# Is the pro-poor premium exemption policy of Ghana's NHIS eliminating health coverage disparities among the elderly?

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**Abstract**

Under the act that established the National Health Insurance Scheme (NHIS), persons 70 years of age or above are automatically enrolled in the scheme and therefore can access health services free at the point of use. This suggests that the elderly who are unable to afford the premiums of private health insurance can enrol in the NHIS thereby eliminating the possibility of disparities in health insurance coverage. Notwithstanding, few studies have examined health insurance coverage among the elderly in Ghana. Using data from the Study on Global Ageing and Health (SAGE) and applying logit models, this paper investigates whether the pro-poor exemption policy is eliminating disparities among the elderly aged 70 years and older. The results show that disparities in insurance coverage among the elderly are based on respondents' socio-economic circumstances, mainly their wealth status. The study underscores the need for eliminating health access disparities among the elderly and suggests that the current premium exemptions alone may not be the solution to eliminating disparities in health insurance coverage among the elderly.

**Key words**: health policy; health insurance; NHIS; aging; wealth; Ghana

**Key Messages**

- Ghana's health insurance scheme has a pro-poor orientation with a social protection exemption policy for the vulnerable in society, including the elderly.
- To date, no study has examined the effectiveness of this policy for the elderly in Ghana. Our study fills this important gap in the literature.
- This study shows that poorer elderly Ghanaians are less likely to have health insurance coverage despite the exemption policy of the scheme.
- It is important for policy makers to look beyond exemption policies in bridging inequality in insurance coverage among the elderly in Ghana.

## Introduction

Globally, it is estimated that two billion people will be over the age of 60 by year 2050 with about 80% of this population expected to reside in low and middle income countries (LMIC) (Aboderin, 2012; Beard et al., 2012; Lancet, 2012). Accordingly, most LMICs have begun to witness considerable increases in the populations of the elderly and the associated health challenges unique to this group. With limited regenerative abilities, the elderly are at heightened risk of poor health due to pronounced risk of diseases, syndromes, and sickness (World Health Organization, 2004). Also, with many LMICs already experiencing economic challenges, any projected increase in the elderly population will have far reaching implications for the broader health systems in such societies and the health of elderly people in particular. This makes the provision of appropriate health services to cater for the needs of the elderly a major challenge for LMICs.

With an older than average population compared to other countries in SSA, Ghana's young age structure is fast changing to an older population. The United Nations projected, for instance, that Ghana's elderly population will grow from 5.3% to 7.9% by 2050 (DeSA & United-Nations, 2013). This demographic shift will not only increase the overall population in need of health care, but also increase demand for age-appropriate health care for the elderly. Recognizing the special health needs of its older population, Ghana implemented a Social Health Protection (SHP) program within its National Health Insurance Scheme (NHIS), with the aim of reducing financial barriers associated with accessing healthcare services for the elderly. However, research examining the effectiveness of the pro-poor mandate of Ghana's NHIS for the elderly is limited. We fill this important gap in the literature.

### *Health insurance in Ghana*

Ghana's NHIS, effectively operating from 2004, is a national health financed scheme intended to increase health service access for its population. Prior to its implementation, the 'cash and carry' system restricted health access for large sections of the populations (i.e. poor, rural, elderly, women), contributing to significant disadvantage due to fees associated with seeking health care (Asenso-Okyere, Anum, Osei-Akoto, & Adukonu, 1998; James et al., 2006; Nyonator & Kutzin, 1999). In light of these disparities, the NHIS was developed as an equitable means of health care financing.

Under the national health insurance act (Act 650, later replaced by Act 852) — which established the NHIS — health insurance is mandatory for every Ghanaian. However, no specific punitive measures are prescribed for violators, and enforcement relating to violations are yet to be

documented (Dixon, Tenkorang, & Luginaah, 2011). The act allows three distinct types of insurance schemes in Ghana — District Mutual Health Insurance Schemes (DMHIS), private mutual insurance schemes, and private commercial insurance schemes. The DMHIS is the most popular and operates in all districts of the country whilst the other two are mainly urban-centered and cover less than one percent of insured individuals (Gajate-garrido & Owusua, 2013). Although the activities of the two other types of private insurance are regulated by the National Health Insurance Authority (NHIA), they do not receive financial support from government.

