

# Lack of naloxone led to increased overdose deaths in rural Pennsylvania, study finds

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Pennsylvania has one of the highest rates of opioid overdose in the

nation, and, according to Penn State researchers, one's chances of surviving that overdose can depend on where the person lives.

Using data from the Pennsylvania Overdose Information Network from the years 2018–20 and American Community Survey data from 2015–19, Penn State geography researchers looked at the prevalence of overdoses in the state and found the availability of the anti-[overdose](#) therapeutic naloxone to be a key factor in overdose survival. The findings were reported in the journal of *Drug and Alcohol Dependence*.

Data showed individuals who received at least one dose of naloxone were nine times as likely to survive an overdose. Naloxone was administered in about 75% of the survival cases and just 29% of fatal overdose cases.

Yet, the availability of the drug at the time of overdose ranged between 41% and 47% in the lowest counties such as nearby Clinton and Huntingdon Counties to 92% in Philadelphia County, the highest. In broad strokes, lesser populated counties had less access to the life-saving treatment, with exceptions for Center and Mercer Counties, which fared better than similarly populated counties.

"One of the main goals of this research is to inform public health practitioners and policymakers who have the capacity to do something about the distribution of naloxone, which is clearly effective," said Louisa Holmes, assistant professor of geography at Penn State, member of Penn State Social Science Research Institute's Consortium on Substance Use and Addiction (CSUA) and lead author of the study. "It gives leaders a target for combating the opioid epidemic by saving lives."

Data showed 82% of Pennsylvania adults survived [opioid overdoses](#). In 2020, there were 4,314 opioid related deaths in the state, a 16% increase

over 2019, according to the Pennsylvania Department of Health.

According to the Centers for Disease Control and Prevention, opioid overdose deaths have increased steadily from 1999 to 2018, before ballooning in 2020 after a dip in 2019, resulting in the first multi-year decrease in life expectancy in more than 50 years.

The increase in overdose deaths coupled with the effectiveness of naloxone prompted the Office of the Surgeon General in 2018 to call for its increased distribution. Similarly, Pennsylvania issued standing orders in 2015 and updated in 2022 authorizing anyone to obtain naloxone, although it leaves decisions to stock the drug up to pharmacists. A recent survey of Pennsylvania pharmacies found 55% did not stock naloxone, and the majority of pharmacists were unclear on policies related to the standing order. The survey also found out-of-pocket naloxone prices in 2017 to range from \$50 to \$400.

Using data for 16,673 unique overdose incidents occurring in Pennsylvania, researchers found 13,724 people survived, while 2,949 did not. About 70% of the deaths were male, 53.5% were ages 25–39 and 90% were white. About 33% of the victims lived in the most rural portions of the state, versus 28% who lived in the most populated areas.

Researchers say the data point to a need for more comprehensive and consistent access to naloxone for [emergency responders](#), agencies, opioid use disorder patients and their families, citing the effectiveness of programs such as community distribution of naloxone kits, which cut overdose deaths by 42%. Measures such as expanding take-home naloxone programs, overdose response training and pharmacist education could also save lives, researchers said.

Although Pennsylvania law allows first responders such as EMTs and [police officers](#) to administer [naloxone](#), researchers said such training is

scarcer in rural areas.

This research is related to more broad efforts by the CSUA, which is a large collective of substance-based addiction researchers, practitioners and educators across all of Penn State's campuses that work on everything from opioids to e-cigarettes to alcohol. Holmes was hired in 2019 among a team of researchers tasked with addressing addiction research.

"The expanding research being done by the CSUA on these topics further positions Penn State as a leader both regionally and nationally," said Brian King, head of the Department of Geography and co-author of the research. "It is a testament to how research at this institution directly impacts residents in the Commonwealth of Pennsylvania."

Provided by Pennsylvania State University

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