Self-rated health and healthcare utilization among rural elderly Ghanaians in Kassena-Nankana district

Amon Exavery[1,2,3*], Kerstin Klipstein-Grobusch[2], Cornelius Debpuur[3]

[1]Ifakara Health Institute (IHI), Plot 463, Kiko Avenue, off Old Bagamoyo Rd, Mikocheni, P.O. Box 78373, Tel. +255 222 774756, Fax +255 222 771714, Dar es Salaam, Tanzania. [2]Department of Epidemiology & Biostatistics, School of Public Health, University of the Witwatersrand, Johannesburg, 7 York Road, Parktown, 2193, South Africa. [3]Navrongo Health Research Centre (NHRC), P.O. Box 114, Navrongo U/E Region, Ghana.

*Corresponding author

Email addresses:

AE   aexavery@ihi.or.tz

KKG   Kerstin.Klipstein-Grobusch@wits.ac.za

CD   cdebpuur@navrongo.mimcom.org

Abstract

Background

Demographic transition is profoundly ongoing in low- and middle-income countries, with increasing healthcare demand being one of the likely consequences of the ageing population. This study examines the effect of self-rated health on healthcare utilization among rural elderly Ghanaians in Kassena-Nankana district.

Methods

Cross-sectional interview data collected on 594 adults aged ≥50 for the WHO-INDEPTH Adult Health and Ageing Survey in Ghana between February and July 2007 were used. Based on the behavioural model of health service utilization, predisposing, enabling and need-related factors for health care utilization were investigated using multivariate logistic regression.

Results

Self-rated health (SRH) was reported as 42.5% (51.3% men, 36.8% women) to be good, 43.3% (32.9% men, 50.1% women) moderate and 14.2% (15.8% men, 13.1% women) poor. Overall healthcare utilization in the form of hospitalizations and out-patient care was 31.5% (30.3% male, 32.2% female). Healthcare utilization was significantly associated with self-rated poor health (poor versus good: OR=1.87, 95% CI 1.05-3.32, P=0.033), presence of medical history of chronic diseases (at least one versus none: OR=2.43, 95% CI 1.55-3.82, P<0.001), age (60-69 versus 50-59: OR=1.74, 95% CI 1.12-2.72, P=0.015), presence of cognitive impairment in the last

30 days (yes versus no: OR=1.60, 95% CI 1.06-2.42, P=0.027), presence of difficulty picking up objects in the last 30 days (yes versus no: OR=0.55, 95% CI 0.35-0.86, P=0.009) and occupation (had one versus never had any: OR=1.70, 95% CI 1.01-2.87, P=0.047).

Conclusion

Self-rated poor health significantly correlated with healthcare utilization among the elderly in the study area independent of chronic diseases, other health conditions such as cognitive limitations and socio-demographic characteristics of the elderly persons. While SRH emerges as an important indicator of elder persons' need for healthcare, increased efforts linking elderly persons perceiving their health status as poor to healthcare (i.e. increasing access) are required, considering that t over 55% of elderly Ghanaians in Kassena-Nankana with perceived poor health reported no healthcare utilization.

Key words

Self-rated health (SRH), chronic diseases, healthcare utilization, elderly, Kassena-Nankana district, Ghana

Background

Demographic transition is profoundly on-going not only in high-income countries but also in low- and middle-income countries [1] and a likely consequence of an ageing population is increased healthcare demand. As people age, they become more vulnerable to ill-health and more dependent [2] with chronic diseases among them emerging as a serious threat to their health [3].

Self-rated health (SRH) has widely gained recognition as an important client-based health outcome indicator [5] and has also been recommended as a disease risk screening tool [6]. Extant literature features multiple studies that support the predictive validity of SRH concerning elderly health, functional decline, disability and mortality [7-11]. Also, SRH status of the elderly has been observed consistently to be associated with utilization of various forms of health services, particularly hospital admissions [12-14]. An individual's decision to utilize healthcare results from a complex interaction of multiple factors linking to one's self-perceived health and the availability of healthcare [4]. In addition, one's experience, values and beliefs with the healthcare systems also play a role in the decision making about healthcare seeking [15]. Previous studies show that, personal attributes which may predispose individuals to seek care, need for services as evidenced by illness and enabling factors such as financial capability to pay for healthcare, ability to get to places where services are offered and knowledge about the service network in the community are associated with healthcare utilization [15].

Because of increasing frequency of episodes of ill-health and associated disease morbidity with age, elderly persons tend to utilize a larger share of health resources [16]. Data from the USA, for example, indicate that 33% of health care expenditure is required by this population [17]. In Spain, the elderly account for 40% of general practitioner activity, 25–65% of home visits and 52% of the medications prescribed at the primary care level. These estimates are three to five times what would be expected according to the percentage of the elderly in the community [18;19].

Sub-Saharan Africa shows an exponentially growing number of elderly [20], projected to stand at 130 million by 2050 from 30 million in 2000 [21]. In Ghana, 5% of the country's population constitutes the elderly [22] and their number is drastically growing as well [23] implying that there is and will be more people to meet their basic needs such as healthcare. Against this background is the fact that older people are affected by growing inadequacies in customary family support systems, vulnerability to poverty and exclusion from health services [24]. Besides, majority of the elderly persons in the region live in rural areas where health services are very limited and often inadequate to meet their demands [23]. This is happening in the context of increasing demand of their responsibility to their communities. Older people, for example, critically contribute to the welfare of younger generations in their families and communities at large, most prominently as care-takers of children especially grandchildren diseased or orphaned by HIV/AIDS [24].