Collectively, the DMHIS make up the NHIS and are financed mainly through central government level funds and premiums. Revenue for the NHIS comes from four main sources — a value-added tax (VAT), the Social Security and National Insurance Trust (SSNIT – a national pension scheme for formal sector employees), investment income and premiums. In 2011, VAT provided over 72% of the scheme's revenue whiles SSNIT, investment income and premiums contributed about 17%, 5%, and 4% respectively (National Health Insurance Authority Ghana, 2011). All formal sector employees and their dependants (18 years or less), are automatically enrolled, and their premiums are collected at the central level via payroll deductions. Self-employed individuals and informal sector workers need to enrol directly in the NHIS.

The NHIS covers outpatient, inpatient and emergency care, deliveries, dental care, and essential drugs which constitute about 95 percent of the disease burden in Ghana. Individuals need to register with the NHIS once in their lifetime and then renew their membership annually. Additionally, the NHIS offers exemption from fees for certain populations. Children under 18, pregnant women, indigents (i.e. the poor and destitute), and all people over 70 are exempted from paying premiums, although they still need to register and renew their membership annually. All exempt groups including Ghanaians over 70 years pay a registration fee of GH¢ 4.00 (about $1) and at the time of renewal every year (Nyonator, 2012). In 2011, 8.2 million people (33% of the population) were active members (registered and had renewed their membership that year) with 4.9% of those active members over the age of 70 (National Health Insurance Authority Ghana, 2011).

***The elderly and health insurance coverage***

Although evidence suggests coverage under the NHIS is effective for improving health outcomes (Mensah, Oppong, & Schmidt, 2010), studies have revealed that Ghana continues to face difficulties enrolling segments of the population including the poorest of society (Dixon et al., 2011). Besides financial constraints, the elderly may face additional barriers to enrol in health care because

aging — particularly in the developing world — is associated with heightened risks and overall social and physical vulnerability (Crooks, 2009; Issahaku & Neysmith, 2013). A main challenge is that older people in SSA usually retire in rural areas, with poor infrastructure and acute problems of basic service provision (Issahaku & Neysmith, 2013). Additionally, for elderly women in particular, the consequences are more severe due to gender related discrimination. Older women encounter social isolation, inequity, and economic adversity that affect their ability to use health services and shape their overall physical and mental health (Bastos, Casaca, Nunes, & Pereirinha, 2009; Brady & Kall, 2008; Davidson, DiGiacomo, & McGrath, 2011; Yee & Capitman, 1996).

The fact that many elderly individuals in developing countries have low educational attainment makes them even more vulnerable. While education influences knowledge of available social services, the lack of it may limit economic participation to the informal sector where there is limited provision for retirement and economic security (Altschuler, 2004; United Nations, 2007). Further, given limited formal employment records, the elderly have no access to formal social security arrangements like pensions — deepening their poverty levels. It is estimated that only 17% of older people in SSA receive an old age pension (ILO, 2014). These consequences are particularly serious given that health care expenditures increase at this stage of the life course (Mendis, Puska, & Norrving, 2011; Williams & Kurina, 2002; World Health Organization, 2009).

Given the projected growth rate of Africa's aging population and associated implications (Aboderin, 2012; DeSA & United-Nations, 2013; Lancet, 2012), it becomes crucial that countries seek to provide adequate and accessible health care for aging populations. Thus, it is imperative that governments implement appropriate health policies and services to meet demographic needs in changing populations. Ghana's NHIS and its exemption policy for vulnerable groups, including the elderly is an important step in this policy area which remains nascent or missing in much of SSA.

Through exemption policies for certain vulnerable groups (including the elderly), the NHIS aims to improve health access and overall health outcomes by providing free services. Exemption of the elderly from premium payment is important for a few reasons. First, the informal sector is the country's largest employer and it is often the case that members of this sector retire without any pension benefits. Consequently, for the elderly in this sector of the economy, removing premiums may facilitate enrolment. Second, even for those in the formal sector who have some pension benefits, this may not be enough to cover their health care needs in old age (Issahaku & Neysmith, 2013). Finally, as individuals age within the population, health costs related to the treatment of

chronic and non-communicable diseases (such as hypertension, arthritis, angina, diabetes and stroke) also increase. This makes the exemption policy under the NHIS extremely crucial for the elderly as it may increase health care access — with implications for morbidity and mortality among this demographic group. Against this backdrop, this paper investigates disparities in health insurance coverage among elderly Ghanaians. By focusing on the elderly population, this paper departs from previous studies that examined the determinants of NHIS enrolment among the general population in Ghana (Dixon, Luginaah, & Mkandawire, 2014a; Dixon et al., 2011; Jehu-Appiah et al., 2011; Sarpong et al., 2010). It is hypothesized that wealthier respondents will be more likely to enrol compared to their poorer counterparts. For the purposes of this study, elderly is used to describe individuals who are 70 years or older.

