

Population Aging and Heat Exposure in the 21st Century

RCCN Workshop: Climate Change and Aging
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November 12, 2024



OVERVIEW

- Understand co-occurring trends of population aging and climate change, and their consequences for older adults.
- Document regional **population aging**, rising **temperatures**, and the **intersection** of the two.
 - County-level in US (n = 3109 in 48 contiguous states)
 - Nation-level worldwide (n = 199)
- Pinpoint **regional “hotspots”** with high population-level exposure to rising temperatures.
- Make recommendations for data collection/policy/practice.
 - Based on **decomposition** of problem source
- Underscore the contributions that **social scientists** can make to climate research!



BACKGROUND

- **Population aging** and **rising global temperatures** are certainties of 21st century.
 - However, **level** and **pace** of changes vary by region.
- The **harmful impacts** of heat are pronounced for older adults, given underlying health conditions, medications, and age-related biological changes.
- Areas with steepest growth in temperatures and age 60+ population will require **interventions and adaptations**.
 - The type of solutions needed depend on whether aggregate exposure is driven largely by population aging or climate change.

SOURCE OF POPULATION EXPOSURE → SOLUTION

CLIMATE CHANGE



POPULATION AGING



METHODS

Temperature

- NASA Earth Exchange Global Daily Down-scaled Projections (NASA-NEX-GDDP-MCIP6).
- Current **daily average** and **maximum temperature** levels and projections for 2050
 - ✓ Cooling degree days (**CDD**). Excess of daily average temperatures over 75.2F threshold
 - ✓ 95th percentile local extreme heat exposure (**TMax95**)

