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National health insurance enrolment among elderly ghanaians: the role of food security status

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Abstract

Older people with food insecurity in Ghana are often exposed to poor health conditions, highlighting the importance of the National health Insurance Scheme (NHIS) enrolment for ensuring they receive necessary medical attention through access to health care services. However, we know very little about the association between food insecurity and National Health Insurance Scheme enrolment among older people in Ghana. To address this void in the literature, this study uses a representative survey of adults aged 60 or older from three regions in Ghana (i.e., Upper West, Bono, and Greater Accra regions ($n = 1,073$)). We find that 77% of older adults reported not being enrolled into the NHIS. Results from logistic regression analysis show that older people who experienced severe household food insecurity were less likely to enroll in the National Health Insurance Scheme than those who did not experience any food insecurity ($OR = 0.48$ $p < 0.001$). Based on these findings, we argue that in addition to the traditional socioeconomic factors, addressing severe food insecurity may improve health insurance enrolment among older adults. Additionally, policymakers should also consider older people's socioeconomic circumstances when formulating policies for them to enrol in health insurance.

Keywords Health insurance, Food insecurity, Older people, Ageing, Healthcare utilization, Ghana

Introduction

Ghana is one of the pioneering nations in sub-Saharan Africa (SSA) to implement a universal health insurance program dubbed the National Health Insurance Scheme (NHIS). It is a publicly-funded program aimed at providing equitable access to quality health care services for residents in Ghana [1, 2]. The scheme allows citizens between the ages of 18 to 70 to enroll in premium-based healthcare services with subsidies. In accordance with its goal of making primary healthcare affordable, the NHIS provides free enrollment for structurally exposed populations, including children under the age of 18, individuals over the age of 70, pregnant women, the homeless, prisoners, indigents, and those suffering from mental illness [3]. Despite these efforts, enrolment rates remain low,

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with approximately 60% of the population not enrolled in the NHIS, including a significant proportion of older adults aged 60 years and above [4].

As one of the possible reasons for this low enrolment rate, Antabe et al. [2] asserts that the current policy focus of the NHIS on social and financial vulnerability alone may be exclusionary as it may not be capturing other potentially significant measures of vulnerability such as food security—defined as when “all people at all times have physical and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preferences for an active and healthy life” [5]. Considering the high prevalence of food insecurity, with estimates suggesting that more than one-third of older people in Ghana experience food insecurity [6], this population may be exposed to unique challenges to NHIS enrolment. As Lee [7] explains, the limited resources available to food-insecure older adults often result in trade-offs and difficult decisions, such as choosing between purchasing food and paying for healthcare, transportation, or other necessities. For example, older adults experiencing food insecurity would prioritize meeting their food needs than using their limited budget to renew membership [8], pay for transportation cost to registration centers [9] and to access information on the program [7, 10, 11]. Research into the old-age exemption policy in Ghana revealed that less 50% of Older adults benefit from this exemption, as some had to pay the premium despite their eligibility or did not enrol at all, especially in rural areas [12]. This suggests that there may be more factors beyond financial vulnerability that drive older adults NHIS enrolment decisions.

In this context, understanding the relationship between food security status and the NHIS enrolment is important, considering that older adults facing food insecurity are not merely deprived of access to food, but are also more prone to adverse health outcomes [2, 13–15]. The susceptibility to food insecurity among older adults is exacerbated by factors such as limited income, diminished physical mobility, and age-associated health issues [16–18]. This can result in malnutrition and contribute to a range of health problems, including chronic illnesses and hospitalization [19]. For example, a study conducted in Ghana found that older individuals living in food-insecure households experienced higher levels of psychological distress [20]. In addition, the suggestion by other studies that food insecure adults are further exposed to poor health conditions highlights the importance of their enrolment into the NHIS to increase their health care access and utilization.

