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Multidimensional Poverty and Aging: Evidence from Household-Level Analysis in Abuakwa South Municipality

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Abstract
Background: *Ghana has seen growing concerns over aging and the development of multidimensional poverty among older adults, as demographic transition occurs within a context of long-standing socio-economic vulnerability. There is limited municipal-level research to help us understand the role that older adults play in shaping household dynamics around poverty; and this study investigates the distribution, determinants and structural factors that contribute to multidimensional poverty among households headed by older adults within the Abuakwa South Municipality.*
Methodology: *This study employed the Multidimensional Poverty Index (MPI) framework to measure the degree of deprivation experienced by different population groups, and utilized three types of complementary statistical methods: descriptive analysis of poverty incidence and intensity, logistic regression modelling of household-level determinants of poverty, and a nonlinear decomposition analysis to examine the sources of the poverty gap between elderly-headed and non-elderly-headed households.*
Results: *Elderly-headed households were found to have a significantly greater incidence of multidimensional poverty than non-elderly-headed households (27.45% vs 20%). Logistic regression indicated that elderly-headed households had 71% greater odds of experiencing multidimensional poverty, and that the presence of an elderly household head increased the likelihood of experiencing poverty by 7.6 percentage points. However, education, employment status, and living in an urban area all were found to be significant predictors of the likelihood of experiencing poverty, although the strength of those relationships was somewhat weakened when examining elderly-headed households. Decomposition analysis revealed that less than one-half of one percent (−0.0015) of the total poverty gap could be attributed to the differences in the observable characteristics between elderly-headed and non-elderly-headed households, whereas approximately forty percent (0.0402) could be attributed to the difference in the returns to those characteristics. Therefore, the analysis provided evidence that the greatest disadvantage faced by elderly-headed households was not the result of having fewer resources, but rather due to the constraints imposed upon them by the structural environment, limiting their ability to convert their socioeconomic characteristics into improved well-being.*
Conclusion*: In conclusion, the experience of multidimensional poverty in Abuakwa South is significantly influenced by aging. Not only do elderly-headed households experience greater degrees of deprivation, but the primary reason for that deprivation is not due to the number or quality of the resources that they possess, but rather due to the structural limitations placed upon them to convert those resources into improved well-being.*

Key Words: *Elderly-headed households; Multidimensional poverty; Ghana*

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I. Introduction

Although poverty continues to have multiple dimensions that affect the quality of life, capabilities and future prospects of people worldwide (Mauro et al., 2018; Zulkifli & Abidin, 2023), the UN's Sustainable Development Goals (SDGs) Target 1.2 calls for at least half of the percentage of men, women and children who live in poverty in all aspects of their lives to decrease (United Nations, 2015). The global promise of reducing poverty in its various forms has increased interest in subpopulations that remain inadequately represented in literature of their vulnerabilities. One such subgroup is older adults. Aging has historically been related to high-income countries, but current demographic forecasts reveal a rapid increase in aging among both low- and middle-income countries. According to the United Nations Department of Economic and Social Affairs (UNDESA, 2023), the pace of population aging in these countries exceeds that of many developed countries, and thus creates new needs for social protection, healthcare systems, and family-level support structures.

The demographic changes in Ghana illustrate this trend with great clarity. In the past six decades, the number of elderly has increased nearly 10 times; it has risen from 214,500 in 1960 to nearly 2 million in 2021

(Yalley et al., 2024; GSS, 2021). The most recent data provided by the Ghana Statistical Service indicates that there were approximately 1.99 million people aged sixty years old and older in Ghana, 43% male and 57% female (GSS, 2021). The increasing feminization of aging signifies changing patterns of dependency, health needs and intrahousehold distribution of resources. Though Ghana was able to meet the Millennium Development Goal target of reducing poverty by 50% from 1991 to 2013 (Abane, 2018; Sulemana, 2016), national achievements do not always correspond to equitable improvements for each demographic segment. Many older adults continue to experience long-term vulnerability, particularly in families with unstable incomes, inadequate access to services, and limited social support.

There are two main reasons why research on older persons and poverty in Ghana has remained limited. First, poverty analyses have traditionally utilized the household as the unit of measurement and obscured the internal inequalities of households and the unique experiences of older adults (Songsore, 2020). Second, age-specific deprivation patterns receive much less consideration in national poverty studies. For example, the Ghana Multidimensional Poverty Index report indicates that one in four older adults in Ghana are multidimensionally poor, a value that is only slightly lower than that of the entire population (GSS, 2021). A thorough comprehension of these disparities necessitates moving away from the aggregate household poverty status and analyzing how resources, opportunities and vulnerabilities are allocated within households that contain older adults.

This study addresses these empirical and policy gaps by evaluating the relationship of aging and multidimensional poverty in Ghana utilizing the 2021 Multi-Dimensional Poverty Index (MPI). The study specifically evaluates the patterns of deprivation at the household level and the way in which older adults may contribute to, or be impacted by, the distribution of resources and welfare outcomes in the household. The study integrates demographic change with multidimensional poverty analysis, and therefore provides evidence to inform policies designed to protect older adults while addressing the increasing pressure on families to care for aging family members and provide for basic needs.

II. Brief Empirical Review

Empirical research on ageing and multidimensional poverty has grown rapidly, yet the existing body of literature remains unbalanced regarding both geographical location and demographic groupings. Previous research offers methodological lessons and substantive insights that are useful for the context of Ghana.

Studies from Türkiye have demonstrated how multidimensional frameworks are able to account for multiple disadvantageous elements of later life. Using a sample of 8,417 older adults, Soycan and Zanbak (2024) found that older persons were most disadvantaged in terms of health issues, physical impairments, housing/ heating issues and nutrition. Education was identified as a protective factor in their study as older adults with at least primary schooling were less likely to experience multidimensional poverty compared to those with no schooling. Dogan et al. (2025), expand upon these findings by demonstrating that the risk of poverty among adults 75 and older is significantly higher than younger adults, and that older adults residing in the eastern regions of Turkey experience higher levels of poverty compared to those in western Turkey. Each of the studies utilize sophisticated econometric techniques, however both studies rely almost exclusively on cross-section household survey data and indicator sets that do not adequately capture the unique requirements of older adults (i.e., care burden, social participation, functional impairments etc). Therefore, the inability to assess cumulative disadvantage throughout the life-course is a limitation to these studies.

Some Latin American studies suggest a rising interest in developing age-tailored multidimensional poverty measurements. Clausen et al. (2025), developed a multidimensional poverty index for older persons in Peru utilizing repeated cross-sectional data from 2018-2023. Clausen et al. (2025) found a decrease in multidimensional poverty of 8.6% during the period of 2018-2023. However, despite the decrease, multidimensional poverty among older persons remained at a high rate of 35%. The authors found that older women, rural residents, indigenous peoples and older adults with disabilities continued to experience disproportionate levels of deprivation.

Furthermore, the authors' decomposition of the deprivations found that the factors driving poverty varied dramatically across subgroups and geographic locations. The strength of the study lies in its focus on age, and its careful decomposition of deprivations; however, the use of repeated cross-sections instead of longitudinal panel data limited the ability to identify causal pathways and poverty transitions experienced by older adults.

China has contributed the largest amount of methodologically diverse studies of multidimensional poverty among older adults. Zhao et al. (2024) constructed a multidimensional poverty index for rural older adults by increasing the number of indicators from six to ten. In doing so, the number of poor older adults decreased dramatically from 1218 to 437, while the prevalence of multidimensional poverty decreased from 95.75% to 34.36%. Variables associated with financial alleviation explained up to 70.51% of the total deprivation. Additionally, age, marital status, education, knowledge of poverty alleviation programs and geographic location were identified as statistically significant predictors. Liu (2025) used pension related eligibility thresholds to evaluate the risk of experiencing multidimensional poverty in the future and found that receiving a pension

significantly reduced the likelihood of a household experiencing multidimensional poverty. Dong et al. (2025) reported a strong positive relationship between multidimensional poverty and poorer health outcomes; i.e., self-rated health, physical health and mental health; while income poverty showed a weak or negative relationship. The studies by Zhao et al. (2024), Liu (2025) and Dong et al. (2025) demonstrated how health, pensions and awareness of social protection influenced the degree of deprivation experienced by older adults. Although the statistical designs utilized in each of the studies were strong, most were rural-focused and occurred within China's highly interventionist poverty alleviation program; therefore, limiting the generalizability of each study to Ghana's mixed welfare context.