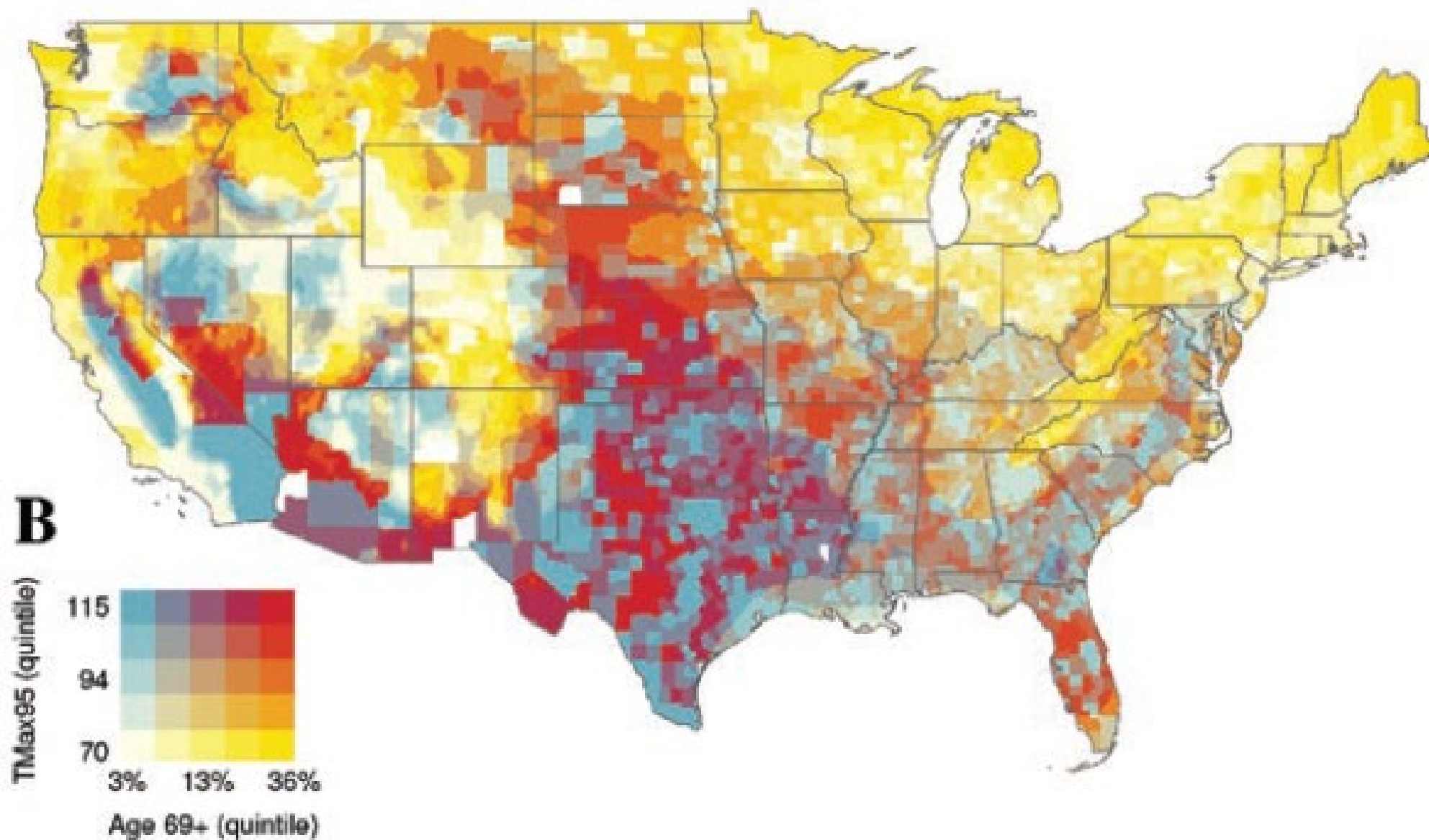
Population

- Two future scenarios: “middle-of-the road” (SSP245) and more extreme (SSP585) projections
 - ✓ Current (2020) and projected 2050 percent population age 69+

