Conceptual,
Theoretical,
Methodological,
and/or Data
Investments

H.-P. Kohler

Diversity of Global
Aging Contexts

Distinctive Aging
Patterns in LMICs?

Innovations in
Lifecourse Frameworks
of Aging

Causal Inference and
Policies

Conclusions

Session 2: Conceptual, Theoretical, Methodological, and/or Data Investments for Aging Research in LMICs

Hans-Peter Kohler

Developing an Agenda for Population Aging and Social Research in LMICs

National Academies Science Engineering Medicine, September 7–8, 2023

Penn
UNIVERSITY of PENNSYLVANIA

Rural Low-income Context: Malawi

Study Context of Malawi Longitudinal Study of Families and Health (MLSFH)

LMIC Diverse Contexts For Aging

Rural Malawi

Johannesburg, S. Africa

← **Low & Middle Income Countries** →

GDP per capita 1950–2018 of poorest countries in 1950s

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Source: Maddison Project Database 2020

Under-5 Mortality $_5q_0$ 1950–1980

Malawi 1950–55
Under–5yr mortality = 35%

Density

Under 5yr mortality: Probability of dying before age 5 (per 1,000)

Aging in Different Demographic Contexts

Malawi 2050 / South Africa, 2050
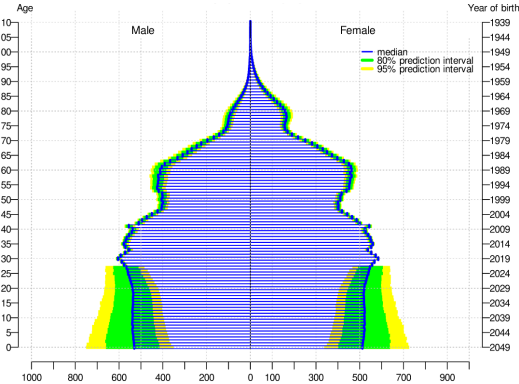
Global Aging Studies & Diversity of Global Aging Contexts
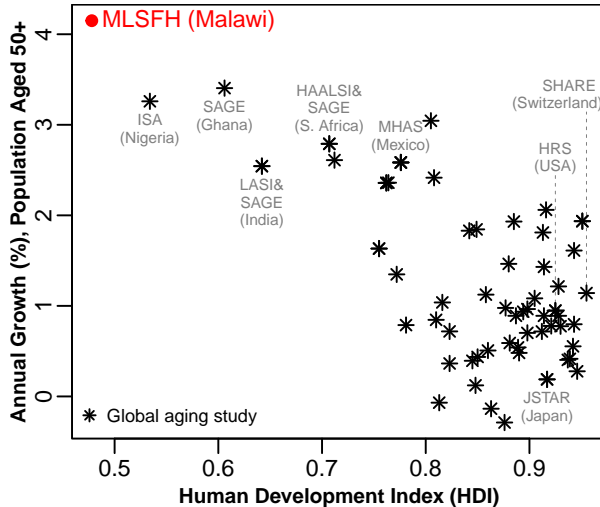
Conceptual,
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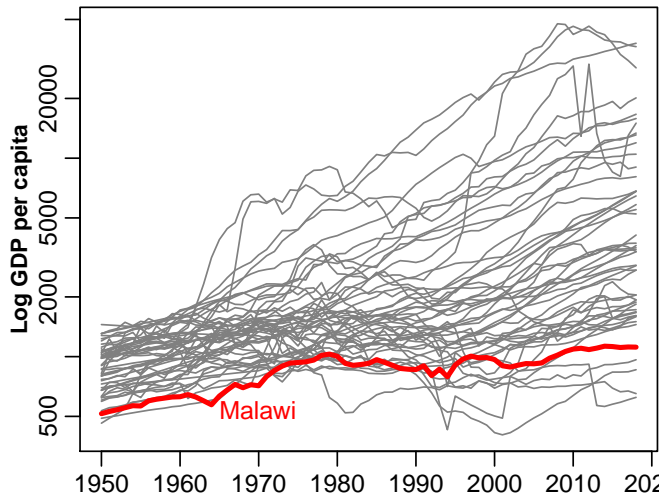Investments

