

# Ambulance response times are worse for low-income people

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A nationwide study of more than 63,000 cases of cardiac arrest found that ambulances on average took nearly four minutes longer to handle calls from low-income areas than high-income communities.

In what is believed to be the first national study evaluating disparities in 911 responses for cardiac arrest in high-income and low-income

neighborhoods, a team led by researchers at UC San Francisco examined whether socioeconomic disparities were associated with longer ambulance responses and transport times for cardiac arrests occurring outside hospital premises. The study appears Nov. 30, 2018 in *JAMA Network Open*, a peer-reviewed, open-access medical journal.

"When it comes to a cardiac arrest, every minute counts," said lead author Renee Y. Hsia, MD, a professor of emergency medicine at UCSF and an emergency physician at Zuckerberg San Francisco General Hospital and Trauma Center. "We found that emergency medical services response times were 10 percent longer in the poorest neighborhoods.

"That stacks the odds against survival for low-income patients," Hsia said. "As a society, we might hope that public services, such as ambulances, would be equally accessible, but our results show that this is not the case, even for deadly conditions like cardiac arrest."

The Institute of Medicine has documented that unequal access to [medical care](#) is a primary contributor to health care disparities in vulnerable communities. But amid a spate of hospital and ER closures across the country, as well as the closures of privately-owned ambulance companies, poorer neighborhoods and vulnerable populations have even less access to care.

"The repercussions of the loss of these services may be particularly detrimental in low-income communities, which rely more heavily on prehospital care and have a higher increased incidence of severe, life-threatening illnesses," wrote the authors of the new analysis.

The cross-sectional study analyzed data from the 2014 National Emergency Medical Services Information Systems. Altogether, 46 of 50 states (92 percent) contributed data. Massachusetts, Texas, Louisiana,

and Delaware did not.

The authors said they focused on cardiac arrests in part because of the high mortality rate of the life-threatening condition and because heart attacks require immediate attention. Emergency medical services provide a vital role in stabilizing and transporting sick patients, but the association between ambulance response and income levels has not been widely studied.

They examined four time measures: from ambulance dispatch to arrival at the patient's location; from arrival to departure from the scene; from departure at the scene to arrival at the hospital; and total emergency medical services time. While EMS performance metrics are not nationally standardized, many systems have adopted benchmarks to arrive on scene in less than 4, 8 and 15 minutes, with the goal of delivering CPR to patients with cardiac arrest within 5 minutes of arrival and defibrillation within 9 minutes.

In total, the team analyzed 63,600 cardiac arrest encounters in the U.S. The study sample was nearly 58 percent male, with a mean age of about 60. The authors reported that high-income areas had a greater proportion of white, male patients with private insurance, while low-income areas had a greater proportion of Medicaid-insured patients. Median incomes in the most affluent zip codes ranged from approximately \$57,000 to \$113,313, while the lowest ranged from \$20,250 to \$42,642.

The researchers found that EMS responses were more likely to meet 8-minute and 15-minute national benchmarks in high-income areas than in low-income communities. They also found that average emergency response time was 37.5 minutes in the highest income zip code, compared to 43 minutes in the lowest income zip code.

Additionally, the mean EMS response times, on-scene times, and

transport times were 10 percent longer in low-income communities, even after controlling for such differences as time of day.

"Each minute of delay increases the odds that a patient will not survive a [heart attack](#)," said Hsia, who is also with the Philip R. Lee Institute for Health Policy Studies at UCSF. "Our findings are particularly concerning given the time-sensitivity of conditions like [cardiac arrest](#), in which the heart has ceased functioning and immediate medical care is required to restore function and circulation.

"Our findings show that health care disparities exist at the system-level, including ambulance transport times," she said. "As hospital closures and the cost of health care continue to rise, we must examine how to ensure access to [care](#) for our most vulnerable."

**More information:** *JAMA Network Open* (2018).  
[jamanetwork.com/journals/jamanetworkopen.2018.5202](https://jamanetwork.com/journals/jamanetworkopen.2018.5202)

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