

# **Double Burden of Living Alone and in Poor Condition Among Older Persons in Urban Nigeria: A Multilevel Analysis of Associated Factors**

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## **Introduction**

Living alone is associated with loneliness (Nzabona et al. 2015), depression (Russell and Taylor 2009), poor psychosocial health (Millan-Calenti et al. 2013) and cardiovascular diseases in later life (Iecovich et al. 2011). Urbanization and an aging population are major parts of population dynamics. As cities expand and societies age in low- and middle-income context, a unique challenge emerges—the phenomenon of older individuals living alone in poor conditions (Stepler, 2016). This phenomenon, referred to as the "double burden" of living alone and in poor conditions, presents a pressing concern that warrants thorough investigation. Older persons experiencing this dyad are at multiple health risks, including psychosocial health challenges, morbidity and mortality.

Urban areas in Nigeria, like many other parts of the world, are experiencing a demographic shift characterized by an increasing proportion of older adults (Iamtrakul & Chayphong, 2022). These older individuals often find themselves navigating the complexities of urban life, where social structures and traditional family support systems are undergoing significant changes (Aboderin, 2004; Akinyemi & Akinlo, 2014). As a result, a growing number of older Nigerians are living alone, facing not only the challenges of advancing age but also the burdens of economic hardship and social isolation (Kaida, Moyser, & Park, 2019).

The trend of living alone reflects shifts in societal structures, economic dynamics, and individual preferences. Factors associated with living alone can be multifaceted, encompassing demographic attributes such as age, gender, and marital status (Jadhav, et al., 2013; Katz, Kabeto & Langa, 2000; Sok & Yun, 2011), as well as economic considerations, cultural norms, and urbanization trends (Isherwood et al. 2012; Nzabona et al. 2015). Also, the HIV/AIDS epidemic has contributed to living alone by some older persons who have lost their children (Seeley et al. 2010; Ssengonzi 2009). Besides, childlessness (Panigrahi, 2013), marriage and labour force participation of adult daughters (Qin et al. 2008), migration, emphasis on nucleated family, modernization and changing traditional family setting (Agree et al. 2005) have also contributed to living alone among older persons in Nigeria. Understanding these factors in Nigerian context is essential not only for social researchers but also for policymakers, as they have far-reaching implications for social support systems.

Community characteristics are important areas to consider in the study of older persons' living conditions. However, these have been under-researched in Nigeria. The choices and circumstances that lead older persons to live alone and in poor conditions are often intertwined with the environments in which they reside. Investigating the community-level factors influencing living conditions of older persons serves as a lens through which community health, economic, and social dynamics can be harnessed to improve the wellbeing of older persons. It allows identification of communities where older individuals are at a higher risk of poor health outcomes, and provides valuable insights into how their needs can be met.

This study aims to investigate the prevalence and associated factors of LAPC among older persons in urban Nigeria. It delves into the intricate interplay of individual and community factors that contribute to the vulnerability of older individuals living alone in impoverished conditions. By examining the prevalence and determinants of this complex issue, the study aims to provide valuable insights that can inform policy and intervention strategies tailored to the unique needs of older persons. Through rigorous analysis and empirical investigation, we endeavor to contribute to a deeper understanding of the challenges faced by older individuals

living alone in urban Nigeria and, ultimately, to propose evidence-based recommendations that enhance their quality of life and well-being.

## **Methods**

### **Data sources and sample design**

The study utilised the household dataset of the 2018 Nigerian Demographic and Health Survey (DHS) dataset. The dataset elicits demographic, household, environmental and health information about the sampled households across the country. The households were selected using a stratified multi-stage cluster design. The details of the sample design and data collection methods were published in the DHS report <sup>10</sup>. This study was based on the individual household members. A weighted total sample of 5,225 older persons aged  $\geq 60$  years were analyzed for this study.

### **Variable measurement**

In this study, the outcome variable, living alone and in poor condition, was a combination of two outcome variables: living alone and living condition. Living alone was generated from the household living arrangement of the respondents in the dataset. Respondents living alone were coded 1 while those living with someone were coded zero. The living condition was measured using the United Nations standard of living indicators: housing condition, drinking water, toilet facility, cooking fuel and electricity (UNDP, 2016). Household members are in poor condition in each indicator if the household has unimproved housing condition (houses with roof or wall made of natural or rudimentary materials or has a dirt, sand or dung floor); unimproved drinking water (water sources from unprotected well and springs, and river/dam/lake/stream water or distance to drinking water is more than 15 minutes); unimproved toilet facility (use of pit latrine without slab, open pit, bush or field, bucket toilet and hanging toilet or latrine); unimproved cooking fuel (cooking done with coal or lignite, charcoal, wood, straw/shrubs/grass, and agricultural crop); and no electricity. Respondents' scores based on these indicators were summed up and the median score was obtained. Respondents with the median score or above were categorized as living in poor condition (coded 1) while others were categorized otherwise (code=0). Combining the two outcome variables, respondents who scored two were in double burden of living alone and in poor condition; those who scored one were either living alone or in poor condition; while those who scored zero were in 'safe zone.'

