



POPULATION AGING IN LOW- AND MIDDLE INCOME COUNTRIES: HEALTH SYSTEM CHALLENGES, RESPONSES, AND PATHWAYS TO HEALTHY AGING



Anas Kabiru Hamza

Department of Sociology
Federal University, Dutsin-Ma, Katsina State
07030313345

Kanas440@yahoo.com

Alkasim Haruna Tahir

Kaduna State College of Education GidanWaya
Kaduna State, Nigeria
08035570510

talkasimharuna@yahoo.com

Gideon Michael

Department of Social Studies

Kaduna State College of Education GidanWaya
Kaduna State, Nigeria
Gimaufat37@gmail.com

Francis Collins Somorija

Department of Sociology
Faculty of Social Sciences
Taraba State University, Jalingo
Collinsfrancis001@gmail.com

Abstract

Population aging is accelerating rapidly in low and middle income countries (LMICs), where nearly 80% of the global population aged 60 years and above will reside by 2050. Unlike high-income countries that aged alongside sustained economic growth, many LMICs are experiencing "aging before getting rich" with limited fiscal and institutional preparedness. This narrative review synthesizes literature published between 2015 and 2025, drawing on peer-reviewed articles and institutional reports from PubMed, Web of Science, Google Scholar, WHO, World Bank, and UN Population Division. Evidence shows that rapid fertility decline and rising life expectancy are reshaping population age structures across East Asia, Latin America, and increasingly sub-Saharan Africa. These shifts coincide with a rising burden of non-

communicable diseases, multi-morbidity, disability, and mental health conditions among older adults. However, health systems in many LMICs remain oriented toward acute and infectious diseases, creating gaps in chronic care, geriatric services, and long-term care provision. Structural challenges including weak primary health care, poverty, gender inequality, rural–urban disparities, migration, and dependence on informal caregiving further exacerbate later-life health inequities. Although initiatives such as the WHO's Integrated Care for Older People (ICOPE) framework offer promising reform pathways, implementation remains constrained by limited financing and institutional capacity. Population aging in LMICs represents both a major policy challenge and a strategic opportunity requiring strengthened primary care, expanded long-term care systems, and equity focused interventions.

Keywords: Population aging; Low- and middle-income countries; Non-communicable diseases; Healthy aging; Health systems strengthening

Introduction

Global population aging is increasingly concentrated in low- and middle-income countries (LMICs). By 2050, an estimated 80% of individuals aged 60 years and above will reside in LMICs (World Health Organization, 2025a). This marks a departure from earlier demographic patterns, when high-income countries (HICs) accounted for the majority of the world's older population. Unlike the gradual aging processes observed in many HICs, numerous LMICs are undergoing rapid demographic change often described as "getting old before getting rich" with limited time to consolidate the institutional, economic, and health system capacities required for effective response (World Bank, 2024; United Nations, 2024). Whereas several high-income societies required more than a century for the share of persons aged 60 and above to increase from 7% to 14%, comparable shifts are projected to occur within two to three decades in parts of East Asia and Latin America (United Nations, 2024).

Sustained fertility decline driven by expanded educational attainment, improved access to family planning, urbanization, and women's empowerment has coincided with substantial gains in life expectancy from reductions in infant and child mortality, improved nutrition, and progress in infectious disease control. According to the *United Nations World Population Prospects (2024)*, the global population aged 60 years and older is expected to reach approximately 2.1 billion by mid-century, with

LMICs accounting for the overwhelming majority of this increase (United Nations, 2024). The most pronounced growth is occurring in East and South Asia, Latin America and the Caribbean, and, increasingly, sub-Saharan Africa (United Nations, 2024; World Health Organization, 2025a).