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**Diversity of Global
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**Distinctive Aging
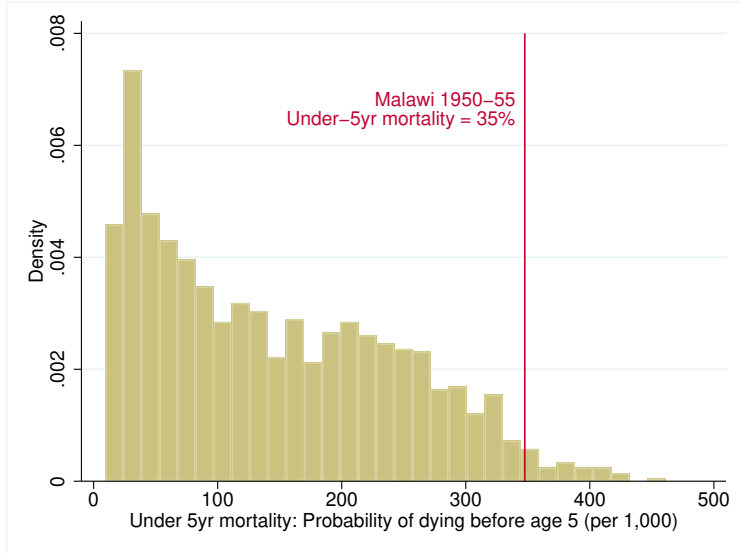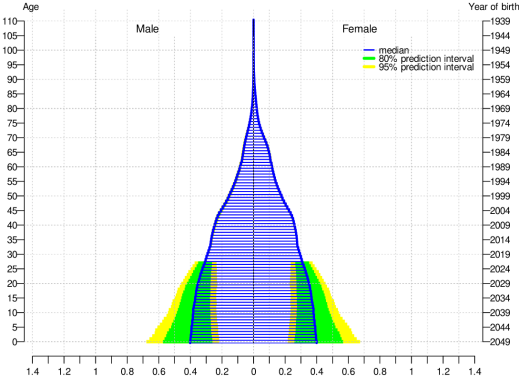Patterns in LMICs?**

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Source: Hoang et al. (forthcoming). Resilience, Accelerated Aging and Persistently Poor Health: Diverse Trajectories of Health in Malawi. *Population and Development Review.* Global aging studies include HRS and sister studies, SAGE and other aging studies available in the g2aging portal and other sources.

Why study global aging?

... many reasons, including

... are there distinctive aging patterns in LMICs?

... does existing knowledge generalize to LMICs?

... do LMIC findings help inform policies + programs in HICs?

Trajectories of Health Across the Lifecourse: Malawi

Resilient aging (yellow), accelerated aging (blue) and persistently poor health (red)

SF12 Mental Health

SF12 Physical Health

Legend (left chart): Persistently Poor Health (6%) | Accelerated Aging (32%) | Resilient Aging (62%)

Legend (right chart): Persistently Poor Health (8%) | Accelerated Aging (39%) | Resilient Aging (54%)

Early Onset of Cognitive Decline: Malawi

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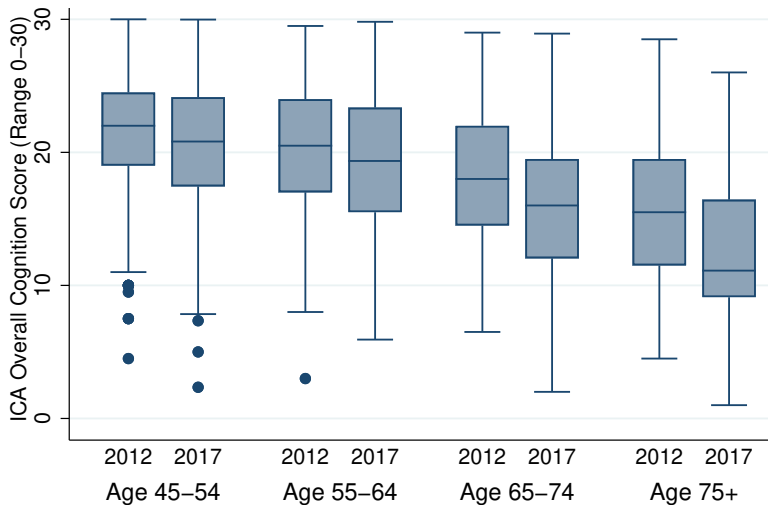
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Source: Kohler et al. (2023). Cognition and Cognitive Changes in a Low-income sub-Saharan African Aging Population. *Journal of Alzheimer's Disease.* Analyses based on longitudinal change of MLSFH Cognition Score during 2012–17, by age in 2012.
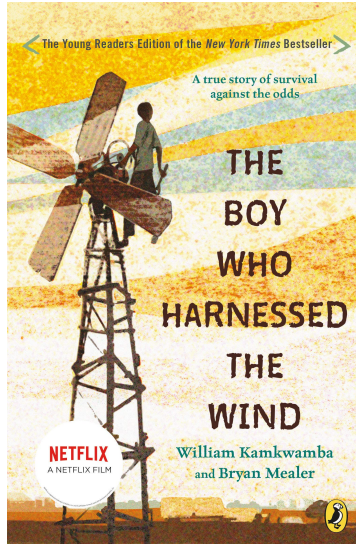
Barker's Hypothesis & Early-life Influences