## Materials and Methods

### *Data and analytical sample*

Our study used the first wave of the World Health Organization's (WHO) Study on Global Ageing and Adult Health (SAGE) from Ghana. Data were collected between January 2007 and December 2008 through face-to-face interviews. The SAGE is a nationally representative multi-country study (involving China, Ghana, India, Mexico, Russian Federation and South Africa) that gathered data on older persons (50 years and over) to respond to their health needs. To enable comparison, the SAGE also includes a smaller sample of young adults between the ages of 18 and 49 years. A stratified multi-stage cluster design was employed to select respondents for the survey in Ghana. First, the sample was stratified by administrative region (using all the 10 regions in Ghana) and location (urban/rural). Some 235 Enumeration Areas (EA) were selected as primary sampling units. Enumeration areas that did not have persons who are 50 years or older were not included. Within each EA, 20 households with one or more persons who was 50 years or over and four households with members aged 18–49 were selected. From these localities, 5269 households were surveyed. A total of 5573 (Male=2799 and Females=2764) individuals were then sampled from these households (Biritwum, Mensah, Yawson, & Minicuci, 2013). Response rates at both household and individual levels were 86% and 80% respectively. For the purposes of this study, only individuals aged 70 years and above were included. Thus, the analytical sample in this study was 1534.

### *Measures*

The dependent variable in this study, health insurance coverage, was derived from the following question 'do [you] have health insurance coverage?' with the following response categories: 'Yes,

mandatory insurance', 'Yes, voluntary insurance', 'Yes, both mandatory and voluntary insurance' and 'No, none'. This was transformed and re-categorized to indicate if respondents had health insurance coverage or not. Consequently, health insurance status was coded as 0=uninsured and 1=insured. Wealth status, the focal independent variable in the study, was operationalized using respondents' household income quintile. Household income quintile is an ordinal variable with five categories — poorest, poorer, middle, richer and richest. Additionally, we controlled for variables that have been identified in the literature as important correlates of health care service utilisation (Gelberg, Andersen, & Leake, 2000). The following variables were selected as controls: age; gender coded (1=Male, 2=Female); education coded (0=No formal education, 1=Primary, 2=Secondary, 3=College/University); marital status coded (1=Married, 2=Separated/Divorced, 3=Widowed, 4=Never Married); ethnicity coded (1=Akan, 2=Ewe, 3=Ga-Adangbe, 4=Gruma, 5=Mole-Dagbani, 6=Other ethnic group); religion coded (1=Christian, 2=Muslim, 3=Traditional, 4=Other religion, 5=None); and location of residence coded (1=Urban, 2=Rural). In addition to the above socio-economic and demographic factors, we also controlled for self-reported prevalence of chronic conditions among respondents. Disease prevalence or conditions constitute a need for health care access and tends to influence health care behaviours (Andersen & Newman, 1973; Gerdle, Björk, Henriksson, & Bengtsson, 2004). Thus, the following chronic conditions were used: ever been diagnosed with arthritis coded (0=No, 1=Yes); ever been diagnosed with angina coded (0=No, 1=Yes); ever been diagnosed with hypertension coded (0=No, 1=Yes), ever been diagnosed with stroke coded (0=No, 1=Yes); ever been diagnosed with diabetes coded (0=No, 1=Yes) and ever been diagnosed with asthma coded (0=No, 1=Yes). Missing cases made up less than 1% for most variables and were deleted from our analysis.

***Analytical strategy***

Descriptive and multivariate techniques were employed for the analysis. Specifically, we use logit models given the dichotomous nature of our outcome variable. Standard regression techniques such as logit models are built under the assumption of independence of subjects. However, the SAGE has a hierarchical structure with respondents nested within clusters which could potentially produce biased standard errors. We handled this problem by using STATA 12SE to impose a 'cluster' variable — typically respondents' ID numbers on our models. This technique adjusts the standard errors thereby producing statistically robust parameter estimates (see Tenkorang & Owusu, 2010). We report exponentiated beta coefficients (Odds ratios) in Tables 2 and 3 which show results of bivariate and multivariate analyses respectively. Two multivariate models are built to examine the relationship

between health insurance coverage and wealth status. In Model 1, we control for respondents' socioeconomic and demographic factors and Model 2, self-reported chronic conditions. The analyses adjusted for the sample weights included in the data.