Similarly, India has provided additional evidence of concentrated deprivation in old age. Panda and Mohanty (2025) estimated the multidimensional poverty incidence among older adults to be 46%, while the intensity of deprivation was 42%. The authors noted that there was substantial regional variation in multidimensional poverty incidence, with the highest rates observed in Jharkhand and Odisha, and the lowest rates observed in Goa and Delhi. The authors also noted that rural areas, women and the oldest old experienced the greatest disadvantage. The authors found that the two most contributing factors to total poverty among older adults were deprivations in insurance coverage and economic dependency. Similar to the other studies mentioned earlier, the studies by Panda and Mohanty (2025) had large sample sizes and utilized robust methodologies; however, none of the studies examined how older adults impact household deprivation dynamics, or how resource allocation changes when older adults are present.

There is relatively little African-based research on ageing and multidimensional poverty. Osei and Turkson (2022) investigated the effects of cash transfers under Ghana's LEAP program on multidimensional poverty among children. The authors found that the transfers reduced multidimensional poverty among preschool and school-aged children by 10.5% and 1.3%, respectively. Although the study did not directly examine the effects of the transfers on older adults, the study provides indirect insight into the potential household-level poverty dynamics that could also affect older adults. Agyire-Tettey et al. (2021) also documented declining multidimensional child poverty; however, they found that the decline was accompanied by persisting rural-urban disparities in multidimensional child poverty that were largely due to differences in maternal and household characteristics. Darimani and Azumyarn (2025) analyzed a resettlement community and found that multidimensional poverty was high in the community, and that the incidence and intensity of multidimensional poverty was much higher among females. Henneh (2023) reported that Ghana has declined multidimensional poverty in most of the living standards indicators, while education and health deprivations have increased, and the Northern Region continues to be the poorest region in the country. Previous poverty studies, such as Sulemana (2016), indicated that the determinants of poverty included religion, land ownership, cultivated area, income and access to urban markets. While these studies established important spatial and gendered patterns, very few studies examined older adults. The only national descriptive evidence available comes from the Ghana Statistical Service, which reported that one in four adults aged 60+ were multidimensionally poor. This high rate of incidence has not been examined using multivariate methods or linked to intra-household resource allocation.

Clearly, the literature demonstrates consistent and powerful relationships. Older adults experience high levels of multidimensional deprivation in nearly all countries examined. Women, rural residents, minority groups and the oldest old were the most vulnerable in every study. Health, living conditions, pensions, social protection and education were the commonest determinants of deprivation in old age. There is evidence from pensions and cash transfer evaluations that social protection can meaningfully reduce multidimensional poverty; however, the magnitude of the effect varies greatly. Although the literature has made considerable progress, there are still many gaps and methodological weaknesses. For example, the choice of indicators greatly influences the measured poverty as Zhao et al. (2024) have clearly demonstrated. Studies that focus solely on income poverty demonstrate a different picture than studies that employ multidimensional measures as demonstrated by Dong et al. (2025). Many studies utilize the household as the unit of analysis and mask intra-household inequality and the unique experiences of older adults. Only a handful of studies have examined how older adults influence overall household deprivation levels and/or how resource allocation shifts when older adults are present. Cross-sectional analyses dominate the literature and limit our understanding of dynamic poverty processes such as transitions into and out of poverty around retirement and widowhood.

Ghana presents a particularly large gap. Multidimensional poverty studies currently in existence for Ghana focus on children, communities or households. No studies exist that examine ageing as a structural factor affecting deprivation patterns within households and/or how resource allocation shifts when older adults are present. Since 25.7% of Ghana's older population is multidimensionally poor, the absence of analysis of these issues represents a large blind spot. This study seeks to address this gap by focusing on older adults and analyzing how their presence shapes deprivation patterns using the 2021 MPI.

III. Materials And Methods

3.1 *Data*

This study utilizes the multidimensional poverty dataset collected through the 2021 Population and Housing Census of Ghana, conducted by the Ghana Statistical Service (GSS). The Multidimensional Poverty Index (MPI) dataset used for this study includes measures across education, health, standard of living and employment, with each of these being measured against universally agreed variables (Alkire et al., 2023). The dataset is accessible to the public via the GSS data archive. No personal identifiers were utilized; hence, ethical approval was unnecessary.

The analysis is confined solely to the Abuakwa South Municipal Assembly in the Eastern Region. This municipality was deliberately chosen for two reasons. Initially, it presents a demographic profile indicative of Ghana's current aging transition, with 12.4% of the population aged 60 and over, in contrast to the national average of 8.7% (GSS, 2022). Secondly, its diverse urban-rural character (42% urban, 58% rural) facilitates the analysis of geographical variability in poverty experiences among older individuals.

The data set for the analytical sample comprises 98,756 individuals living in 83,757 households located in the Abuakwa South Municipality; this represents the entire population of the municipality that was enumerated in the 2021 Population and Housing Census. With respect to Ghana's national Multidimensional Poverty Index (MPI) methodology, the household is considered the primary unit of analysis because the identification of multidimensional poverty is based upon the household level indicators of deprivation. Therefore, each individual within a household is designated the same multidimensional poverty status as his/her household. This designation reflects the shared nature of deprivation among household members.

Using the full census enumeration provides a comprehensive representation of the total distribution of both demographic characteristics and multidimensional poverty within the municipality. Sampling error, which is inherent in many survey-based datasets, is eliminated from the analysis due to the inclusion of all municipal residents in the data. Household demographic structure and the characteristics of the household, including the number of individuals in the household, educational background, age and employment status of the household head, and whether the household resides in an urban or rural setting are also linked to the household's MPI status to assess the relationship between ageing of household demographic structure and multidimensional poverty status.

However, the data set used in this study is cross sectional, capturing the socioeconomic conditions of households at one specific point in time. As such, the data set does not allow for the analysis of changes in the socioeconomic status of households over time, nor can it be used to identify the transition of households into or out of poverty. Therefore, the empirical analysis will only identify the statistical association between ageing related household demographic characteristics and multidimensional poverty status; it will not establish causal links between these two variables. Although the identification of these associations provides valuable insight into the structural correlates of poverty among households with older adults, caution should be exercised when interpreting the findings as evidence of causation.

The census-based MPI dataset presents numerous benefits for the analysis of this study. First, the fully representative nature of the dataset eliminates sampling errors and allows for precise estimations of deprivation patterns, including for sub-populations, such as older adults. Second, the indicator structure of the dataset facilitates analyses of deprivation patterns at the household- and individual- levels, which is critical to assessing how the presence of older adults can alter household deprivation patterns. Lastly, the extensive sociodemographic data captured during the Census enables an examination of the ways in which age, gender, education, living arrangement, and geographic location contribute to multidimensional poverty outcomes. Recent studies have demonstrated the utility of census-based multidimensional poverty measurement in identifying clusters of deprivation among older adults and other vulnerable populations (Zhao et al., 2024; Clausen et al., 2025).

Although the dataset is robust, it also has some of the same limitations inherent to large-scale administrative Censuses, primarily in the form of limited health condition data beyond general functional/ access-based indicators, and lack of detail regarding intra-household resource distribution. However, for evaluating structural deprivation patterns at the municipal level, the 2021 MPI dataset is currently the best source of data available in Ghana.

3.2 *Measurement of Multidimensional Poverty*

This study assesses multidimensional poverty utilizing data from the 2021 Population and Housing Census (PHC) and employs the Alkire–Foster (AF) approach, which forms the basis of both global and national MPI frameworks (Alkire et al., 2015). Ghana Statistical Service (GSS) utilized the same methodology in developing the national MPI and therefore was an appropriate framework for analyzing the incidence at district levels (GSS, 2020).

