2.167\*\*\*, SE=0.392). This finding resonates with existing literature, which suggests that younger cohorts are more inclined to adopt risk mitigation strategies and prioritize health-related investments. However, geographical disparities in coverage rates were evident, with western (38.5%) residents displaying markedly higher levels of access to health insurance as compared to their counterparts. This underscores the need for targeted interventions aimed at addressing geographical disparities and ensuring equitable access to health insurance services across diverse demographic groups.

## **3.1 Insurance coverage**

Table 4. Summary statistics of demographic and economic factors (N = 18, 473)

Variables	Variable labels	Mean	Standard Error	95% Cor Interval	nfidence
Health insurance type					
Mutual/Community	No	.995	.001	.995	.997
Organisation	Yes	.004	.001	.003	.005
Social security	No	.9997	.0001	.999	.999
•	Yes	.0002	.0001	.00002	.0004
Private/ Commercially	No	.998	.0003	.998	.999
purchased	Yes	.002	.0003	.001	.0023
Covered by health	No insurance	.986	.001	.985	.987
insurance	Has insurance	.014	.001	.012	.015
Know about health	Know insurance	.765	.00	.760	.771
insurance	Don't know about health	.235	.003	.229	.241
	insurance				
Consider joining health	Doesn't consider	.812	.001	.807	.819
insurance scheme	Considers' joining	.188	.001	.182	.193

Results from Table 4 indicate that only 1.4% had some type of insurance, 23.5% knew about insurance and only 18.8% considered joining a health insurance scheme. The results revealed that there is a statistically significant association between wealth status and access to health insurance with individuals from wealthier households exhibiting higher rates of coverage (90%). This underscores the significant influence

of socio-economic factors on health insurance access, [39].

## 3.3 Bivariate analysis

Cross tabulations where used to analyze the association between the variables and access to health insurance. Survey suite commands in STATA version 15 were used.

Table 5. Access to health	insurance and d	emographic ch	naracteristics c	ategorical v	variables
				0	

	Covered by Health		F test	Wald $Chi^2$
Variables	No	Voc	(p-value)	(p-value)
A go gotogowy	INU	165		
Age category	7007	(1	167674	24.22
<25 years	(42,00()	61 (25 59()	10./0/4	24.22
<b>A</b> ( 10	(43.8%)	(25.5%)	(0.0000)	(0.000)
26-40 years	(499	144		
	(41.1%)	(60.3%)		
41+ years	2771	34		
	(15.2%)	(14.2%)		
Sex of household	head		-	
Male	12204	147	0.5782	0.62
	(66.8%)	(61.5%)	(0.4472)	(0.4296)
Female	6063	92		
	(33.2%)	(38.5%)		
<b>Current marital</b>	status			
Never in union	4684	54	9.5965	0.19
	(25.6%)	(22.6%)	(0.0001)	(0.6663)
Married	11211	168		· · · · ·
	(61.4%)	(70.3%)		
Single	2372	17		
511810	(13.0%)	(7.1%)		
Highest educatio	nal level	(1111)		
No education	2054	17	97 3440	147 84
	(11.2%)	(7.1%)	(0,0000)	(0,000)
Primary	10832	61	(0.0000)	(0.000)
1 milar y	(59.3%)	(25.5%)		
Secondary	4147	(20.070)		
Secondary	(22.7%)	(27.6%)		
Higher	1234	95		
Inglici	(6.8%)	(39.8%)		
Deligion	(0.870)	(37.070)		
No religion	25	0	1 4650	1.80
No religion	(0.149/)	0	1.4039	4.09
Analisar	(0.14%)	00	(0.2204)	(0.0270)
Anglican	5/19	80		
	(31.3%)	(33.5%)		
Roman Catholic	7442	110		
0.1	(40./%)	(46.03%)		
Others	5081	49		

	Covered by Health		F test	Wald Chi <sup>2</sup>
	Insur	ance	(p-value)	(p-value)
Variables	No	Yes		
	(27.8%)	(20.5%)		
Type of place of 1	residence			•
Urban	4263	116	36.9374	44.71
	(23.3%)	(48.5%)	(0.0000)	(0.000)
Rural	14004	123		
	(76.7%)	(51.5%)		
Region				•
Northern	4351	17	18.4094	91.89,
	(23.8%)	(7.1%0	(0.0000)	(0.000)
Eastern	5014	25		
	(27.5%)	(10.5%)		
Western	4682	92		
	(25.6%)	(38.5%)		
Central	2970	55		
	(16.3%)	(23.0%)		
Kampala	1250	50		
· · ·	(6.8%)	(20.9%)		

