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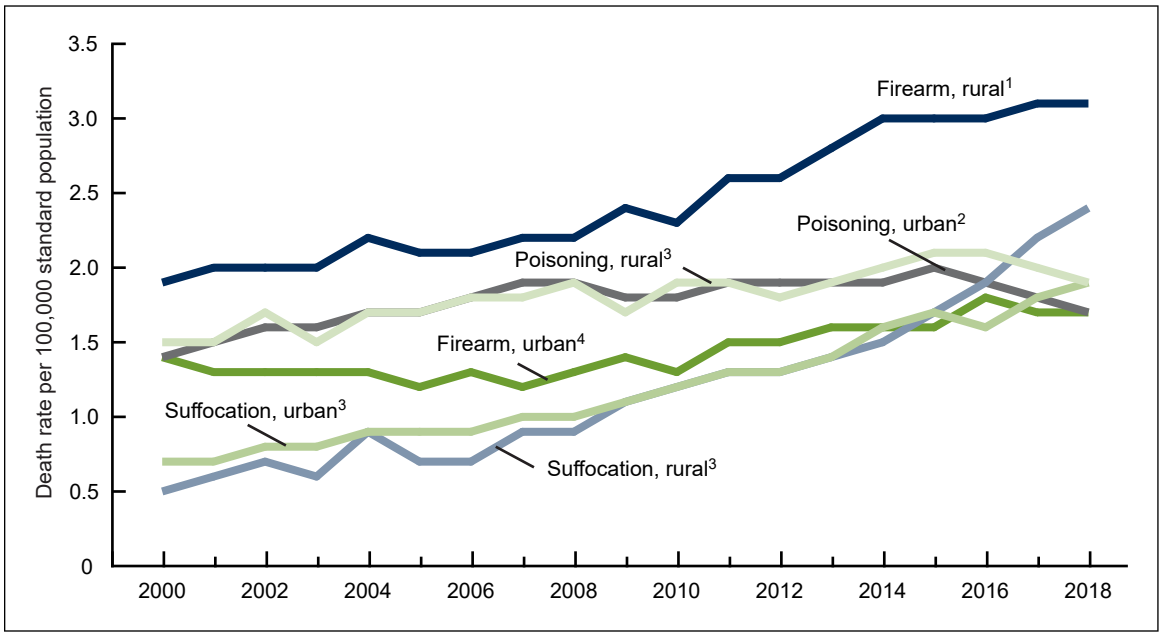
For females, rural firearm-related suicide rates remained higher than urban rates over the 2000 through 2018 period, while suffocation rates in rural areas experienced the highest rate of increase.

- For females in rural areas, firearms were the leading method of suicide and increased 58% from 2000 (1.9 per 100,000) through 2014 (3.0), and then remained stable through 2018. For females in urban areas, firearm-related suicide increased 42% from 2005 (1.2) through 2018 (1.7) (Figure 4).
- Rural suffocation-related suicide rates for females increased steadily over the period and were more than 4 times higher in 2018 (2.4) than in 2000 (0.5). Urban suffocation-related suicide rates more than doubled from 2000 (0.7) through 2018 (1.9) and passed poisoning to become the leading method in urban areas in 2018.
- While rural and urban female poisoning-related suicide rates were similar and increased from 2000 through 2015, the rate in urban areas declined 15% between 2015 (2.0) and 2018 (1.7). The observed decline in rural areas from 2016 through 2018 was not statistically significant.

