Determinants of Health Insurance Coverage among Women in Egypt: Evidence from the 2021 Egypt Family Health Survey

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ABSTRACT

Health insurance is a fundamental mechanism for achieving universal health coverage and enhancing access to healthcare services. The current paper examined the coverage and determinants of health insurance among Egyptian women. Data for this paper were derived from Egypt Family Health Survey (EFHS) conducted by CAPMAS during 2021-2022. Chi-square test was employed to determine the statistical significance of the bivariate relationships between health insurance coverage and different demographic and socioeconomic factors. Additionally, multivariate logistic regression analysis was used to identify factors associated with health insurance ownership. The findings of our study showed that a low proportion of women (13 percent) have access to any type of health insurance. The results reveal that factors identified to be associated with health insurance coverage were age, level of education, wealth index, current working status, region. Policy interventions that prioritize vulnerable and low-income households, simplify enrollment procedures, and promote equitable access to high-quality health insurance services are urgently needed to reduce disparities in insurance coverage. Additionally, future research should incorporate a broader range of variables, particularly maternal health indicators, to deepen understanding of the underlying factors contributing to inequality in health insurance coverage and to inform more targeted and effective policy responses.

Keywords: Insurance, Socioeconomic, Health, Women, Egypt

INTRODUCTION

Achieving the Sustainable Development Goals (SDGs) by 2030 relies heavily on health insurance as a primary method of financing healthcare globally. Developing countries, committed to this agenda [21], are actively working towards Universal Health Coverage (UHC) as a core means to meet SDG target 3.8. Universal Health Coverage ensures that all people can access health services equally, without financial hardship, fundamentally protecting them from burdensome out-of-pocket costs [14].

Health insurance access is a fundamental determinant of health equity and financial protection, especially in low- and middle-income countries (LMICs) where, as highlighted by the World Health Organization [23], significant out-of-pocket expenditures frequently impede healthcare utilization. In Egypt, despite recent reforms aimed at achieving universal health coverage through the implementation of the Universal Health Insurance Law in 2018, disparities in insurance coverage persist, particularly among women [15].

While numerous studies [8, 10, 17] have identified socio-demographic factors such as sex, age, economic status, place of residence, and household size as determinants of health insurance coverage, there is a scarcity of research focusing specifically on these determinants of health insurance coverage in Egypt. To address this gap, our study aimed to examine the determinants of health insurance coverage specifically among women in Egypt to provide evidence-based insights for policy development. The goal is to promote inclusive health system reforms that ensure all women, particularly those in disadvantaged groups, are included in the movement towards universal health coverage.

Data Source

Data for the study were derived from Egypt Family Health Survey (EFHS) conducted during 2021-2022. The EFHS is a nationally representative sample survey conducted under the supervision of the Central Agency for Public Mobilization and Statistics (CAPMAS). The main objective of the survey is to present estimates on indicators such as fertility, mortality, morbidity, maternal health, children's health, women empowerment, family planning and violence. In the EFHS, a total of 20457 women aged 15-49 were interviewed [3].

METHODOLOGY

Our analysis utilized health insurance coverage as the dependent variable, defined as a dichotomous outcome (presence or absence of coverage). Drawing from a thorough literature review, various explanatory variables were selected for inclusion in this study. Descriptive statistics are employed to determine the health insurance coverage among women by each of the explanatory variables. Additionally, Chi-square test was then employed to determine the statistical significance of the bivariate relationships between health insurance coverage and different demographic and socioeconomic factors.

Since the dependent variable in our study is measured as dichotomous variable, which correctly requires the use of nonlinear regression models. Our empirical models of health insurance coverage are based on logistic regression models, which are nonlinear. Logistic regression models expand the techniques of multiple regression analysis to explore circumstances in which the dependent variable is binary [6].

For a binary response variable y and a single independent variable X, recall that p(y=1) denotes the "success" probability at value x [i.e. the probability that the event y occurs, P (y=1)]. The logistic regression model has linear form for the logit of this probability,

$$Logit[\mathrm{P}(y=1)] = Log\left(\frac{p(y=1)}{1-p(y=1)}\right) = \alpha + \beta x$$

Using the exponential function exp (α+βx) = $e^{\alpha+\beta x}$, the logistic regression implies the following formula for the probability π(x),

$$\mathrm{P}(y=1) = \frac{\exp(\alpha+\beta x)}{1+\exp(\alpha+\beta x)}$$

In the case of the general logistic regression model with k predictors, the model for the log odds is:

$$Logit\left[\frac{P(y=1)}{1-P(y=1)}\right] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k$$

The parameter β_i denotes to the effect of X_i on the log odds that y =1, controlling the other Xs. For example, exp (β_i) is the multiplicative effect on the odds of a 1-unit increase in X_i, at fixed levels of the other Xs [1].

