Significant disparities in U.S. life expectancy found at census-tract level

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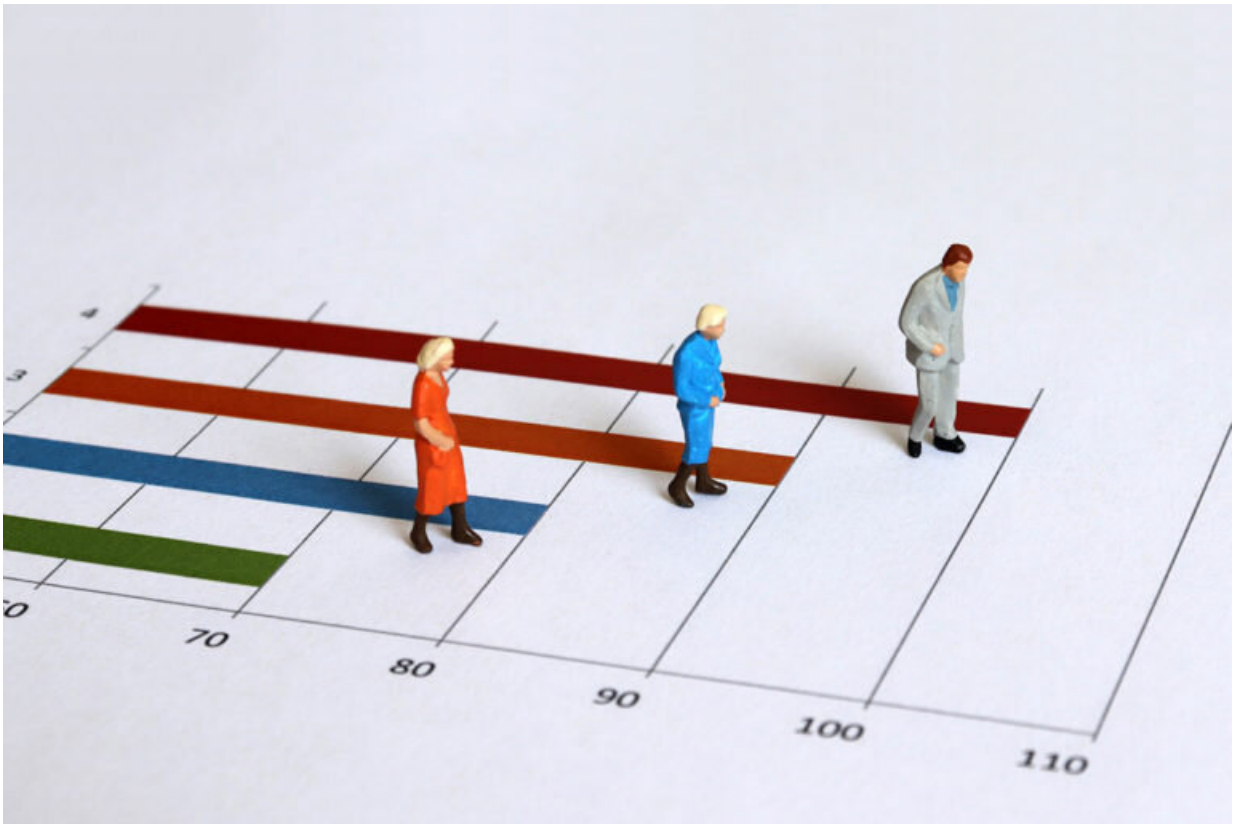

Credit: Hyejin Kang

Life expectancy in the U.S. varies widely when analyzed at the census-tract level and the method may provide a more detailed picture of health disparities in the U.S. than other widely used analyses of life expectancy,

according to new research led by Harvard T.H. Chan School of Public Health. The study is the first to analyze life expectancy data at the census-tract level across the contiguous U.S., as well as at the state and county level.

The findings were published online July 13, 2020 in *Proceedings of the National Academy of Sciences* (*PNAS*).

"Our study shows that as far as geographic variation in life expectancy is concerned, it's a pretty local phenomenon," said S (Subu) V Subramanian, professor of population health and geography and co-author of the study. "States are also quite important, but counties are not."

Data on many public health indicators, including life expectancy, is often gathered and analyzed at the county or state level. This is important because legislation, policies, and programs that provide health care, economic assistance, and social services are administered and implemented at both levels. Focusing on counties or states, however, may fail to highlight significant health disparities at the local level.

For this study, the research team analyzed life expectancy data in 65,662 census tracts that were nested in 3,020 counties across 48 states. Census tracts are small geographic units that typically range in population from 1,200 to 8,000 residents.

The analysis identified significant disparities in life expectancy at the census-tract level within counties and states. For instance, at the county level, Allegheny County, Pennsylvania, has a life expectancy of 77.4 years. But the researchers found that the county contained a census tract with a life expectancy of 62 years and another census tract with a life expectancy of 86 years, a 24-year difference. Similarly, at the county level, Chatham County, North Carolina, has a life expectancy of 80.4

years. But it contained a census tract with a life expectancy of 76.2 years and a census tract with a life expectancy of 97.5 years, a 21-year difference.

The researchers also found that socioeconomic and demographic variables, especially education, income, and race, were strongly associated with life expectancy at the census-tract level. Analyzing life expectancy and other public health data at the census-tract level can help illuminate significant local health disparities and aid in the development of better and more targeted public health interventions and policies, according to the researchers.

"By looking at the census-tract level we found large disparities within counties in the U.S.," said Antonio Fernando Boing, research fellow in the Department of Social and Behavioral Sciences and co-author of the study. "In addition, we observed that socioeconomic conditions explain an important proportion of the between-census tracts variation. These findings reinforce the importance of small geographic units when allocating resources and implementing policies that aim to increase life expectancy in the U.S."

More information: Antonio Fernando Boing et al. Quantifying and explaining variation in life expectancy at census tract, county, and state levels in the United States, *Proceedings of the National Academy of Sciences* (2020). DOI: 10.1073/pnas.2003719117

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