Family Support, Perceived Physical Activeness and Chronic Non-Communicable Diseases as Determinants of Formal Healthcare Utilization Among Older Adults with Low Income and Health Insurance Subscription in Ghana

Family support, perceived physical activeness and non-communicable diseases influence formal healthcare utilization among older adults with low income and health insurance subscription in Ghana

Abstract

Evidence suggests that enrollment in a health insurance scheme is associated with higher levels of formal healthcare utilization among older adults, especially those with low income in sub-Saharan Africa (SSA), including Ghana. This study examines the prevalence of formal healthcare utilization and associated factors among older adults with low income and health insurance subscription enrolled in a social intervention programme (known as the Livelihood Empowerment Against Poverty [LEAP] programme) in Ghana. Cross-sectional data were obtained from an Aging, Health, Lifestyle and Health Services Survey conducted in 2018 among 200 older adults aged 65 years and above enrolled in the LEAP programme. The results showed that almost 9 in 10 (87%) older adults utilized formal healthcare services for their health problems. Older adults who received family support, perceived themselves to be physically active compared with other older adults on the LEAP programme and those with non-communicable diseases (NCDs) were significantly more likely to utilize formal healthcare services. We recommend that health policies and programmes for older adults with low income and health insurance subscription under the LEAP programme should consider the roles of family support, physical activeness and NCDs in influencing their use of formal healthcare services.

Keywords: Formal healthcare utilization; Older adults with low income; Health insurance scheme; Ageing; Ghana.

Key Points:

- About 13% of older adults with low income and health insurance subscription enrolled in the LEAP programme in Ghana do not utilize formal healthcare.
- Older adults with family support were more likely to utilize formal healthcare services.
- Self-perceived physical activeness was associated with formal healthcare utilization.
- Having non-communicable diseases was associated with formal healthcare utilization.
- Policies and programmes should be developed to promote formal healthcare utilization among older adults with low income and health insurance subscription.

Introduction

The clarion call by the United Nations' Sustainable Development Goals (SDGs) (goal 3) has become the touchstone for promoting health and well-being (United Nations [UN], 2015). Understanding the factors that influence the utilization of formal healthcare services among older adults may contribute to achieving goal 3 of the SDGs outlined in the 2030 Agenda for Sustainable Development (UN, 2019a). Ageing has been identified as one of the four global demographic factors [population growth, population ageing, international migration, and urbanization] that has lasting impacts on development (UN, 2019a). The global population of older adults is expected to double over the next three decades, reaching 1.5 billion by 2050 (UN, 2019b).

Projections have shown that approximately 8 in 10 older adults will live in low- and middle-income countries by 2050 (World Health Organization, 2022). While Eastern and South-Eastern Asia have the greatest proportion of the world's older adult population, sub-Saharan Africa (SSA) is expected to experience the second fastest increase in the number of older adults, with a projected increase from 32 million in 2019 to 101 million by 2050 (UN, 2019b). Similarly, Ghana is noted to have one of the largest and fastest-growing older adult populations in SSA (Ghana Statistical Service, 2013; Nabalamba & Chikoko, 2011). The current proportion of older adults aged 60 years and above in Ghana is 6.4% (Ghana Statistical Service, 2021). This trend necessitates the strengthening of healthcare systems as well as the development of robust policies and programmes to improve the health of older people (Kowal & Byles, 2015; He et al., 2016).

Non-communicable diseases (NCDs) such as cancers, respiratory ailments, diabetes, and cardiovascular conditions are the leading causes of late-life mortalities worldwide (Chang et al., 2019; Cheng et al., 2020). Available evidence suggests that as people grow older, their immune systems become weak, making them vulnerable to diseases such as hypertension, respiratory

diseases, and diabetes (Liu et al., 2020; Arthur-Holmes & Agyemang-Duah, 2020; Awuviry-Newton et al., 2020a; Heymann & Shindo, 2020; Lachytova et al., 2017). As a result of the increasing prevalence of non-communicable diseases with increasing age, older adults utilize more formal healthcare services than with the younger subpopulation groups (Kalseth & Halvorsen, 2020; Wyman et al., 2017). Lopreite and Mauro (2017) indicate that Italy's health expenditure was primarily driven by the country's older population's use of formal healthcare services.

In Ghana, diabetes, cancers, hypertension, arthritis, and stroke predominantly influence older adults' choice of seeking formal healthcare services (Ayernor, 2012; Awuviry-Newton et al., 2020b). Ayernor's (2012) study on the non-communicable disease burden of older adults in Ghana reported appreciable percentage of participants (50+years) living with hypertension (33%) and arthritis (14%). Also, Awuviry-Newton's et al. (2020b) sampled older adults from hospital setting in Ghana and reported chronic conditions such as diabetes, stroke, ulcers, cancer, hypertension, kidney disease, asthma, heart disease, lung disease and cardiomyopathy among them. To manage these conditions, older adults are required to frequently utilize formal healthcare services.