Population-Level Heat Exposure (overall, and decompositions)

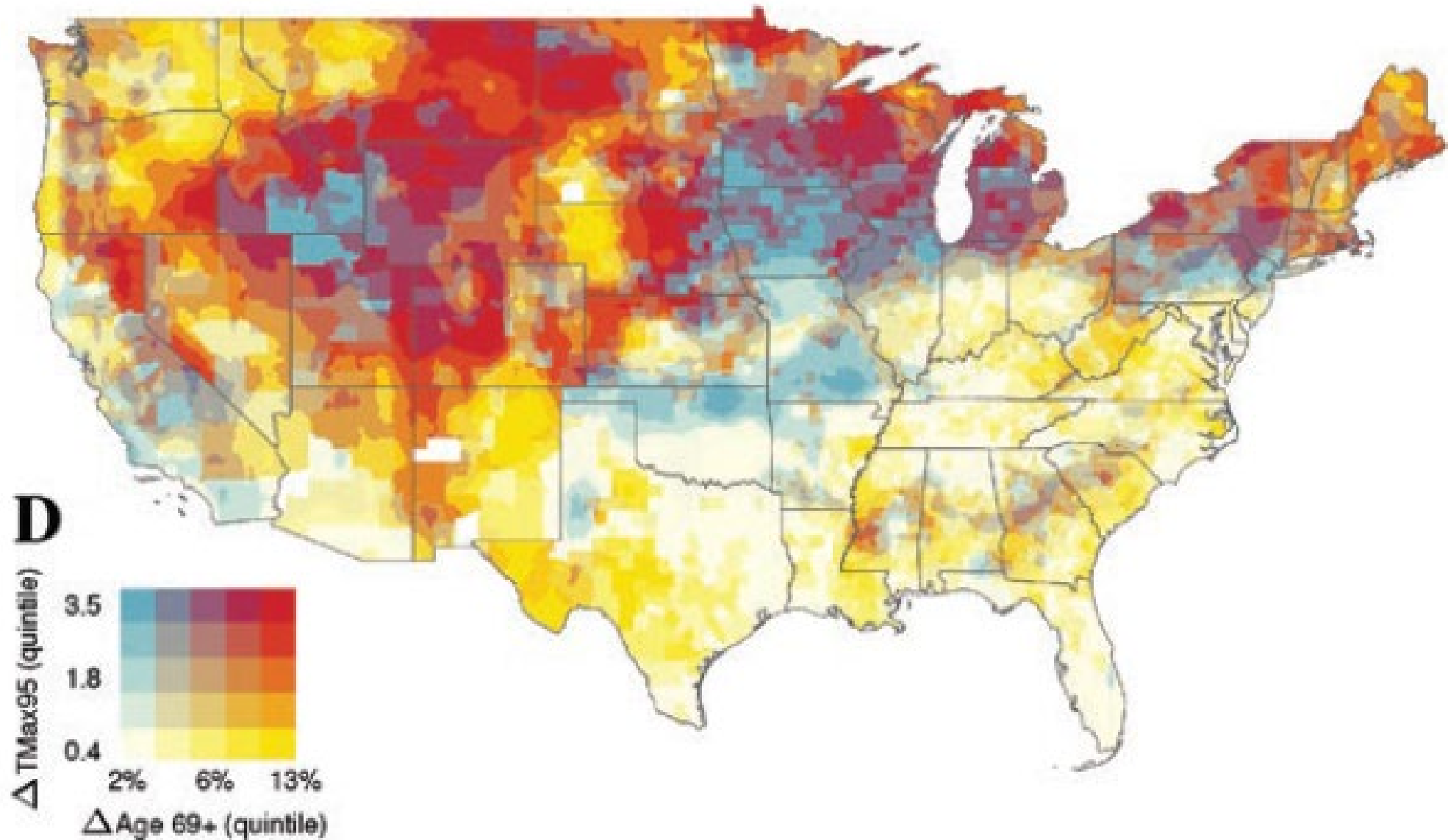
- Percent age 69+ multiplied by temperature measures
 - ✓ Person-degree days (PDD). %69*CDD
 - ✓ Cumulative acute heat exposure (PD). %69*TMax95