Studies in recent years have investigated the factors that predict NHIS enrollment in SSA. These studies have identified various demographic, socioeconomic, and geographical factors that are related to health insurance

enrollment [10, 21–24]. While these findings are informative, very little attention has been paid to understanding whether the rate of NHIS enrolment differs between older people based on their food security status. That is, studies do not consider the independent effect of food security status on enrolment in the NHIS. To address this void in the literature, the current study uses a representative survey of adults aged 60 or older from three regions of Ghana to examine the association between the NHIS enrolment and household food security status. Given the positive association between food security status and healthcare utilization, we hypothesize that older adults in food secure households in Ghana are more likely to be enrolled in the NHIS. This study’s novelty lies on its specific focus on the ageing population in Ghana, who constitute the fastest growing sub-group in the country, and more vulnerable to poor health. The study contributes empirical evidence to help policy-makers in achieving the World Health Organization’s decade of healthy ageing (2020–2030) goals that aim to create an enabling environment and improve the health and well-being of older people through a focus on policy, research, and advocacy [25, 26].

Methods

This study utilized a cross-sectional survey of older adults, defined as those aged 60 years and above in Ghana. The data were collected between June to August 2019 with the help of experienced research assistants from the University of Ghana, the University for Development Studies, and the Catholic University College, Ghana. We trained the research assistants on how to administer the survey and various ethical issues, including seeking verbal and written consent as well as confidentiality agreements prior to the data collection. Ethical approval was granted by the Queen’s University General Research Ethics Board (GGEOPL-277-19). The Upper West, Bono East, and Greater Accra Regions were purposively selected to represent the three agroecological zones of Ghana.

The Upper West Region is known as the poorest region in Ghana, with high levels of poverty, food insecurity, and semi-arid climatic conditions. the Bono East Region, on the other hand is considered the ‘breadbasket’ of Ghana. This region is marked by favourable rainfall patterns and fertile soils, making it ideal for food and cash crops cultivation. Given these favourable agronomic and climatic conditions, as well as its proximity to Northern Ghana, make the Bono East Region the ideal destination for migrant workers, especially smallholder farmers in northern Ghana. Host to the nation’s capital, the Greater Accra Region is the most urbanised region, with 92% of its population living in urban areas and a poverty incidence is 2.5%, much lower than Bono East (26.8%) and

the Upper West (70.9%) regions, as well as the national average of 23.4%. Despite their diverse socioeconomic and demographic characteristics, older adults in these regions are crucial support pillars, particularly in caring for grandchildren and vulnerable community members. Thus, including these regions in the study helps reflect the diverse experiences of older adults in Ghana.

For sampling, two districts were randomly selected from each region, followed by the random selection of ten enumeration areas from each district. One respondent was then interviewed from randomly chosen households within these enumeration areas. Calibration weights for the regression analysis were constructed based on the 2010 Population and Housing Census to account for regional differences between the sample and population characteristics. Additional sampling weights were constructed at each stage of sampling to account for selection probabilities. The final analytical sample consisted of 1,073 older adults. Standardised instruments for data collection on food security, health, health behaviours, and access to care were adapted from the Ghana Living Standards Survey and the WHO Study on Global Ageing and Adult Health. Informed consent was obtained from all participants for their participation and for publication of the findings.

Measures

Respondents were asked whether they are currently enrolled in the National Health Insurance Scheme. Based on this question, we created the dependent variable called 'NHIS enrolment' (0=no; 1=yes). The independent variable captures food security status, which was constructed using the nine-item Household Food Insecurity Access Scale developed by Coates et al. [27]. Respondents were asked to answer questions about the frequency of occurrence of each food insecurity situation on a Likert scale (0=rarely; 1=sometimes; 2=often) when they experienced each situation. Based on the combination of the responses from nine questions, respondents can be categorized into four groups: food security, mild insecurity, moderate insecurity, and severe insecurity. Considering that the number of respondents who experienced mild insecurity was very small, we combined this category with moderate insecurity, resulting in that we have three categories for the independent variable (0=food security; 1=mild/moderate insecurity; 2=severe insecurity). Informed by previous studies [3, 4], we also included a range of demographic and socioeconomic factors in analytical models to account for potential confounders. Specifically, we considered demographic factors such as household size (0= ≤ 5 ; 1=10–6; 2= ≥ 11), marital status (0=married; 1=divorced; 2=single; 3=widowed), gender (0=male; 1=female), age of respondents (0= ≥ 80 ; 1=70–79; 2=60–69), religion (0=Christian; 1=Muslim;