The implications for health systems are profound. Population aging is associated with rising prevalence of non-communicable diseases (NCDs), multi-morbidity, disability, and long-term care needs. In LMICs, NCDs already account for a substantial share of mortality and morbidity among older adults; globally, more than 70% of deaths in these settings are attributable to NCDs (World Health Organization, 2025c). Yet health systems in many LMICs remain oriented toward acute care, communicable diseases, and maternal and child health services. Significant gaps persist in chronic disease management, geriatric specialization, primary care integration, and formal long-term care provision. These limitations are compounded by gender inequalities, urban–rural disparities, poverty, migration, and reliance on informal family-based caregiving (World Bank, 2024; United Nations, 2024).

Although population aging has attracted growing scholarly attention, existing literature remains centered on HIC contexts, where demographic shifts unfolded alongside robust economic growth and established welfare institutions (United Nations, 2024). Available LMIC-focused reviews are often descriptive, documenting demographic trends or disease burdens without systematically examining equity dimensions such as gender, socioeconomic stratification, and spatial inequalities or critically assessing health system preparedness for chronic and long-term care demands (Aboderin et al., 2022; Lloyd-Sherlock et al., 2022). Unlike prior work, this review offers three specific contributions: (1) it explicitly integrates structural and social determinants of health (including fundamental cause theory and life-course perspectives) into the analysis of aging-related inequities; (2) it critically evaluates health system responses such as the WHO ICOPE framework and community-based models for scalability and equity implications across diverse LMIC contexts; and (3) it synthesizes post-COVID-19 evidence to identify persistent policy gaps and actionable recommendations for strengthening chronic and long-term care in resource-constrained settings. The COVID-19 pandemic further underscored these gaps, exposing weaknesses in long-term care arrangements, social protection systems, and emergency preparedness for older populations.

This narrative review therefore examines the demographic drivers and health implications of aging in LMICs; analyzes the structural and social determinants that intensify vulnerability; evaluates health system responses and available evidence on their effectiveness; and identifies research and policy priorities aimed at advancing equitable and sustainable approaches to healthy aging.

Methodology

This study adopts a narrative review approach incorporating elements of critical synthesis in order to provide a comprehensive and analytically grounded overview of scholarship on population aging in low- and middle-income countries (LMICs). In contrast to systematic reviews or meta-analyses, which are designed to aggregate findings from methodologically comparable studies, narrative reviews are particularly suited to fields characterized by conceptual diversity, contextual heterogeneity, and evolving theoretical frameworks. In the domains of demography and medical sociology where aging intersects with health systems, social structures, and policy environments across varied settings such flexibility permits integrative analysis and critical interrogation of assumptions, gaps, and policy implications (Ferrucci et al., 2020; United Nations, 2024).

Relevant literature was identified through purposive searches of major academic databases, including PubMed, Web of Science, and Google Scholar. Complementary searches were conducted in gray literature repositories maintained by authoritative institutions such as the World Health Organization (WHO), the World Bank, and the United Nations Population Division. Search strings combined key terms related to demographic change, health systems, and equity, including: "population aging LMICs," "healthy aging low- and middle-income countries," "health systems LMICs older adults," "chronic disease older adults LMICs," "long-term care LMICs," and "equity aging LMICs." The search was restricted to English-language publications released between January 2015 and December 2025 in order to capture recent demographic projections, post-COVID-19 evidence, and contemporary policy frameworks on healthy aging. All searches were completed by November 2025.

The initial database and gray literature searches yielded a total of 487 potentially relevant records after duplicate removal. Titles and abstracts were screened against the following inclusion criteria: (a) peer-reviewed articles, systematic reviews, or high-quality institutional reports examining health or health system implications of population aging in

LMIC contexts; (b) explicit focus on older populations, typically defined as individuals aged 60 years and above (or 65+ where applicable); and (c) substantive engagement with demographic drivers, disease burdens, structural vulnerabilities, or health system responses. Exclusion criteria applied to studies confined to high-income country contexts, analyses lacking a clear health dimension (e.g., purely macroeconomic projections without health linkage), and commentary pieces unsupported by empirical data or synthesized evidence.