## Results

### *Univariate*

Table 1 presents the distribution of the study participants as well as chi-squared tests describing the relationship between health insurance coverage and selected explanatory factors. The average age of respondents was about 76 years and females constitute the largest proportion of the sample (56%). Respondents who were married or cohabiting constitute the largest proportion of the insured, whiles those who were widowed constitute the largest proportions of the uninsured. Compared with the uninsured, insured respondents are relatively well educated, worked in the public and informal sectors of the economy, are wealthier and resided in urban areas. The results also indicated that uninsured elderly have higher rates of chronic conditions.

**<<<Insert Table 1>>>**

### *Bivariate*

Table 2 shows bivariate relationships between health insurance coverage and selected independent variables. Wealth status was significantly associated with health insurance coverage. Specifically, respondents in the middle, poorer and poorest income quintiles were all less likely to have health coverage compared to their counterparts in the richest income quintile. Separated or divorced individuals were 39% less likely to have insurance coverage compared to the married. Compared to Akans, Ga-Adangbes and those in the 'Other' ethnicity category had lower odds of insurance coverage. Relative to Christians, Traditionalist and respondents with no religion were 0.33 and 0.32 times less likely to have health insurance, respectively. Respondents residing in rural areas had lower odds of insurance coverage compared to those in urban areas. In the bivariate analysis, three of the five selected chronic conditions were significantly associated with the likelihood of health insurance coverage. Individuals who indicated they were hypertensive, had diabetes and asthma had higher odds of health insurance coverage compared to those without these conditions.

**<<<Insert Table 2>>>**

***Multivariate***

In Model 1 of the multivariate analysis, the observed relationship between health insurance coverage status and income quintile persisted. Respondents in the Middle and Poorest income quintiles were 39% and 42% less likely to have health insurance coverage compared to those in the Richest wealth quintile, respectively (OR=0.61, ρ<0.05; and OR=0.57, ρ<0.05, respectively).

Some control variables were also statistically associated with health insurance coverage in Model 1. Specifically, marital status, occupation, ethnicity, religion and location of residence were significantly associated with health insurance coverage among the elderly. Separated and divorced individuals were less likely to have health insurance compared to those who are married or cohabiting (OR=0.56, ρ<0.01). Respondents engaged in the informal sector had higher odds of having health insurance compared to those who are self-employed (OR=1.61, ρ<0.05). Ga-Adangbes compared to Akans were less likely to have health insurance (OR=0.60, ρ<0.05). Traditionalists compared to their Christian counterparts were 61% less likely to have health insurance coverage (OR=0.39, ρ<0.001). Respondents belonging to 'Other' religious groups were less likely to have health insurance compared to Christians (OR=0.44, ρ<0.05). Those without any religious affiliation were also less likely to have health insurance coverage compared to Christians (OR=0.35, ρ<0.01). Respondents who live in rural areas had lower odds of health insurance coverage compared to those in urban areas (OR=0.75, ρ<0.05).

The final model added self-reported prevalence of chronic conditions. The association between wealth (the focal independent variable) and health insurance coverage was statistically robust. We found that respondents in the Middle income quintile compared to those in the Richest income quintile had 0.62 lower odds of health insurance coverage (OR=0.62, ρ<0.05). Also, the Poorest respondents were significantly less likely to have health insurance coverage compared to the Richest respondents (OR=0.58, ρ<0.05).

**<<<Insert Table 3>>>**

Apart from location of residence, all the socioeconomic and demographic control variables which were significant in Model 1 remained statistically robust in Model 2 (see Table 3). For example, for marital status, separated and divorced respondents were significantly less likely to have health insurance coverage compared to those who are married or cohabiting (OR=0.56, ρ<0.01); whilst for occupation, informal sector workers were significantly more likely to have health insurance

compared to those in who are self-employed (OR=1.66, ρ<0.05). Ga-Adangbes were significantly less likely to have health insurance coverage compared to Akans (OR=0.59, ρ<0.01). Compared to Christians, adherents of the Traditional religion were 0.39 times less likely to have health insurance coverage; whilst those who belong to the 'Other' religious faiths were 0.46 times less likely to have health insurance compared to Christians. The elderly who have no religious affiliation were each less likely to have health insurance coverage compared to their Christian counterparts (OR=0.36, ρ<0.01). Unlike in the bivariate analysis, only one of the selected chronic conditions was significantly associated with the likelihood of health insurance coverage among respondents in the multivariate analysis. Respondents with asthma were 1.84 times more likely to have health insurance coverage compared to those who indicated they did not have the condition (OR=1.84, ρ<0.05).