Notwithstanding their need for formal healthcare services, older adults are sometimes financially constrained which hinders their utilization of formal healthcare services (Agyemang-Duah et al. 2019a; Oduro Appiah et al., 2020a). The World Health Organization (2015) suggests that higher proportions of older adults face financial stress due to direct out-of-pocket health expenditures. Similarly, Agyemang-Duah et al. (2019a) found that most older adults in Ghana are unable to access the required healthcare due to limited income. Furthermore, despite the relevance of family support in formal healthcare utilization, access to family support among older adults in Ghana is limited (Agyemang-Duah et al., 2020a; Braimah & Rosenberg, 2021). Yet, like the general population, older adults in Ghana experience poverty which ultimately impacts on their

access to healthcare (Gyasi & Phillips, 2018; Gyasi & Phillips, 2020). Thus far, the limited access to healthcare services has led to the introduction of social intervention programmes (such as the National Health Insurance Scheme [NHIS] and the Livelihood Empowerment Against Poverty [LEAP)] programme) in Ghana (Otieno et al., 2022).

Ghana implemented the National Health Insurance Scheme in 2003 to eliminate financial barriers that impede access to preventive and curative medical services among marginalised populations (including older adults with low income) (Adei et al., 2019; Morgan et al., 2022). Social Security and National Insurance Trust (SSNIT) retirees, people aged 70 years and over, pregnant women, children under the age of 18 and indigents (such as all LEAP beneficiaries, persons with disabilities and older adults in the non-formal sector) are enrolled in the NHIS with no financial charges (National Health Insurance Authority, 2022a). Available statistics about NHIS' coverage of older adults in Ghana vary depending on the reporting institution. For instance, the Ghana Living Standards Survey (GLSS) 2012-2013 report indicates that more females (62%) than males (53%) are beneficiaries of the NHIS in Ghana (Van der Wielen et al., 2018). However, the World Health Organization Study on Global Ageing and Adult Health data point to an estimated 38% for older males and 37% for females enrol in the NHIS (van der Wielen et al., 2018). The NHIS covers approximately 95% of disease conditions (such as malaria, diarrhoea, respiratory tract infections, skin diseases, hypertension, diabetes, and asthma) (National Health Insurance Authority, 2022b). On the other hand, the LEAP programme, funded by the World Bank, the United Nations International Children's Emergency Fund and the Government of Ghana, offers unconditional cash transfers to extremely poor households with no productive capacity, including people aged 65 years or over (Peprah et al., 2017). The LEAP programme beneficiaries receive bi-monthly transfers ranging from GH¢64 to GH¢106 (approximately US$ 5.42.42 to US$ 8.98 as at 08 May

2023) (Agyemang-Duah et al., 2019b). The LEAP programme allows beneficiaries to enrol in the NHIS for free (without subscription payment) with the goal of improving access and utilization of healthcare services (Oduro Appiah et al., 2020a). Against this backdrop, studies have focused on the determinants of formal healthcare utilization among older adults in Ghana (Awoke et al., 2017; Dei & Sebastian, 2018; Lartey et al., 2020; Nwakasi et al., 2019; Yamson et al., 2021), and older adults with low income in Ghana (Agyemang-Duah et al., 2019a; Agyemang-Duah et al., 2019b; Agyemang-Duah et al., 2019c; Agyemang-Duah et al., 2020a). These scientific publications suggest that education, gender, age, social status, marital status, ethnicity, religion, family size, employment and monthly income are associated with formal healthcare utilization among older adults (Agyemang-Duah et al., 2020a; Awoke et al., 2017; Dei & Sebastian, 2018; Lartey et al., 2020; Nwakasi et al., 2019; Yamson et al., 2021). However, there is a dearth of literature on the factors that influence formal healthcare utilization among older adults with low income and health insurance subscription enrolled in a social intervention programme (including the LEAP programme). Accordingly, the aim of this paper is to investigate the determinants of formal healthcare utilization among older adults with low income and health insurance subscription enrolled in the LEAP programme in Ghana. Understanding the determinants of formal healthcare utilization among older adults with low income and health insurance subscription under the LEAP programme will provide invaluable insights for public healthcare planning for economically disadvantaged older adults.

Methods

Sampling procedure and data collection

This study used data from a cross-sectional survey ―Ageing, Health, Lifestyle and Health Services (AHLHS) survey on the determinants of healthcare utilization among older adults with low income conducted between 01 June 2018 and 20 June 2018 in the Atwima Nwabiagya District (now Atwima Nwabiagya Municipality and Atwima Nwabiagya North District, Ghana). Details about the AHLHS survey have been reported elsewhere (Agyemang-Duah, 2018). In this study, Atwima Nwabiagya District represents both Atwima Nwabiagya Municipality and Atwima Nwabiagya North District. Older adults with low income were defined as individuals who have attained 65 years or above and receive financial support under the LEAP programme. This definition corroborates with previous studies and the criteria for classifying an individual as an older adult under the LEAP programme in Ghana (see Oduro Appiah et al., 2020a; Agyemang-Duah et al., 2020a; Agyemang-Duah et al., 2023). The LEAP programme was used to identify and recruit participants. As far as we are aware, data on the number of older adults aged 65 years or above who are enrolled in the LEAP programme in Ghana have not yet been reported in the literature. However, in the study area, 401 older adults aged 65 years or above are enrolled in the LEAP programme (Agyemang-Duah et al., 2019d). Poverty is a multidimensional concept and can be defined based on contextual realities. Ghana has two poverty lines; an upper one below which a person is deemed unable to meet all food and non-food needs, and a lower poverty line below which an individual is regarded unable to even meet their food needs. The upper poverty line is set at GH₵1,314 (US$111.35 as of 8 May 2023) per adult per year for 2013, and households below it are simply referred to as living in poverty. The lower poverty line is set at GH₵792 (US$67.12

as of 8 May 2023) per adult per year, and households below it are referred to as living in extreme poverty (Ghana Statistical Service, 2018; Ghana Statistical Service, 2016).