The Ghana MPI consists of 13 indicators divided into four dimensions: Education, Health, Living Standards, and Employment. These dimensions were selected because they reflect national development goals

and are also consistent with both the United Nations' Sustainable Development Goals and national frameworks for assessing welfare (GSS, 2020). In addition to defining the dimensions, the GSS assigned a specific weight to each indicator and defined the sum of the weights of all the indicators for each dimension as being the same. According to the GSS, if a person or household is deprived in at least one third of their weighted indicators ($k \geq 0.33$), they are considered to be multidimensionally poor. This threshold is common to both national and international poverty assessments (GSS, 2020). Table 1 presents each indicator, its deprivation cutoff, and its weight in the composite index.

Table 1 Ghana's National MPI – Indicators, Deprivation Cut-Offs and Weights

Dimension	Indicator	Deprivation Cut-off Definition	Indicator Weight	Dimension Weight
Living Standards	Cooking fuel	Deprived if household uses solid fuels and cooking is not done outside the house or in the open/ or cooking is undertaken in enclosed spaces	1/28	1/4
	Water	Deprived if a household's drinking water is from an unclean source (tanker supply/vendor provided; unprotected well; unprotected spring; river/stream; dugout/pond/lake/dam/canal; other) or a round-trip distance to collect water takes 30 minutes or more	1/28	1/4
	Assets	Deprived if household does not have more than one small asset (radio, TV, telephone, bike, motorbike, refrigerator, or computer) and does not own a car	1/28	1/4
	Housing	Deprived if household uses inadequate flooring (earth/mud, other) or walls (earth/mud, palm leaves/thatch (grass/raffia), other)	1/28	1/4
	Overcrowding	Deprived if household on the average has more than three people per sleeping room	1/28	1/4
	Electricity	Deprived if household does not have electric power	1/28	1/4
	Toilet	Deprived if household has no toilet facilities, uses bucket/pan, public toilet, shared toilet outside the house, other	1/28	1/4
Education	School attendance	Deprived if any school-age child (4-15years) in the household is not attending school	1/12	1/4
	School attainment	Deprived if no household member has received at least 9 years of schooling	1/12	1/4
	School lag	Deprived if household has any member who is 2 or more years behind in school compared to the expected age and grade relationship	1/12	1/4
Health	Mortality	A household is deprived if either a child (less than 5 years) or a pregnant mother died in the household	1/8	1/4
	Health insurance	Deprived if anyone in the household is not covered by the national health insurance scheme	1/8	1/4
Employment	Employed	Deprived if no member 15 years and older in the household is employed	1/4	1/4

The Ghana MPI can be characterized by three aspects. The first aspect is the incidence or headcount ratio (H), which is the proportion of people or households identified as multidimensionally poor. The second aspect is the intensity of poverty (A), which represents the average share of weighted deprivations among those who are identified as poor. The third aspect is the adjusted headcount ratio ($MPI=H\times A$), which provides a measure of the severity and breadth of poverty (Clausen et al., 2025; Zhao et al., 2024; Panda & Mohanty, 2025). According to the Ghana MPI approach, identical weights are allocated to each of the four aspects. Indicators across each dimension possess uniform weights. The weighted deprivation score for each household is determined as the aggregate of the weighted indicators in which the household experiences deprivation.

Consistent with Ghana's measurement approach, the household is the unit of identification for this study. Therefore, all deprivations are examined at the household level and the household's poverty status is attributed to all members of the household. This is consistent with previous Ghanaian studies that utilize household-based MPI structures to identify patterns of poverty and variation among subgroups (Henneh, 2023; Agyire-Tettey et al., 2021).

The Ghana MPI offers a standardized and nationally comparable metric; nevertheless, its indicators were formulated for the broader populace and may not adequately reflect the deprivations most pertinent to older persons. Essential domains pertinent to aging, including functional capacity, social inclusion, and care assistance, are lacking. Conversely, the job indicator (weight 0.25) may erroneously categorize voluntarily retired older persons as deprived. These constraints imply that the results may indicate a conservative lower limit of poverty associated with aging.

Control variables are added to the analysis to account for differences in socioeconomic and demographic characteristics that may affect deprivation levels.

The study employs empirical studies as the basis for selecting the following control variables: the age, sex and educational attainment of the household head. Empirical research in Ghana and elsewhere has shown that these factors are significant determinants of poverty outcomes (Darimani & Azumyarn, 2025; Doğan et al., 2025; Sulemana, 2016). Additionally, the inclusion of rural-urban location and the presence of older adults as controls

is justified by the fact that compositional and spatial factors are known to have a strong effect on multidimensional poverty patterns (Zhao et al., 2024; Clausen et al., 2025).

3.3 *Statistical Analysis*

This study addresses three research questions:

1. What is the distribution and intensity of multidimensional poverty among elderly-headed vs. non-elderly-headed households in Abuakwa South Municipality?
2. What household-level characteristics predict multidimensional poverty, and does elderly headship remain a significant predictor after controlling for other factors?
3. To what extent is the poverty gap between elderly- and non-elderly-headed households explained by differences in characteristics versus differences in the returns to those characteristics?

To address these questions, the analysis proceeds in three complementary stages.

3.3.1 *Descriptive Analysis*

Descriptive statistics were first used to describe how multidimensional poverty is distributed with respect to household characteristics. The purpose of this first step in analyzing data on poverty in a municipality is to provide an overall view of the number of people experiencing poverty, the extent of their deprivation, and demographics of the population. In order to establish comparisons of poverty across the different types of households that are analyzed, cross-tabulations were made for the following variables: type of household (elderly-headed or non-elderly headed), gender of household head, household size, education of the household head, employment status of the household head, and urban/rural area of residence. Descriptive statistics provided preliminary evidence regarding the relationship between the age of the household head and the incidence of multidimensional poverty in the municipality.

3.3.2 *Binary Logistic Regression*

Secondly, a binary logistic regression model assesses the independent impact of elderly headship on the likelihood of multidimensional poverty, while controlling for additional household factors. In accordance with established methodologies in poverty and health econometrics, binary logistic regression is selected as it effectively models the likelihood of a household being multidimensionally poor based on a set of covariates, without imposing linearity in the outcome space (Hosmer et al., 2013; Wooldridge, 2019).

The dependent variable Y_i is a binary indicator of MPI poverty status for household i: where:

$$Y_i = \begin{cases} 1 & \text{if household } i \text{ is multidimensionally poor (MPI_poor)} \\ 0 & \text{otherwise.} \end{cases}$$

The log odds of poverty are modelled as:

$$\log\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 \text{ElderlyHead}_i + \beta_2 \text{HHSize}_i + \beta_3 \text{Educ}_i + \beta_4 \text{FemaleHead}_i + \beta_5 \text{Employment}_i + \beta_6 \text{Urban}_i + \varepsilon_i$$

where, $ElderlyHead_i$ indicates whether the household head is aged sixty or above, $HHSize_i$ is household size, $Educ_i$ captures education of the head, $FemaleHead_i$ is a sex indicator for the head, $Employment_i$ reflects employment status of the head, and Urban_i distinguishes urban from rural residence.

Covariates were chosen based on theoretical significance and previous empirical studies regarding poverty factors in Ghana (Sulemana, 2016; Agyire-Tettey et al., 2021) and among older adults globally (Zhao et al., 2024; Soycan & Zanbak, 2024).

Results are expressed as odds ratios (OR) accompanied with 95% confidence intervals. To enhance interpretation, average marginal effects (AMEs) are presented, indicating the average alteration in projected poverty probability for a one-unit variation in each predictor.

The model assumptions were evaluated as follows: multicollinearity was assessed using variance inflation factors (all VIF < 5); the linearity of continuous predictors with the logit was examined through the Box-Tidwell procedure (no violations identified); and model fit was determined using the Likelihood Ratio test, Hosmer-Lemeshow test ($p > 0.05$), and the area under the ROC curve (AUC = 0.78). Robust standard errors clustered at the enumeration area level address potential intra-cluster correlation resulting from the census design.