Considering the increasing episodes of health-related problems with age, the expansion of the elderly population – which in essence reflects a rise in the amount of social and healthcare requirements [25-29]– calls for collective and strategic multisectoral responses to ensure healthy ageing

Older persons' matters are not receiving adequate attention as that given to other vulnerable population groups such as children and mothers. Likewise, the area is currently under-researched partly due to data paucity. We found published results of only one study from Kassena-Nankana district demonstrating evidence of association between SRH and functional limitations among older people [23]. However, it remains undocumented in this population how their SRH consequently influences healthcare utilization. This study, thus, attempts to (1) describe levels of healthcare utilization and (2) examine the effect SRH has on healthcare utilization among the elderly Ghanaians in the Kassena-Nankana district.

Methods

Study area and population

The present study was carried out in the Navrongo Health and Demographic Surveillance System (HDSS) in Kassena-Nankana district in Upper East region, northern Ghana (latitudes $10^o30'$ and $11^o00'$ north of the equator and between longitudes $1^o00'$ and $1^o30'$ west of the zero meridian). The Navrongo HDSS was incepted in 1993 and routinely records and updates vital demographic events such as births, deaths, migration, marriages and pregnancies in all approximately 14,200

6

compounds within the study area. All vital demographic events occurring within the district are updated through regular visits to each compound every 90 days. Where a death has occurred, the compound is revisited to obtain information on the circumstances leading to the death [30].

The Navrongo Health Research Centre (NHRC) which manages the Navrongo HDSS is one of the sites that implemented the full version of the WHO-INDEPTH Adult Health and Ageing Survey instrument. The Adult Health and Ageing Survey is an INDEPTH Network multi-site activity in collaboration with the World Health Organisation's Study on Global Ageing and Adult Health (WHO SAGE). The objective of SAGE is to improve the empirical understanding of the health and well-being of older adults and ageing in developing countries through provision of reliable, valid and cross-nationally comparable data for examining health difference across individuals, countries and regions, in addition to providing validated health measurement methods [31].

The full version of the module implemented in the INDEPTH sites targeted only the elderly aged 50 years and above. A sample of 700 elderly males and females was drawn through a single stage random sampling of individuals who were residents of the Kassena-Nankana district in 2007. Individuals willing to participate in the study signed a consent form after which they were interviewed and among the sampled individuals, 594 (85%) were successfully interviewed for the primary study. All these constituted the sample size for the current analysis.

Data and variables

Data pertaining to the 594 individuals were secondarily analyzed for the current study. Participants who reported that they obtained healthcare the last time when they needed such services, and if this occurred within the last three years, were defined as participants who utilized healthcare. Participants who reported that they never needed healthcare or those who needed care more than three years ago were altogether defined as not having utilized healthcare. Healthcare considered in this case included hospitalizations and out-patient care. A binary outcome variable was thus defined such that:-

$$Healthcare\ utilization = \begin{cases} 1\ if\ healthcare\ utilization\ occurred\ in\ the\ last\ 3\ years \\ 0\ if\ no\ healthcare\ utilization\ occurred\ in\ the\ last\ 3\ years \end{cases}$$

Our analysis made use of the behavioural model of health service utilization [32;33] to analyze the effect of SRH on healthcare utilization among the elderly rural Ghanaians. According to the model, explanatory variables are classified in three groups as predisposing, enabling and need-related. The predisposing variables refer to characteristics which exist prior to occurrence of any specific disease episode [4;15;34] (for example age, sex, marital status and other socio-demographic factors). Enabling variables are factors that hinder or enable the use of health care services such as financial capability and ability to get to places where services are offered [4]. Need variables refer to perception of a change in one's health as may be

evidenced by illness [4;15] (self-perceived health status and history of previous diagnosis of any disease are examples of need-related variables).

In this study, predisposing variables investigated were age, sex, marital status, ethnic background, education and smoking or use of smokeless tobacco. Ever having had an occupation was included as an enabling measure. The need indicator variables were SRH, medical history of chronic diseases (data were available about stroke, arthritis, diabetes, angina, chronic lung disease, asthma, depression, hypertension and cataracts), cognitive impairment (i.e. difficulty with concentrating or remembering things in the last 30 days), difficulty with picking up objects in the last 30 days and functional status in performing activities of daily living such as bathing, washing and dressing.

Statistical analysis

We conducted descriptive analysis in the form of both univariate and bivariate tabulations in order to assess distributional characteristics of the data as a prerequisite for multivariate analysis. Chi-square was used as a test of association between categorical explanatory variables and healthcare utilization. Multivariate analysis was performed using logistic regression to investigate the independent effect of SRH on healthcare utilization. For face validity and to rule out confounding, the final model was also adjusted for other known or suspected potential confounding variables such as education, ethnicity and marital status of individuals as recommended [35] as shown in table 3. All these statistical analyses were

9

conducted using STATA (version 10) statistical software at 5% two-sided

significance level.