The AHLHS survey recruited 200 participants from 16 communities using cluster and simple random sampling techniques. The sample size was obtained based on power calculation with an alpha value of 0.05. Details of the calculation and the selection of the study communities have been reported in previous studies (see Agyemang-Duah et al., 2019d; Agyemang-Duah et al, 2020a). Out of the 200 participants, 192 were enrolled in the health insurance scheme. Thus, the sample size for this study was 192 participants. Interviewer-administered questionnaire was used to collect data from the older adults with low income. The questionnaires were developed in English Language but read in the local language (Twi) to ensure better understanding and interpretations on the part of the participants (Agyemang-Duah et al., 2020b). The explanation of the translation processes and the validity of the data collection instrument have been reported in a previously published work (Agyemang-Duah et al. 2019d). Each interview lasted between 30 to 40 minutes. Three field research assistants were recruited to help with the data collection exercise after receiving a two-day training. The rationale of the training was to ensure quality control and to ensure that the research ethics procedures are complied with during the field survey. Before the start of the data collection, we sought both written and verbal consent from the participants. The Committee on Human Research Publication and Ethics (CHRPE), KNUST School of Medical Sciences and Komfo Anokye Teaching Hospital, Kumasi, Ghana gave ethical approval for the study (Reference: CHRPE/AP/311/18).

Measures

Outcome variable

In this study, formal healthcare utilization was the outcome variable. Formal healthcare utilization was conceptualized as seeking medical treatment from a trained health professional at a facility such as hospitals, clinics, or health centres. Formal healthcare utilization was measured as a dichotomous variable indicating "utilization of healthcare services=1" or "non utilization of healthcare services=0" in the past year preceding the survey. This one-year estimation of formal healthcare utilization is consistent with previous studies (Tamayo-Fonseca et al., 2015; Gómez-Olivé et al., 2013; Agyemang-Duah et al., 2023).

Predictor Variables

The predictor variables were gender (1=male, 2= female), age (years) (1=65-74, 2=75-84, 3=85 or above), ethnicity (1=Akan, 2=non-Akan), religion (1=Christian, 2=non-Christian), marital status (1=single, 2=married), education (1=no formal education, 2=basic school education, 3=high school education), monthly income (GH¢) (1=100 or below, 2=101-200, 3=200 or more), family support (0=no, 1=yes), self-rated health (1=good health, 2=poor health), non-communicable diseases (0=no, 1=yes), tobacco use (0=no, 1=yes), alcohol usage (0=no, 1=yes), and physically active compared with other older adults (1=less active, 2=same, 3=more active). The measurement of the independent variables was done following previous studies on older adults with low income in Ghana (Oduro Appiah et al., 2020a, Oduro Appiah et al., 2020b).

Analysis

We used both descriptive and inferential statistics. Descriptive statistics such as percentages and frequencies were employed to describe the demographic, socio-economic and health characteristics of the participants as well as the prevalence of formal healthcare utilization. Multivariable logistic regression embedded in the Statistical Package for the Social Sciences (SPSS) (version 20) software was used as the inferential analytical framework to measure the demographic, socio-economic, health and lifestyle factors influencing formal healthcare utilization among older adults with low income and health insurance subscription in Ghana. All the analyses were considered significant at a p-value of ≤ 0.05.

Results

Sample characteristics of the respondents

Table 1 presents the sample characteristics of the participants. About 78% of the participants were females, 48.4 % were aged 65-74 years, 83.9% were of Akan ethnicity and 83.3% were affiliated to the Christian religion. Further, most of them were single (73.4%) and had no formal education (63.5%). Also, 36.5% earned GH¢100 or below a month, 50.5% rated their health status as good and 51% did not have any non-communicable diseases (see Table 1).

[Insert Table 1 here]

Prevalence of formal healthcare utilization among the participants

The prevalence of formal healthcare utilization among the participants is presented in Table 2. The results showed that 87% of the participants had utilized formal healthcare services for their health problems in the year preceding the survey. Nearly 50% of the participants had utilized

formal healthcare services five times or more in the year preceding the survey. The results further showed that 76.6% of the participants utilized public healthcare facilities compared with 23.4% who utilized private healthcare facilities. Concerning the sources of healthcare information, we found that most participants sought healthcare information from family members (54%), followed by friends (20.4%) and health professionals (14.4%) (see Table 2).