**Discussion**

This study examined disparities in health insurance coverage among the elderly in Ghana and found that extreme inequality exists regarding health insurance coverage mostly determined by respondents' wealth status. This finding is at variance with the pro-poor orientation and equity mandate of the NHIS that seeks to eliminate disparities in health care access within the population; particularly for vulnerable groups including the elderly. Health insurance is important for improving curative and preventive health care with implications for morbidity and mortality outcomes (Amin, Shah, & Becker, 2010; Gnawali et al., 2009; Jowett, Deolalikar, & Martinsson, 2004; Lei & Lin, 2009). Among the elderly this is even more salient because of the peculiar health care needs associated with aging. The introduction of the NHIS as a pro-poor policy with premium payment exemptions for persons 70 years and over was intended to help bridge the gap between the poor and rich in respect of health care access — a gap which was exacerbated by decades of practicing the 'cash-and-carry' system in Ghana (Agyepong & Adjei, 2008; James et al., 2006; Nyonator & Kutzin, 1999). Yet the findings here show that for the poorest elderly, poverty remains a barrier to health insurance enrolment.

In Ghana where the retirement age is 60 years and pensions tend to be generally low, removing financial barriers for the elderly is critical for improving health access. The implication of the findings here suggest that the NHIS' exemption policy in its current form may not have been very successful at bridging the gap between the poor and wealthy elderly regarding health insurance coverage. A couple of reasons are proposed here. First, it is possible that the observed differences may be due to the NHIS registration fee (the equivalent of about $1), which is required of everyone

regardless of premium exemption. Although this financial requirement for registration seems negligible, for the poor without any direct source of income, raising approximately $1 may be difficult. Second, the cost of registration might only be a fraction of the entire cost of getting registered (e.g. transportation cost to registration centres, unofficial payments, etc.). Further exploration of the data showed that majority of the elderly in this study who fall in the poor and middle wealth quintiles reside in rural areas unlike the richer and richest elderly Ghanaians who mostly reside in urban areas. This means the rural poor are faced with severe challenges of enrolling or getting covered; challenges that not only emanate from their poverty but also their location. Rural locations in Ghana tend to be highly underdeveloped and lacking basic facilities such as adequate roads, schools, good source of drinking water, electricity and health facilities. Thus, the utter lack of facilities in rural areas makes it difficult for older people in such locations to benefit from the exemption policy of the NHIS. Additionally, lack of identification and documentation, such as proof of age (i.e. birth certificate), often prevents older people from accessing the health exemption (HelpAge-International, 2008).

Some studies have suggested that the exemption policy of the NHIS favours people in certain groups — particularly the elderly and children — to the detriment of the poor (Derbile & Van Der Geest, 2013). Contrary to this, our findings show that even within supposed favoured groups such as the elderly, disparities in health insurance coverage based on wealth status exist. This is amidst mounting evidence that the rich continue to be the biggest beneficiaries from the introduction of the NHIS (Amoako Johnson, Frempong-Ainguah, & Padmadas, 2015; Dixon, Tenkorang, Luginaah, Kuuire, & Boateng, 2014; Parmar, De Allegri, Savadogo, & Sauerborn, 2014).

Although not the central focus of this study, it is important to discuss, some selected socioeconomic and demographic factors (marital status, occupation, ethnicity and religion) that influenced health insurance coverage. The finding that widowed and separated respondents were less likely to have health insurance coverage compared to the married perhaps indicates the importance of social capital derived from marriage and how this affects health outcomes including access to important health services (Kawachi, Subramanian, & Kim, 2008). Spouses provide not only emotional support, but also financial resources to their partners in times of need and as a result may have improved health access and outcomes compared to the single and never married. This is more pronounced for the elderly who tend to have limited social networks and connections within their

communities ( Laporte, Nauenberg, & Shen, 2008; Parmar, Williams, et al., 2014; Ramlagan, Peltzer, & Phaswana-mafuya, 2013).