2=traditionalist; 3=no religion), region of residence (0=Bono East; 1=Greater Accra; 2=Upper West), and place of residence (0=urban; 1=rural) while household wealth (0=richest; 1=richer; 2=middle; 3=poorer; 4=poorest), education (0=higher; 1=secondary; 2=primary; 3=no education), and occupation (0=civil servant; 1=agriculture; 2=business; 3=employed; 4=other) were integrated as part of socioeconomic factors. Household wealth was calculated based on the household asset index adapted from the Demographic and Health Survey.

Statistical analysis

We employed two separate analyses. First, we conducted a univariate analysis to document sample characteristics. Second, logistic regression analysis was applied to understand the relationship between household food security status and NHIS enrolment. Models were built sequentially. We explored the bivariate association between food security status and health insurance enrolment in Model 1. Models 2 and 3 further accounted for demographic and socioeconomic factors, respectively. Given the multi-stage sampling strategy, our analyses were weighted with sampling weights constructed for each stage of sampling based on the probabilities of each sampling unit being selected as part of the sample. We conducted some extra sensitivity analysis such as variance inflation factor, and we did not observe anything above 4, indicating that multicollinearity is not an issue. Results were shown with odds ratios (ORs). Any ORs higher than 1 indicate higher odds of people enrolling in NHIS, while those lower than 1-point lower odds of people doing so.

Results

Table 1 shows sample characteristics. We found that 77% of older people were not enrolled in the NHIS. In addition, more than a third of respondents experienced severe food insecurity (36%), 28% reported moderate food insecurity, and the remaining 36% did not experience food insecurity (36%). We also found that about 40% of respondents lived in households with five or fewer members and were men (53%), currently married (56%), and about 58% of the respondents were between 60 and 69 years old. It was also found that about half of the sample lived in rural areas (51%). Regarding regional distribution, 36%, 29% and 35% of them lived in the Bono, Greater Accra and Upper West Regions, respectively. In addition, more than 40% of respondents had no formal education while 35% and 32% worked in agriculture and business sectors, respectively.

In Table 2, we present findings from our logistic regression analysis. In Model 1, we find at the bivariate level that older people who experienced severe food insecurity had lower odds of enrolling in the NHIS compared to their counterparts who did not experience any food

Table 1 Sample characteristics

| | Percentage |
|----------------------------|------------|
| Health insurance enrolment | |
| No | 77 |
| Yes | 23 |
| Food security status | |
| Food secure | 36 |
| Moderately insecure | 28 |
| Severely insecure | 36 |
| Household size | |
| ≤ 5 | 40 |
| 10–6 | 38 |
| ≥ 11 | 22 |
| Marital status | |
| Married | 56 |
| Divorced | 9 |
| Single | 7 |
| Widowed | 28 |
| Gender | |
| Male | 53 |
| Female | 47 |
| Age | |
| ≥ 80 | 18 |
| 70–79 | 24 |
| 60–69 | 58 |
| Region of residence | |
| Bono East | 36 |
| Greater Accra | 29 |
| Upper West | 35 |
| Place of residence | |
| Urban | 49 |
| Rural | 51 |
| Religion | |
| Christian | 61 |
| Muslim | 26 |
| Traditionalist | 9 |
| No religion | 4 |
| Household wealth | |
| Richest | 20 |
| Richer | 20 |
| Middle | 20 |
| Poorer | 20 |
| Poorest | 20 |
| Education | |
| Higher | 16 |
| Secondary | 14 |
| Primary | 29 |
| No education | 41 |
| Occupation | |
| Civil servant | 12 |
| Agriculture | 35 |
| Business | 32 |
| Unemployed | 13 |
| Other | 7 |
| Total | 1,073 |

insecurity (OR=0.31, $p<0.001$). This significant relationship remained largely robust, even after accounting for demographic and geographical factors in Model 2 (OR=0.30, $p<0.001$) and socioeconomic factors in Model 3 (OR=0.48, $p<0.001$).