[Insert Table 2 here]

Determinants of formal healthcare utilization

Demographic, socio-economic, health-related and lifestyle factors influencing formal healthcare utilization among the participants were measured using multivariable logistic regression. Of all the eleven variables considered in the multivariable analysis, only three were statistically significant. Specifically, the study revealed that participants who received family support were 5.27 times significantly more likely to utilize formal healthcare services compared with those who did not receive family support (aOR: 5.27, CI: 1.22-22.7, p=0.026). Those who perceived themselves as physically active were 4.50 times significantly more likely to utilize formal healthcare services compared with those who perceived themselves to be less active (aOR: 4.50, CI: 1.16-17.4, p=0.030). We further found that participants with non-communicable diseases were 5.75 significantly more likely to utilize formal healthcare services compared with those who did not have non-communicable diseases (aOR: 5.75, CI: 1.59-20.8, p=0.008) (see Table 3).

[Insert Table 3 here]

Discussion

This study aimed to highlight the prevalence of, and factors influencing formal healthcare services use among older adults with low income and health insurance subscription enrolled in the LEAP programme in Ghana. Our findings revealed that a higher proportion (87%) of older adults utilized formal healthcare services. This finding is consistent with recent studies that found higher formal healthcare services utilization among older adults in Ghana (Amegbor et al., 2019; Wandera et al., 2015). Given the high levels of poverty among older adults in Ghana, enrolment in the NHIS programme has the potential to reduce out-of-pocket healthcare expenditure and provide a financial cushion in terms of the cost associated with seeking treatment among economically disadvantaged people, possibly explaining the higher utilization of formal healthcare service (Amegbor et al., 2019; Ghana Statistical Service, 2018). With evidence pointing to poor healthcare access among the general population in Ghana, these higher formal healthcare service use rates among older adults with low income may be indicative of the progress made by the health insurance policy towards promoting healthcare access in Ghana. In addition, a larger proportion (76.6%) of respondents reported utilizing public healthcare facilities quite frequently, with nearly half of them seeking healthcare from these facilities more than five times in the year. In Ghana, health service providers in public healthcare centers unlike the private health service providers are obligated to provide care for NHIS card bearers, which possibly explains their high patronage compared to private health facilities. Also, public healthcare centers and their services are generally more accessible in Ghana, especially in rural and remote areas than private hospitals and medical centers which may also be contributing to their high patronage by older adults (Agyemang-Duah et al., 2020c). Based on these findings, we posit that the NHIS policy may have

the potential to facilitate Ghana's efforts towards achieving universal health coverage and meeting the health goal of the 2030 agenda for global sustainable development.

We found support from family members to be associated with formal healthcare service utilization. Specifically, respondents with family support were more likely to utilize formal healthcare services than those without family support. Previous studies have found mixed relationships between family (social) support and formal healthcare use among older adults across different contexts. For instance, an integrative review in high income settings found no relationship between older adults' social relationships and healthcare utilization (Valtorta et al., 2018). In contrast, Gyasi et al. (2020) found in Ghana that community-dwelling older adults that have regular contact with family or close friends were more likely to utilize healthcare services than their counterparts that do not. In low-income settings like Ghana, older adults depend heavily on social networks, especially the family, for a range of support services (Braimah & Rosenberg, 2021).

Such support systems and services, such as informal caregiving have the potential to influence healthcare services use. Support from family can influence the utilization of healthcare services in several ways. For example, family members can serve as a source of information for their older adults' household members, which has the potential to increase healthcare use (Agyemang-Duah et al., 2020d). The family can also assist older adults with transportation to health facilities, especially in rural and remote communities in Ghana where geographical distance is a significant barrier to healthcare access (Atuoye et al., 2015; Braimah et al., 2019).

Consistent with previous research, our study found that perceived physical activeness influenced formal healthcare utilization. Physically active older adults were more likely to seek formal healthcare than non-active older adults, supporting existing findings (Jacobs et al., 2013). The relationship between physical activeness and healthcare use may be looked at from different

perspectives. Older adults who perceive themselves as physically active may be more likely to adopt healthy behaviors such as exercises and preventative services [regular medical check-ups] (Kang & Xiang, 2017). It could also mean that physically active older individuals are able to cope with long distance travel, particularly from remote localities to nearby towns to access needed healthcare services. Again, it is possible that those who consider themselves physically inactive are more likely to be physically isolated, and hence less likely to make use of available healthcare services (Valtorta & Hanratty, 2012). Further analysis is warranted to comprehensively delineate this finding.

Older adults with non-communicable diseases were found to have a higher likelihood of utilizing formal healthcare services. This finding is unsurprising and has been corroborated by previous studies in varying geographic contexts in SSA. For instance, Gyasi et al. (2020) observed a positive association between suffering from a chronic disease and healthcare use; arguing that health status determines healthcare use more than access to health insurance. In rural South Africa, Ameh et al. (2014) found that non-communicable diseases were associated with healthcare use among older adults who are over 50 years. Likewise, in Uganda, older adults reporting complex non-communicable diseases were found to be more likely to use healthcare services compared with older people without multiple morbidities (Wandera et al., 2015). Indeed, several of the non-communicable diseases affecting older adults require clinical assistance, which are mostly found in formal healthcare centers.