In binary logistic regression, we will use a different formula than the linear regression equation. The binary logistic formulas are stated in terms of the probability that Y = 1, which is referred to as P. The probability that Y is 0 is (1 – P).

$$\mathrm{Ln}\left(\frac{\mathrm{p}}{(1-\mathrm{p})}\right) = \beta_0 + \beta_i X_i$$

The Ln symbol refers to a natural logarithm and ($\beta_0 + \beta_i X_i$) is our familiar equation for the linear regression line (B_0 is the constant and B_i is the coefficients of Xi), and i is the number of independent variables in the model.

RESULTS

Prevalence of health insurance coverage among the women is shown in Figure 1. The results reveal that only 12.7% of women had health insurance. The General Agency of Health Insurance was the most common type (7.8%), followed by employer-based plans (4.3%). In contrast, very limited coverage came from "other" types (0.3%), syndicate insurance (0.2%), and private commercial health insurance (0.1%), underscoring significant disparities in access.

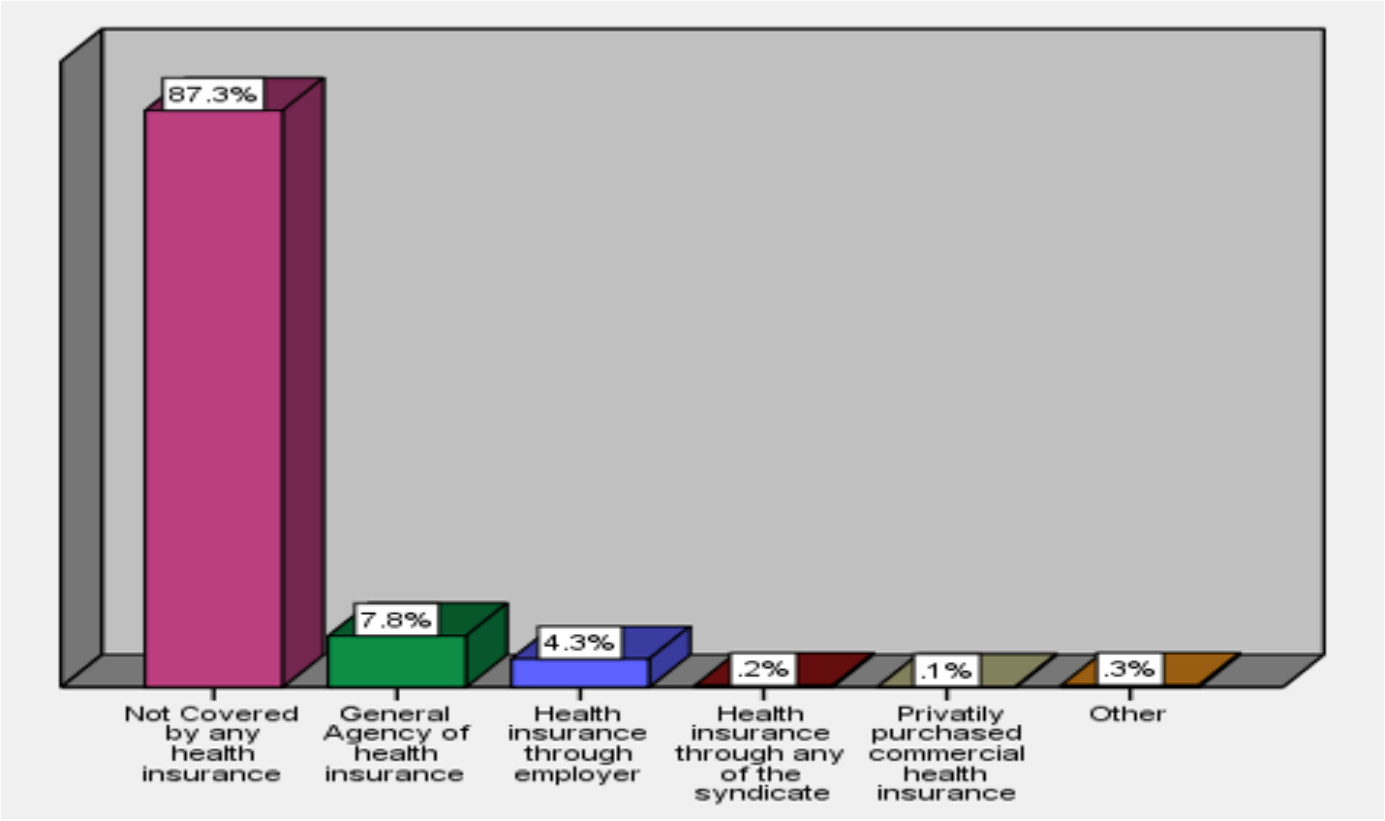

Figure 1: Coverage of health insurance among the women in Egypt, (2021)

Table 1 summarizes the results of the distribution of health insurance coverage across independent variables, showing that coverage percentages differ among various groups. The results showed that health insurance coverage is prevalent among women who had completed secondary or higher education (10.4%), those who aged (35-49) (8.2%), those who were working (6.8%), those who were married (11.5%), and those exposed to mass media (12.3%). Additionally, the percentage of health insurance coverage was high among women with male household heads (12%), those in the richest wealth index (4.9%), those in the urban areas (7.4), and those from urban governorates (3.4%). Table 1 also highlights the significant relationships between health insurance coverage across independent variables. All the independent variables were statistically correlated with health insurance coverage at p-value < 0.05, except for mass media exposure and gender of household head.

Table 1: Distribution of health insurance coverage across independent variables

Variable	**N**	**%**	**Health insurance subscription**	
			Yes	**P-value**
Women's age (years)				**< 0.001**
15–24	**2565**	**12.5**	**0.8%**	
25–34	**7398**	**36.2**	**3.7%**	
35-49	**10494**	**51.3**	**8.2%**	
Level of education				**< 0.001**

No education	**3279**	**16.0**	**.7%**	