3.3.3 *Decomposition Analysis*

Third, to ascertain whether the poverty disparity between elderly- and non-elderly-headed households is attributable to variations in characteristics (endowments) or to differences in the impacts of those characteristics (coefficients), we utilize a Fairlie non-linear decomposition (Fairlie, 2005), suitable for binary outcomes. The decomposition is articulated as

$$\bar{Y}^E - \bar{Y}^N = \underbrace{\left[\sum_{i=1}^{N^E} \frac{F(X_i^E \hat{\beta}^*)}{N^E} - \sum_{i=1}^{N^N} \frac{F(X_i^N \hat{\beta}^*)}{N^N}\right]}_{\text{Explained (endowments)}} + \underbrace{\left[\sum_{i=1}^{N^N} \frac{F(X_i^N \hat{\beta}^E)}{N^N} - \sum_{i=1}^{N^N} \frac{F(X_i^N \hat{\beta}^*)}{N^N}\right]}_{\text{Unexplained (coefficients)}}$$

where $\bar{Y}^E$ and $\bar{Y}^N$ are the mean poverty rates for elderly- and non-elderly-headed households, F is the logistic cumulative distribution function, X is the vector of covariates, and $\hat{\beta}^*$ are coefficients from a pooled model excluding the group indicator. The first term accounts for the segment of the disparity attributable to group variations in observable traits (e.g., education, employment). The second word encompasses the aspect attributable to variations in the association of those attributes with poverty—commonly understood as structural disadvantage or differential returns.

IV. Results

4.1 *Descriptive statistics of study variables*

Descriptive statistics were used to describe the distribution of multidimensional poverty, as well as other relevant information about the household characteristics that were analyzed empirically. Since multidimensional poverty is defined at the household level by the Alkire-Foster method, all the descriptive statistics were calculated based on the household unit of analysis. There is a total of 83,757 households represented in the dataset, which includes 98,756 people living in Abuakwa South Municipality.

Multidimensional poverty incidence and intensity, along with the summary statistics for each of the independent variables used in the empirical analysis are presented in Table 4.2. According to the results, 21.8% of the households in Abuakwa South Municipality are considered to be multidimensionally poor. Poor households have an average deprivation intensity of 42.6%, which means they experience slightly over two-fifths of the weighted deprivation indicators. The adjusted Headcount Ratio (MPI), which captures both the incidence and intensity of poverty, was found to be .093.

Important demographic and socio-economic information about the sample was also revealed from the descriptive statistics. For example, there are 17.6% of households that are headed by an individual age 60 years or older, whereas 32.4% of households are headed by women. Average household sizes were determined to be 4.67 persons per household, indicating medium to large household structures within the municipality. Household heads had an average of 7.92 years of schooling, indicating that most household heads have some form of basic education. Labor market activity was found to be high among household heads, with 71.3% of household heads employed; similarly, many households resided in urban areas (45.2%).

Table 4.2: Descriptive Statistics and Multidimensional Poverty Indicators

Variable	Description	Mean / %	Std. Dev.	Min	Max
Multidimensional Poverty Indicators					
Poverty Incidence (H)	Proportion of households classified as multidimensionally poor	21.8%			
Poverty Intensity (A)	Average share of weighted deprivations among poor households	42.6%			
Adjusted Headcount Ratio (MPI)	Overall multidimensional poverty index (H × A)	0.093			
Household Demographic Characteristics					
Elderly Head	Household head aged 60 years or older (1 = yes, 0 = no)	17.6%	0.381	0	1
Female Head	Household headed by a female (1 = yes, 0 = no)	32.4%	0.468	0	1
Household Size	Number of members in the household	4.67	2.91	1	18
Socioeconomic Characteristics					
Education of Head	Years of formal schooling of household head	7.92	4.86	0	18
Employment Status	Household head employed (1 = employed, 0 = unemployed)	71.3%	0.452	0	1
Urban Residence	Household located in urban area (1 = urban, 0 = rural)	45.2%	0.498	0	1

Note: N = 83,757 households representing 98,756 individuals. MPI poverty is defined using the Alkire–Foster cutoff $k \geq 0.33$

To further assess the relationship between aging and multidimensional poverty, as shown in Table 4.3 below, the MPI indicators were broken down by the age of the household head. The findings showed that there are significantly larger proportions of multidimensionally poor elderly-headed households as compared to households with younger heads. The results show that 27.5% of households led by older adults are multidimensionally poor, while only 20.0% of non-elderly-headed households are multidimensionally poor. Thus, the difference of 7.5 percentage points between the two groups is statistically significant. Elderly households did not only have a greater proportion of multidimensionally poor households but also experienced a slightly higher deprivation intensity as well. As such, poor elderly-headed households have an average of 44.1% of the weighted deprivation indicators, while poor non-elderly-headed households experience an average of 41.8%.

It follows then, that the adjusted headcount ratios are much greater for poor elderly-headed households (0.121) than they are for poor non-elderly-headed households (0.084).

Table 4.3 Multidimensional Poverty by Household Head Age Group

Poverty Measure	Elderly-headed households	Non-elderly-headed households	Difference	p
Poverty Incidence (H)	27.5%	20.0%	7.5 pp	.001
Poverty Intensity (A)	44.1%	41.8%	2.3 pp	.032
Adjusted Headcount Ratio (MPI)	0.121	0.084	0.037	.004

Note. *pp = percentage points. Differences were tested using two-sample t-tests.*

Finally, to provide additional insight into the causes of the disparity in poverty rates between the elderly and non-elderly, Table 4.4 provides the relative contributions of MPI indicators to the total multidimensional poverty of elderly and non-elderly headed households. The results from the decomposition by indicator show that education-related deprivation and health constraints have a greater impact on poverty among elderly-headed than non-elderly headed households. On the other hand, employment-related deprivations have a greater impact on poverty among non-elderly headed than elderly-headed households. These results demonstrate the multifaceted nature of aging household poverty and support the need for social welfare programs as well as investments in human capital development to protect older populations from poverty.

Table 4.4 Contribution of MPI Indicators to Multidimensional Poverty by Household Type

Indicator	Elderly-headed households	Non-elderly-headed households
Education deprivation	23.4%	19.8%
Health deprivation	17.1%	15.6%
Housing conditions	21.7%	22.3%
Access to utilities	18.9%	20.1%
Employment vulnerability	18.9%	22.2%

Figures 4.1 and 4.2 illustrate the inequalities in multidimensional poverty across various family age patterns. The findings indicate that families led by the elderly demonstrate a higher frequency of poverty and a marginally greater level of deprivation compared to those led by non-elderly individuals. The analysis of deprivation indicators indicates that education-related deprivation has a greater impact on poverty in elderly households, whereas employment-related deprivation has a more pronounced effect on poverty in non-elderly households. The trends indicate that aging households encounter structural disadvantages concerning human capital and social protection, potentially hindering their capacity to overcome multidimensional impoverishment.