In addition to household food security status, a range of demographic and socioeconomic factors were significantly associated with enrolling in the NHIS (see Model 3 of Table 2). For example, compared to their richest counterparts, older people whose household wealth belonged to the 'poorest' (OR=0.42 $p<0.01$), 'poorer' (OR=0.37 $p<0.01$), and 'middle' (OR=0.54 $p<0.05$) categories were also less likely to be enrolled in the NHIS. Also, older adults with no formal education (OR=0.22 $p<0.001$) and primary education (OR=0.35 $p<0.001$) were less likely to be enrolled in the NHIS compared to older adults with secondary education. Finally, older people whose main occupation was agriculture (OR=0.34 $p<0.001$), business (OR=0.29 $p<0.001$), and unemployed (OR=0.22 $p<0.001$) had lower odds of being enrolled in the NHIS compared to those whose main occupation was civil servant.

Discussion

Despite the old-age premium exemption policy, many older adults in Ghana remain without NHIS membership. Policymakers are concerned that there may be other factors beyond traditional financial barriers hindering elderly Ghanaians from enrolling in health insurance. Enrolment in the NHIS is critical among older adults with the experience of food insecurity, considering their heightened risks of poor health conditions that often require medical attention. Yet, the literature pays very little attention to the association between food security status and enrolment in the NHIS among older people in Ghana. To address this void in the literature, we collected a cross-sectional survey to identify whether the impact of food security status on enrolment in the NHIS while accounting for theoretically relevant demographic and socioeconomic factors. Exploring the intersection of food security and health insurance enrollment among older adults in Ghana represents a novel contribution to the existing literature on healthcare access and utilization in low-income countries.

We found that older people facing severe food insecurity were less likely to enrol in the NHIS in comparison to their food secure counterparts, even after controlling for a range of demographic and socioeconomic factors. This finding may be discussed in light of previous studies in Ghana's Upper West Region [2] and other studies that have found connections between food security status and healthcare access and utilization [20, 28, 29]. In explaining the unique challenges older people face, Fenny et al. [30] opined that food-insecure older people are often