Ethical approval for the current study was given by the Human Research Ethics

Committee (Medical) of the School of Public Health, University of the

Witwatersrand, Johannesburg and the Institutional Review Board (IRB) of the

Navrongo Health Research Centre.

Results

Demographic characteristics

Table 1 summarizes demographic characteristics of the 594 participants of whom

60.6% were females. Differentials in these demographics by sex were observed. The

participants' age ranged from 50 to 106 and averaged 64.3 (SD=9.9) years. Median

age was 62 years. Further, 210 (35.4%), 206 (34.7%) and 178 (30.0%) were aged

between 50-59, 60-69 and ≥70 years respectively. About half (49.8%) of the study

participants were currently married. Majority of those currently not married were

widowed (85.9%) and the rest were divorced (10.7%), never married (2.7%) and

cohabiting (0.7%).

In terms of ethnic backgrounds, study participants were from *Nankam* (48.8%),

Kassem (46.7%), *Buli* (2.9%) and 1.7% unspecified backgrounds. However, due to

the small proportion of respondents from the *Buli* and unspecified backgrounds, the

ethnic categories were re-coded to form a new category combining *Kassem*, *Buli* and

the unspecified backgrounds, leaving *Nankam* unaltered. This new category accounted for 51.2% of the study participants.

Moreover, education level was assessed by inquiring whether or not a participant had been to school. Participants who reported that they had had been to school were further asked their highest level of education attained. Eighty eight percent (88%) of the participants reported that they had never been to school. Of those who had been to school, 46 (69.7%) had primary education and 20 (30.3%) had at least a secondary education. Concerning occupations (not including house work), a few participants reported not having had any (17.7%).

SRH levels and healthcare utilization by background characteristics

Participants were asked to rate their physical and mental health as to whether they perceived their health status as good, moderate or poor. The proportions rating their health status as good and moderate were roughly equal (42.5% and 43.3% respectively), whereas those rating their health status as poor amounted to 14.2%. Differentials in SRH by sex were observed (P<0.001). There were more men (51.3%) than women (36.8%) rating their health status as good, while fewer men (32.9%) than women (50.1) rated their health as moderate. Nevertheless, a little more men than women rated their health status as poor (15.8% versus 13.1%).

Overall, the proportion of the participants reporting healthcare utilization in the last three years was 31.5% (30.3% male and 32.2% female). While healthcare utilization

remained similar between men and women (P=0.628), variations by other background characteristics of the study participants were observed as presented in Table 2a.

Healthcare utilization was highest among individuals whose SRH status was poor (42.9%). The proportions utilizing care among those who rated their health status as good and moderate were 26.8% and 32.3% respectively. Healthcare utilization increased with declining health status and these variations were statistically significant (P=0.023).

Information pertaining to previous diagnosis of some chronic disease, namely arthritis, stroke, angina, diabetes, chronic lung disease, asthma, depression, hypertension and cataracts was available. Based on this, we assessed prevalence of each chronic disease and found that four most prevalent were arthritis (6.8%), cataracts (4.3%), angina (3.9%) and depression (3.6%). The rest were less than 2.0% prevalent each (Figure 1). Due to the fact that participants reporting some of these chronic diseases were indeed too few to attract sound interpretations, we created a new variable with two categories as (1) having had no previous diagnosis of any of the chronic diseases and (2) having had been diagnosed with at least one (≥1) chronic disease. We found that 102 (17.4%) had actually been diagnosed with at least one chronic disease and 50.0% of these reported occurrence of healthcare utilization in the last three years. However, slightly over a quarter (27.5%) of those

who had no medical history of any of the chronic diseases reported healthcare

utilization anyway (P<0.001) (Table 2a).

With regard to age group, healthcare utilization was 24.4% among the 50's, peaked

among the 60's (36.1%) and dropped slightly to 34.5% among the ≥70 year-olds

(P=0.022).

Furthermore, cognitive impairment (measured as difficulty with concentrating or

remembering things in the last 30 days) was significantly associated with healthcare

utilization (P=0.028). Over three-fifths (61.4%) reported being cognitively impaired

and 34.9% of them reported healthcare utilization. Healthcare utilization due to

reasons other than cognitive impairment was 26.2%.

There was also evidence of healthcare utilization by occupation (P=0.015). Having

had an occupation was associated with 33.7% healthcare utilization. The

corresponding proportion of healthcare utilization among those who have never

had any occupation was 21.4%. In terms of ethnic backgrounds, healthcare

utilization was 25.6% among *Nankam* and 37.0% among non-*Nankam* ethnic

individuals (P=0.003).

Specific healthcare utilized by SRH and chronic diseases

Table 2b shows types of healthcare utilized in the last 12 months by SRH status and

chronic diseases. Specific healthcare utilized was enquired for referring to the last

13

12 months preceding the survey. Hospitalization or in-patient care was considered as having had stayed in a hospital or a long-term care facility for at least one night for medical care. Out-patient care (e.g. physician consultation) referred to healthcare received not involving an overnight stay in a hospital or a long-term care facility. We found in our analysis that of the 184 (31.5% of all) participants reporting healthcare utilization in the last three years, 140 (76.1%) had actually utilized care in the last 12 months. In view of all the participants, the proportion of out-patient and in-patient healthcare utilization was 19.2% and 8.4% respectively.

