Population Aging and Heat Exposure in the 21st Century: Which U.S. Regions Are at Greatest Risk and Why?

Objective

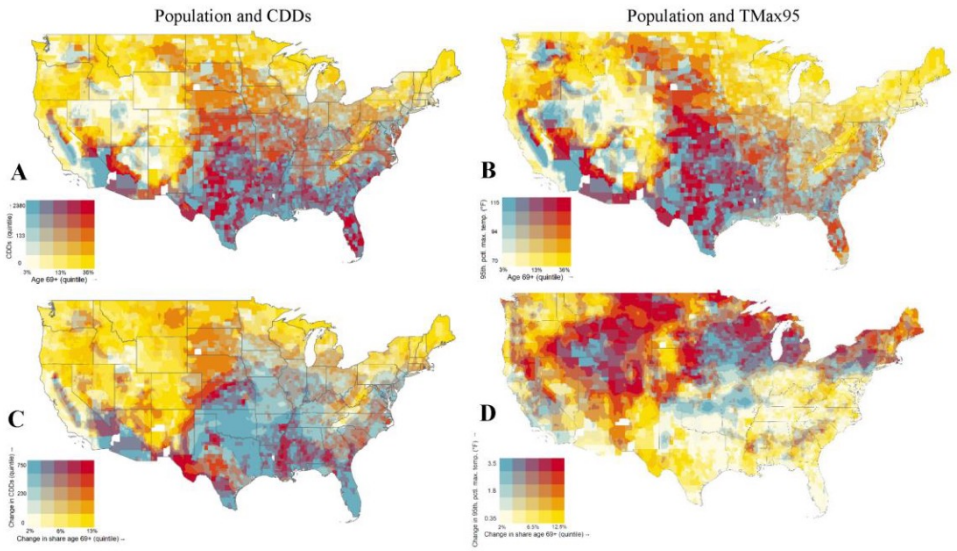
Co-occurring trends of an aging population and a changing climate will put growing numbers of older adults at risk of intensifying extreme heat exposures. We estimate county-level elderly heat exposures in current and mid-century climates, and decompose future increases in exposures into the separate effects of climate change versus population aging.

Approach

NASA NEX Global Daily Downscaled Product projections from 35 CMIP6 climate models are used to construct metrics for chronic (annual cooling degree days) and acute (95th percentile of daily maximum temperature) heat exposures for the 20y periods 1995-2014 and 2041-2060. These are combined with county-level age 69+ population projections consistent with the Shared Socioeconomic Pathways to assess how rising exposures are attributable to climate change versus population aging.

Impact

Hotspots of elderly heat exposure occur in the Deep South, Florida, and parts of the rural Midwest, and substantial increases in heat exposures in historically colder regions with large older populations in New England, the upper Midwest, and rural Mountain states. Exposure increases are attributable to rising temperatures in historically cool northern regions, and population aging warm southern regions.



Bivariate quantile maps of the intersection of aging and chronic heat exposure in the current climate (1995-2014) and mid-century (2041-2060) SSP585. *(A) Current age 69+ population and chronic heat exposure (20y annual cooling degree days—CDD). (B) Current age 69+ population and current 95th percentile of acute heat exposure (20y daily maximum temperatures—TMax95). (C) Circa 2050 – current changes in age 69+ population and CDDs. (D) Circa 2050 – current changes in in age 69+ population TMax95.*

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