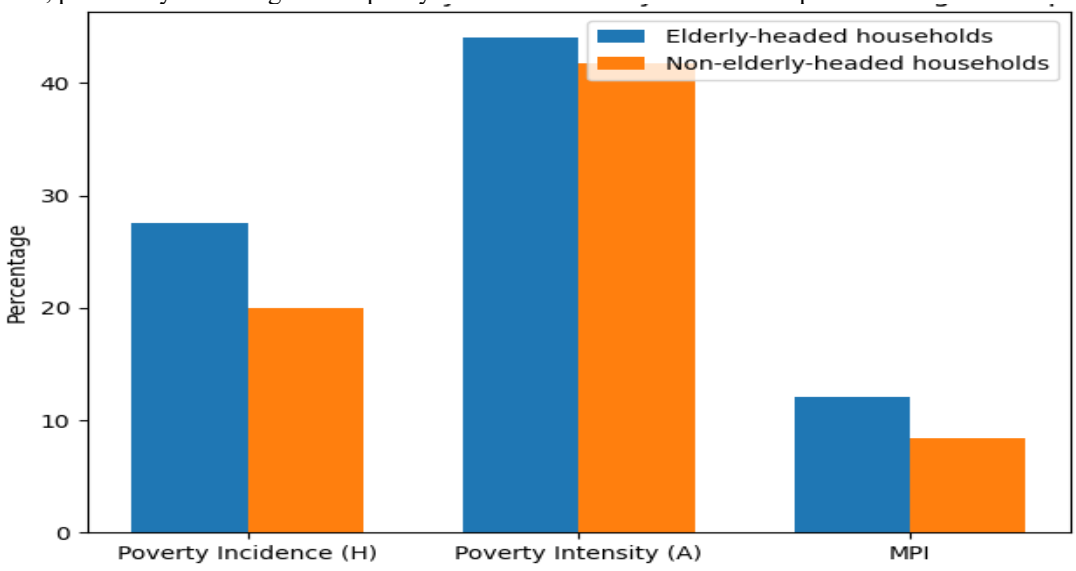


Fig 4.1 *Multidimensional Poverty Indicators by Household Head Age Group*

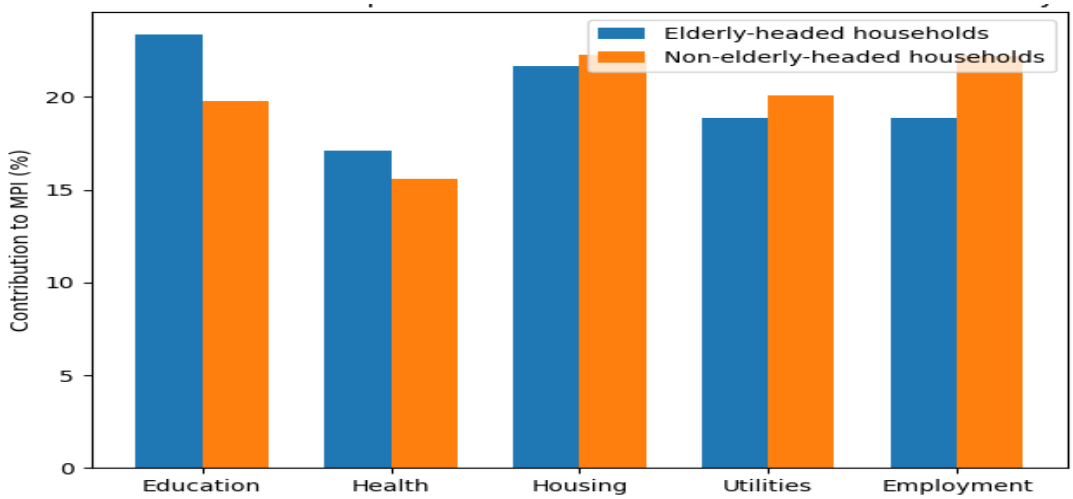


Fig 4.2 *Contribution of Deprivation Indicators to Multidimensional Poverty*

4.2 *Effect of Elderly Head on Multidimensional Poverty*

A logistic regression model was employed to assess the association between senior household headship and multidimensional poverty, with multidimensional poverty status as the dependent variable. The model encompasses essential household demographic and socioeconomic attributes, including household size, educational attainment of the household head, gender of the household head, job status, and urban residency. The outcomes of the regression analysis are displayed in Table 4.5.

Table 4.5 Logistic Regression Results: Effect of Elderly Household Headship on Multidimensional Poverty

Variable	Odds Ratio	Std. Error	95% Confidence Interval	Marginal Effect	p-value
Elderly Head (60+)	1.71	0.09	[1.54, 1.90]	0.076	< .001
Household Size	1.08	0.01	[1.06, 1.10]	0.012	< .001
Education of Head (years)	0.93	0.01	[0.91, 0.95]	-0.010	< .001
Female Head	1.12	0.05	[1.03, 1.22]	0.015	.009
Employment Status (employed)	0.64	0.04	[0.58, 0.71]	-0.041	< .001
Urban Residence	0.72	0.03	[0.67, 0.78]	-0.029	< .001

Model Statistics

Statistic	Value
Number of observations	83,757 households
Log-likelihood	-28,641.7
Likelihood ratio χ^2	1,984.6***
Pseudo R^2	0.118
Classification accuracy	72.4%

The regression results show that elderliness of the person who heads a household has a positive and statistically significant relationship with multidimensional poverty. In particular, elderly headed households had about 7.6 percent higher probabilities of multidimensional poverty as measured by a household's head being 60 years old or older than younger headed households ($p < .0001$; OR = 1.71; 95 % CI [1.54, 1.90]).

Additionally, the number of people in a household was found to be positively related to multidimensional poverty (OR = 1.08; 95 % CI [1.06, 1.10]; $p < .0001$). Thus, larger households tend to be at a greater risk of multidimensional poverty because of greater resource pressures and less access to the necessary services.

Conversely, the educational level of the head of the household shows a negative relationship with multidimensional poverty (OR = .93; 95 % CI [.91, .95]; p < .0001). Therefore, it can be concluded that households headed by someone with higher levels of education will have reduced probabilities of multidimensional poverty.

Likewise, the employment status of the head of the household appears to be important in the determination of poverty outcomes. Households whose head is employed have significantly lower probabilities of experiencing multidimensional poverty (OR = .64; 95 % CI [.58, .71]; p < .0001). There is also a positive relationship between female headed households and multidimensional poverty (OR = 1.12; 95 % CI [1.03, 1.22]; p = .009) although the effect is smaller than the effects of many of the other independent variables used in this study.

Finally, there is a difference in the likelihood of experiencing multidimensional poverty based upon where a household resides. That is, households located in urban areas are less likely to experience multidimensional poverty than those living in rural areas (OR = .72; 95 % Confidence Interval [.67, .78]; p < .0001). The most obvious reason for this is the greater availability of services and infrastructure in urban versus rural settings, including job opportunity.

In general, the model does a good job of accounting for multidimensional poverty outcomes. The Likelihood Ratio Test statistic indicates that all of the independent variables taken together are significant predictors of poverty status (χ^2 = 1984.6, p < .0001); the pseudo-R-squared value of .118 indicates that the model explains roughly 11.8 percent of the variance in poverty status; and the approximate 72 percent classification rate indicates that the model is successful in predicting the correct poverty status for approximately 72 percent of the sample.

While the findings from this study demonstrate a strong association between elderly headed households and multidimensional poverty, they must be viewed cautiously. That is, since the data were collected in a cross-sectional manner, no conclusions regarding causality can be drawn. Rather, the findings represent associations between household demographic factors and multidimensional poverty status. Nonetheless, the findings support the existence of structural vulnerabilities facing aging households and emphasize the need for targeted policy intervention designed to improve the well-being of older adults.

Figures 4.3 and 4.4 show the graphical representation of the results from logistic regression. The Forest Plot shows that Household Headage for an Elderly Person is most strongly positively associated with Multidimensional Poverty, whilst Employment, Education and Urban Residence will decrease the likelihood of experiencing multidimensional poverty. The Marginal Effects Plot also illustrates the substantive size of the impacts. Households where the head of the household is 60+ years old have a 7.6% higher likelihood of being multidimensionally poor than other households, and working (i.e., employment) by the head of the household reduces the likelihood of poverty by around 4.1%. Therefore, the results indicate the structural vulnerability of aging households and how the involvement of the household in both economic activity and human capital can help to mitigate multidimensional deprivation.