Participants rating their health status as poor were the most users of both out-patient (33.3%) and in-patient care (19.1%). Among those who rated the health status as moderate, 21.0% and 6.6% were users of out-patient and in-patient care respectively. Corresponding figures among those who rated their health status as good were 12.7% and 6.8%. In terms of medical history of chronic diseases, individuals with previous diagnosis of at least one chronic disease were the most out-patient (32.0%) and in-patient (13.6%) healthcare users. The proportion of users of out-patient and in-patient healthcare for reasons other than medical history of chronic diseases was 16.5% and 7.3% respectively.

Multivariate logistic regression results

We finally fit a multivariate logistic regression model in order to examine the adjusted effect of SRH on healthcare utilization. Given the need for a parsimonious model, only variables which exerted a statistically pronounceable effect on

healthcare utilization were adjusted for to obtain independent effect of SRH. Results

in terms of adjusted odds ratio (OR), 95% confidence interval (CI) and P-value are

presented in Table 3. Self-rated poor health status was significantly associated with

health care utilization. With self-rated good health status being a reference category,

the odds of health care utilization was 87% higher among individuals rating their

health status as poor than those rating their health status as good (OR=1.87, 95% CI

1.05-3.32, P=0.033). We also observed that the likelihood of healthcare utilization

was not statistically different between individuals who reported moderate health

and those who reported good health status (OR=1.10, 95% CI 0.73-1.67, P=0.650).

Other independent correlates of healthcare utilization were medical history of

chronic diseases (at least one versus none: OR=2.43, 95% CI 1.55-3.82, P<0.001),

age group (60-69 versus 50-59: OR=1.74, 95% CI 1.12-2.72, P=0.015), presence of

cognitive impairment in the last 30 days (yes versus no: OR=1.60, 95% CI 1.06-2.42,

P=0.027), presence of difficulty picking up objects in the last 30 days (yes versus no:

OR=0.55, 95% CI 0.35-0.86, P=0.009) and occupation (had one versus never had

any: OR=1.70, 95% CI 1.01-2.87, P=0.047).

Diagnostic tests were carried out to assess the best fit for the data as far as model

assumptions are concerned. Neither was the assumption of linearity in the

relationship between the log odds of the outcome (healthcare utilization) and the

explanatory variables violated nor was there evidence of lack of fit in the model. The

Hosmer-Lemeshow goodness-of-fit test at the generally recommended number of

groups [36] suggested adequate model fit (P = 0.928). In addition, no evidence of effect modification (statistical interaction) was observed.

Discussion

The purpose of this study was to describe levels of health care utilization and examine the effect of SRH on healthcare utilization among ≥50 year-old male and female residents of the Kassena-Nankana district in Ghana. Our findings demonstrate that self-rated poor health status is significantly associated with healthcare utilization. Study participants who rated their health status as poor were 87% more likely than those who reported their health status as good to utilize healthcare. The poorer the health status the elderly person perceived, the higher was the likelihood of healthcare utilization. This observation agrees with findings from other studies carried out in both developed [12;13] and developing countries [4;14;20;34;37-40]. Given the well-known predictive power of SRH on morbidity and mortality among the elderly [37-39], there is a need to create conducive, friendly and sustainable environment that informs and enables the elderly person to receive healthcare whenever he or she perceives own health as poor or not good. In addition, as Debpuur [23] suggests, regular monitoring of elderly persons' health status is important to provide public health actors with data required for assessment, protection and promotion of healthy ageing.

Among the nine chronic conditions investigated, from which arthritis, cataracts, angina and depression were the most prevalent, elderly persons with one or more of

them utilized more healthcare care than did those without any. However, over a quarter (27.5%) of those who reported none of the chronic diseases sought healthcare anyway, possibly because of some other health conditions such as communicable diseases. Chronic conditions have been consistently acknowledged in many studies to adversely affect lives of the elderly people and consequently influence their healthcare use [2;41]. Other studies have shown the importance of early diagnosis and treatment as one of the strategies to manage chronic diseases in elderly [42].

With respect to age, the influence on healthcare utilization was such that, the 60 to 69 year-olds were 74% more likely than the 50 to 59 year-olds to utilize healthcare. Also those in the age group ≥70 years were 55% more likely to utilize healthcare than the 50 to 59 year-olds, but this effect was not statistically significant (P=0.087). In view of the fact that the Ghanaian health sector implements health insurance scheme in which vulnerable population groups such as the elderly (over 70 years of age) are freely covered [43], one would expect more healthcare utilization in this group than any other. It is thus questionable if – in this context – elderly individuals really receive free unlimited treatments for any presenting health condition. Unfortunately, no data on health insurance coverage was available to shed more light on the reduced healthcare utilization after age 70, given the so called exemption to pay insurance premiums. Considering that the most-old are highly vulnerable to poverty and dependence as they can no longer produce sufficiently by themselves to meet their needs [2;41], the declining healthcare utilization after age

17

70 may probably be because families do not want to spend their limited family resources on an older person who will die soon anyway.