RESULTS: U.S. (2020): TMax95 by Old-Age Concentration



Source: Carr, Falchetta & Sue Wing (*The Gerontologist*, 2024)

U.S. (2050): Projected Extreme Heat Exposure and Population Aging

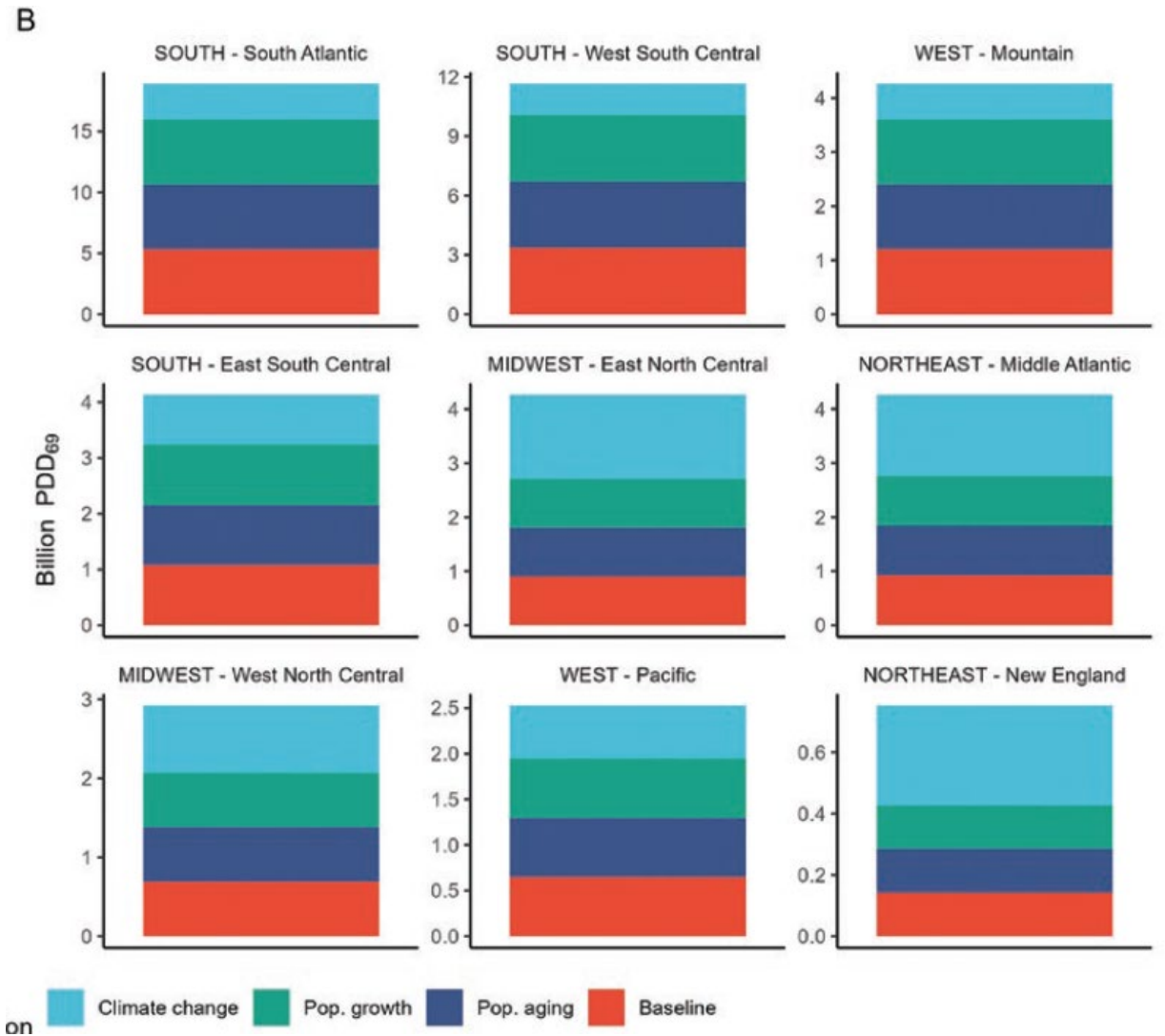


Source: Carr et al. (*The Gerontologist*, 2024)

U.S. SUMMARY:
Northeast & Midwest:
old, and getting
hotter

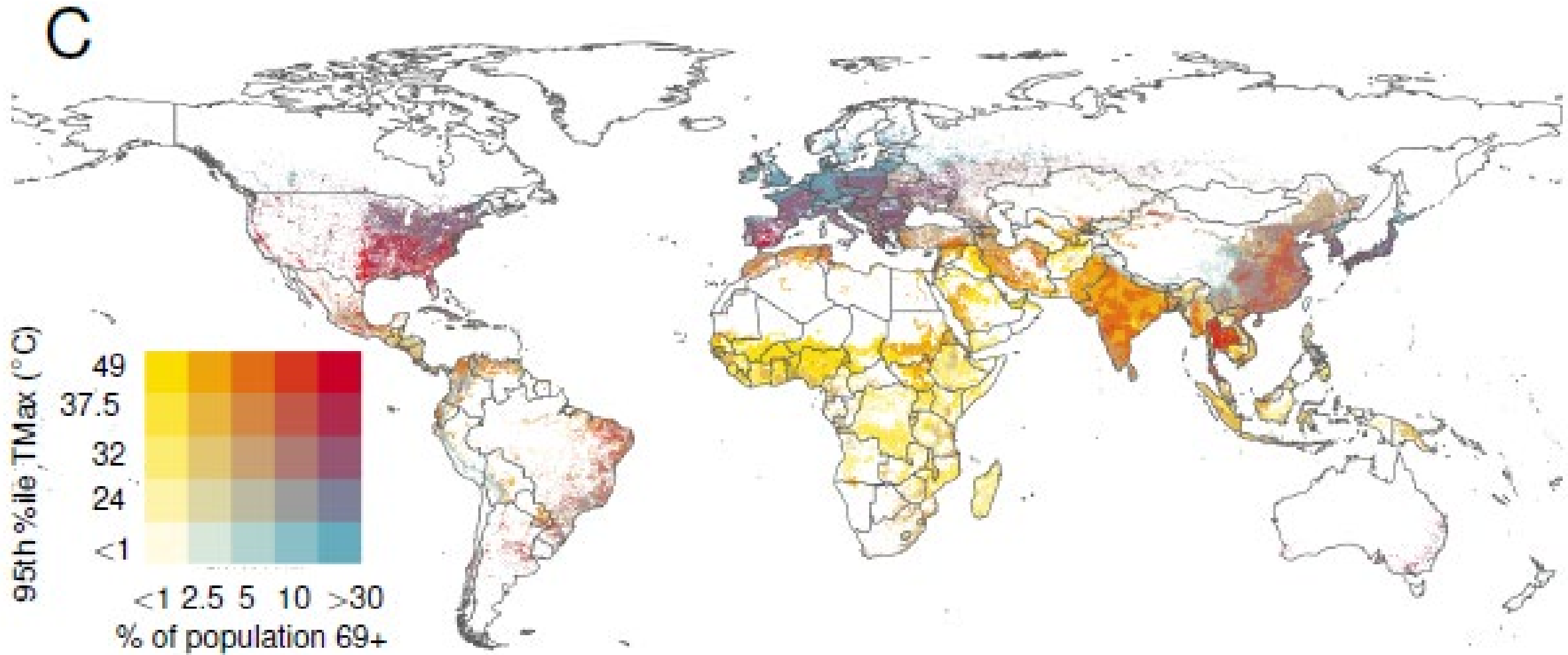
South & Southwest:
hot, and getting older

