

# The Malawi Longitudinal Study of Families and Health

Newsletter 2023/04:

## Adversity, Aging and ADRD Risk: A Biosocial Lifecourse Approach

2023–28

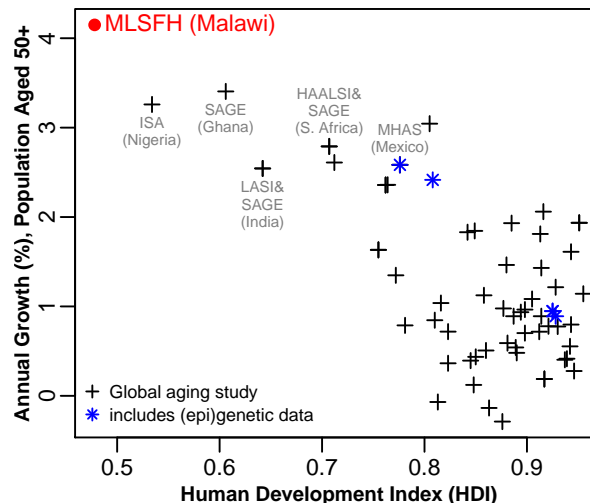


### MLSFH Project Description

The **Malawi Longitudinal Study of Families and Health (MLSFH)** is one of few long-standing publicly-available longitudinal cohort studies in sub-Saharan Africa (SSA). With an overall study population of more than 6,000 individuals, an age range from adolescents to old persons, and data collection rounds in 1998, 2001, 2004, 2006, 2008, 2010, 2012–13, 2017–18, 2020 and 2021–22, the MLSFH documents 25 years of demographic, socioeconomic and health conditions in one of the world’s poorest countries. The MLSFH public-use data can be requested on the project website <https://web.sas.upenn.edu/malawiresearch>. **MLSFH Cohort Profiles** [1, 2] provide detailed project information, reviews of MLSFH research, and discussions of MLSFH data quality. Funding by U.S. National Institutes of Health provides a continuation of the MLSFH through 2028, focusing on research questions related to **Adversity, Aging and ADRD Risk** among poor older individuals in Malawi.

### Gaps in Global Aging Research

¶ Global populations are aging. Yet, very few aging studies cover low-income countries (LICs) like Malawi



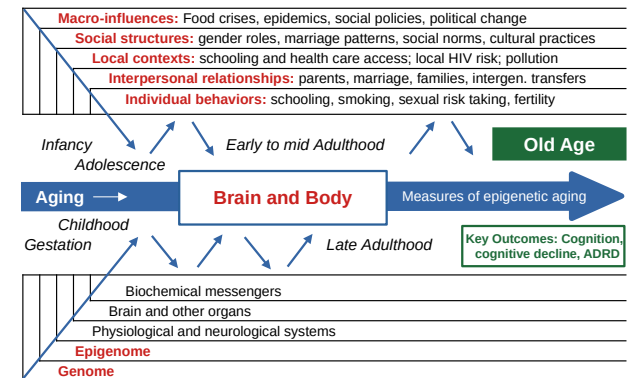
### Adversity and Accelerated Aging: A Biosocial Life-course Approach

¶ Many poor and/or disadvantaged individuals face **accelerated aging** with an earlier onset of morbidity; yet, some resilient individuals experience (relatively) healthy aging despite lifecourse adversities.

¶ Novel biosocial research allows measuring these individual-level differences in the aging process via **epigenetic aging biomarkers** (“epigenetic clocks”).

¶ However, biosocial aging research predominantly focuses on high-income mostly-white populations, severely limiting the understanding of aging in LICs.

**This project pursues biosocial aging research in a low-income context (Malawi) to study the interaction of lifecourse adversities, aging, cognitive decline and dementia among poor older individuals.**



### Key Outcome: Cognition & ADRD

¶ Brain health is the most precious resource of individuals at all ages and for all human activities.

¶ Rapid growth of the global aging population is projected to lead to sharp rises in Alzheimer’s Disease and Related Dementia (ADRD), including in LICs.

¶ The Lancet: “Dementia is the greatest global challenge for health and social care in the 21st century.”

**Lack of aging & ADRD research in LICs leaves poor countries unprepared for global aging transformation.**

## Project Goals

¶ Supplement 25 years of existing lifecourse social, contextual, and health data in the MLSFH with epigenetic aging biomarkers and additional longitudinal measures of cognition and ADRD risk.

