US CVD death rate drops overall, county-level data signals ongoing regional disparities

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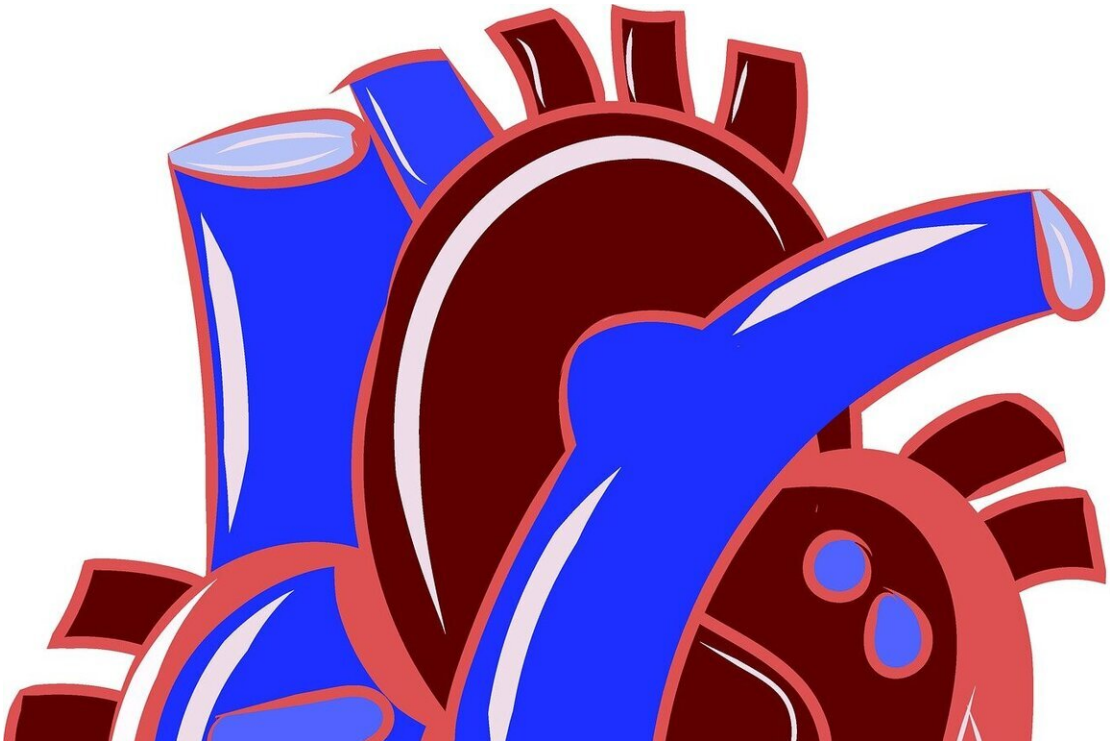

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While death rates from cardiovascular disease (CVD) nationwide have steadily declined over the past few decades, the overall trend masks significant disparities between high- and low-mortality counties, according to preliminary research to be presented at the American Heart Association's Epidemiology, Prevention, Lifestyle & Cardiometabolic

Health Conference 2021. The meeting is virtual, May 20-21, and offers the latest science on population-based health and wellness and implications for lifestyle.

The researchers examined mortality data from the National Center for Health Statistics collected from 1980 to 2014 from all 3,133 counties in the United States. Cardiovascular deaths included all deaths attributable to cardiovascular causes as determined by the death certificates. Using longitudinal, data clustering analysis, the researchers identified three distinct clusters among the counties based on the longitudinal trajectory of mortality over the study period: persistently high mortality (beginning at about 60 CVD deaths per 10,000 population at baseline), intermediate mortality (beginning at about 50 CVD deaths per 10,000 population at baseline), and low mortality (beginning at about 40 CVD deaths per 10,000 population at baseline).

Further evaluation of additional government and national data sets compared the associations of CVD mortality over the course of 35 years with county-level characteristics such as demographics, socioeconomics, health status, crime rates, housing vacancies, number of businesses and food deserts (areas where people don't have adequate access to healthy foods).