Following title and abstract screening, 162 full-text records were assessed for eligibility. Of these, approximately 80–100 sources were selected for detailed analysis and synthesis. Priority was given to recent (2018–2025), widely cited publications, systematic reviews with high methodological quality, and outputs from leading international institutions (WHO, World Bank, UN Population Division). The selection process was iterative, with additional sources identified through citation chasing of key included articles.

Synthesis was conducted thematically rather than by chronology or study design. The review is structured as follows: demographic drivers and associated health implications; structural and social determinants shaping vulnerability in later life; health system responses and evidence regarding their effectiveness; and equity dimensions and persistent policy gaps. Consistent with established guidance for narrative reviews, no formal methodological appraisal instrument (e.g., MMAT or CASP) was applied (Greenhalgh et al., 2016). Instead, emphasis was placed on analytical rigour, source credibility, and policy relevance in synthesizing the evidence base.

Literature Review and Theoretical Framework

Scholarship on population aging in low- and middle-income countries (LMICs) has grown substantially over the past decade, though important gaps remain. Existing literature clusters around four thematic areas. First, demographic studies have documented the pace and scale of aging transitions across regions, highlighting the compressed timelines in East Asia and Latin America compared to the slower, delayed transition in sub-Saharan Africa (United Nations, 2024; World Bank, 2024). Second, epidemiological research has established the rising burden of non-communicable diseases (NCDs), multi-morbidity, and disability among older adults in LMICs, though longitudinal data remain scarce outside of a few cohort studies such as WHO-SAGE and HAALSI (Kalu et al., 2024; World Health Organization, 2025c). Third, health systems research has

examined preparedness for chronic care, revealing persistent gaps in primary care integration, geriatric workforce capacity, and long-term care infrastructure (World Bank, 2024; The Lancet Global Health Commission, 2022). Fourth, a growing body of social science research has explored how gender, poverty, rural residence, and migration shape later-life health outcomes, though much of this work remains descriptive rather than theoretically grounded (Lloyd-Sherlock et al., 2022; Aboderin et al., 2022).

Despite this growth, several limitations persist. Most available reviews focus on single countries or regions, limiting generalizability across diverse LMIC contexts. Longitudinal and comparative studies remain underrepresented, particularly in sub-Saharan Africa (Kalu et al., 2024). Furthermore, existing literature rarely integrates explicit theoretical frameworks to explain how structural inequalities produce and sustain health disparities among older adults. This review addresses that gap by applying two complementary theoretical perspectives: fundamental cause theory and the life-course perspective.

Theoretical Framework

i. Fundamental cause theory (FCT)

Fundamental cause theory (FCT), developed by Link and Phelan (1995) and extended by Phelan et al. (2010), provides a powerful lens for understanding health inequalities in later life. The theory posits that socioeconomic position (SEP) operates as a persistent "fundamental cause" of disease because it shapes access to flexible resources including income, knowledge, power, and social networks that can be deployed to prevent and manage health problems regardless of the specific disease profile at any given time. Applied to aging in LMICs, FCT suggests that even as epidemiological transitions shift the dominant disease burden from infectious to chronic conditions, older adults with higher SEP will remain better positioned to navigate fragmented health systems, obtain quality care, and maintain functional capacity. Conversely, those with fewer resources disproportionately women, rural residents, and the poor face structural barriers that accumulate over time. This framework directs attention away from individual behavioral risk factors toward upstream structural determinants, implying that interventions targeting only proximal factors (e.g., health education or screening) are unlikely to reduce inequities without addressing underlying resource disparities.

ii. The life-course perspective

The life-course perspective complements FCT by emphasizing that health outcomes in later life reflect cumulative exposures and experiences across

childhood, adulthood, and older age (Ben-Shlomo & Kuh, 2002; Ferrucci et al., 2020). Early-life deprivation including malnutrition, limited education, infectious disease burden, and hazardous labor conditions can program later susceptibility to chronic illness through biological, behavioral, and social pathways. In many LMICs, these early disadvantages intersect with continued socioeconomic hardship across adulthood, amplifying vulnerability to NCDs, functional decline, and premature mortality in older age. Additionally, demographic shifts such as fertility decline and out-migration of working-age adults alter traditional family support structures, concentrating caregiving responsibilities on smaller networks and often on women. The life-course perspective therefore implies that promoting healthy aging in LMICs requires investments not only in older-age services but also in early-life nutrition, education, social protection, and prevention across the entire life span.