Some primary	**888**	**4.3**	**.2%**	
Primary complete/ some secondary	**4211**	**20.6**	**1.4%**	
Secondary complete/ higher	**12079**	**59.0**	**10.4%**	
Current working status				**< 0.001**
Not working	**17024**	**83.2**	**5.9%**	
Working	**3433**	**16.8**	**6.8 %**	
Marital status				**< 0.001**
unmarried	**1461**	**7.1**	**1.2%**	
married	**18996**	**92.9**	**11.5%**	
Mass media exposure				
No	**773**	**3.8**	**0.4%**	**0.128**
Yes	**19684**	**96.2**	**12.3%**	
Internet usage and social media				**< 0.001**
No	**16823**	**82.2**	**8.2%**	
Yes	**3634**	**17.8**	**4.4%**	
Gender of household head				**0.898**
Female	**1116**	**5.5**	**0.7%**	
Male	**19341**	**94.5**	**12.0%**	
Wealth index				**< 0.001**
Poorest	**3871**	**18.9**	**1.1%**	
Poorer	**3879**	**19.0**	**1.4%**	
Middle	**4132**	**20.2**	**2.0%**	
Richer	**4321**	**21.1**	**3.3%**	
Richest	**4254**	**20.8**	**4.9%**	
Place of residence				**< 0.001**
Rural	**8115**	**39.7**	**5.3%**	
Urban	**12342**	**60.3**	**7.4%**	
Region of residence				**< 0.001**
Urban governorates	**2984**	**14.6**	**3.4%**	
Lower Egypt Urban	**2103**	**10.3**	**1.2%**	
Lower Egypt Rural	**5882**	**28.8**	**2.1%**	
Upper Egypt Urban	**2276**	**11.1**	**2.3%**	
Upper Egypt Rural	**6123**	**29.9**	**3.0%**	
Frontier governorates	**1089**	**5.3**	**.6%**	

The results of the binary logistic regression analysis for the determinants of health insurance coverage among women in Egypt are shown in Table 2. The findings reveal that women aged (25-34) were significantly associated with a higher probability of having health insurance compared to those aged (15-24) (OR = 1.211; $p < 0.05$). Similarly, women aged (35-49) were more likely to be covered with health insurance compared to those aged (15-24) (OR = 1.925; $p < 0.01$). Additionally, mother's education was a significant determinant of

having health insurance coverage. Women who had completed Primary and some secondary level of education (OR = 1.831; $p < 0.01$) and completed secondary education or higher (OR = 2.986; $p < 0.01$) were significantly associated with a higher likelihood of having health insurance compared to those with no education. As shown in Table 2, working women were eight times more likely to have health insurance coverage compared to those not working. Additionally, women who used internet and social media sites were significantly associated with a higher probability of having health insurance compared to those who never did (OR = 1.619; $p < 0.01$).