"We were surprised to find that even though CVD death rates improved across the country, including in areas where rates had been among the highest and the lowest, relative differences across county groups and existing disparities among counties didn't change. Counties that started with the highest rates of death continued to perform worse than other counties, and those with the lowest rates of death stayed the lowest during the study period," said Shreya Rao, M.D., M.P.H., lead author of the study and a cardiovascular fellow at the University of Texas Southwestern Medical Center in Dallas. "Importantly, high- and low-mortality counties were found to differ in traditional individual risk

factors for heart disease as well as in their social and environmental characteristics."

While geographic disparities in cardiovascular mortality had previously been documented at specific time points, Rao noted this study takes a deeper dive to assess county-level clustering based on temporal trajectories in cardiovascular mortality from 1980 to 2014. It is focused on evaluating whether counties maintained low or high levels of cardiovascular mortality over time and provides a comprehensive assessment of the county-level characteristics that may be influencing the differences in cardiovascular mortality.

"It's challenging to capture county-level data on social and health characteristics, and we chose to focus on counties because public health policies are often made at the county level," Rao said. "We wanted to be as close as possible to the individuals' communities, while still finding meaningful information that can help us develop and tailor how we approach public health strategies for improvement."

Geographically, researchers found that the counties with the lowest mortality over time were scattered around the country and included large areas in the Northwest, Midwest, Great Plains and parts of the Northeast and Florida. In contrast, the highest-mortality counties were largely found in the Deep South and portions of Appalachia and the South Atlantic states.

"High-mortality counties were much more clustered and centered in areas known to have high rates of chronic health conditions such as heart disease, stroke, high blood pressure, Type 2 diabetes and obesity," Rao said.

Researchers analyzed county-level information on social characteristics and health factors collected from five different databases with data from

near the end of the study period from 2012 to 2014. They compared this to counties with high-mortality vs, low-mortality trajectories from 1980 to 2014, and found that counties with the highest mortality had:

- A higher proportion of non-white residents (27% vs. 12% for low-mortality counties, respectively);
- A higher proportion of residents who did not complete high school (20% vs. 11%, respectively); and
- Higher rates of violent crime (30 vs. 1 per 10,000 population, respectively).

"We observed that counties with high mortality trajectory had a higher proportion of Black adults and worse measures of social distress, including higher housing vacancy rates and violent crime rates and low levels of high school education," Rao said. "This isn't a coincidence. It's important to understand that structural and environmental characteristics are not randomly distributed. These patterns are reflective of historical patterns of structural racism, and much of what we found are the long-term, downstream effects of these types of systems and policies that created and maintained inequities, whether openly stated or not."

Education status, violent crime rates and smoking were the strongest predictors of being in the high-mortality trajectory group.

"Factors such as education level and violent crime rates aren't typically considered modifiable risk factors for cardiovascular disease by public health agencies. Yet, we found that they both influenced long-term health outcomes even when adjusting for traditional cardiovascular health risk factors such as smoking rates, access to physical activities and obesity. Social and health risk factors aligned significantly. Communities with significant socioeconomic and social distress consistently had worse health metrics as well; they were inextricable," Rao said. "Our study's findings highlight the need to target both social and health behavior-

based risk factors to help reduce the existing disparities in cardiovascular health across counties."

Limitations of this analysis, which uses population-level data, are that it cannot be used to draw conclusions about any individual's death from cardiovascular disease. The results also cannot establish a cause-and-effect relationship between the predictive factors and health outcomes studied.

"For clinicians, it's very natural to focus on the modifiable risk factors for our patients. That's not wrong, however, it's important to understand that some of an individual's risk factors are not necessarily under their control. And some factors may be modifiable through public policy and health systems changes and programs," said the study's senior author Ambarish Pandey, M.D., M.S.C.S., an assistant professor of internal medicine at UT Southwestern Medical Center in Dallas. "While it's important to educate our patients on addressing those risk factors they can control, these results point to the need to address public health at the community, state and national level."

Provided by American Heart Association