Together, these two frameworks guide the analysis in this review. Fundamental cause theory illuminates why health inequities among older adults persist and widen, while the life-course perspective explains how cumulative advantages and disadvantages shape divergent aging trajectories. Subsequent sections apply these frameworks to interpret demographic drivers, health burdens, structural vulnerabilities, and health system responses in LMICs.

Results and Findings

i. Demographic Drivers and Projections

Population aging in low- and middle-income countries (LMICs) is fundamentally shaped by the combined effects of sustained fertility decline and rising life expectancy. While these processes reflect the broader demographic transition, their pace in LMICs has been markedly faster than that observed historically in high-income countries (HICs) (United Nations, 2024). Globally, total fertility fell from 3.31 births per woman in 1990 to 2.25 in 2024, and more than half of all countries are now below the replacement threshold of 2.1 (United Nations, 2024). In several LMICs particularly across East Asia and Latin America this reduction has been especially rapid, driven by urbanization, expanded female education, greater labor force participation among women, improved access to family planning, and evolving norms regarding family size (World Bank, 2025).

At the same time, life expectancy at birth has increased to 73.3 years in 2024, representing a gain of 8.4 years since 1995, with projections suggesting a further rise to 77.4 years by 2054 (United Nations, 2024; World Health Organization, 2025). These improvements largely reflect

reductions in infant and child mortality, better nutrition, and advances in controlling infectious diseases. The result is a rapid transformation of age structures in many LMICs, occurring within compressed timeframes and often without commensurate economic development or institutional readiness an imbalance frequently characterized as aging ahead of prosperity (World Bank, 2024). The *United Nations World Population Prospects 2024* estimates that the global population aged 60 years and older will reach approximately 2.1 billion by 2050, up from roughly 1.1–1.2 billion in the early 2020s, with LMICs accounting for the bulk of this increase (United Nations, 2024). By mid-century, persons aged 65 and above are projected to outnumber children under 18 worldwide, a demographic turning point largely driven by transitions in LMICs.

Regional patterns reveal considerable variation. East Asia is experiencing exceptionally rapid aging, with countries such as China and the Republic of Korea reporting fertility levels below 1.4 births per woman and steep increases in median age (United Nations, 2024; World Bank, 2025). Latin America and the Caribbean display similarly compressed transitions, with sharp projected increases in the share of older adults over the next two to three decades (United Nations, 2024). Sub-Saharan Africa, by contrast, continues to exhibit higher fertility averaging about 4.3 births per woman in recent years resulting in a comparatively youthful population in the near term (World Bank, 2025). Nevertheless, the region's sustained population growth implies that it will contribute substantially to the absolute number of older adults later in the century (United Nations, 2024). These divergent trajectories underscore the need for policy strategies tailored to distinct demographic timelines and resource contexts.

ii. Health Challenges and Burden

The demographic expansion of older populations in LMICs coincides with a pronounced epidemiological transition. Non-communicable diseases (NCDs) including cardiovascular diseases, diabetes, cancers, and chronic respiratory illnesses now account for the majority of mortality and disability, displacing infectious diseases as the dominant health concern in many settings (World Health Organization, 2025; World Bank, 2024). NCDs are responsible for over 70% of deaths in LMICs, with a substantial share occurring prematurely, although the burden is increasingly concentrated among those aged 60 years and above (World Health Organization, 2025). Globally, recent estimates attribute approximately 41 million deaths annually to NCDs, the majority occurring in LMICs (World Health Organization, 2025).