Barker's Hypothesis & Early-life Influences: Hypertension

1949: Nyasaland Famine

Source: Ciancio, A. et al. (forthcoming). Barker's Hypothesis Among the Global Poor: Positive Long-term Cardiovascular Effects of In-utero Famine Exposure. *Demography*
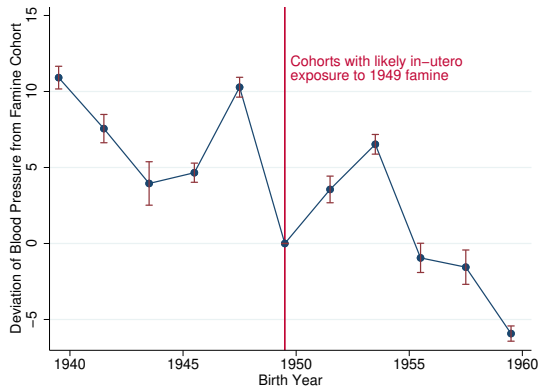
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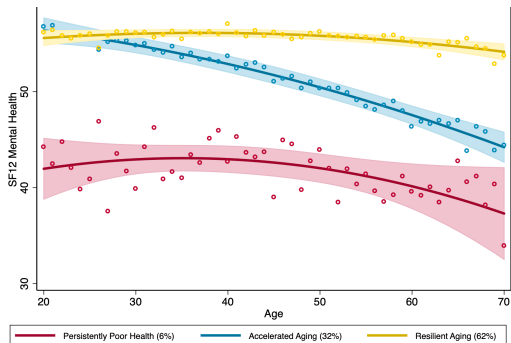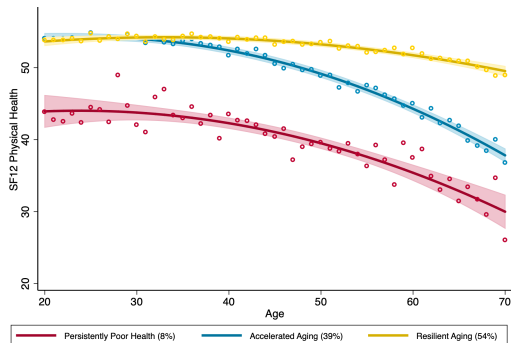
Conclusions

Macro-influences: Food crises, epidemics, social policies, political change
Social structures: gender roles, marriage patterns, social norms, cultural practices
**Local contexts:** schooling and health care access; local HIV risk; pollution
Interpersonal relationships: parents, marriage, families, intergen. transfers
Individual behaviors: schooling, smoking, sexual risk taking, fertility

Infancy
Adolescence
Early to mid Adulthood
Old Age

Aging →
Body and Brain

Childhood
Gestation
Late Adulthood

Outcomes: Physical, mental & cognitive health from middle to older ages

Biochemical messengers
Brain and other organs
Physiological and neurological systems
Epigenome
Genome

Source: Hoang et al. (forthcoming). Resilience, Accelerated Aging and Persistently Poor Health: Diverse Trajectories of Health in Malawi. *Population and Development Review.*

Causal Inference and Policies: Blood Pressure Screening

	Blood pressure	Hypertension	Diagnosis	Medication
RDD	⇓	⇓	⇑	—
Matching	⇓	⇓	⇑	⇑

	Knowledge	Risky health behaviors	Subjective health
RDD	—	—	↑
Matching	—	↑	—

Source: Ciancio, A. et al. (2021). Health Screening for Emerging Disease Burdens Among the Global Poor: Evidence from Sub-Saharan Africa. *Journal of Health Economics.* Upwards (downwards) double arrows: positive (negative) and statistically significant effects (p-value=0.05). Upwards (downwards) arrows: positive (negative) and statistically significant effects at conventional levels on some dimensions of the characteristics.