According to Table 2, other significant determinants of having health insurance were the gender of household head, wealth index and region of residence. Women living in male-headed households were significantly more likely to have health insurance (OR = 1.307; $p < 0.05$) compared to women in female-headed households. Additionally, the probability of having health insurance increased as wealth index increased. Women in the richest wealth index were about three times more likely to have health insurance coverage compared to those in the poorest wealth index. Moreover, women from Lower Egypt urban, Lower Egypt rural and Frontier governorates had a significantly lower likelihood of having health insurance compared to women in urban governorates.

Table 2 presents overall percentage of classification which identified that the model correctly classified 88.6 percent of cases overall. The results found that the value of Nagelkerke's R^2 was 0.306, which shows that about 30.6% of the variation in health insurance coverage can be accounted to the independent variables in the model. Moreover, Omnibus Test is designed to test the significance of the total (overall) model of binary logistic regression. The model was statistically significant compared to the null model, as indicated by a likelihood ratio test ($p < 0.01$). The Hosmer and Lemeshow test is also a test of model goodness of fit. Here, the model adequately fits the data. Hence, there is no difference between the observed and predicted model. Hosmer and Lemeshow test showed no significant lack of fit ($p > 0.05$), suggesting the model fits the data well.

Table 2: Determinants of health insurance coverage among women in Egypt, 2021

Determinants	**Coefficient (B)**	**OR**	**95% CI for OR**	
			Lower	**Upper**
Women's age (years)				
15–24		**1**		
25–34	**0.191***	**1.211**	**1.001**	**1.464**
35-49	**0.655****	**1.925**	**1.599**	**2.316**
Level of education				
No education		**1**		
Some primary	**-0.088**	**0.916**	**0.629**	**1.334**
Primary complete/ some secondary	**0.605****	**1.831**	**1.468**	**2.284**
Secondary complete/ higher	**1.094****	**2.986**	**2.455**	**3.632**
Current working status				
Not working		**1**		
Working	**2.113****	**8.275**	**7.486**	**9.146**
Marital status				
Unmarried		**1**		
Married	**0.066**	**1.068**	**0.901**	**1.265**

Media Exposure				
No		**1**		
Yes	**0.150**	**1.162**	**0.896**	**1.507**
Internet usage and social media sites				
No		**1**		
Yes	**0.482****	**1.619**	**1.449**	**1.810**
Gender of household head				
Female		**1**		
Male	**0.267***	**1.307**	**1.062**	**1.607**
Wealth index				
Poorest		**1**		
Poorer	**0.197***	**1.217**	**1.000**	**1.481**
Middle	**0.382****	**1.465**	**1.212**	**1.771**
Richer	**0.805****	**2.237**	**1.848**	**2.706**
Richest	**0.956****	**2.600**	**2.127**	**3.179**
Place of residence				
Rural		**1**		
Urban	**0.357**	**1.430**	**0.878**	**2.329**
Region of residence				
Urban governorates		**1**		
Lower Egypt Urban	**-1.236****	**0.291**	**0.243**	**0.347**
Lower Egypt Rural	**-1.593****	**0.203**	**0.122**	**0.338**
Upper Egypt Urban	**0.015**	**1.015**	**0.870**	**1.185**
Upper Egypt Rural	**-0.458**	**0.632**	**0.381**	**1.050**
Frontier governorates	**-1.035****	**0.355**	**0.270**	**0.468**
Overall Percentage of Classification	88.6%			
Omnibus Tests of Model Coefficients — **Chi-square**	**3634.924**			
Omnibus Tests of Model Coefficients — **P-value**	**0.000****			
Nagelkerke R Square	**0.306**			
Hosmer and Lemeshow Test — **Chi-square**	**2.372**			
Hosmer and Lemeshow Test — **P-value**	**0.241**			

OR = odds ratios; CI = Confidence Interval; *p < 0.05, **p < 0.01; 1 = Reference category

DISCUSSION

The findings of our study indicate that household wealth status is a significant determinant of health insurance ownership. The likelihood of being insured increased steadily with each increase in the household wealth index. This observation is supported by a wide range of prior research [4, 7,10, 11, 12, 16, 19, 20, 22] that has consistently demonstrated a higher prevalence of health insurance coverage among households with greater economic resources.