Cognitive impairment (i.e. difficulty concentrating or remembering things in the last 30 days) is yet another factor which exhibited a significant association with healthcare utilization. Participants who experienced cognitive limitations reported 60% more healthcare utilization than those who did not experience such limitations. Similar results were also observed in the state of Indiana, whereby presence of moderate to severe cognitive impairment was associated with increased healthcare utilization and mortality in the elderly [44]. Furthermore, participants who reported presence of difficulty with picking or lifting up objects (e.g. lifting a coin on a table) in the last 30 days had 45% less likelihood of healthcare utilization compared to those without the difficulty. This finding was not expected but also serves as an indicator that in the context of absence of or poor enabling mechanisms (e.g. means of transport, money etc) which is usually the case in rural settings [45], the most sick individuals may fail to take themselves to healthcare units. In this context, home-based healthcare through community health workers for example, may help curb many of their health problems.

Finally, ever having had an occupation (excluding housework) was included as a proxy indicator for economic wellbeing of individuals. We observed a 70% higher likelihood of healthcare utilization among individuals who have had occupations than those who have never had one. Although financial incapability is known to be a

detrimental factor against healthcare utilization [20], a health seeking behaviour pattern developed previously when one was economically well-off may linger even if such person currently has no paid job. Areas of work bring diverse people together and as they intermingle, information exchange on various aspects such as health and education wide-spreads [15], thus impact ones' health attitudes and consequently utilization.

This study was carried out in a largely rural setting of the Kassena-Nankana district in northern Ghana. Although the rural population may not always resemble their urban counterparts in many aspects including healthcare accessibility and utilization, the evidence associating self-rated poor health status and chronic diseases with increased healthcare utilization in the current study, is consistent with findings from other urban-based studies [4;34;40;41].

Limitations

Information on healthcare utilization referred to the last 3 years. This is a long time and consequently, may increase the possibility of recall bias, even though, in comparison, the rate of healthcare utilization in this study (31.5%) was similar to that observed in Nigeria [20] for example. Data on the distance to the nearest health facility, cost of care and household factors such as living arrangements of the study participants, was unfortunately not available. Furthermore, healthcare sought from traditional healers and the use of traditional local treatments was not known, hence not accounted for in estimating the proportion of healthcare utilization in this study.

Conclusions and recommendations

Self-rated poor health (SRH) was observed to be a significant correlate of healthcare utilization among the elderly in Kassena-Nankana district independent of chronic diseases, other health conditions such as cognitive limitations and socio-demographic characteristics of the elderly persons. Individuals perceiving their health as poor were most often hospitalized and out-patient healthcare users in the last 12 months. Considering that over 55% of elderly study participants who perceived their health as poor reported no healthcare utilization in the last three years, increased efforts linking elderly persons with healthcare (i.e. increasing access) are required, This highlights the importance to support or establish chronic care centres and ease healthcare availability for the elderly persons in order to properly manage subsequent poor health outcomes such as disability, morbidity and mortality.

Competing interests

No conflict of interest was declared.

Acknowledgements

References

1. Fengler W. Can rapid population growth be good for economic development? http://blogs.worldbank.org/africacan/node/1859 . 2011. 9-26-2011.

2. Australian Bureau of Statistics. Older people, Australia: a social report Canberra. <http://www.healthinfonet.ecu.edu.au/population-groups/older-people/reviews/our-review> . 1999. Australian Bureau of Statistics. 3-4-2010.

3. Jamison DT, Mosley WH: **Disease Control Priorities in Developing Countries: Health Policy Responses to Epidemiological Change**. *American Journal of Public Health* 1991, **81:**15-22.

4. Fernández-Olano C, Hidalgo JDL, Cerdá-Díaz R, Requena-Gallego M, Sánchez-Castaòo C, Urbistondo-Cascales L, Otero-Puime A: **Factors associated with health care utilization by the elderly in a public health care system**. *Health Policy* 2006, **75:**131-139.

5. Rohrer JE, Arif A, Denison A, Young R, Adamson S: **Overall self-rated health as an outcome indicator in primary care**. *J Eval Clin Pract* 2007, **13:**882-888.

6. May M, Lawlor DA, Brindle P, Patel R, Ebrahim S: **Cardiovascular disease risk assessment in older women: can we improve on Framingham? British Women's Heart and Health prospective cohort study**. *Heart* 2006, **92:**1396-1401.

7. Jylhä M, Guralnik JM, Fried LP, alfour J: **Walking difficulty, walking speed, and age as predictors of self-rated health**. *J Gerontol A Biol Sci Med Sci* 2001, **56:**M609-M617.

8. Lee Y: **The predictive value of self assessed general, physical, and mental health on functional decline and mortality in older adults**. *J Epidemiol Community Health* 2000, **54:**123-129.

9. Wilcox VL, Kasl SV, Idler EL: **Self-rated health and physical disability in elderly survivors of a major medical event**. *J Gerontol B Psychol Sci Soc Sci* 1996, **51B:**S96-S104.

10. Idler EL, Kasl SV: **Self-ratings of health: Do they also predict change in functional ability?** *J Gerontol B Psychol Sci Soc Sci* 1995, **50B:**S344-S353.

11. Lyyra T-M, Heikkinen E, Lyyra A-L, Jylhä M: **Self-rated health and mortality: could clinical and performance-based measures of health and functioning explain the association?** *Arch Gerontol Geriatr* 2006, **42:**277-288.