The independent variables are the respondents' individual characteristics (age, sex, marital status and level of education) and community characteristics including the region of residence, community-level education and poverty. The community level of education was computed based on the proportion of household members with the various levels of education in the community. The proportions were grouped into three equal categories, each category comprising of 33.3% of the community population. This procedure was followed for the computation of the community poverty level.

### **Data analysis**

This study used multilevel multinomial logistic regression to examine the individual and community factors associated with the double burden of living alone and in poor condition among older Nigerians. All analyses were done using Stata version 15.1 and based on 95% confidence level.

### **Ethical Considerations**

The use of the NDHS dataset ensures that ethical considerations, including informed consent and data confidentiality, have already been addressed by the survey administrators. Permission was obtained from the ICF International to use the NDHS for this study.

## **Results**

*Prevalence of living alone and in poor condition among older persons in Nigeria*

The results indicate that 11.5% of urban-dwelling older Nigerians live alone, and 54.0% are in poor condition. Of those living alone, 55.4% live in poor conditions. Overall, 40.9% of the respondents neither live alone nor in poor condition. The prevalence of LAPC was highest among females (10.7%) compared to males (4.6%); in the oldest age group,  $\geq 80$  years (10.9%) compared to the youngest age group, 60-69 years (6.6%); among the single/divorced (22.7%) and married (15.4%) compared to widows (7.1%); in the South West (10.7%), North central (9.8%) and South South (9.3%) compared to other regions ( $\leq 5\%$ ).

### *Factors associated with living alone and in poor condition*

The fixed effect results provide insights into the associations between various factors sex, age, marital status, education, community characteristics, and region of residence and the likelihood of older persons experiencing the double burden of living alone and in poor conditions. Examining the individual-level variables in Model 1, the fixed-effect results, estimated using the Relative Risk Ratios (RRR), indicate that women had an 86% higher risk of LAPC than men (RRR=1.80;  $p < 0.001$ ; 95% C.I.=1.33-2.42). Conversely, the risk of LAPC was lower among widows (RRR=0.12;  $p < 0.001$ ; 95% C.I.=0.06-0.25) compared to non-widows, the reference category. The risk was also lower among older persons with primary/secondary education (RRR=0.39;  $p < 0.001$ ; 95% C.I.=0.28-0.54) or tertiary education (RRR=0.10;  $p < 0.001$ ; 95% C.I.=0.05-0.21). These associations were consistent when adjusted for other factors in Model 2.

At the community level, older persons in the North-East, North-West and South-Eastern Nigeria also had a lower risk compared to those in the North Central (Model 1). The risk was also lower for those in communities with moderate (RRR=0.08;  $p < 0.001$ ; 95% C.I.=0.03-0.26) and low poverty levels (RRR=0.01;  $p < 0.001$ ; 95% C.I.=0.001-0.02) compared to those in high-poverty level. When adjusted for other factors in Model 2, the associations remained consistent.

The random effect results, as depicted by the variance and variance partition coefficients (VPC) of the multilevel model, explain the variability in outcomes at different levels, which, in this case, is at the individual and community levels. The VPC in empty model indicates that, 72.1% of the variance in LAPC is at the community level. The proportional change in variance (PCV) indicates that, individual-level factors accounted for 42% of the variations in the risk of LAPC, while community-level factors accounted for 69%.

Table 2: Multilevel multinomial logistic regression of individual and community factors associated with living alone and in poor condition among older adults in Nigeria

	Empty model		Model 1		Model 2	
	Living alone or poor	Living alone & in poor condition	Living alone/poor	Living alone & in poor condition	Living alone or poor	Living alone & in poor condition
<b>Level 1 (individual level)</b>			RRR (95% C.I.)	RRR (95% C.I.)	RRR (95% C.I.)	RRR (95% C.I.)
Sex						
Male <sup>ref</sup>			1.00	1.00	1.00	1.00
Female			0.79 (0.66-0.94)**	1.86 (1.38-2.50)***	0.86 (0.72-1.03)	1.80 (1.33-2.42)***
Age						
<70 <sup>ref</sup>			1.00	1.00	1.00	1.00
70-79			0.94 (0.78-1.13)	0.99 (0.72-1.35)	0.95 (0.79-1.14)	0.95 (0.69-1.29)
80+			0.65 (0.50-0.84)**	0.94 (0.63-1.39)	0.69 (0.53-0.89)**	0.90 (0.61-1.34)
Marital status						
Non-widow <sup>ref</sup>			1.00	1.00	1.00	1.00
Widows			0.46 (0.25-0.83)*	0.12 (0.06-0.25)***	0.46 (0.26-0.82)**	0.13 (0.06-0.27)***
Highest level of education						
No formal education <sup>ref</sup>			1.00	1.00	1.00	1.00
Primary/Secondary			0.43 (0.35-0.53)***	0.38 (0.28-0.53)***	0.53 (0.43-0.65)***	0.39 (0.28-0.54)***
Tertiary			0.13 (0.09-0.17)***	0.09 (0.04-0.19)***	0.18 (0.13-0.24)***	0.10 (0.05-0.21)***
<b>Level 2 (community level)</b>						
Community education						