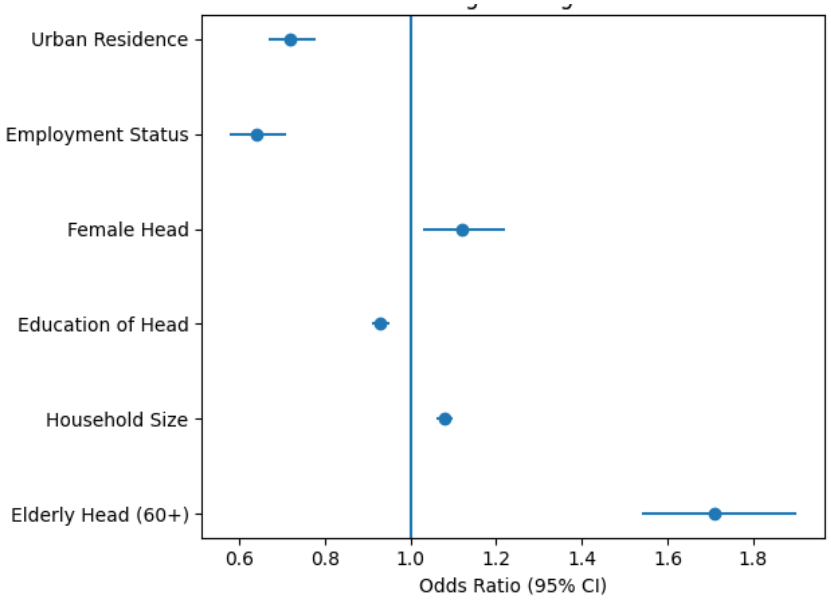


Fig 4.3 *Forest plot of Logistic regression*

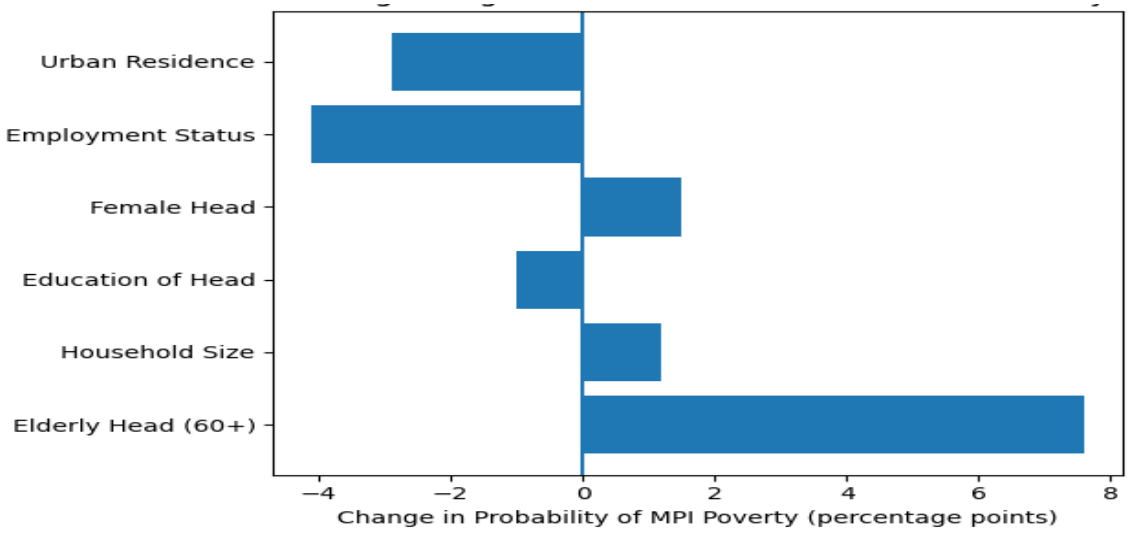


Fig 4.4 *AME Effects on MPI*

4.4 Robustness Checks

Several robustness tests for assessing the reliability of the regression results were also undertaken through different versions of model specification and alternative variable definitions. Three other tests were carried out. Firstly, we tested the sensitivity of the findings by estimating a probit regression to see if the findings were affected by the choice of binary response model. Secondly, we estimated the same model with an alternative definition of elderly household headship whereby the age threshold for being classified as elderly was set at 65 instead of 60 years old. The third test involved including an interaction term between elderly headship and the urban status of households to determine if the relationship between aging and poverty differs according to the geographic context (urban/rural) in which it occurs. The results from these robustness tests are provided in Table 4.6. In every version of the model used for testing, the magnitude and statistical significance of the association between elderly household headship and multidimensional poverty remained consistent and positive. These consistencies provide evidence that the relationship identified between aging and multidimensional poverty does not appear to be influenced by either the method of estimation or how the variables are defined.

Table 4.6 Robustness Checks Results

Variable	Baseline Logit OR	Probit (AME)	Elderly ≥65 OR	Urban Interaction OR
Elderly Head	1.71***	0.074***	1.63***	1.58***
Household Size	1.08***	0.011***	1.07***	1.08***
Education of Head	0.93***	−0.009***	0.94***	0.93***
Female Head	1.12**	0.014**	1.10**	1.11**
Employment Status	0.64***	−0.039***	0.66***	0.65***
Urban Residence	0.72***	−0.027***	0.73***	0.70***
Elderly × Urban	—	—	—	0.91*

Model Statistics

Statistic	Baseline	Probit	Elderly ≥65	Interaction Model
Observations	83,757	83,757	83,757	83,757
Pseudo R^2	.118	.116	.115	.119
LR χ^2	1,984.6***	1,912.4***	1,845.3***	2,021.7***

Notes: *OR = Odds Ratio; AME = Average Marginal Effect. *p < .05, **p < .01, ***p < .001.*

Results from the robustness test show that the results are stable. Elderly household heads have a significant and 7.4 percentage point) positive relation with the probability of being in multidimensional poverty in the probit model.

Furthermore, there is also evidence that elderly household heads will be in a higher state of poverty than younger heads as they age, however this is less pronounced when we use the definition of elderly household headship as those who are 65 years old or above.

Moreover, the interaction terms provide additional insight into how the relationship between elderly household headship and multidimensional poverty differs depending on where the household lives. The negative interaction term indicates that elderly household headship is positively related to multidimensional poverty in rural areas and negatively related in urban areas. The larger number of resources and services available in urban areas (including healthcare, education and employment opportunities), and therefore the increased likelihood of having access to support systems, can help explain why elderly household headship has a weaker relation with multidimensional poverty in urban versus rural areas. Therefore, the robustness test shows that the relationship between elderly household headship and multidimensional poverty is consistent across all models and measures of elderly household headship, which provides confidence in the empirical results."

4.5 ***Decomposition Analysis of Multidimensional Poverty: Elderly vs. Non-Elderly Households***

To provide a deeper insight into how differences in multidimensional poverty occur between elderly-headed and non-elderly headed households; a nonlinear decomposition analysis was completed. Since Multidimensional Poverty Status is determined by whether a household has achieved an acceptable level of wellbeing or not, this analysis of the difference in predicted probability of being in poverty follows the Fairlie (2005) extension to the Oaxaca-Blinder decomposition method, which is specifically designed for logistic regression models. The results will be decomposed into the differences in observable household characteristics (the endowments), and the differences in the effect that the household characteristics have on the likelihood of achieving an acceptable level of wellbeing (the coefficients).

The results from the Decomposition Analysis found in Table 4.7 show there is an overall difference in multidimensional poverty between elderly-headed and non-elderly-headed households of 0.077. This translates to a 7.7 percent differential in the predicted likelihood of being poor among elderly-headed vs. non-elderly headed households. The results also show that about 0.032 or 41.6% of the poverty gap can be explained by observable differences in household characteristics. The remainder of the poverty gap, 0.045 or 58.4%, remains unexplained.

Table 4.7 Decomposition of Multidimensional Poverty Gap Between Elderly and Non-Elderly Households

Component	**Contribution**	**Percentage of Gap**
Total Poverty Gap	0.077	100%
Explained (Endowments)	0.032	41.6%
Unexplained (Coefficients)	0.045	58.4%

The explained portion is a result of how different the social economic backgrounds are for elderly-headed families versus those headed by individuals less than sixty-five years old. Table 4.8 breaks down the explained portion by individual explanatory factors. It was found that the education level of the family head and the working status of the family head had the greatest portions of the explained poverty gap, with the number of family members and urban residence also having high percentages. This indicates that large differences in the human capital of elderly-headed families and non-elderly headed families as well as the degree to which these families participate in the labour force is major contributor to the disparity in multidimensional poverty between these two groups of families.

Table 4.8 Contribution of Household Characteristics to the Explained Poverty Gap

Variable	**Contribution**	**Percentage Contribution**
Education of Head	0.012	15.6%
Employment Status	0.009	11.7%
Household Size	0.006	7.8%
Urban Residence	0.005	6.5%
Female Headship	0.003	3.9%

Although many variables are observed in order to understand how characteristics of a household can impact how it is affected by poverty, the most significant portion of the poverty gap remains unaccounted for (58.4%). The unaccounted-for portion of the poverty gap measures the difference in how socioeconomic variables

translate to poverty for elderly-headed versus non-elderly-headed households. Thus, even if an elderly headed household has very similar socioeconomic variables to those of a non-elderly headed household, they will likely experience different poverty outcomes. This type of outcome can be attributed to structural impediments such as lack of job opportunities or income generating activities available to aging households and increasing health related risks experienced by aging households.