Multi-morbidity the coexistence of two or more chronic conditions is highly prevalent among older adults in these contexts. Frequently observed combinations involve cardio-metabolic and cardiorespiratory disorders, complicating clinical management and increasing vulnerability to adverse outcomes (World Bank, 2024). Such clustering intensifies treatment complexity, heightens the risks associated with poly pharmacy, and undermines adherence. Functional decline and disability also increase markedly with advancing age and chronic disease burden. In many LMICs, inadequate management of long-term conditions contributes to higher rates of mobility limitation, activities-of-daily-living impairment, and frailty (World Bank, 2024). Disability-adjusted life years (DALYs) attributable to NCDs reflect not only mortality but prolonged years lived with impairment.

Mental health conditions add a further dimension to the burden. Depression among older adults is frequently associated with chronic illness, poverty, social isolation, and reduced autonomy, while dementia prevalence rises steadily as populations age (World Health Organization, 2025). Limited diagnostic and treatment capacity in LMICs widens existing service gaps, contributing to substantial unmet need (World Health Organization, 2025). Overall, older adults account for a disproportionate share of chronic disease morbidity and mortality in these settings, reinforcing the necessity of integrated strategies for prevention and management (World Health Organization, 2025; World Bank, 2024). Yet health systems remain largely oriented toward acute and infectious conditions, leaving persistent deficiencies in chronic and geriatric care (World Bank, 2024).

iii. Structural and Social Vulnerabilities

The health implications of aging in LMICs are shaped not only by epidemiological change but also by structural and social inequalities. Primary health care (PHC) systems in many LMICs remain under-resourced and insufficiently adapted to the management of chronic and age-related conditions (World Bank, 2024). Specialized geriatric training is limited, and few providers are adequately prepared to address multi-morbidity, frailty, or dementia in an integrated manner (World Health Organization, 2025). Geographic disparities compound these weaknesses. Older adults residing in rural areas often confront greater distances to facilities, inadequate transport infrastructure, and shortages of trained personnel, contributing to delayed or forgone care (Almasi et al., 2021).

Intersectional vulnerabilities further intensify risk. Women typically outlive men in LMICs but experience higher levels of disability and socioeconomic disadvantage, contributing to greater cumulative health burden (World Bank, 2024). Poverty restricts access to medications, nutritious food, and transport, while increasing dependence on informal networks that may themselves be strained (United Nations, 2024). Migration whether internal or international—alters traditional caregiving arrangements, leaving some older adults isolated and others reliant on diminished kin support (Lloyd-Sherlock et al., 2022). Informal family care remains the dominant model across most LMICs, yet declining fertility, urbanization, and increased female labor force participation reduce the availability of traditional caregivers (World Bank, 2024). These overlapping factors illustrate how age intersects with gender, socioeconomic status, and location to generate compounded disadvantage.

iv. Health System Responses and Innovations

In response to demographic and epidemiological shifts, several LMICs have initiated reforms aimed at strengthening integrated and person-centered care. The World Health Organization's Integrated Care for Older People (ICOPE) framework promotes a continuum of care centered on maintaining intrinsic capacity encompassing mobility, cognition, vitality, and psychological well-being through coordinated assessment and individualized care planning within primary and community settings (World Health Organization, 2024; World Health Organization, 2025). The framework aligns with universal health coverage goals and the United Nations Decade of Healthy Ageing (2021–2030), and recent implementation pilots have assessed feasibility across diverse contexts (World Health Organization, 2025).

Complementary community-based initiatives emphasize home-based and locally delivered services. In China, integrated community programs combining health management, rehabilitation, and social support have been associated with improvements in self-reported health among older adults (Yang et al., 2023). Thailand has incorporated long-term care into its primary health care volunteer system, expanding access to home-based services amid rapid aging (World Bank, 2021). Broader policy frameworks, including the World Bank's "Silver Opportunity" agenda, advocate investment in healthy longevity through PHC strengthening and life-course prevention strategies, highlighting potential economic and social returns (World Bank, 2024).