Table 2 Complementary log-log models predicting health insurance enrolment

| | Model 1 | | | Model 2 | | | Model 3 | | |
|----------------------|----------|--------|------|---------|--------|------|----------|--------|------|
| | OR | 95% CI | | OR | 95% CI | | OR | 95% CI | |
| Food security status | | | | | | | | | |
| Food secure | 1.00 | | | 1.00 | | | 1.00 | | |
| Moderately insecure | 0.62*** | 0.46 | 0.83 | 0.73* | 0.53 | 0.99 | 0.19 | 1.55 | 0.78 |
| Severely insecure | 0.31*** | 0.22 | 0.43 | 0.30*** | 0.21 | 0.43 | 0.48*** | 0.33 | 0.70 |
| Household size | | | | | | | | | |
| ≤ 5 | | | | 1.00 | | | 1.00 | | |
| 10–6 | | | | 1.04 | 0.73 | 1.49 | 1.12 | 0.75 | 1.65 |
| ≥ 11 | | | | 1.08 | 0.73 | 1.61 | 1.16 | 0.78 | 1.71 |
| Marital status | | | | | | | | | |
| Married | | | | 1.00 | | | 1.00 | | |
| Divorced | | | | 0.56* | 0.34 | 0.94 | 0.84 | 0.49 | 1.44 |
| Single | | | | 0.49* | 0.28 | 0.88 | 0.55 | 0.30 | 1.04 |
| Widowed | | | | 0.60** | 0.43 | 0.84 | 1.07 | 0.73 | 1.57 |
| Gender | | | | | | | | | |
| Male | | | | 1.00 | | | 1.00 | | |
| Female | | | | 1.00 | 0.75 | 1.32 | 1.18 | 0.86 | 1.62 |
| Age | | | | | | | | | |
| ≥ 80 | | | | 1.00 | | | 1.00 | | |
| 70–79 | | | | 1.09 | 0.65 | 1.83 | 1.07 | 0.63 | 1.81 |
| 60–69 | | | | 1.08 | 0.68 | 1.73 | 1.17 | 0.73 | 1.87 |
| Region of residence | | | | | | | | | |
| Bono East | | | | 1.00 | | | 1.00 | | |
| Greater Accra | | | | 0.30*** | 0.20 | 0.43 | 0.69 | 0.44 | 1.09 |
| Upper West | | | | 0.45*** | 0.32 | 0.63 | 1.21 | 0.76 | 1.94 |
| Place of residence | | | | | | | | | |
| Urban | | | | 1.00 | | | 1.00 | | |
| Rural | | | | 1.00 | 0.76 | 1.31 | 1.23 | 0.89 | 1.70 |
| Religion | | | | | | | | | |
| Christian | | | | 1.00 | | | 1.00 | | |
| Muslim | | | | 0.79 | 0.56 | 1.10 | 1.24 | 0.85 | 1.80 |
| Traditionalist | | | | 0.20* | 0.05 | 0.81 | 1.56 | 0.88 | 2.75 |
| No religion | | | | 0.99 | 0.58 | 1.67 | 0.36 | 0.08 | 1.50 |
| Household wealth | | | | | | | | | |
| Richest | | | | | | | 1.00 | | |
| Richer | | | | | | | 0.76 | 0.52 | 1.12 |
| Middle | | | | | | | 0.54* | 0.34 | 0.87 |
| Poorer | | | | | | | 0.37** | 0.21 | 0.67 |
| Poorest | | | | | | | 0.42** | 0.23 | 0.76 |
| Education | | | | | | | | | |
| Higher | | | | | | | 1.00 | | |
| Secondary | | | | | | | 0.81 | 0.53 | 1.26 |
| Primary | | | | | | | 0.35*** | 0.22 | 0.55 |
| No education | | | | | | | 0.22*** | 0.12 | 0.39 |
| Occupation | | | | | | | | | |
| Civil servant | | | | | | | 1.00 | | |
| Agriculture | | | | | | | 0.34*** | 0.21 | 0.55 |
| Business | | | | | | | 0.29*** | 0.18 | 0.45 |
| Unemployed | | | | | | | 0.22*** | 0.11 | 0.47 |
| Other | | | | | | | 0.79 | 0.47 | 1.35 |
| F | 24.34*** | | | 7.41*** | | | 11.62*** | | |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

poor and without social support and are excluded from social and family support services, thereby making it hard for them to be well-informed about the NHIS. Reflecting on this finding, we note that the healthcare needs of older adults in Ghana could be compromised without addressing underlying household deprivations such as food security considering that older adults constitute the sociodemographic group most at risk of food insecurity [31]. As older people focus on overcoming food insecurity, they often reprioritize meeting their nutritional needs and forgo health insurance enrolment [32]. It has been argued that households might not prioritize using healthcare services, including health insurance enrolment, when the basic resources required for survival, such as food and shelter, are not readily available [33]. In addition, it is also possible that older adults' limited mobility, which may be further heightened among those in food insecure households due to low calorie intake, may be contributing to their observed lower enrolment [25].