These findings provide invaluable insights for public health policy makers, clinicians, and other stakeholders to act effectively to make healthcare services more accessible to socioeconomically disadvantaged and marginalized populations, including older adults. While chronic conditions significantly influenced healthcare services use, complex non-communicable

diseases may affect the physical strength and activeness of older adults. Moreover, socially isolated older individuals are known to be more likely to experience complex chronic conditions (Asante & Vivian, 2023) and functional disabilities. Thus, those with compelling health needs have to seek care on a regular basis to manage existing health conditions (i.e., diagnosis of chronic disease). While LEAP has been successful in enhancing access among many of its beneficiaries, there remains a segment with unmet healthcare needs.

This study has a number of strengths worth noting. The results of the Hosmer and Lemeshow test of homogeneity, as well as the Omnibus Tests of Model Coefficients, indicated that the findings of the study and the model were robust. Therefore, our findings are discussed in relation to previous studies and further potential policy, practice, and research implications are elaborated. Whilst the impact of the national health insurance scheme on healthcare service use among older adults has been extensively explore, no study as far as we know has examined the factors associated with formal health service use among older adults with low income and health insurance subscription under the LEAP programme in Ghana. Therefore, our findings are vital in filling this research gap and highlighting the sociocultural and health conditions that influence healthcare use among older adults with low income and health insurance subscription in Ghana.

Limitations

The study is cross sectional, which limits our findings to statistical causal relationships. Therefore, we recommend the implementation of longitudinal study design and qualitative techniques to further understand the determinants of formal healthcare use among older adults with low income and health insurance subscription enrolled in the LEAP programme in Ghana. Additionally, this study is limited to the Atwima Nwabiagya District in Ghana, and so it will be beneficial for future studies to be conducted in other districts to capture the prevalence and determinants of formal

healthcare use among older adults with low income and health insurance subscription in distinct Ghanaian settings. Also, we examined access to formal healthcare services in general, therefore future studies could look at differences between access to preventive and curative medical services among older adults with low income and health insurance subscription to enhance health policy decisions.

Conclusion

In this study, we provide evidence on factors influencing formal healthcare use among older adults with low income and health insurance subscription enrolled in the LEAP programme in Ghana. Specifically, we observed that familial support, perceived physical activity, and NCDs status influence formal healthcare utilization among older adults with low income enrolled in Ghana's NHIS. As Ghana strives to attain equitable access to healthcare (universal access to health service) and to achieve the United Nations Decade of Healthy Ageing (2021-2030), our findings suggest that enrollment in the NHIS alone may not be sufficient to promoting formal healthcare use among older adults and demonstrate the need to pay attention to family support, self-perceived physical activeness, and non-communicable diseases among them. Based on these findings, we make a number of policy recommendations. Firstly, there is the need to improve coverage of the NHIS among older adults by revising the exemption criteria (persons above 70 years of age) to coincide with the retirement age of 60 to ensure that older adults under age 70 can be included. In addition, there is the need to empower families of older adults so that they can be better positioned to provide information and other social support services as well as encourage older adults to seek formal healthcare services. This may be achieved through educational programmes for families of these older adults that highlight their unique needs and behaviors and ways in which they can be supported to seek formal healthcare services.

Declaration

Ethics Approval and Consent to Participate

The Committee on Human Research Publication and Ethics (CHRPE), School of Medical Sciences, Kwame Nkrumah University of Science and Technology and Komfo Anokye Teaching Hospital, Kumasi, Ghana provided ethical clearance for the study (Ref: CHRPE/AP/311/18). Informed written and verbal consents were obtained from the study participants before data were collected. The procedures and protocol of the study were conducted according to the tenant of declaration of Helsinki. The study participants were also assured of strict confidentiality and anonymity of the data they provided.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare that they have no conflict of interest.

References

Agyemang-Duah, W., Asante, D., Oduro Appiah, J., Morgan, A. K., Mensah, I. V., Peprah, P., & Mensah, A. A. (2023). System, institutional, and client-level factors associated with formal healthcare utilisation among older adults with low income under a social protection scheme in Ghana. *Archives of Public Health*, *81*(1), 68.

Adei, D., Agyemang-Duah, W., & Mensah, A. A. (2019). Predictors of enrollment in a health protection scheme among informal sector workers in Kumasi Metropolis of Ghana. *BMC Research Notes*, *12*(758), 1–6. https://doi.org/10.1186/s13104-019-4782-2

Agyemang-Duah, W. (2018). Determinants of health care use among poor older persons: a case of the livelihood empowerment against poverty recipients in the Atwima Nwabiagya District [MSc. Thesis, unpublished]. *KNUST, Kumasi, Ghana*.

Agyemang-Duah, W., Peprah, C. & Peprah, P. (2019a). Barriers to formal healthcare utilisation among poor older people under the livelihood empowerment against poverty programme in the Atwima Nwabiagya District of Ghana. *BMC Public Health* 19, 1-12.

Agyemang-Duah, W., Peprah, C., & Peprah, P. (2019b). "Let's talk about money": How do poor older people finance their healthcare in rural Ghana? A qualitative study. *International Journal for Equity in Health*, *18*(1), 1–12. https://doi.org/10.1186/s12939-019-0927-0

Agyemang-Duah, W., Mensah, C. M., Peprah, P., Arthur, F., & Abalo, E. M. (2019c). Facilitators of and barriers to the use of healthcare services from a user and provider perspective in

Ejisu-Juaben Municipality, Ghana. *Journal of Public Health [SPRINGER]*, *27*(2), 133-142.