12. Boult C, Dowd B, McCaffey BA, Boult L, Hernandez R, Krulewitch H: **Screening elders for risk of hospital admission**. *Journal of the American Geriatrics Society* 1993, **41:**811-817.

13. Branch L, Jette A, Evashwick C, Polansky M, Rowe G, Diehr P: **Toward understanding elder's health service utilization**. *Journal of Community Health* 1981, **7:**80-92.

14. Fernandez-de-la-Hoz K, Leon DA: **Self-perceived health status and iniqualities in use of health services in Spain**. *International Journal of Epidemiology* 1996, **25:**593-603.

15. Wan TTH, Odell BG: **Factors Affecting the Use of Social and Health Services Among the Elderly**. *Ageing and Society* 1981, **1:**95-115.

16. Palangkaraya A, Yong J: **Population ageing and its implications on aggregate health care demand: empirical evidence from 22 OECD countries**. *International Journal of Health Care Finance and Economics* 2009.

17. American Medical Association: **White Paper on Elderly Health. Council of Scientific Affairs (Special Article)**. *Arch Intern Med* 1990, **150:**2459-2472.

18. Libro B: **Gabinete de estudios sociol´ogicos Bernard Krief ySociedad Espa˜nola de Geriatr´ýa. Madrid: .** *El m´edico y la terceraedad* 1986.

19. Ministerio de Sanidad y Consumo: **EDIS. Uso de medicamentos en la tercera edad. Situaci´on en Espa˜na, Madrid**. *EDIS* 1989.

20. Abdulraheem IS: **Health Needs Assessment and Determinants of Health-Seeking Behaviour among Elderly Nigerians: A House-Hold Survey**. *Annals of African Medicine* 2007, **6:**58-63.

21. Allain TJ, Matenga JA, Gomo Z, Adamchak DJ, Wilson AO: **Determinants of happiness and life satisfaction in elderly Zimbabweans**. *Centr Afr J Med*. 1996, **42:**308-311.

22. Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), ORCMacro. Ghana Demographic and

Health Survey 2003. 2004. Calverton, Maryland, GSS, NMIMR and ORC Macro.

23. Debpuur C, Welaga P, Wak G., Hodgson A: **Self-reported health and functional limitations among older people in the Kassena-Nankana District, Ghana**. *Global Health Action Supplement 2,* 2010.

24. Aboderin I. Advancing Health Service Provision for Age-related Non-communicable Disease and Older Persons in Africa: Identifying Key Information and Training Needs. African Research on Ageing Network (AFRAN), Policy-Research Dialogue. 2008. 7-8-2008.

25. Kalache A, Veras RP, Ramos LR: **O envelhecimento da população mundial. Um desafio novo**. *Revista de Saúde Pública* 1987, **21:**200-210.

26. Lima-Costa MFF, Guerra HL, Barreto SM, Maia R: **Diagnóstico da situação de saúde da população idosa brasileira: Um estudo da mortalidade e das hospitalisations hospitalares públicas**. *Informe Epidemiológico do SUS* 2000, **9:**23-41.

27. Ramos LR, Veras RP, Kalache A: **Envelhecimento populacional: Uma realidade brasileira**. *Revista de Saúde Pública* 1987, **21:**211-223.

28. Taket SR: **Resource allocation problems and health services for the elderly.** *World Health Statistics Quarterly* 1992, **45:**89-94.

29. Veras RP, Ramos LR, Kalache A: **Crescimento da população idosa no Brasil. Transformações e conseqüências na sociedade**. *Revista de Saúde Pública* 1987, **21:**225-233.

30. Nyarko P, Wontuo P, Nazzar A, Phillips J, Ngom P, Binka F. Navrongo DSS, Ghana. http://www.indepth-network.org/dss_site_profiles/navrongo.pdf 1 Part C. 2011. 9-28-2011.

31. Kowal P, Kahn K, Ng N, Naidoo N, Abdullah S, Bawah A, Binka F, Chuc NTK, Debpuur C, Ezeh A, Gómez-Olive FX, Hakimi M, Hirve S, Hodgson A, Juvekar S, Kyobutungi C, Menken J, Minh HV, Mwanyangala MA, Razzaque A, Sankoh O, Streatfield PK, Wall S, Wilopo S, Byass P, Chatterji S, Tollman SM: **Ageing and adult health status in eight lower-income countries: the INDEPTH WHO-SAGE collaboration**. *Global Health Action Supplement 2,* 2010.

32. Aday LA, Andersen RM: **A Framework for the study of access to medical care**. *Health Service Research* 1974, **9:**208.

33. Andersen R, Newman JF: **Societal and individual determinants of medical care utilisation in the United States**. *Milbank Memorial Fund* 1973, **81:**95-123.

34. Guerra HL, Firmo JOA, Uchoa E, Lima-Costa MFF: **The Bambuí Health and Aging Study (BHAS): factors associated with hospitalization of the elderly**. *Cad.Saúde Pública, Rio de Janeiro,* 2001, **17:**1345-1356.

35. Vittinghoff E, Shiboski SC, Glidden DV, McCulloch CE: **Predictor Selection**. In *Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models*. Edited by Dietz K, Gail M, Krickeberg K, Samet J, Tsiatis A. New York, USA: Springer Science+Business Media, Inc.; 2005:133-156.