Our research in Egypt demonstrates that education level significantly influences health insurance coverage among women. More educated women in our study were significantly more likely to be insured than those with no formal education. This finding is consistent with evidence from prior research [4, 7, 10, 16] that has established education as an important predictor of health insurance ownership.

As observed in numerous previous studies [5, 7, 10, 11, 13,16, 18, 19, 20, 22], our findings also highlight a significant age-related disparity in health insurance ownership. Specifically, women aged 35 years and above were more likely to be insured than younger women.

The results of our study conducted in Egypt demonstrate that the geographical region of residence is a significant determinant of health insurance coverage. Specifically, women from lower Egypt or frontier governorates had a lower likelihood of being insured compared to women residing in urban governorates. This observation is consistent with prior research conducted in other countries [7, 9, 10, 16], which has also demonstrated varying levels of health insurance coverage across different regions.

Consistent with previous studies [4, 10, 16], our study found that women's work is a significant predictor of health insurance coverage. These studies similarly demonstrated a higher likelihood of health insurance coverage among employed women compared to unemployed women.

Our study found no significant association between marital status and health insurance coverage. This finding is consistent with previous studies conducted in Malawi and Mauritania [4, 7]. However, this contrasts with other studies [2, 10, 11, 16] that reported married women were more likely to have insurance than the never-married.

CONCLUSION

This study underscores the substantial impact of demographic and socio-economic factors on health insurance coverage among women in Egypt. The findings highlight the overall low level of health insurance coverage among Egyptian women. Advancing equitable access to health insurance is essential for enhancing the efficiency and responsiveness of Egypt’s health system. Future research should examine the underlying barriers to enrollment and assess the quality of services offered through insurance schemes to ensure that coverage translates into tangible health benefits for all women.

Our analysis reveals that health insurance coverage is low among Egyptian women, especially for those with less education, limited employment, and lower household wealth. This highlights a clear need for targeted outreach initiatives to boost awareness and make it easier for these women to enroll in health insurance.

The findings highlights that women from lower Egypt or frontier governorates had a lower likelihood of being insured compared to women residing in urban governorates. Special efforts should focus on rural and underserved regions where these disparities are more noticeable. To effectively implement and expand health insurance strategies that meet women's specific needs in Egypt, coordinated efforts among the Ministry of Health and Population, CAPMAS, social protection agencies, and civil society organizations are essential.

A major strength of this study is the use of the most recent nationally representative data from Egypt Family Health Survey (EFHS) conducted by CAPMAS during 2021-2022. However, a key limitation of the current paper is the exclusion of certain important factors that may influence health insurance coverage among women, such as the presence of chronic illnesses and the frequency of illness episodes. These health-related variables are likely to affect both the perceived need for insurance and the likelihood of enrollment. However, such information was not available in the EFHS 2021dataset used in this analysis. The absence of these variables may limit the study’s ability to fully capture the complexity of determinants influencing women's health insurance coverage. Future research should consider incorporating health status indicators to provide a more comprehensive understanding of the factors that drive insurance uptake among women in Egypt.