South: Greatest
aggregate exposure
(Y-axis)



Historically “red” U.S. states like TX and OK currently lack climate action plans that could protect large and growing populations of older adults.

GLOBAL (2020): TMax95 by Old-Age Concentration



Source: Falchetta et al. (2024, *Nature Communications*)

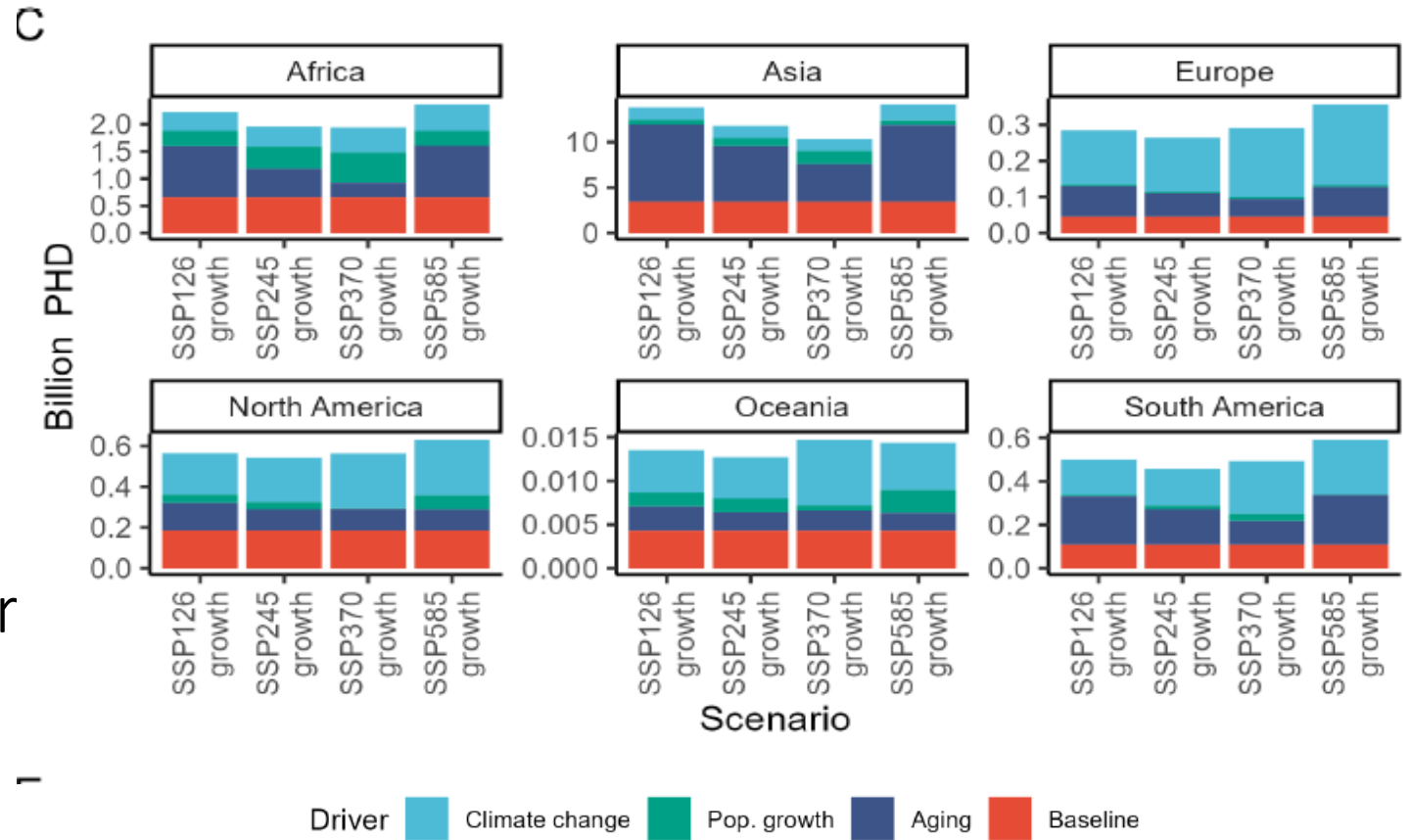
GLOBAL SUMMARY:

Global North (North America, Oceania, Europe): old, and getting hotter

Global South (Asia, Africa, Latin America): hot, and getting older

Africa: also getting more populous

Asia: Greatest overall future exposure (Y-axis)



LMICs, largely in Global South, may lack the resources to implement mitigation and adaptation policies on their own, without assistance from affluent nations.

PRACTICAL IMPLICATIONS

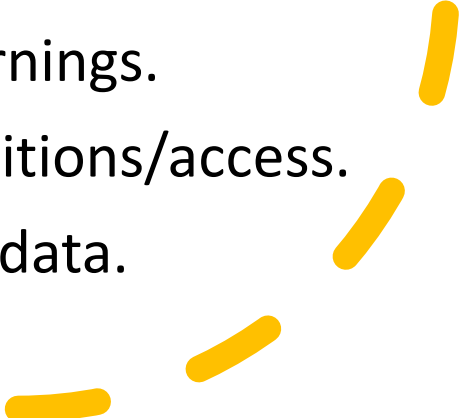


The next 10 years will be critical for the agendas of both climate change and healthy ageing. Stakeholders in both agendas must understand the interconnections and find ways to amplify and reinforce them mutually for the benefit of people in the second half of their lives now, for future generations and for planet Earth, our home.

Source: PAHO-WHO (2023)

- Address **impacts of rising concentrations of older adults** in places already equipped to manage extreme heat.
 - Accessible/safe cooling centers
 - Age-appropriate messaging & surveillance
 - Educating 'snow birds' about risk.
 - Health care workforce growth
 - Training for 'geriatrics competence' among medical, care, and first response workers.
- Address **rising temperatures** in places with robust supports for concentrated older populations.
 - Educating older adults and caregivers about age-related vulnerabilities.
 - Cost-effective cooling systems and green spaces
- Climate research and policy needs the inputs of **social gerontologists**.
 - Esp. with attention to those facing further physical, social, economic, cognitive or environmental obstacles

GAPS? DATA COLLECTION AND LINKAGE NEEDS

- The dream: shared measures across NIA-funded surveys (similar to cognition items).
 - Impacts on health behaviors and social isolation/engagement.
 - Retirement aspirations/behavior affected by climate concerns.
 - Monthly expenditures related to climate (oil bills, flood insurance) including NOT purchasing/accessing needed resources.
 - Climate knowledge and risk perceptions.
 - Preferred form/delivery of climate warnings.
 - Interviewer observation of home conditions/access.
 - Linkage to climate and climate impact data.
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Final Thoughts

- Older adults are not only passive victims but can be active agents in fighting climate change and its impacts:
 - Green consumption and behaviors
 - Social activism
 - Voting behavior
- These are other possible directions for study...



Earth Day, first held April 1970

Thank you!

Questions or comments to carrds@bu.edu