36. Vittinghoff E, Shiboski SC, Glidden DV, McCulloch CE: **Logistic Regression**. In *Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models*. Edited by Dietz K, Gail M, Krickeberg K, Samet J, Tsiatis A. New York, USA: Springer Science+Business Media, Inc.; 2005:157-209.

37. Helmer C, Barberger-Gateon P, Letenneur I, Dartigues JF: **Subjective health and mortality in French elderly women and men**. *Journals of Gerontology.Series B, Psychological Sciences and Social Sciences,* 1999, **54:**S84-92.

38. Korten AE, Jorm AF, Jiao Z, Letenneur I, Jacomb PA, Henderson AS, Christensen H, Hodgers B: **Health, cognitive, and psychosocial factors as predictors of mortality in an elderly community sample**. *Journal ofEpidemiology and Community Health* 1999, **53:**83-88.

39. Menec VH, Chipperfield JG, Perry RP: **Self-perceptions of health: A prospective analysis of mortality, control, and health.** *Journalsof Gerontology.Series B, Psychological Sciencesand Social Sciences* 1999, **54:**85-93.

40. Goodlin S, Boult C, Bubolz T, Chiang L: **Who Will Need Long-Term Care?: Creation and Validation of an Instrument that Identifies Older People at Risk**. *Disease Management* 2004, **7**.

41. Loring KR, Sobel DS, Stewart AL, Brown BW Jr, Bandura A, Ritter P, Gonzalez VM, Laurent DD, Holman HR: **Evidence suggesting that a chronic disease self-management program can improve health**

status while reducing hospitalization. A randomized trial. *Med Care* 1999, **37:**5-14.

42. Borson S: **Should Older Adults Be Screened for Cognitive Impairment?** *Medscape General Medicine* 2004, **6:**30.

43. Witter S, Garshong B: **Something old or something new? Social health insurance in Ghana**. *BMC International Health and Human Rights* 2009, **9**.

44. Callahan CM, Hendrie HC, Tierney WM: **Documentation and evaluation of cognitive impairment in elderly primary care patients**. *Ann Intern Med* 1995, **122:**422-429.

45. Buor D: **Analysing the primacy of distance in the utilization of health services in the Ahafo-Ano South district, Ghana**. *International Journal of Health Planning and Management* 2003, **18:**293-311.
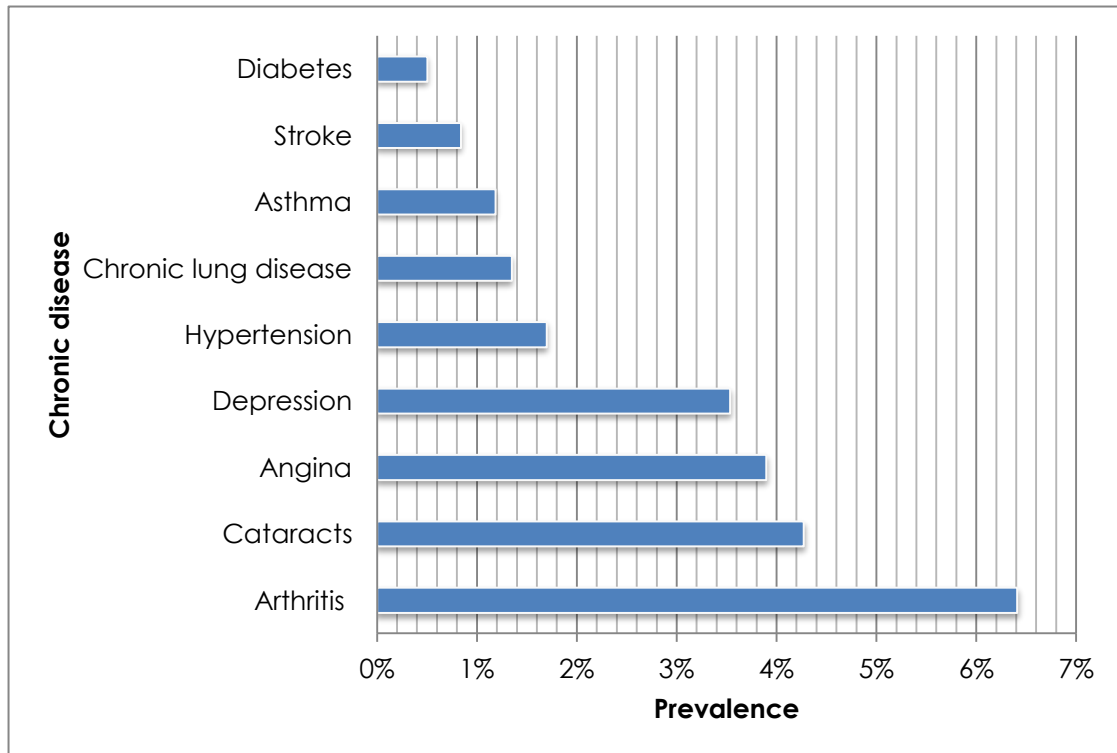
Figure 1. Prevalence of chronic diseases among rural elderly Ghanaians in Kassena-Nankana district, 2007 (n = 594)

Tables

Table1. Demographic characteristics of the study participants by sex (N = 594)

