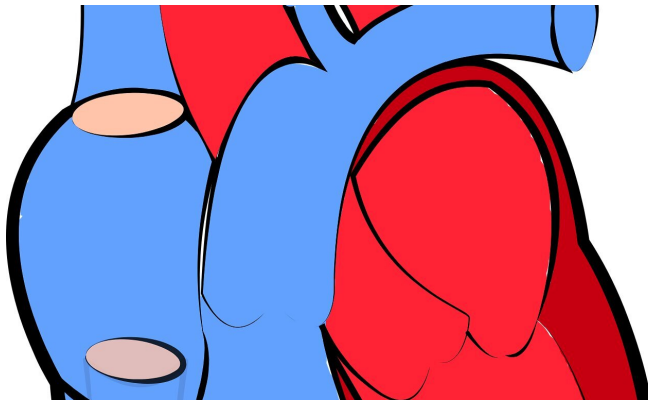


# Health disparities in rural US: Higher coronary artery disease death in women under 65 and people with heart failure

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Women who live in rural areas are dying of coronary artery disease prematurely, and living in a rural area is one of the factors impacting heart failure survival, according to the findings in two separate research studies published today in the *Journal of the American Heart Association*, an open access journal of the American Heart Association.

A Presidential Advisory issued by the American Heart Association last month, Call to Action: Rural Health: A Presidential Advisory from the American Heart Association and American Stroke Association, highlights the [health inequities](#) facing rural communities. According to the statement there is a three-year life expectancy gap, on average, between rural and [urban populations](#), with people who reside in rural areas having [higher death rates](#) from cardiovascular [disease](#) and stroke compared to people living in urban areas.

**Increasing Mortality from Premature Coronary Artery Disease in Women in the Rural United States**

Despite a decades-long decline in heart disease deaths, there has been an alarming upswing in coronary artery disease deaths among rural women 65 or younger since 2009, according to a review of national data on coronary artery disease deaths between 1999-2017. About 60 million Americans—roughly 20% of the U.S. population reside in rural areas.

"Women living in rural areas of the United States have for the first time suffered an increase in premature deaths from coronary artery disease. This is in stark contrast to their urban counterparts, who have experienced a virtually uninterrupted reduction in premature coronary artery disease deaths," said Federico Moccetti, M.D., senior author of the study, a former research fellow at Oregon Health & Sciences University in Portland, Oregon, and now an interventional cardiologist at Heart Centre Lucerne in Switzerland.

Researchers analyzed and compared changes from 1999-2017 in premature deaths (before age 65) from coronary artery disease among women living in rural areas and women in more populated urban areas.

Among the findings:

- Premature coronary artery disease deaths remain consistently higher in rural areas of the United States, regardless of sex, race or age group.
- While deaths have not risen among men overall, the rate of coronary artery disease deaths in those aged 55-64 stopped improving in small to medium towns in 2011, and rural areas in 2008.
- Among women in rural communities, coronary artery disease death rates have increased significantly in women aged

55-64 from 2010 to 2017 (estimated annual percentage change +1.4%, cumulatively +11.2%); as well as in women aged 45-54 from 1999 to 2017 (estimated annual percentage change +0.6%, cumulatively +11.4%).

- Overall (including urban areas), premature coronary artery disease deaths have declined over time.

"This significant increase in coronary artery disease deaths among young women in the rural U.S. is shocking. Disparities in the prevention and control of [cardiovascular disease](#) risk factors in these communities are likely the reason for this upswing," said Dr. Moccetti. "Blockages in the heart don't happen overnight. They are the result of decades of exposure to cardiovascular risk factors such as smoking, high blood pressure, high cholesterol, diabetes, obesity, a sedentary lifestyle and poor diet. Since the increase in deaths is among [younger women](#), this means that it is the result of exposure to risk factors that occurred during young adulthood, adolescence and even childhood."

Distinct aspects of rural life that might make a heart attack more deadly, such as the travel distance to an emergency room, may not account for the difference in death rates in rural women, according to the researchers. While researchers considered distance may cause the difference in outcomes, the increase in distance didn't affect men, as men are just as far from emergency departments as women.

"This leads to the inevitable conclusion that an intensification of the public health efforts aimed at increasing cardiovascular health of rural [women](#), during young adulthood, adolescence and childhood are necessary," said Dr. Moccetti.

Researchers noted a limitation of the study is that it relied on the cause of death listed on [death](#) certificates, which can be inaccurate. In addition, this type of data does not allow to identify a clear cause for the adverse trend. A strength of this study is that it does not represent a limited sample of deaths, but rather the entirety of the deaths due to [coronary artery disease](#) in the U.S.

### Social Determinants of Health and 90-Day

### Mortality after Hospitalization for Heart Failure in the REasons for Geographic and Racial Differences in Stroke (REGARDS) Study

A separate study evaluated the impact of social factors, including living in a [rural area](#), income, race and access to professional healthcare, on the health outcomes for people with heart failure. Researchers analyzed the electronic health records of 690 patients (44% female), age 65 or older, who had been hospitalized for heart failure while participating in a larger study about racial and geographic differences in the stroke belt.

Information on nine social factors influencing health (race, education, income, social isolation, social network, high-poverty residential area, health professional shortage area, rural residence, and state public health infrastructure), also known as social determinants of health, were available in the records. The study focused on investigating whether an individual's total number of social factors was associated with the likelihood of dying within 90 days after hospital discharge for heart failure.

After adjusting for age, the data analysis on mortality indicated:

- 79 people died within 90 days of hospital discharge;
- Patients with one social determinant of health factor were nearly three times as likely to die as those who had no [social factors](#); and
- Patients with two or more social determinants of health were also about three times more likely to die as those who had none.

"I think the powerful influence of these social determinants of health is incredible and underappreciated," said Madeline R. Sterling, M.D., M.P.H., M.S., lead author of the study and assistant professor of medicine in the Division of General Internal Medicine at Weill Cornell Medicine and an internist at NewYork-Presbyterian/Weill Cornell Medical Center in New York. "Our findings add to a growing body of research that suggests social determinants matter. In fact, assessing them may

serve as a new marker for identifying, intervening and providing supports to the most vulnerable heart failure patients after discharge."

The researchers were surprised that multiple social determinants of health did not proportionately increase mortality risk. "These findings are important because if people with more vulnerabilities did worse, interventions could target a narrower group of patients," said Sterling. "These results can still have a major impact on patient care. If a patient being discharged has one or more of the social determinants of health (for example, a lack of social support), a strategy might be to more closely monitor that person after discharge—for example by helping them receive community-based or home care services. We hope that social determinants will be considered more when discharging patients," said Sterling.

One limitation is that data on the social determinants of health were collected at the baseline of the study, which may have occurred years before the [heart](#) failure hospitalization of interest.

**More information:** *J Am Heart Assoc.* 2020;9:e014836. [DOI: 10.1161/JAHA.119.014836](https://doi.org/10.1161/JAHA.119.014836)

*J Am Heart Assoc.* 2020;9:e015334. [DOI: 10.1161/JAHA.119.015334](https://doi.org/10.1161/JAHA.119.015334)

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