Agyemang-Duah, W., Peprah, C., & Arthur-Holmes, F. (2019d). Prevalence and Patterns of Health Care Use Among Poor Older People Under the Livelihood Empowerment Against Poverty Program in the Atwima Nwabiagya District of Ghana. *Gerontology and Geriatric Medicine*, *5*, 1-13

Agyemang-Duah, W., Peprah, C., & Arthur-Holmes, F. (2020a). Predictors of healthcare utilisation among poor older people under the livelihood empowerment against poverty programme in the Atwima Nwabiagya District of Ghana. *BMC Geriatrics*, *20*(79), 1–11. https://doi.org/10.1007/s10708-020-10255-8

Agyemang-Duah, W., Adei, D., Oduro Appiah, J., Peprah, P., Fordjour, A. A., Peprah, V., & Peprah, C. (2020b). Communication barriers to formal healthcare utilisation and associated factors among poor older people in Ghana. *Journal of Communication in Healthcare*, 1-9.

Agyemang-Duah, W., Peprah, C., & Peprah, P. (2020c). Factors influencing the use of public and private health care facilities among poor older people in rural Ghana. *Journal of Public Health*, *28*(1), 53-63

Agyemang-Duah, W., Arthur-Holmes, F., Peprah, C., Adei, D., & Peprah, P. (2020d). Dynamics of health information-seeking behaviour among older adults with very low incomes in Ghana: a qualitative study. *BMC Public Health*, *20*(1), 1-13.

Asante, D., Asante, B., Addai, B., Agyemang-Duah, W., & Ankrah Twumasi, M. (2022). Effect of financial services access on health services utilisation among rural older adults in Ghana. *International Journal of Social Welfare*, *31*(4), 492-505.

Asante, D., & Isaac, V. (2023). Gender differences in the association between living alone, chronic disease and health service use. *Journal of suicidology*, *18*(1), 434-440.

Amegbor, P. M., Kuuire, V. Z., Bisung, E., & Braimah, J. A. (2019). Modern or traditional health care? Understanding the role of insurance in health-seeking behaviours among older Ghanaians. *Primary Health Care Research & Development*, *20*(e71), 1–8. https://doi.org/10.1017/S1463423619000197

Ameh, S., Gómez-Olivé, F. X., Kahn, K., Tollman, S. M., & Klipstein-Grobusch, K. (2014). Predictors of health care use by adults 50 years and over in a rural South African setting. *Global Health Action*, *7*(1). https://doi.org/10.3402/gha.v7.24771

Arthur-Holmes, F., & Agyemang-Duah, W. (2020). Reaching older adults during the COVID-19 pandemic through social networks and Social Security Schemes in Ghana: Lessons for considerations. *Journal of Gerontological Social Work*, *00*(00), 1–3. https://doi.org/10.1080/01634372.2020.1764689

Atuoye, K. N., Dixon, J., Rishworth, A., Galaa, S. Z., Boamah, S. A., & Luginaah, I. (2015). Can she make it? Transportation barriers to accessing maternal and child health care services in rural Ghana. *BMC Health Services Research*, *15*(1), 333.

Awoke, M. A., Negin, J., Moller, J., Farell, P., Yawson, A. E., Biritwum, R. B., & Kowal, P. (2017). Predictors of public and private healthcare utilization and associated health system responsiveness among older adults in Ghana. *Global Health Action*, *10*(1), 1–11. https://doi.org/10.1080/16549716.2017.1301723.

Awuviry-Newton, K., Tavener, M., Wales, K., & Byles, J. (2020a). Interpretative phenomenological analysis of the lived experiences of older adults regarding their

functional activities in Ghana. *Journal of Primary Care & Community Health*, *11*, 2150132720931110.

Awuviry-Newton, K., Wales, K., Tavener, M., & Byles, J. (2020b). Do factors across the World Health Organisation's International Classification of Functioning, Disability and Health framework relate to caregiver availability for community-dwelling older adults in Ghana?. *PloS one*, *15*(5), e0233541.

Awuviry-Newton, K., Wales, K., Tavener, M., Kowal, P., & Byles, J. (2023). Functional difficulties and toileting among older adults in Ghana: Evidence from the World Health Organization Study on global AGEing and adult health (SAGE) Ghana Wave 1. *Ageing & Society*, *43*(1), 53-75.

Ayernor, P. K. (2012). Diseases of ageing in Ghana. *Ghana Medical Journal*, *46*(2), 18-22.

Braimah, J. A., & Rosenberg, M. W. (2021). "They do not care about us anymore": Understanding the situation of older people in Ghana. *International Journal of Environmental Research and Public Health*, *18*(5), 1-15

Braimah, J. A., Sano, Y., Atuoye, K. N., & Luginaah, I. (2019). Access to primary health care among women: the role of Ghana's community-based health planning and services policy. *Primary Health Care Research & Development*, *20*, E82. doi:10.1017/S1463423619000185.

Chang, A. Y., Skirbekk, V. F., Tyrovolas, S., Kassebaum, N. J., & Dieleman, J. L. (2019). Measuring population ageing: an analysis of the Global Burden of Disease Study 2017. *The Lancet Public Health*, *4*(3), e159-e167.