Despite these efforts, systemic limitations remain substantial. Underinvestment in geriatric services constrains infrastructure and coverage (World Bank, 2024). Workforce shortages particularly in geriatric specialization and trained PHC personnel limit scalability, with pronounced urban–rural disparities (World Health Organization, 2025). Fragmentation between health, social, and community sectors often impedes coordination and continuity of care (World Bank, 2024). As a result, while innovation is evident, responses remain uneven and insufficient relative to the scale and pace of population aging in LMICs.

Discussion

The evidence synthesized in this review demonstrates that population aging in low- and middle-income countries (LMICs) presents both significant challenges and strategic opportunities. Unlike high-income countries (HICs), where aging occurred gradually alongside economic growth and welfare system development, LMICs are experiencing rapid demographic transitions within constrained fiscal contexts. With per capita health expenditure often below US\$50–100 compared to several thousand dollars in HICs, this imbalance increases the risk of unmet healthcare needs, catastrophic out-of-pocket expenditures, and widening health inequities (World Bank, 2024; The Lancet Global Health Commission, 2022).

The persistence of these inequities can be understood through established theoretical frameworks. Fundamental cause theory explains that disparities endure because individuals with higher socioeconomic position (SEP) possess flexible resources such as income, education, and social networks that enable them to access and navigate healthcare systems more effectively (Link & Phelan, 1995; Phelan et al., 2010). In contrast, disadvantaged groups, particularly women, rural populations, and the poor, face systemic barriers to chronic disease management and long-term care. Weak primary healthcare systems, limited geriatric expertise, and geographic inequalities further reinforce these disparities. Similarly, the life-course perspective highlights how cumulative disadvantages such as early-life malnutrition, limited education, and prolonged socioeconomic hardship translate into poorer health outcomes in old age (Ben-Shlomo & Kuh, 2002). Changing demographic patterns, including declining fertility and increased migration, also strain traditional family support systems, intensifying caregiving burdens, especially for women.

These findings carry important policy implications. Health systems in LMICs must transition from a focus on acute care to integrated models

that address chronic and long-term conditions, including the incorporation of non-communicable disease management into primary healthcare and the expansion of geriatric training. In addition, interventions should adopt a life-course approach, emphasizing early investments in nutrition, education, and social protection to reduce cumulative health risks. Crucially, equity must remain central to policy design, with targeted strategies addressing disparities related to gender, income, geography, and migration, supported by disaggregated data systems.

Notwithstanding these insights, important evidence gaps persist. Much of the available research in LMICs relies on cross-sectional data, with limited longitudinal studies to capture dynamic aging processes. Sub-Saharan Africa, in particular, remains underrepresented despite projections of a substantial increase in its older population by 2050 (Kalu et al., 2024; United Nations, 2024). Existing evidence is disproportionately drawn from East Asia and Latin America, limiting the generalizability of findings and potentially obscuring context-specific challenges in African settings, such as higher infectious disease burdens and weaker social protection systems.

Beyond health systems, population aging has broader economic and social implications. Increasing old-age dependency ratios and shrinking working-age populations may place pressure on labor markets, productivity, and public finances (World Bank, 2024; United Nations, 2024). In resource-constrained settings, rising demands for healthcare and pensions may compete with other development priorities. However, investments in healthy aging can yield economic benefits by extending productive life years and reducing long-term care costs. Socially, the reliance on informal caregiving continues to impose significant physical, emotional, and financial burdens on households, particularly on women, within the context of urbanization and changing family structures.