Covariate	Number and percent of subjects	Sex		P-Value*
		Female	Male	
	n (%)	%	%	
Marital Status	594 (100.0)	60.6	39.4	<0.001
Currently not married	298 (50.2)	83.6	16.4	
Currently married	296 (49.8)	37.5	62.5	
Age (years)	594 (100.0)	60.6	39.4	0.007
50 - 59	210 (35.3)	59.5	40.5	
60 - 69	206 (34.7)	68.5	31.5	
70+	178 (30.0)	52.8	47.2	
Ethnicity	594 (100.0)	60.6	39.4	0.193
Nankam	290 (48.8)	57.9	42.1	
Other**	304 (51.2)	63.2	36.8	
Education	593 (100.0)	60.5	39.5	<0.001
Never been to school	526 (88.7)	63.3	36.7	
Ever been to school	67 (11.3)	38.8	61.2	
Occupation (excluding housework)	593 (100.0)	60.7	39.3	0.024
Never had any	105 (17.7)	70.5	29.5	
Had one	488 (82.3)	58.6	41.4	

*Based on Pearson Chi-square test at 5% significance level. **Kassem, Buli and very few unknown ethnic backgrounds

Table 2a. Distribution of healthcare utilization by background characteristics of the rural elderly Ghanaians in Kassena-Nankana, 2007 (n = 585)

Covariate	Number of subjects	Percent utilized health care	P-value*
Self-rated health status	584	31.5	0.023
Good	246	26.8	
Moderate	254	32.3	
Poor	84	42.9	
Sex	585	31.5	0.628
Female	354	32.2	
Male	231	30.3	
Age (years)	585	31.5	0.022
50-59	209	24.4	
60-69	202	36.1	
≥70	174	34.5	
Medical history of chronic diseases	585	31.5	<0.001
None	483	27.5	
At least one	102	50.0	
Presence of cognitive impairment in the last 30 days	583	31.6	0.028
No	225	26.2	
Yes	358	34.9	
Marital Status	585	31.5	0.574
Currently not married	293	30.4	
Currently married	292	32.5	

Table 2a. Continued

Covariate	Number of subjects	Percent utilized health care	P-value*
Ethnicity	585	31.5	0.003
Nankam	285	25.6	
Other**	300	37.0	
Education	584	31.5	0.976
Never been to school	517	31.5	
Ever been to school	67	31.3	
Presence of difficulty picking up objects in the last 30 days	584	31.5	0.503
No	379	32.5	
Yes	205	29.8	
Occupation (excluding housework)	584	31.5	0.015
Never had any	103	21.4	
Had one	481	33.7	
Presence of difficulty with self-care (e.g. bathing, washing, dressing etc) in the last 30 days	584	31.5	0.653
No	401	30.9	
Yes	183	32.8	
Ever smoked or used smokeless tobacco	584	31.5	0.225
No	261	34.1	
Yes	323	29.4	

*Test of significance is based on Pearson Chi-square at 5% level. **Kassem, Buli and very few unknown ethnic backgrounds.

Table 2b. Specific healthcare utilized in the last 12 months by self-rated health status and chronic diseases among elderly in Kassena-Nankana distric in Ghana, 2007

Covariate	Number of subjects	Percent utilized out-patient care	Percent utilized in-patient care	P-value
Self-rated health status	593	19.2	8.4	<0.050
Good	252	12.7	6.8	
Moderate	257	21.0	6.6	
Poor	84	33.3	19.1	
Medical history of chronic diseases*	594	19.2	8.4	<0.050
None	491	16.5	7.3	
At least one	102	32.0	13.6	

*Chronic diseases considered in this case are arthritis, stroke, angina, diabetes, chronic lung disease, asthma, depression, cataracts and hypertension.

Table 3. Multivariate logistic regression analysis of correlative effect of self-rated health status on healthcare utilization among rural elderly Ghanaians in Kassena-Nankana district, 2007 (n = 580)

Covariate	Adjusted odds ratio	95% CI	P-value
Self-rated health status			
Good	1.00		
Moderate	1.10	0.73-1.67	0.650
Poor	1.87	1.05-3.32	**0.033**
Age group (years)			
50 - 59	1.00		
60 - 69	1.74	1.12-2.72	**0.015**
≥70	1.55	0.94-2.56	0.087
Medical history of chronic diseases*			
None	1.00		
At least one	2.43	1.55-3.82	**<0.001**
Presence of cogntive impairment in the last 30 days			
No	1.00		
Yes	1.60	1.06-2.42	**0.027**
Presence of difficulty with picking up objects in the last 30 days			
No	1.00		
Yes	0.55	0.35-0.86	**0.009**
Occupation (excluding housework)			
Never had any	1.00		
Had one	1.70	1.01-2.87	**0.047**

CI = Confidence interval, *Chronic diseases considered in this case are arthritis, stroke, angina, diabetes, chronic lung disease, asthma, depression, cataracts and hypertension. Selection of variables for this multivariate or adjusted parsmonious model was by the use of the log-likelihood ratio test. The independed effect of self-reported poor health status on healthcare utilization was statistically significant at 5% level. Diagnostic test for this model was performed using the Specification link test and the results revealed no lack of fit (P=0.484).