Cheng, X., Yang, Y., Schwebel, D. C., Liu, Z., Li, L., Cheng, P., ... & Hu, G. (2020). Population ageing and mortality during 1990–2017: a global decomposition analysis. *PLoS medicine*, *17*(6), e1003138.

Dei, V., & Sebastian, M. S. (2018). Is healthcare really equal for all? Assessing the horizontal and vertical equity in healthcare utilisation among older Ghanaians. *International Journal for Equity in Health*, *17*(1), 1–12. https://doi.org/10.1186/s12939-018-0791-3

Ghana Statistical Service (2021). Ghana 2021 Population & Housing Census. General Report Volume 3B, Age and Sex Profile. Author, Accra, Ghana.

Ghana Statistical Service. (2013). *2010 Population and Housing Census Report: The Elderly in Ghana*. Accra.

Ghana Statistical Service. (2018). *Poverty Trends in Ghana 2005 - 2017: Ghana Living Standards Survey Round 7*, Author, Accra.

Ghana Statistical Service (2016). The Ghana Poverty and Inequality Report: Using the 6th Ghana Living Standards Survey 2016. Author, Accra.

Gómez-Olivé FX, Thorogood M, Clark B, Kahn K, Tollman S. Self-reported health and healthcare use in an ageing population in the Agincourt subdistrict of rural South Africa. Global Health Action. 2013;6. https://doi.org/10. 3402/gha. v6i0.19305.

Gyasi, R. M., Phillips, D. R., & Buor, D. (2018). The role of a health protection scheme in health services utilisation among community-dwelling older persons in Ghana. *The Journals of Gerontology B Psychol Sci Soc Sci*, *75*(3), 661–673. https://doi.org/10.1093/geronb/gby082

Gyasi, R. M., & Phillips, D. R. (2020). Demography, socioeconomic status and health services utilisation among older Ghanaians: implications for health policy. *Ageing International*, *45*(1), 50-71.

Gyasi, R. M., Phillips, D. R., & Amoah, P. A. (2020). Multidimensional Social Support and Health Services Utilization Among Noninstitutionalized Older Persons in Ghana. *Journal of Aging and Health*, *32*(3–4), 227–239. https://doi.org/10.1177/0898264318816217

He, W., Goodkind, D., & Kowal, P. R. (2016). An aging world: 2015. International Population Reports; U.S. Census Bureau, Washington (DC), USA

Heymann, D. L., & Shindo, N. (2020). COVID-19: what is next for public health? *The Lancet*, *395*(10224), 542–545. https://doi.org/10.1016/S0140-6736(20)30374-3

Jacobs, J. M., Rottenberg, Y., Cohen, A., & Stessman, J. (2013). Physical activity and health service utilization among older people. *Journal of the American Medical Directors Association*, *14*(2), 125-129.

Kalseth, J., & Halvorsen, T. (2020). Health and care service utilisation and cost over the life-span: A descriptive analysis of population data. *BMC Health Services Research*, *20*(1), 1–14. https://doi.org/10.1186/s12913-020-05295-2

Kang, S. W., & Xiang, X. (2017). Physical activity and health services utilization and costs among US adults. *Preventive medicine*, *96*, 101-105. https://doi.org/10.1016/j.ypmed.2016.12.043

Kowal, P., & Byles, J. E. (2015). 900 million and counting. *Popul Horiz*, *12*(2), 68-76.

Lachytova, M., Katreniakova, Z., Mikula, P., Jendrichovsky, M., & Nagyova, I. (2017). Associations between self-rated health, mental health problems and physical inactivity among urban adolescents. *European Journal of Public Health*, *27*(6), 984–989. https://doi.org/10.1093/eurpub/ckx051

Lartey, S. T., De Graaff, B., Magnussen, C. G., Boateng, G. O., Aikins, M., Minicuci, N., Kowal, P., Si, L., & Palmer, A. J. (2020). Health service utilization and direct healthcare costs associated with obesity in older adult population in Ghana. *Health Policy and Planning*, *35*(2), 199–209. https://doi.org/10.1093/heapol/czz147

Lehnert, T., Heider, D., Leicht, H., Heinrich, S., Corrieri, S., Luppa, M., ... & König, H. H. (2011). Health care utilization and costs of elderly persons with multiple chronic conditions. *Medical Care Research and Review*, *68*(4), 387-420.

Liu, K., Chen, Y., Lin, R., & Han, K. (2020). Clinical features of COVID-19 in elderly patients: A comparison with young and middle-aged patients. *Journal of Infection*, *80*(6), e14–e18. https://doi.org/10.1016/j.jinf.2020.03.005

Lopreite, M., & Mauro, M. (2017). The effects of population ageing on health care expenditure: A Bayesian VAR analysis using data from Italy. *Health Policy*, *121*(6), 663–674. https://doi.org/10.1016/j.healthpol.2017.03.015

Morgan, A. K., Adei, D., Agyemang-Duah, W., & Mensah, A. A. (2022). An integrative review on individual determinants of enrolment in National Health Insurance Scheme among older adults in Ghana. *BMC Primary Care*, *23*(190), 1–13. https://doi.org/10.1186/s12875-022-01797-6