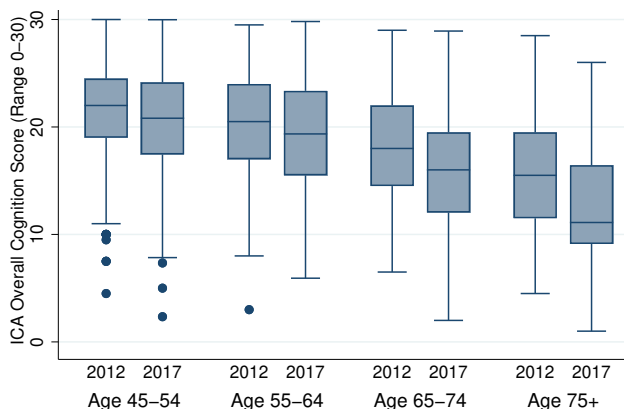
¶ Resulting longitudinal biosocial MLSFH aging data will be unique within LICs, and it will allow research at the forefront of current global aging studies:

### Aim 1—Lifecourse adversities and epigenetic aging biomarkers:

Investigate critical factors contributing to accelerated aging in an LIC population with extensive lifecourse adversities by (a) evaluating existing and novel epigenetic biomarkers of aging, and (b) testing their relationship to lifecourse adversities, health behaviors, and underlying genetic predisposition.

### Aim 2—Epigenetic aging biomarkers and ADRD risk among older adults in an LIC:

Investigate the relationship between epigenetic biomarkers and cognitive function/decline and ADRD to evaluate the biosocial determinants of ADRD in a LIC population experiencing high levels of adversities.



Cognitive health declines in MLSFH study population, especially at older ages: longitudinal change in MLSFH cognition score 2012-17.

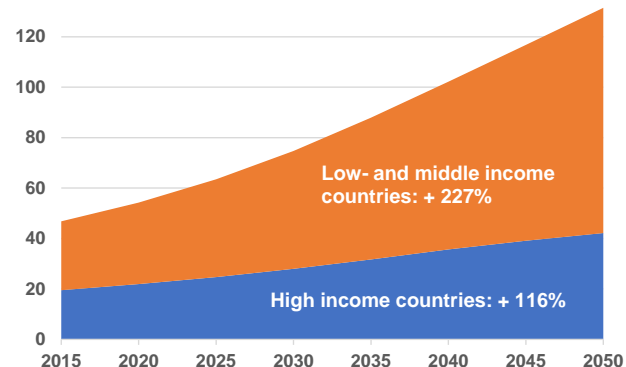
## Public Health Relevance

This project is relevant to public health, health policy and research capacity building because it will:

¶ Enhance our understanding of how social and environmental exposures interact with biology to shape accelerated aging and ADRD in LICs like Malawi,

¶ Inform policy interventions aimed at reducing global disparities in life expectancies and quality of life among older adults, and

¶ Create a novel and timely public resource for biosocial aging research in LICs, and create capacity in Malawi for training and research at the frontier of global aging & ADRD studies.



Number of people with dementia in low and middle income countries (LMICs) compared to high income countries (in millions).

## Data Collection

### 25 years of MLSFH data will be expanded with:

¶ Two new rounds of survey data collection for ≈3,500 MLSFH respondents aged 45+ in 2024+27, including extensive health indicators to measure accelerated aging and cognitive assessments that are comparable to Harmonized Cognitive Assessment Protocol (HCAP).

¶ Informant interviews for respondents unable to participate due to cognitive or other health limitations.

¶ Research diagnoses of normal cognitive aging, cognitive impairment no dementia (CIND), and ADRD.

¶ Collection of dried blood spots (DBS) for DNA methylation profiling (DNAm) and whole-genome sequencing (WGS), allowing the calculation of epigenetic clocks and related epigenetic aging biomarkers.

¶ Qualitative studies of community perceptions, extensive community engagements, a scientific advisory

board, and IRB oversight will monitor study implementation, community acceptance, protocol adherence and overall progress.

## MLSFH Project Website

<https://web.sas.upenn.edu/malawiresearch>

## Acknowledgments

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## Contact Information

The MLSFH is conducted by the the Population Aging Research Center (PARC) and Population Studies Center (PSC) at the **University of Pennsylvania**, in collaboration with the **Kamuzu University of Health Science (KUHeS)** and **Invest in Knowledge** in Zomba, Malawi. Key contact persons for this MLSFH project on Adversity, Aging and ADRD Risk include:

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