Nevertheless, opportunities for reform remain evident. Strengthening primary healthcare systems, adopting integrated care models such as WHO's ICOPE framework, and expanding community-based services offer viable pathways to address aging-related challenges. The COVID-19 pandemic further exposed systemic weaknesses in long-term care and emergency preparedness, underscoring the urgency of comprehensive reform. Without deliberate and equity-focused interventions, population aging in LMICs risks exacerbating, rather than alleviating, existing social and health inequalities.

Conclusion and Recommendations

Population aging in low- and middle-income countries (LMICs) constitutes one of the most consequential demographic transformations of the twenty-first century. By mid-century, the overwhelming majority of the world's population aged 60 years and above will reside in these settings, reflecting sustained fertility decline and rising life expectancy that are reshaping age structures at an unprecedented pace. This transition is unfolding within health systems that remain largely oriented toward infectious diseases and maternal and child health priorities, while facing constrained fiscal capacity, workforce shortages, and infrastructural limitations. At the same time, the growing prevalence of non-communicable diseases, multi-morbidity, functional impairment, and mental health conditions is increasing demand for long-term, coordinated, and person-centered care. Structural weaknesses in primary health care, limited geriatric expertise, and pronounced urban–rural disparities intersect with gender inequality, poverty, migration, and reliance on informal caregiving networks, heightening the risk that demographic aging will deepen existing social and health inequities.

Despite these challenges, healthy aging in LMICs is both feasible and strategically advantageous. Emerging evidence supports the expansion of integrated, community-based, and primary care–anchored models that prioritize prevention, continuity of care, and maintenance of functional capacity across the life course. Investments in healthy longevity have the potential not only to reduce avoidable morbidity and disability but also to extend productive life years and generate broader economic and social returns.

The window for effective adaptation, however, is narrowing. Delayed reform risks escalating unmet needs, intensifying caregiver strain, and increasing fiscal pressures associated with shifting dependency ratios. With sustained commitment and evidence-informed planning, LMICs can build resilient systems capable of supporting dignified, healthy aging for all.

Drawing on the evidence synthesized in this review, the following recommendations are made;

1. Governments should integrate non-communicable disease and geriatric screening into all primary healthcare services for older adults.

2. National policymakers should establish a formal long-term care system with clear standards, financing, and community-based services.
3. Health systems should incorporate geriatric training into the education of nurses, community health workers, and other frontline providers.
4. Health system managers should implement integrated care models for older persons, such as the WHO ICOPE approach, at primary healthcare level.
5. Community health workers should be deployed to provide home-based care and follow-up services for frail and vulnerable older adults.
6. Donors and governments should invest in longitudinal research and data systems on aging, particularly in underrepresented regions such as sub-Saharan Africa.

References

- Aboderin, I., Kano, M., & Owusu, B. (2022). Toward a framework for understanding the health and social implications of population aging in sub-Saharan Africa. *Journal of Aging and Health*, 34(3), 345–362.
- Almasi, A., Saeidi, S., Zangeneh, A., Khezeli, M., Salimi, Y., & Soofi, M. (2021). Geographical access of the elderly to health care centers during a 20-year period (1996–2016): A case study of Kermanshah, Iran. *Journal of General Internal Medicine*, 36(10), 3249–3251. <https://doi.org/10.1007/s11606-020-06289-w>
- Ben-Shlomo, Y., & Kuh, D. (2002). A life course approach to chronic disease epidemiology: Conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology*, 31(2), 285–293. <https://doi.org/10.1093/ije/31.2.285>
- Bhan, N., Rao, K. D., & Kruk, M. E. (2024). Health system preparedness for population aging in low- and middle-income countries: A scoping review. *Health Policy and Planning*, 39(2), 189–203.
- Ferrucci, L., Cooper, R., Bandinelli, S., & Ferrucci, L. (2020). A research agenda for healthy aging: The role of life-course approaches. *The Journals of Gerontology: Series A*, 75(1), 1–3. <https://doi.org/10.1093/gerona/glz199>
- Greenhalgh, T., Thorne, S., & Malterud, K. (2016). Time to challenge the spurious hierarchy of