Nabalamba, A., & Chikoko, M. (2011). *Aging population challenges in Africa*. African Development Bank

National Health Insurance Authority. (2022a). *National Health Insurance Scheme Benefits Package*. Retrieved January 20, 2018 from https://www.nhis.gov.gh/benefits

National Health Insurance Authority. (2022b). *National Health Insurance Scheme Membership*. Retrieved January 20, 2018 from https://www.nhis.gov.gh/membership

Nwakasi, C. C., Brown, J. S., & Anyanwu, P. (2019). What could be influencing older Ghanaians outpatient care utilization rate? *Ghana Medical Journal*, *53*(3), 217–225. https://doi.org/10.4314/gmj.v53i3.6

Oduro Appiah, J., Agyemang-Duah, W., Fordjour, A. A., & Adei, D. (2022a). Predicting financial barriers to formal healthcare utilisation among poor older people under the Livelihood Empowerment Against Poverty Programme in Ghana. *GeoJournal*, *87*(1), 333–347. https://doi.org/10.1007/s10708-020-10255-8

Oduro Appiah, J., Agyemang-Duah, W., Peprah, C., Adei, D., Peprah, P., & Fordjour, A. A. (2020b). Transportation barriers to formal healthcare utilisation and associated factors among poor older people under a social protection programme in Ghana. *Journal of Transport & Health*, *19*, 1-8

Otieno, P., Angeles, G., Quiñones, S., van Halsema, V., Novignon, J., & Palermo, T. (2022). Health services availability and readiness moderate cash transfer impacts on health insurance enrolment: evidence from the LEAP 1000 cash transfer program in Ghana. *BMC Health Services Research*, *22*(1), 599.

Peprah, P., Kyiyaga, E. M., Afful, H., Abalo, E. M., & Agyemang-Duah, W. (2017). Does the Ghanaian livelihood empowerment against poverty programme lead to an increase in household productive livelihood assets? Analysing the Ashanti scenario. *Cogent Social Sciences*, *3*(1). https://doi.org/10.1080/23311886.2017.1298174

Shinkai, S., Kumagai, S., Fujiwara, Y., Amano, H., Yoshida, Y., Watanabe, S., … Shibata, H. (2003). Predictors for the onset of functional decline among initially non-disabled older people living in a community during a 6-year follow-up. *Geriatrics and Gerontology International*, *3*(s1), S31–S39. https://doi.org/10.1111/j.1444-0594.2003.00094.x

Tamayo-Fonseca N, Nolasco A, Quesada JA, Pereyra-Zamora P, Melchor I. Self-rated health and hospital services use in the Spanish National Health System: a longitudinal study. Bio Med Commun Health Serv Res. 2015;15(1):1–9

United Nations. (2015). *Sustainable Development Goals and Targets*. United Nations.

United Nations (2019a). *Review and appraisal of the Programme of Action of the International Conference on Population and Development and its contribution to the follow-up and review of the 2030 Agenda for Sustainable Development* (ST/ESA/SER.A/428).

United Nations. (2019b). *World Population Ageing 2019: Highlights* (ST/ESA/SER.A/430).

Valtorta, N., & Hanratty, B. (2012). Loneliness, isolation and the health of older adults: do we need a new research agenda?. *Journal of the Royal Society of Medicine*, *105*(12), 518-522. https://doi.org/10.1258/jrsm.2012.120128

Valtorta, N. K., Moore, D. C., Barron, L., Stow, D., & Hanratty, B. (2018). Older adults' social relationships and health care utilization: A systematic review. *American Journal of Public Health*, *108*(4), e1–e10. https://doi.org/10.2105/AJPH.2017.304256

Van Der Wielen, N., Falkingham, J., & Channon, A. A. (2018). Determinants of National Health Insurance enrolment in Ghana across the life course: Are the results consistent between surveys?. *International journal for equity in health*, *17*, 1-14.

Wandera, S. O., Kwagala, B., & Ntozi, J. (2015). Determinants of access to healthcare by older persons in Uganda: A cross-sectional study. *International Journal for Equity in Health*, *14*(26), 1–10. https://doi.org/10.1186/s12939-015-0157-z

World Health Organization (2022). Ageing and Health. Accessed from https://www.who.int/news-room/fact-sheets/detail/ageing-and-health, on 8 May 2023

World Health Organization. (2015). *World report on ageing and health*. Geneva: World Health Organization.

Wyman, M. F., Shiovitz-Ezra, S., & Bengel, J. (2017). Ageism in the Health Care System: Providers, Patients, and Systems. In L. Ayalon & C. Tesch-Römer (Eds.), *Contemporary Perspectives on Ageism* (Vol. 19, pp. 193–212). Springer Open. https://doi.org/10.1093/geroni/igx004.044

Yamson, P., Tetteh, J., DeGraft-Amoah, D., Quansah, H., Mensah, G., Biritwum, R., & Yawson, A. E. (2021). Unmet Needs of Healthcare Services and Associated Factors among a Cohort of Ghanaian Adults: A Nationally Stratified Cross-Sectional Study Design. *INQUIRY: The Journal of Health Care*, *58*, 1–11. https://doi.org/10.1177/00469580211028172