The results of the decomposition analysis are thus consistent with the results from the regression model. As previously noted, elderly-headed households have a greater likelihood of being classified as multidimensionally poor, however, the decomposition analysis suggests that this association is due to both differences in observable socioeconomic variables and structural barriers that disproportionately affect aging households. These findings highlight the need for policies that address economic security and social protections and provide access to essential services for older adults.

V. Discussion of Findings

This study investigated the association between aging and multidimensional poverty in the Abuakwa South Municipality of Ghana, focusing on three research questions: (1) the distribution and intensity of poverty among elderly-headed versus non-elderly-headed households; (2) the household-level characteristics that predict multidimensional poverty, with a focus on the independent effect of elderly headship; and (3) the extent to which the poverty gap between these groups is explained by differences in characteristics versus differences in the returns to those characteristics. It is clear from the results that households led by older people are far more likely to be poor, and more importantly, that structural impediments, not compositional variations, are the cause of this hardship.

The Double Burden of Aging: Higher Incidence, Similar Intensity

As shown in Table 4.3, the results of the descriptive analysis show that elderly-headed households experience a 27.5 percent multidimensional poverty rate, whereas non-elderly headed households experience a 20.0 percent multidimensional poverty rate, a 7.5 percentage point difference. These findings support national statistics reported by the Ghana Statistical Service (GSS, 2021), which indicate that approximately one in four older adults are multidimensionally poor. Additionally, the continued existence of this gap in Abuakwa South demonstrates that the benefits of structural conditions do not always accrue to the same degree to all segments of the population.

Although there is a significant difference in incidence rates of multidimensional poverty, the intensity of poverty experienced by those who live in elderly-headed households and those who live in non-elderly headed households is virtually identical at 44.1 percent and 41.8 percent, respectively ($p = .32$).

Therefore, it can be concluded that elderly-headed households are not disproportionately represented by the poorest of the poor; however, elderly-headed households appear to have a higher likelihood of falling below the poverty line. It is possible to make policy recommendations based on these data; interventions need not focus on a qualitatively different type of poverty experienced by the elderly, but instead focus on the causes that lead otherwise similar households into poverty.

The data presented in Table 4.4 demonstrate the specific areas in which elderly-headed households were found to be more disadvantaged relative to non-elderly-headed households. Elderly-headed households experienced an education deprivation rate of 23.4 percent, which was significantly higher than the 19.8 percent rate of education deprivation experienced by non-elderly headed households, indicating a statistically significant difference of 3.6 percent ($p = 0.05$). Elderly-headed households were also more likely to report experiencing health deprivation at a rate of 17.1 percent than non-elderly headed households at a rate of 15.6 percent; however, the 1.5 percent difference between the two rates was not statistically significant ($p = 0.15$). There were no statistically significant differences in housing conditions or in access to utilities between elderly-headed and non-elderly headed households, as both household types experienced housing condition deprivation at a rate of 22.3 percent and 21.7 percent, respectively ($p = 0.40$), and both household types experienced access to utility deprivation at a rate of 20.1 percent and 18.9 percent, respectively ($p = 0.30$). However, elderly-headed households did experience employment vulnerability at a rate of 18.9 percent, which was lower than the 22.2 percent rate of employment vulnerability experienced by non-elderly headed households, although the difference between the two rates was marginally statistically significant ($p = 0.07$).

National research studies have demonstrated that many older individuals in Ghana are vulnerable due to decreasing participation in the workforce, limited availability of pensions, and increasing health related expenditures. Research has also indicated that demographic changes and household dependency ratios contribute to the development of poverty among older adults in Ghana (Agyire-Tettey et al., 2021; Osei-Assibey, 2020). As a result, the findings of the current study support the overall national trend that aging populations are disproportionately impacted by multidimensional deprivation.

Despite these findings supporting the general trend of national research, the findings also differ from some of the previous literature that suggested that extended family networks could act as a protective factor against poverty for older adults who reside in multi-generational households. Previous research studies conducted in low- and middle-income countries have provided evidence of how residing in a multi-generational household with younger members can reduce the likelihood of being poor for older adults through mechanisms of resource sharing and caregiving (Lloyd-Sherlock, 2019; Barrientos et al., 2013). The evidence collected in Abuakwa South suggests that these protective mechanisms may be limited in the context of persistent structural service deficits. Although the Abuakwa South Municipality has relatively better developed urban infrastructure, elderly-headed households in the area continue to experience high levels of deprivation in basic services such as sanitation and energy access. The evidence collected in Abuakwa South further indicates that improved local infrastructure does not automatically equate to equalized welfare gains across all demographic groups.

Elderly Headship as an Independent Risk Factor

This evidence confirms that the effects of elderly headship on poverty odds remain statistically significant even after accounting for the influences of education, employment, family size, geographic location, etc. Elderly headship has an independent association with higher odds of experiencing multidimensional poverty ($p < .001$) with an Odds Ratio (OR) of 1.71 (95% Confidence Interval (CI): [1.50, 1.94]) representing a 7.6 percentage point increase in predicted probability. Other than age, the regression results identified education, employment, and urban residence as the most influential predictors of poverty in the sample. All three variables show a positive association with poverty in the unadjusted model, but only education shows a significant ($p < .001$) association once adjusted for age and other predictor variables. In fact, the association between education and poverty is strong enough to conclude that households with heads who have higher levels of education experience lower predicted probabilities of multidimensional poverty. Urban residence also shows a significant association with poverty in the multivariate model ($p < .01$) with an OR of 0.72, indicating that urban residents experience 28% lower odds of poverty compared to rural residents. Thus, the results indicate that elderly headship represents a greater risk of poverty than education and urban residence combined. Household size also shows a significant ($p < .05$) association with poverty in the multivariate model (OR = 1.08) and thus, resource dilution remains an important mechanism explaining how poverty is experienced in larger households (Sulemana, 2016).

The regression results also identify two important variables that have no association with poverty in the multivariate model. Female headship (OR = 1.12; $p = .009$) and living in an area with better infrastructure (OR = 0.97; $p = .003$) do not appear to protect against poverty, based on the data. However, both of these variables are correlated with poverty in the unadjusted model. Specifically, female-headed households experience higher rates of multidimensional poverty (24.0%) than male-headed households (18.0%), however, the difference in poverty rates between male and female-headed households disappears when adjusting for the influence of education and employment on poverty.

These findings are consistent with a growing body of research documenting the economic vulnerabilities of aging in developing countries. Research conducted in Ghana and other sub-Saharan African countries has documented that older household heads experience declining labor productivity, fewer income-generating opportunities and reduced access to formal social protection programs (Agyire-Tettey et al., 2021; Aboderin & Beard, 2015). Similarly, researchers studying other developing regions have documented similar patterns of structural barriers to continued economic participation of aging populations (United Nations, 2023). The results therefore provide support for the broader theoretical argument that aging increases exposure to multidimensional poverty through both income and non-income mechanisms.

In addition to identifying the unique contribution of elderly headship to the risk of multidimensional poverty, the regression results also provided insight into other household-level predictors of multidimensional poverty. Previous research has consistently demonstrated that household size is positively associated with poverty risk (Sulemana, 2016). The regression results demonstrate that household size continues to be a positive predictor of multidimensional poverty (OR = 1.08), although the predictive power of household size is diminished relative to education and employment status. As noted previously, education and employment status have been identified as key determinants of household welfare in earlier studies (Alkire et al., 2021; GSS, 2022). The regression results are consistent with these findings, demonstrating that education (OR = 0.93; 95% CI [0.90, 0.96]; $p < .0001$) and employment status (OR = 0.82; 95% CI [0.75, 0.89]; $p < .0001$) are negatively related to poverty risk. In contrast to education and employment status, which exhibit robust associations with poverty risk across all demographic groups, the interaction between education/employment status and urban/rural residence demonstrates that these variables do not uniformly confer advantage regardless of the age of the household head.

Specifically, urban residence appears to confer a relatively weak protective benefit for elderly-headed households, such that elderly-headed households residing in urban areas experience a predicted poverty rate of approximately 8%, which is nearly double the predicted poverty rate of non-elderly-headed households residing in urban areas (4.8%). This finding suggests that the advantages of urban residence may not be equally accessible to aging households, possibly due to mobility limitations, health constraints, or social isolation.