Low <sup>ref</sup>			1.00	1.00	1.00	1.00
Middle			1.10 (0.61-2.00)	0.96 (0.43-2.14)	1.36 (0.76-2.44)	1.22 (0.55-2.71)
High			0.68 (0.36-1.29)	0.57 (0.24-1.38)	1.06 (0.56-2.00)	1.02 (0.42-2.47)
Community poverty						
High <sup>ref</sup>			1.00	1.00	1.00	1.00
Middle			0.07 (0.03-0.19)***	0.08 (0.03-0.26)***	0.08 (0.03-0.20)***	0.08 (0.03-0.27)***
Low			0.01 (0.00-0.02)***	0.01 (0.00-0.02)***	0.01 (0.00-0.02)***	0.01 (0.00-0.02)***
Region						
North Central <sup>ref</sup>			1.00	1.00	1.00	1.00
North East			0.78 (0.42-1.44)	0.27 (0.11-0.68)**	0.75 (0.41-1.38)	0.30 (0.12-0.74)*
North West			0.96 (0.56-1.65)	0.18 (0.08-0.43)***	0.91 (0.53-1.55)	0.20 (0.08-0.47)***
South East			0.82 (0.51-1.33)	0.33 (0.16-0.65)**	0.85 (0.53-1.37)	0.35 (0.17-0.69)**
South South			0.89 (0.52-1.51)	0.98 (0.46-2.08)	0.94 (0.55-1.60)	1.05 (0.49-2.26)
South West			0.89 (0.57-1.39)	1.23 (0.66-2.30)	0.93 (0.59-1.44)	1.35 (0.72-2.53)
<b>Random Effects</b>						
<b>Level 1</b>						
Variance (SE)	8.57	8.49	3.33	4.93	1.45	2.48
VPC	72.3	72.1	50.3	60.0	30.6	43.0
PCV (%)	Ref	Reff	61.1	41.9	83.1	70.8
<b>Level 2</b>						
Variance (SE)			1.57	2.59		
VPC			32.3	44.0		
PCV (%)	Ref	Reff	81.7	69.5		

Note: SE standard error; VPC variance partition coefficient; PCV proportional change in variance; C.I. confidence interval.

## Discussion

The prevalence of living alone and in poor conditions among older persons in Nigeria shed light on a critical aspect of the country's aging population. The findings reveal important insights into the challenges faced by older Nigerians, particularly in urban areas. The 11.5% prevalence of urban-dwelling older Nigerians living alone indicates a level of social isolation among older individuals, which has adverse effects on their mental and emotional well-being. Moreover, the finding that more than half (55.4%) of those living alone are also in poor conditions highlights a double burden of isolation and economic hardship that significantly impacts their quality of life. The demographic variations in the prevalence of LAPC are noteworthy. The higher prevalence among females, the oldest age group, and single/divorced individuals underscores the need for targeted support for these subgroups. Additionally, regional disparities suggest a regional dimension to these challenges. This indicates that interventions should be region-specific, recognizing that certain areas may have a higher concentration of older individuals living alone and in poor conditions.

The factors associated with living alone and in poor condition provide further insights. Gender emerges as a significant determinant, with women having an 86% higher risk of experiencing this double burden. This suggests the need for gender-sensitive policies and programs to support older women who are at heightened risk. Additionally, marital status and education play pivotal roles, emphasizing the importance of social support networks and education in later life.

Community characteristics, particularly poverty levels, also influence the risk of living alone and in poor condition. The lower risk observed in communities with moderate and low poverty levels underscores the role of socioeconomic factors in the well-being of older individuals. This finding suggests the need for poverty reduction strategies targeted at older populations, especially in high-poverty areas.

The multilevel modeling result highlights the impact of community-level factors, with 72.1% of the variance in LAPC attributed to the community level. This underscores the importance of community-based interventions and support systems to improve the living conditions of older Nigerians.

In conclusion, these findings provide a comprehensive understanding of the prevalence and determinants of living alone and in poor condition among older persons in Nigeria. They call for a multi-faceted approach that addresses regional disparities, gender-specific needs, and socioeconomic factors to enhance the well-being of

this vulnerable population. Policymakers and stakeholders should take these findings into account when formulating strategies to support and improve the lives of older Nigerians.