Figure 4. Age-adjusted suicide rates among females, by leading method and urban–rural status: United States, 2000–2018



[1]Significant increasing trend from 2000 to 2014, with different rates of change over time; stable trend from 2014 through 2018; $p < 0.05$.
[2]Significant increasing trend from 2000 to 2016, with different rates of change over time; significant decreasing trend from 2016 through 2018; $p < 0.05$.
[3]Significant increasing trend from 2000 through 2018; $p < 0.05$.
[4]Significant decreasing trend from 2000 to 2006; significant increasing trend from 2006 through 2018; $p < 0.05$.
NOTES: Suicides in all ages are identified using the *International Classification of Diseases, 10th Revision* underlying cause-of-death codes U03, X60–X84, and Y87.0. Age-adjusted death rates are calculated using the direct method and the 2000 U.S. standard population. Classification of the decedent's county of residence is based on the 2013 NCHS Urban–Rural Classification Scheme for Counties, available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf.
Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db373-tables-508.pdf#4.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Summary

In 2018, suicide was the 10th leading cause of death (4). Sex and urban–rural disparities in methods of suicide may inform targeted suicide prevention strategies. From 2000 through 2018, differences in suicide rates between rural and urban areas increased. Rural suicide rates increased 48% from 2000 through 2018 compared with a 34% urban rate increase. In rural and urban areas, suicide rates for males remained higher than for females. The rural male suicide rate was 3.8 times higher than the female rate in 2018, and the urban male suicide rate was 3.6 times higher than the female rate. The rural male suicide rate increased 34% from 2007 through 2018 compared with a 17% urban rate increase. The rural female suicide rate nearly doubled from 2000 through 2018 compared with a 51% urban rate increase.

Of the three leading methods of suicide, firearm-related suicide remained the leading method in 2018 among rural males and females (2). The rural firearm-related suicide rate was 63% higher than the urban rate for males and 82% higher for females. Over the 2000 through 2018 period, suffocation-related suicides had the greatest rate of increase, more than doubling in rural areas for males and quadrupling in rural areas for females. By 2018, suffocation was the leading method of suicide for females in urban areas. Poisoning-related suicides decreased overall from 2000 through 2018 for males in both urban and rural areas and from 2015 through 2018 for females in urban areas.

Definitions

Firearms: Includes handguns, rifles, shotguns or other large firearms, or other unspecified firearms.

Poisoning: Includes overdose of medicinal (such as opioids or sedatives) and nonmedicinal substances (such as gases or other toxic materials).

Suffocation: Includes hanging, strangulation, or other means resulting in oxygen deprivation.

Data source and methods

The National Vital Statistics System's multiple-cause-of-death mortality files for 2000–2018 for all ages were used for the analysis in this report (5). *International Classification of Diseases, 10th Revision* (ICD–10) codes were used to identify suicide deaths: U03, X60–84, and Y87.0. Means of suicide deaths were categorized using the underlying cause-of-death ICD–10 codes: firearms (X72–X74), suffocation (X70), and poisoning (X60–X69). Age-adjusted death rates were calculated using the direct method and the 2000 U.S. standard population (6).

Urban–rural categorization was based on the 2013 NCHS Urban–Rural Classification Scheme for Counties (7). This county-level scheme includes six designations from most urban to most rural: large central metro, large fringe metro, medium metro, small metro, micropolitan, and noncore. For the purposes of this study, urban classification included the four metropolitan categories and rural, the micropolitan and noncore designations. Trends in age-adjusted suicide rates were evaluated using the Joinpoint Regression Program (Version 4.7.0.0) (8). Joinpoint uses a least-squares regression analysis to fit a series of joined lines on a log scale. For this study, the minimum number of joints was zero and the maximum number was three. The level of significance for a change in trend was p less than or equal to 0.05. Urban-rural rates were compared using a two-sided z test with a significance level of 0.05.

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NCHS Data Brief ■ No. 373 ■ August 2020

Keywords: intentional self-harm • urban-rural • firearm • suffocation • poisoning • male-female

Suggested citation

Pettrone K, Curtin SC. Urban–rural differences in suicide rates, by sex and three leading methods: United States, 2000–2018. NCHS Data Brief, no 373. Hyattsville, MD: National Center for Health Statistics. 2020.

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National Center for Health Statistics

ISSN 1941–4927 Print ed.
ISSN 1941–4935 Online ed.

CS318100