Regarding employment, some studies have documented that employees in the informal sector may be excluded from enrolling in health insurance due to challenges of affordability (Derbile & Van Der Geest, 2013; Gajate-garrido & Owusua, 2013). For example Gajate-garrido and Owusua (2013), argue that many in the informal sector in developing economies such as Ghana are poor. Yet, they are not categorized as indigents and are expected to pay premium. In the face of poverty, such payments may serve as a barrier for enrolment. However, our study showed that the elderly in the informal sector were more likely to have health insurance coverage. As the retirement age in Ghana is set at 60 years, it is mostly the case that Ghanaians who retire still remain economically active well beyond their retirement age and may be engaged in the informal sector (Ahadzie, 2009; Gha na Statistical Service (GSS), 2013). Income derived from such engagements may facilitate health insurance enrolment among this group.

With regards to ethnicity, it was found that Ga-Adangbes were less likely to enrol in NHIS compared to Akans. A cross-classification of ethnicity and wealth status showed that the majority of Akans were in the middle income category compared to Ga Adangbes who mostly fell in the poorer and poorest wealth quintiles. Also, relatively higher proportions of Akans resided in urban areas whilst the majority of Ga-Adangbes resided in rural areas. It is evident that the ethnic difference in health insurance enrolment is an artefact of the socio-economic differences existing between the two ethnic groups.

Evidence on the relationship between religion and health insurance coverage in Ghana is mixed. For instance, Jehu-Appiah et al. (2011) found that Muslims were more likely to be covered by NHIS. Contrary to this, some other studies demonstrate Muslims, Traditionalists and respondents with no religion were less likely to be covered by NHIS compared to Christians (Dixon, Luginaah, et al., 2014a; Dixon, Luginaah, & Mkandawire, 2014b; Jehu-Appiah, Aryeetey, Agyepong, Spaan, & Baltussen, 2012). Our findings are consistent with several other studies that show Traditionalists, and respondents belonging to 'Other' faiths, or have no religious affiliation, were less likely to have health insurance coverage compared to Christians. Some research in Ghana suggests that Christians are more likely to accept and patronize western or mainstream health services compared to their counterparts in other religions (Gyimah, Takyi, & Addai, 2006). Gyimah and colleagues explain that this may be due to theological differences between religions where the norms of some religious

groups may encourage certain attitudes toward western medicine. It is also the case that the observed differences may reflect socio-economic gaps between Christians and people in other religious denominations. This is more the case when this analysis indicated Christians tend to be more educated and wealthier than Traditionalists, people of 'Other' religions and those with no religious affiliations.

The findings on the relationship between health insurance status and chronic conditions among the elderly were interesting. Among the selected chronic conditions, only asthma had a significant association with health insurance status. Asthmatic respondents were more likely to have insurance coverage. The reasons for this observation is unclear. A potential explanation may be due to the relative ease in understanding the signs of asthma, compared to determining the associated symptoms of hypertension, diabetes, angina, and stroke. Since asthma is easily diagnosed, those with asthma perhaps recognised the need to obtain health insurance coverage because they understand they are more likely to need health care. As a result, they may be more likely to obtain health insurance coverage. Additionally, unlike the other chronic diseases (i.e. hypertension, angina, stroke, diabetes and arthritis), which are generally associated with lifestyle and also tend to occur later in life, asthma usually manifests itself relatively much early in life. Perhaps, these differences might be responsible for the findings obtained in this study.

**Limitations and Conclusions**

While this study presents important findings, certain limitations exist. The study relies on the first wave of SAGE data, which is cross-sectional, and as a result causal links cannot be established from these findings. Further, the analysis did not control for distance to health facility or health insurance registration locations, as this information was unavailable in the data.

In spite of the stated limitations, this study offers new insights on the determinants of health insurance coverage among the elderly in the context of the premium exemption policy, revealing that socio-economic barriers to insurance coverage persist despite the exemption policy for the elderly. Our findings bode well for Ghana's National Aging Policy developed in 2010 aimed at improving the health and nutrition of the elderly population (Government of Ghana, 2010). Policy makers must pay particular attention to barriers beyond initial enrollment fees and consider broader systemic issues of health infrastructure, distance and costs of transportation to health services, social support and prevention mechanisms, and yearly renewal fees.