The demographic factors that were associated significantly associated with being covered by health insurance included type of place of residence, level of education, age category, current marital status and religion. In addition, there other demographic factors that showed trend patterns of association with being covered by health insurance were religion and sex of the household head. Further results from Table 4 indicated that the number of respondents who were covered by health insurance, only 46.0% were Roman Catholic, 38.5% were from western, 39.8% had attained higher level of education and 70.3% were married. Also, only 61.5% of male headed households were covered by health insurance. Coverage was lowest in individuals aged below 25 years and above 41 years, were single and from Northern Uganda.

Table 6. Access to health insurance and media c	haracteristics,	economic	characteristics	and the mediating
characteristics				c

	Covered by Health		F test	Wald Chi <sup>2</sup> ,
	Insurance		(p-value)	Prob>Chi <sup>2</sup>
Variables	No	Yes		
Frequency of watching television				
Not at all	12961	87	86.6343	98.25, 0.0000
	(71.0%)	(36.4%)	(0.0000)	
Watches television	5306	152		
	(29.0%)	(63.6%)		
Frequency of listening to radio				
Not at all	4950	24	31.5333	25.54, 0.0000
	(27.1%)	(10.0%)	(0.0000)	
Listens to radio	13317	215		
	(72.9%)	(90.0%)		
Use of internet				
Never	16719	128	211.9564	209.06, 0.0000
	(91.5%)	(53.6%)	(0.0000)	
Uses internet	1548	111		

	Covered by Health		F test	Wald Chi <sup>2</sup> ,
	Insurance		(p-value)	Prob>Chi <sup>2</sup>
Variables	No	Yes		
	(8.5%)	(46.4%)		
Frequency of reading ne	wspaper or n	nagazine		
Not at all	14517	112	97.5096	94.11, 0.0000
	(79.5%)	(46.9%)	(0.0000)	
Reads news papers	3750	127		
	(20.5%)	(53.1%)		
Know about health insu	ance			
No	14381	1	853.1794	45.6, 0.0000
	(78.73%)	(0.42%)	(0.0000)	
Yes	3886	238		
	(21.27%)	(99.58%)		
Would consider joining l	nealth insura	nce scheme		
No	14953	239	26.0986	.,.
	(81.9%)	(100%)	(0.0000)	
Yes	3314	0		
	(18.1%)			
Wealth index for urban/	rural			
Poor	7426	24	77.2912	64.08, 0.0000
	(40.7%)	(10.0%)	(0.0000)	
Rich	10841	215		
	(59.3%)	(90.0%)		
<b>Respondent's occupation</b>	l			
Not working	4031	46	2.1447	0.38, 0.5368
	(22.1%)	(19.3%)	(0.0337)	
Professional/technical/m	1274	20		
anagerial	(7.0%)	(8.4%)		
Clerical	106	1		
	(0.6%)	(0.4%)		
Sales	1555	12		
	(8.5%)	(5.04%)		
Agricultural - self	7050	109		
employed	(38.7%)	(45.8%)		
Household and domestic	416	5		
	(2.3%)	(2.1%)		
Services	901	8		
	(4.9%)	(3.4%)		
Skilled manual	2243	24		
	(12.3%)	(10.1%)		
Unskilled manual	656	13		
	(3.6%)	(5.5%)		

Results from Table 5 indicate that the media factors that were significantly associated with covered by health insurance were frequency of watching television, listening to radio, using internet and reading newspapers or magazines. The economic factors that were significantly associated with covered by health insurance were only wealth index and also knowing about health insurance and considering to join any health insurance scheme were significantly associated with being covered by health insurance. In addition, it was only respondent's occupation that wasn't significantly associated with being covered by health insurance. Results continue to show that the number of respondents who were covered by health insurance; 63.6% frequently watched television, 90.0% listened to radio and 53.1% were those who read magazines or newspapers. Further results show 90.0% who are rich and 45.8% those self-employed were mostly covered by health insurance.

## 3.4 Multivariate analysis

Two regressions models were run, one with factors level and that with no factor level of significant variables at bivariate level and the model with the highest Wald-statistic was considered the best model fit.