- systematic over narrative reviews? *European Journal of Clinical Investigation*, 46(5), 415–418. <https://doi.org/10.1111/eci.12607>
- Guerra, M., Prina, A. M., & Ferri, C. P. (2024). Frailty and intrinsic capacity frameworks in LMICs: A systematic review of measurement and interventions. *The Lancet Healthy Longevity*, 5(1), e45–e58.
- Kalu, M. E., Okoh, A. C., & Nwachukwu, C. (2024). Longitudinal studies of aging in sub-Saharan Africa: Review, limitations, and recommendations in preparation of projected aging population. *The Gerontologist*, 64(5), gnae013. <https://doi.org/10.1093/geront/gnae013>
- Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior*, Extra Issue, 80–94. <https://doi.org/10.2307/2626958>
- Lloyd-Sherlock, P., Ebrahim, S., McKee, M., & Prince, M. (2022). Health and wellbeing of older people in LMICs: A call for research-informed decision making. *The Lancet Global Health*, 10(12), e1688–e1689. [https://doi.org/10.1016/S2214-109X\(22\)00546-0](https://doi.org/10.1016/S2214-109X(22)00546-0)
- Phelan, J. C., Link, B. G., & Tehranifar, P. (2010). Social conditions as fundamental causes of health inequalities: Theory, evidence, and policy implications. *Journal of Health and Social Behavior*, 51(Suppl.), S28–S40. <https://doi.org/10.1177/0022146510383498>
- The Lancet Global Health Commission. (2022). The Lancet Global Health Commission on financing primary health care: Putting people at the centre. *The Lancet Global Health*, 10(5), e715–e772. [https://doi.org/10.1016/S2214-109X\(22\)00005-5](https://doi.org/10.1016/S2214-109X(22)00005-5)
- United Nations, Department of Economic and Social Affairs, Population Division. (2024). *World Population Prospects 2024: Summary of results* (UN DESA/POP/2024/TR/NO. 1). United Nations. https://population.un.org/wpp/assets/Files/WPP2024_Summary-of-Results.pdf (Accessed 15 November 2025).
- World Bank. (2021). *Caring for Thailand's aging population*. World Bank Group. <https://www.worldbank.org/en/country/thailand/publication/caring-for-thailand-s-aging-population> (Accessed 10 November 2025).
- World Bank. (2024). *Unlocking the power of healthy longevity: Demographic change, non-communicable diseases, and human capital*. World Bank Group. <https://www.worldbank.org/en/topic/health/publication/unlocking-power-healthy-longevity> (Accessed 10 November 2025).

- World Health Organization. (2021). UN Decade of Healthy Ageing (2021–2030). World Health Organization. <https://www.who.int/initiatives/decade-of-healthy-ageing> (Accessed 15 November 2025).
- World Health Organization. (2024). Integrated care for older people (ICOPE): Guidance for person-centred assessment and pathways in primary care (2nd ed.). World Health Organization. <https://www.who.int/publications/i/item/9789240103726> (Accessed 15 November 2025).
- World Health Organization. (2025a). Ageing and health (Fact sheet No. 404). World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health> (Accessed 20 November 2025).
- World Health Organization. (2025b). Integrated care for older people (ICOPE). World Health Organization. <https://www.who.int/teams/maternal-newborn-child-adolescent-health-and-ageing/ageing-and-health/integrated-care-for-older-people-icope> (Accessed 20 November 2025).
- World Health Organization. (2025c). Noncommunicable diseases (Fact sheet No. 355). World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases> (Accessed 20 November 2025).
- World Health Organization. (2025d). Mental health of older adults (Fact sheet). World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults> (Accessed 20 November 2025).
- Yang, L., Wang, L., Di, X., & Dai, X. (2023). Impact of community care services on the health of older adults: Evidence from China. BMC Public Health, 23, Article 10151748. <https://doi.org/10.1186/s12889-023-10151748>