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**Table 1: Distribution of elderly health insurance status by selected explanatory factors (n=1,534)**

| | Total | Uninsured | Insured | P-value |
|---|---|---|---|---|
| | Percent % | Percent% | Percent % | |
| **Income quintile** | | | | P<0.001 |
| Richest | 16 | 11.8 | 20.7 | |
| Richer | 18.4 | 14.2 | 23 | |
| Middle | 21.2 | 22.6 | 19.7 | |
| Poorer | 22.6 | 25.1 | 20 | |
| Poorest | 21.8 | 26.4 | 16.7 | |
| **Gender** | | | | P>0.05 |
| Male | 44.3 | 44 | 44.7 | |
| Female | 55.7 | 56 | 55.3 | |
| **Marital Status** | | | | P<0.05 |
| Married | 41.3 | 38.6 | 44.3 | |
| Separated/divorced | 12.1 | 13.9 | 10.2 | |
| Widowed | 44.7 | 45.9 | 43.5 | |
| Never married | 1.8 | 1.6 | 2 | |
| **Educational level** | | | | P<0.01 |
| No formal education | 75.5 | 79.2 | 71.5 | |
| Primary | 13.8 | 12.3 | 15.4 | |
| Secondary | 9.3 | 7.9 | 10.9 | |
| college/Uni | 1.4 | 0.6 | 2.3 | |
| **Main Occupation** | | | | P<0.05 |
| Self-employed | 74 | 76.4 | 71.3 | |
| Public sector | 6.9 | 5.8 | 8.2 | |
| Private sector | 2.2 | 2.6 | 1.8 | |
| Informal Sector | 16.9 | 15.2 | 18.8 | |
| **Ethnicity** | | | | P<0.001 |
| Akan | 44 | 39 | 49.5 | |
| Ewe | 7.1 | 7.3 | 6.9 | |
| Ga-Adangbe | 9.3 | 10.5 | 8 | |
| Gruma | 3.8 | 3.9 | 3.7 | |
| Mole-Dagbani | 2.3 | 3.3 | 1.2 | |
| Other | 33.5 | 36.1 | 30.7 | |
| **Religion** | | | | P<0.001 |
| Christian | 60.1 | 52.8 | 68.1 | |
| Muslim | 14.7 | 15.7 | 13.6 | |
| Traditional | 11.3 | 15.7 | 6.7 | |
| Other | 8.9 | 9 | 8.8 | |
| None | 5 | 6.9 | 2.9 | |
| **Location** | | | | P<0.001 |

| | | | | |
|---|---|---|---|---|
| Urban | 37.5 | 31.8 | 43.8 | |
| Rural | 62.5 | 68.2 | 56.3 | |
| **Arthritis** | | | | P<0.05 |
| No | 82.6 | 85 | 80 | |
| Yes | 17.4 | 15 | 20 | |
| **Angina** | | | | P>0.05 |
| No | 96.1 | 96.7 | 95.4 | |
| Yes | 3.9 | 3.3 | 4.6 | |
| **Hypertension** | | | | P<0.001 |
| No | 86 | 89.8 | 81.9 | |
| Yes | 14 | 10.2 | 18.1 | |
| **Stroke** | | | | P>0.05 |
| No | 96.5 | 97 | 96.1 | |
| Yes | 3.5 | 3 | 3.9 | |
| **Diabetes** | | | | P<0.01 |
| No | 96.5 | 97.9 | 95.1 | |
| Yes | 3.5 | 2.1 | 4.9 | |
| **Asthma** | | | | P<0.05 |
| No | 95.3 | 96.6 | 93.9 | |
| Yes | 4.7 | 3.4 | 6.1 | |

**Table 2: Bivariate Logistic regression of health insurance status among the elderly (n=1,534)**

| | Bivariate Analysis |
|---|---|
| VARIABLES | |
| | **OR (Robust Std.Err)** |
| **Income quintile (ref: Richest)** | |
| Richer | 1.08(0.23) |
| Middle | 0.58(0.12)** |
| Poorer | 0.56(0.11)** |
| Poorest | 0.45(0.09)*** |
| **Age** | 1.00(0.01) |
| **Gender (ref: Male)** | |
| Female | 0.87(0.10) |
| **Marital Status (ref: Married)** | |
| Separated/divorced | 0.61(0.12)** |
| Widowed | 0.80(0.12) |
| Never married | 0.84(0.36) |
| **Educational level (ref: No formal education)** | |
| Primary | 1.25(0.22) |
| Secondary | 1.41(0.30) |
| college/Uni | 2.09(1.22) |
| **Main Occupation (ref: Self-employed)** | |
| Public sector | 1.23(0.30) |
| Private sector | 0.61(0.25) |
| Informal Sector | 1.26(0.20) |
| **Ethnicity (ref: Akan)** | |
| Ewe | 0.72(0.17) |
| Ga-Adangbe | 0.52(0.11)** |
| Gruma | 0.66(0.21) |
| Mole-Dagbani | 0.43(0.20) |
| Other | 0.71(0.10)* |
| **Religion (ref: Christian)** | |
| Muslim | 0.71(0.13) |
| Traditional | 0.33(0.071)*** |
| Other | 0.73(0.16) |
| None | 0.32(0.10)*** |
| **Location (ref: Urban)** | |
| Rural | 0.62(0.08)*** |
| **Arthritis (ref: No)** | |
| Yes | 1.30(0.21) |
| **Angina (ref: No)** | |
| Yes | 0.98(0.32) |
| **Hypertension (ref: No)** | |