Causal Inference and Policies: HIV testing prior to ART

Effect effects of learning HIV status in 2004 on survival

Respondent is alive in:				
	2006-07	2008	2010	2018-19
	(1)	(2)	(3)	(4)
Learn HIV–	0.001	0.002	-0.007	0.006
	(0.007)	(0.014)	(0.014)	(0.024)
Learn HIV+	-0.110	-0.183*	-0.231**	-0.227*
	(0.089)	(0.111)	(0.113)	(0.128)
Observations	2756	2694	2649	2332
Mean HIV–	0.994	0.977	0.958	0.888
Mean HIV+	0.910	0.806	0.770	0.612

Source: Ciancio et al. (2024). Health Information and Survival without Treatment Options. Unpublished. Table shows estimates of the effect on the probability of being alive for various years based on instrumental variable estimates that account for endogeneity of learning HIV status. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Causal Inference and Policies: Mortality Misperceptions

Effect of 2017 mortality risk information on Covid-19 vaccine uptake
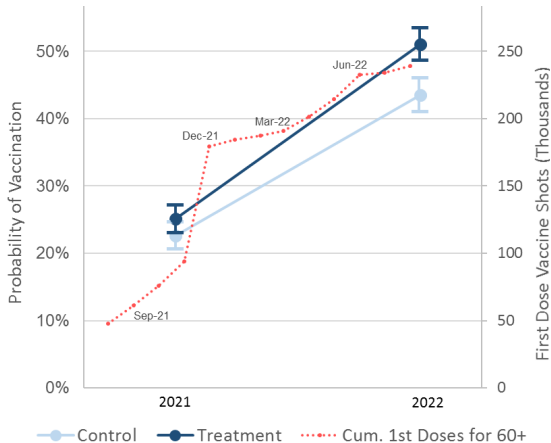
Source: Purcell et al (2023). Mortality Risk Information and Health Seeking Behavior During an Epidemic. Unpublished

Conclusions: Importance of Conceptual Framework

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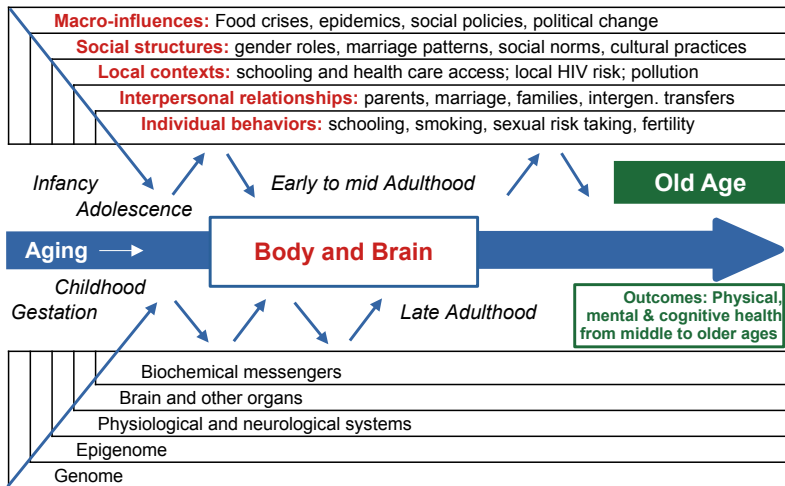
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Conclusions: Data and Methods Innovations

- ▶ **Create innovative global aging data that**
  - ▶ capture diverse aging contexts across and within LMICs
  - ▶ allow life-course analyses and include family/community contexts
  - ▶ capture biological, social and behavioral aspect of aging
  - ▶ allow comparative analyses via harmonization of key outcomes and exposures, while recognizing limitations of doing so across LMICs
  - ▶ capture changing environmental, social and economic contexts
  - ▶ are nationally representative (priority?)

- ▶ **Document distinctive and common aging trajectories across development spectrum**

- ▶ **Leverage diversity of global aging contexts to enhance understanding of aging processes**

- ▶ **Plan research design to allow for causal analyses**
  - ▶ but recognize ongoing need for insightful descriptive analyses

- ▶ **Build strong partnerships and inclusive research teams**

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