Beyond food insecurity status, we also found other variables to be associated with the NHIS enrolment. For example, older adults in poor households were less likely to enrol in the NHIS. This finding is consistent with other studies pointing out the role of financial barriers in health insurance enrolment [3, 4, 23]. In addition, we found that one's level of educational attainment was associated with health insurance enrolment among elderly Ghanaians. This finding supports a previous study in Ghana which highlighted that people with higher education were more likely to enrol in the NHIS [34]. Studies suggest higher educational attainment serves as a platform for people to better recognize the benefits of the NHIS enrolment [35, 36]. Furthermore, we found that the type of employment is associated with the uptake of health insurance among older people. For instance, civil servants are more likely to enrol in the NHIS relative to their counterparts in other occupations and those who are unemployed. This finding can be explained by the fact that those employed in civil service are not required to pay for premium to enrol and given that part of their pension stipends from government are used for NHIS coverage. In contrast however, those in other occupations which are largely informal do not contribute towards the pension and as such they are required to pay their NHIS premiums out of pocket. Given that these premiums may be relatively expensive, it may work to exclude older people in these other occupations from enrolling into the NHIS [23].

Despite these noteworthy findings, there are some limitations to this study. First, we use a cross-sectional survey. Therefore, our results are limited to the statistical association and cannot claim any causal relationship between the dependent and independent variables. Second, because the analysis hinges on self-reported data, it

may be subjected to recall bias. For instance, it is possible that some respondents would have had difficulty recalling pertinent questions about their NHIS enrolment and food security status. Furthermore, because of social desirability bias, some respondents may under-report their enrolment in the NHIS. This study did not ask questions related to older adult's knowledge of the exemption policy on NHIS enrolments. Future studies may control for factors such as knowledge of exemption policy when examining factors influences NHIS enrolments among older adults in Ghana. Finally, we argue that quantitative indicators alone may not comprehensively assess the rationale behind the uptake of NHIS. To explain the contextual factors that may contribute to greater enrolment among elderly people, we suggest future studies to employ in-depth qualitative approaches. Despite these limitations, our study is the first to examine the linkage between food security status and health insurance enrolments among older people in Ghana.

Conclusion and policy recommendations

In the context of a rising ageing population and associated vulnerabilities to poor health, this study assesses the role of food insecurity in NHIS enrolment among older adults in Ghana. Our findings revealed that older adults who are severely food insecure are less likely to be enrolled onto the NHIS compared to their food insecure counterparts. This relationship remained robust even after controlling for demographic and socioeconomic factors, highlighting the independent effect on food security status on NHIS enrolment among this vulnerable group. This study underscores the importance of policy consideration of household food security status as a critical factor in NHIS enrolment. As a first step, it may be useful to redefine an "indigent" to encompass vulnerable older adults that are severely food insecure.

Based on our findings, we present the following recommendations. A re-examination of the exemption policies could potentially improve the inclusivity of the scheme, targeting households experiencing severe food insecurity and not only those living below the national poverty line. Additionally, expanding the scope and resources of social protection programs like the Livelihood Empowerment Against Poverty (LEAP) program, may also benefit vulnerable populations by incorporating provisions for health insurance enrolment, especially for severely food insecure older adults. Furthermore, public awareness campaigns on the importance quality health and well-being can foster greater participation in positive health-seeking behaviours, such as enrolling in and retaining membership in the NHIS. Finally, considerable disparity in NHIS enrolment among older Ghanaians based on wealth status underscores the urgency of addressing systematic barriers and implementing the National

Ageing Policy. Urgent action is needed to implement the National Ageing policy, focusing on initiatives aligned with the UN Decade of healthy ageing (2021–2030). Government support for national and local initiatives aimed at promoting the health and well-being of older people through the elimination of financial and food insecurity barriers to NHIS enrolment is a crucial for fostering inclusive health coverage.

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Author contributions

All authors contributed to the study conception. Data collection was done by JAB. Data analyses were done by DA, YS and RA. The first draft of the manuscript was prepared by DA, JAB, WA-D, YS, RA and ED. All authors read and approved the final manuscript.

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Data availability

The data used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Queen's University General Research Ethics Board (GGEOP-277-19). All the participants provided written and verbal informed consent prior to the data collection. Additionally, legally Authorized Representatives of illiterate participants (e.g., family members) provided informed consent for the study. All procedures were performed in accordance with the Helsinki Declaration.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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