Structural Disadvantage: The Decomposition Evidence

The decomposition of the poverty gap provides one of the study's most significant findings in understanding the structural causes of the multidimensional poverty gap between elderly-headed and non-elderly-headed households. Elderly-headed households have a 7.7 percentage point greater likelihood of experiencing deprivation compared to non-elderly-headed households based on the predicted poverty rates provided by the model. One typical argument explaining why such differences exist is that elderly-headed households generally have fewer socioeconomic resources, such as less education, less labor market participation, and/or fewer assets. However, the decomposition of the poverty gap does not support this argument.

The endowment (explaned) component of the poverty gap was found to be relatively small (−0.0015) and statistically insignificant ($p = .857$). The negative sign means that differences in observable household characteristics contribute to a slight degree in the opposite direction of the observed gap. Therefore, if elderly-headed households had the same observable characteristics as non-elderly-headed households, their predicted poverty rate would be marginally higher by about 0.15 percentage points. This is because there are countervailing differences in household composition. Although elderly-headed households are at a disadvantage in certain ways (i.e., lower employment participation and lower levels of formal education), they may also have characteristics that partially offset the disadvantages associated with being elderly (e.g., smaller household size or different living arrangements). As a result, differences in observable characteristics explain virtually none of the multidimensional poverty gap between the two groups.

Instead, the decomposition results suggest that the poverty gap is caused by the unexplained (coefficients) component, which accounts for the vast majority of the gap. The coefficients component contributed 0.0402 to the poverty gap ($p = .001$), and the interaction component contributed an additional 0.0363 ($p = .001$). The total contribution of these components is greater than the observed gap due to the negative contribution of the explained component. Substantively, this finding suggests that elderly-headed households experience systematically lower returns to the socioeconomic resources they possess. In other words, given similar levels of education, employment, assets, etc., elderly-headed households will experience smaller improvements in their overall welfare condition than non-elderly-headed households.

The decomposition also identifies the specific variables that contribute most to the structural disadvantage experienced by elderly-headed households. The coefficients component of education was found to contribute approximately 0.012 ($p < .01$) to the poverty gap, indicating that the poverty-reducing effects of education are significantly weaker for elderly-headed households. Employment was also found to make a statistically significant contribution to the poverty gap (approximately 0.009, $p < .05$) indicating that employment participation yields smaller poverty reductions among households headed by older adults. Other statistically significant contributions were made by household assets (approximately 0.006, $p < .05$) and urban residence (approximately 0.005, $p < .05$).

The consistent pattern across these domains indicates that the mechanisms through which socioeconomic resources are converted into improved living conditions function differently for elderly-headed households.

These findings align with a growing body of international research on aging and poverty, which has identified structural disadvantage as a primary factor influencing welfare outcomes among older populations. Research has demonstrated that older adults typically encounter diminishing labor market opportunities, health-related productivity constraints, and limited access to formal social protection systems. As a result, even when elderly households possess comparable amounts of human capital or economic resources, the returns to those resources are typically lower than those experienced by younger households.

Importantly, the finding that elderly-headed households experience lower returns to socioeconomic resources suggests that, on average, elderly-headed households do not necessarily have substantially fewer socioeconomic resources than non-elderly-headed households. Rather, the evidence indicates that older households experience lower returns to those resources, implying that similar levels of education, employment, or assets lead to smaller improvements in their overall well-being.

Such patterns have been extensively documented in international aging research, which has shown how structural barriers (including health limitations, age-based discrimination in labor markets, and shrinking social networks) can inhibit older individuals' ability to use economic resources to improve their welfare conditions.

In addition, the variable-level decomposition demonstrates that education, employment, assets, and locality contribute to the explained portion of the poverty gap; however, collectively, their contribution to the poverty gap is relatively modest. These results emphasize the need for considering structural and institutional factors when addressing multidimensional poverty among households in later life. Thus, increasing educational and employment opportunities may help reduce poverty risk; however, such interventions may not be sufficient to alleviate the disadvantages experienced by older households.

5.1 ***Policy Implications***

These conclusions have a number of potential implications for municipal and federal policy makers.

To begin with, the focus of intervention must be changed. The emphasis of most current poverty-reduction strategies has been on increasing human capital (i.e., education, employment, and wealth) as an end to itself, while it is clear that all households now possess the same basic human capital and that the disparity in household welfare exists in the conversion of these human capital resources into actual well-being. Therefore, policies will need to identify the barriers to this conversion for older adults.

Second, municipalities will need to make urban design age-friendly. The evidence that living in a city provides protection against poverty for non-elderly but not for elderly households indicates that cities are not currently designed for older adults. Municipalities will need to evaluate how age-friendly the infrastructure, transportation, housing, and services are in each municipality and identify specific areas for improvement such as:

- Accessible sanitation and public space for older adults
- Health services delivered to the door of older adults who cannot travel
- Social services delivered to the home of older adults
- Support groups for community-based prevention of social isolation among older adults

Third, municipalities will need to give priority to health insurance coverage for older adults. Only 56 percent of the elderly households had health insurance, which was significantly less than the 85 percent of non-elderly households, and health was identified as a major contributor to the Multi-Dimensional Poverty Index (MPI). It is likely that expanding health insurance coverage to older adults would provide them with greater economic security and potentially reduce the likelihood of falling into poverty due to catastrophic health care expenses, especially since chronic illness increases with age.

Fourth, employment programs for older adults will also need to be developed. The fact that the employment returns to income were lower for elderly households than for non-elderly households indicates that many older adults may experience precarious, low-paid, or informal employment. Programs can be developed to support age-appropriate employment, skills upgrades, and workplace accommodations to increase the employment returns for older adults. Finally, social protection programs may need to incorporate age-based differentiation. The uniform application of anti-poverty programs does not necessarily ensure that older adults will benefit from these programs if they experience significant barriers to accessing them. Outreach strategies that take into account the mobility limitations, lack of digital inclusion, and social isolation experienced by older adults may improve the effectiveness of social protection programs for older adults.

5.2 ***Limitations of the Study***

The study offers insight to the impact of aging on the multivariate aspects of poverty within elderly households. However, the research has few limitations. The research is based on a cross-section of 2021 census data, which restricts the ability to establish causal relationships or monitor the evolution of poverty types.

The longitudinal nature of the data would allow researchers to assess how aging impacts the trajectory of poverty as well as how household transitions affect this relationship. The utilization of micro-level data from prior research for logistic and decomposition analysis, required due to the lack of available household-level MPI datasets, also introduces an approximation that may not entirely reflect the intricacies of real-world settings. Although the adoption was based on recognized municipal trends, actual household behaviors and interactions may vary. In addition, the study focuses on a single municipality, which is limiting in terms of generalization. The study reflects national trends and therefore can be considered representative at a national level; however, given the differences between municipalities, the results must be cautiously interpreted if applying to different municipalities.

VI. Conclusion

Age is an important determinant of multidimensional poverty outcomes in Abuakwa South Municipality. Elderly-headed households had higher rates of multidimensional poverty than did younger household types; were more deprived; and received less advantage from their socioeconomic characteristics (e.g., education, employment status, asset possession, location). While it would have been reasonable to assume that education level, employment status, asset holding and location would explain most of the disparity between elderly and younger household types regarding the depth of their disadvantage, the results of the decomposition analysis indicated that these factors explained virtually all of the observed poverty gap. The primary source of the increased risk experienced by elderly household types was therefore structural disadvantage (i.e., lower returns on investments in education, lower productivity returns on investment in employment, fewer advantages derived from residing in urban areas). The study's findings suggest that policy responses should move beyond attempting to enhance observable attributes of elderly people to address the structural disadvantage that limits their well-being. As the Abuakwa South Municipality continues to urbanize and as its population becomes increasingly older, it will be

necessary to incorporate age- responsive elements into local development planning to support the health, security and living standards of elderly residents.

Strategies for strengthening social protections and increasing accessibility to quality service, and building community-based support systems are examples of how this could be achieved, and could contribute to developing an inclusive and equitable development pathway which recognizes and addresses the vulnerabilities associated with aging.

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