REFERENCES

1. Agresti, A. (2007). An Introduction to Categorical Data Analysis. Second Edition, JohnWiley & Sons, Inc., Hoboken, New Jersey.
2. Boateng, D., & Awunyor-Vitor, D. (2013). Health insurance in Ghana: evaluation of policy holders' perceptions and factors influencing policy renewal in the Volta region. International journal for equity in health, 12, 1-10.
3. Central Agency for Public Mobilization and Statistics (CAPMAS) (2022): Egypt Family Health Survey–2021: Cairo, CAPMAS – December 2022.
4. Chauluka, M., Uzochukwu, B. S., & Chinkhumba, J. (2022). Factors associated with coverage of health insurance among women in Malawi. Frontiers in Health Services, 2, 780550.
5. Conde, K. K., Camara, A. M., Jallal, M., Khalis, M., Zbiri, S., & De Brouwere, V. (2022). Factors determining membership in community-based health insurance in West Africa: a scoping review. Global Health Research and Policy, 7(1), 46.
6. Dayton, C. M. (1992). Logistic Regression Analysis. Department of Measurement Statistics and Evaluation, University of Maryland. Available from: https://www.researchgate.net/publication/268416984_Logistic_Regression_Analysis
7. Dowou, R. K., Atanuriba, G. A., Adzigbli, L. A., Balame, S. K., Tahidu, I., Aggrey-Korsah, J., & Aboagye, R. G. (2024). Determinants of health insurance coverage among women in Mauritania: a multilevel analysis. BMC Public Health, 24(1), 229.
8. Jehu-Appiah, C., Aryeetey, G., Agyepong, I., Spaan, E., & Baltussen, R. (2011). Household perceptions and their implications for enrolment in the National Health Insurance Scheme in Ghana. Health Policy and Planning, 27(3), 222–233. https://doi.org/10.1093/heapol/czr032
9. Kawuki, J., Gatasi, G., & Sserwanja, Q. (2022). Women empowerment and health insurance utilisation in Rwanda: a nationwide cross-sectional survey. BMC Women's Health, 22(1), 378. https://doi.org/10.1186/s12905-022-01976-8
10. Kimani, J. K., Ettarh, R., Warren, C., & Bellows, B. (2014). Determinants of health insurance ownership among women in Kenya: evidence from the 2008–09 Kenya demographic and health survey. International journal for equity in health, 13, 1-8.
11. Kirigia, J. M., Sambo, L. G., Nganda, B., Mwabu, G. M., Chatora, R., & Mwase, T. (2005). Determinants of health insurance ownership among South African women. BMC health services research, 5, 1-10.
12. Kumi-Kyereme, A., & Amo-Adjei, J. (2013). Effects of spatial location and household wealth on health insurance subscription among women in Ghana. BMC health services research, 13, 1-8.
13. Liu, T. C., & Chen, C. S. (2002). An analysis of private health insurance purchasing decisions with national health insurance in Taiwan. Social science & medicine, 55(5), 755-774.
14. McKee, A. C. (2013). The spectrum of disease in chronic traumatic encephalopathy. Ann C. McKee, Thor D. Stein, Christopher J. Nowinski, Robert A. Stern, Daniel H. Daneshvar, Victor E. Alvarez, Hyo-Soon Lee, Garth Hall, Sydney M. Wojtowicz, Christine M. Baugh, David O. Riley, Caroline A. Kubilus, Kerry A. Cormier, Matthew A. Jacobs, Brett R. Martin, Carmela R. Abraham, Tsuneya Ikezu, Robert Ross Reichard, Benjamin L. Wolozin, Andrew E. Budson, Lee E. Goldstein, Neil W. Kowall and Robert C. Cantu. Brain (2013) 136 (1): 43–64 .... Brain, 136(1), e255.
15. Ministry of Health and Population (MoHP). (2020). Annual report on the implementation of the Universal Health Insurance System. Cairo, Egypt: MoHP.
16. Mulenga, J. N., Bwalya, B. B., & Gebremeskel, Y. (2017). Demographic and Socio-economic determinants of maternal health insurance coverage in Zambia. Epidemiology, Biostatistics, and Public Health, 14(1).
17. Onwujekwe, O., Hanson, K., & Uzochukwu, B. (2010). Examining inequities in incidence of catastrophic health expenditures on different healthcare services and health providers in Nigeria. PLoS ONE, 7(7), e40811. https://doi.org/10.1371/journal.pone.0040811
18. Richardson, E., Roberts, B., Sava, V., Menon, R., & McKee, M. (2012). Health insurance coverage and health care access in Moldova. Health policy and planning, 27(3), 204-212.
19. Salari, P., Akweongo, P., Aikins, M., & Tediosi, F. (2019). Determinants of health insurance enrolment in Ghana: evidence from three national household surveys. Health policy and planning, 34(8), 582-594.

20. Sarpong, N., Loag, W., Fobil, J., Meyer, C. G., Adu-Sarkodie, Y., May, J., & Schwarz, N. G. (2010). National health insurance coverage and socio-economic status in a rural district of Ghana. Tropical medicine & international health, 15(2), 191-197.
21. United Nations (UN) (2025). "Transforming Our World: The 2030 Agenda for Sustainable Development". [Cited:24 May, 2025]. Available from: https://sdgs.un.org/2030agenda
22. Weldesenbet, A. B., Kebede, S. A., Ayele, B. H., & Tusa, B. S. (2021). Health insurance coverage and its associated factors among reproductive-age women in east Africa: a multilevel mixed-effects generalized linear model. ClinicoEconomics and Outcomes Research, 693-701.
23. World Health Organization (WHO). (2010). Health systems financing: The path to universal coverage. Geneva, Switzerland: WHO. https://www.who.int/publications/i/item/9789241564021