| | |
|---|---|
| Yes | 1.60(0.28)** |
| **Stroke (ref: No)** | |
| Yes | 1.54(0.49) |
| **Diabetes (ref: No)** | |
| Yes | 2.03(0.65)* |
| **Asthma (ref: No)** | |
| Yes | 1.86(0.53)* |

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

**Table 3: Multivariate Logistic regression of health insurance status among the elderly (n=1,534)**

| VARIABLES | Model (1) | Model (2) |
|---|---|---|
| | AOR (Robust Std.Err) | AOR (Robust Std.Err) |
| **Income quintile (ref: Richest)** | | |
| Richer | 1.12(0.25) | 1.12(0.25) |
| Middle | 0.61(0.14)* | 0.62(0.14)* |
| Poorer | 0.67(0.15) | 0.68(0.16) |
| Poorest | 0.57(0.13)* | 0.58(0.14)* |
| **Age** | 0.90(0.12) | 0.90(0.12) |
| **Gender (ref: Male)** | | |
| Female | 1.01(0.17) | 0.97(0.17) |
| **Marital Status (ref: Married)** | | |
| Separated/divorced | 0.56(0.12)** | 0.56(0.12)** |
| Widowed | 0.76(0.13) | 0.76(0.14) |
| Never married | 0.80(0.35) | 0.81(0.36) |
| **Educational level (ref: No formal education)** | | |
| Primary | 1.00(0.17) | 0.96(0.18) |
| Secondary | 0.970(0.250) | 0.94(0.25) |
| college/Uni | 1.08(0.74) | 1.01(0.69) |
| **Main Occupation (ref: Self-employed)** | | |
| Public sector | 0.83(0.240) | 0.86(0.25) |
| Private sector | 0.52(0.244) | 0.50(0.24) |
| Informal Sector | 1.61(0.35)* | 1.66(0.36)* |
| **Ethnicity (ref: Akan)** | | |
| Ewe | 0.83(0.21) | 0.83(0.21) |
| Ga-Adangbe | 0.60(0.14)* | 0.59(0.13)* |
| Gruma | 0.56(0.19) | 0.55(0.19) |
| Mole-Dagbani | 0.55(0.28) | 0.54(0.26) |
| Other | 1.01(0.21) | 1.07(0.23) |
| **Religion (ref: Christian)** | | |
| Muslim | 0.64(0.15) | 0.64(0.15) |
| Traditional | 0.39(0.09)*** | 0.39(0.09)*** |
| Other | 0.44(0.14)* | 0.46(0.15)* |
| None | 0.35(0.11)** | 0.36(0.12)** |
| **Location (ref: Urban)** | | |
| Rural | 0.75(0.11)* | 0.76(0.11) |
| **Arthritis (ref: No)** | | |
| Yes | | 1.31(0.23) |
| **Angina (ref: No)** | | |
| Yes | | 0.97(0.35) |
| **Hypertension (ref: No)** | | |

| | | |
|---|---|---|
| Yes | | 1.13(0.23) |
| **Stroke (ref: No)** | | |
| Yes | | 1.21(0.39) |
| **Diabetes (ref: No)** | | |
| Yes | | 1.66(0.55) |
| **Asthma (ref: No)** | | |
| Yes | | 1.84(0.56)* |
| *Log pseudo-likelihood* | -663233.32 | -658808.43 |
| Model significance (Wald $X^2$) | 80.05*** | 88.56*** |
| Pseudo $R^2$ | 0.0589 | 0.0652 |
| Constant | 2.513(0.645)*** | 2.197(0.579)*** |
| Observations | 1,534 | 1,534 |

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