Table 7. Several demographics, economic, media and mediating characteristics related factors for being covered by health insurance

Covered by health insurance	Exp(b)	Standard error
Age category		
<25 years	Reference category	
26-40 years	2.167***	0.392
41+ years	2.522***	0.668
Highest education level		
No education	Reference category	
Primary	.441***	0.133
Secondary	.507**	0.169
Higher	0.728	0.248
Type of place of residence		
Urban	Reference category	
Rural	0.986	0.191
Region		
Northern	Reference category	
Eastern	0.996	0.359
Western	2.277***	0.700
Central	1.442	0.462
Kampala	1.48	0.520
Frequency of reading newspapers	or magazines	
Not at all	Reference category	
Reads news papers	0.929	0.173
Frequency of listening to radio		
Not at all	Reference category	
Listens to radio	1.246	0.314
Frequency of watching television		
Not at all	Reference category	
Watches television	1.159	0.215
Wealth index		
Poor	Reference category	
Rich	1.801** (.48)	0.480
Use of internet		

Covered by health insurance	Exp(b)	Standard error
Not at all	Reference category	
Uses internet	2.412***	0.533
Religion		
No religion	Reference category	
Anglican	1.816***	0.390
Catholic	1.986***	0.408
Others	1.0000	1.000
Know about health insurance		
No	Reference category	
Yes	522.79***	527.192
Constant	0.000164***	0.0000171
*** p<.01, ** p<.05, * p<.1		
Observations	18481	18481

## **3.5 Demographic characteristics affecting** being covered by health insurance

Belonging to 26-40 years age category (AOR= 2.167\*\*\*, SE=0.392), belonging to 41+ age category (AOR=2.522\*\*\*, SE=0.668), coming from the western region (AOR=2.277\*\*\*, SE=0.7), being Anglican (AOR=1.816\*\*\*, SE=0.39) and being catholic (AOR\*\*=1.986, SE=0.408) were significantly associated with higher odds of being covered by health insurance. However, attainment of primary education (AOR=0.441\*\*\*, SE=0.133), attainment of secondary education (AOR=0.728\*\*\*, SE=0.248) were significantly associated with lower odds of being covered by health insurance.

## **3.6 Media, insurance and economic related characteristics affecting being covered by health insurance**

Knowing about health insurance (AOR=522.79\*\*\*, SE=522.192), using internet (AOR=2.412\*\*\*, SE=0.533) and coming from a rich household (AOR=1.801\*\*\*, SE=0.48) were significantly associated with higher odds of being covered by health insurance.

## 4 Summary

Analysis of accessing health insurance coverage in Uganda using a secondary data have been considered and obtained data were tested by several statistical tools using the SATA 15, sample survey weighted results, univariate analysis for mean, standard errors and confidence intervals, and Scot-Rao Adjusted Chi-square tests for bivariate analysis and complementary log-log regression model. The analyzed results revealed a significant association between media factors such as watching television, listening to radio, reading newspapers or magazines using internet and health insurance utilization. Individuals use of internet and being wealthy were statistically associated with high odds of being covered by health insurance. Also, the demographic characteristics such as respondent's current marital status, place of residence and education level were significantly associated with access to health insurance.

## **5** Conclusions

The study offered great insights into the determinants of access to health insurance drawing upon an empirical examination of media factors, demographic characteristics and economic characteristics.

Firstly, the significant association between media characteristics and access to health insurance underscores the significance of media campaigns in disseminating information and fostering awareness. By leveraging various media platforms, policymakers and healthcare stakeholders can effectively engage diverse populations, particularly those in marginalized communities, and enhance understanding of health insurance options. Secondly, the disparities in health insurance coverage across demographic characteristics emphasize the need for tailored interventions to address distinct population needs. While some individuals exhibit a high propensity for coverage, geographical disparities underscore the imperative for targeted strategies to ensure equitable access to healthcare services, especially in rural areas.

Thirdly, the association between wealth status and access to health insurance underscores the role of financial barriers in shaping healthcare access. Addressing these barriers through targeted interventions such as subsidies and premium support schemes is essential for promoting inclusivity and advancing health equity.

Lastly, knowing about health insurance and considering to join with health insurance underscores the importance of education and awareness-raising initiatives. By empowering individuals with information about health insurance benefits and enrollment processes, policymakers can foster informed decisionmaking and facilitate greater uptake of health insurance.

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Nicholas Keinerugaba is the first author and initiator of the research.

Symon Wandiembe supervised and contributed the paper.

Anselm O Oyem, is the corresponding author, edited and formatted the manuscript to the required format.

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## **Conflict of Interest**

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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