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Nonfatal and Fatal Falls Among Adults Aged ≥65 Years — United States, 2020–2021

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Abstract

In the United States, unintentional falls are the leading cause of injury and injury death among adults aged ≥65 years (older adults). Patterns of nonfatal and fatal falls differ by sex and state. To describe this variation, data from the 2020 Behavioral Risk Factor Surveillance System and 2021 National Vital Statistics System were used to ascertain the percentage of older adults who reported falling during the previous year and unintentional fall-related death rates among older adults. Measures were stratified by demographic characteristics, U.S. Census Bureau region, and state. In 2020, 14 million (27.6%) older adults reported falling during the previous year. The percentage of women who reported falling (28.9%) was higher than that among men (26.1%). The percentage of older adults who reported falling ranged from 19.9% (Illinois) to 38.0% (Alaska). In 2021, 38,742 (78.0 per 100,000 population) older adults died as the result of unintentional falls. The unintentional fall-related death rate was higher among men (91.4 per 100,000) than among women (68.3). The fall-related death rate among older adults ranged from 30.7 per 100,000 (Alabama) to 176.5 (Wisconsin). CDC's Stopping Elderly Accidents, Deaths and Injuries (STEADI) initiative recommends that health care providers screen and assess older adults for fall risk and intervene using effective preventive strategies.

Introduction

Among adults aged ≥65 years (older adults) in the United States, the leading cause of injury and injury deaths is unintentional falls.* Although the estimated prevalence of nonfatal and fatal falls increases with age, falls are not an inevitable part of aging. Older adult falls can be prevented by addressing modifiable risk factors through effective preventive strategies. Nationally, the medical costs attributed to nonfatal and fatal falls in this age group amounts to approximately $50 billion every year (*1*). Demographic and geographic variation in the distribution of fatal falls has been reported (*2*). This report aims to identify the differences in nonfatal and fatal falls estimates by sex and state.

Methods

This report used 2020 Behavioral Risk Factor Surveillance System (BRFSS) data and 2021 National Vital Statistics System (NVSS) data, the latest years available for each source. BRFSS is a landline/mobile telephone survey which collects information about health-related behavioral risk factors and chronic conditions from noninstitutionalized adults aged ≥18 years residing

Continuing Education examination available at https://www.cdc.gov/mmwr/mmwr_continuingEducation.html

* https://www.cdc.gov/falls/data/index.html

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in the 50 U.S. states, the District of Columbia (DC), and U.S. territories.† BRFSS collects fall-related data from respondents aged ≥45 years using the question, "In the past 12 months, how many times have you fallen?" Responses ranged from zero to 76 falls. A dichotomous variable was created to calculate the percentage of adults aged ≥65 years residing in the 50 states and DC who reported one or more fall. Accounting for complex survey design, age-adjusted percentages and 95% CIs were estimated using SAS-callable SUDAAN (version 11; RTI International). Respondents with missing values or responses of "Don't know/Not sure" or "Refused" for falls were excluded (8,297), resulting in an analytic sample size of 127,724. NVSS extracts data from death certificates filed in the 50 states and DC. CDC WONDER was used to access 2021 NVSS data to produce age-adjusted death rates and 95% CIs.§ Falls were identified as the underlying cause of death using *International Classification of Diseases, Tenth Revision* codes W00–W19.

Age-adjusted percentages and death rates were calculated using the direct method and 2000 U.S. Census Bureau standard population.¶ Statistical comparisons between percentages were made using two sample t-tests as appropriate for complex survey designs such as BRFSS. Death rates were compared using a z-test when counts were >100. In addition, for counts <100, CIs were compared for overlap; in instances where the z-test and CI comparison yielded conflicting results, Monte Carlo simulation was employed as a third method of assessing rate differences. Statistical comparisons between national and state estimates were made by removing the state's estimate from the national estimate to account for nonindependence. P-values <0.05 were considered statistically significant. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.**

Results

In 2020, 14 million (27.6%) older adults reported falling during the previous year (Table 1). A higher percentage of women (28.9%) than men (26.1%) reported one or more falls. Percentages of persons reporting falls were higher among non-Hispanic White and non-Hispanic American Indian or Alaska Native persons than among other racial or ethnic groups. By urban-rural status,†† the percentage of older adults reporting falls was higher in noncore counties than in all other counties except small metros.

In 2021, a total of 38,742 (78.0 per 100,000) unintentional fall–related deaths occurred among older adults. The fall-related death rate was higher among men (91.4 per 100,000)

† https://www.cdc.gov/brfss/annual_data/annual_2020.html
§ https://wonder.cdc.gov/ucd-icd10.html
¶ https://www.cdc.gov/nchs/data/statnt/statnt20.pdf

** 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.
†† Status follows the CDC's National Center for Health Statistics 2013 Urban-Rural Classification Scheme for Counties. https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf

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TABLE 1. Age-adjusted* percentage of adults aged ≥65 years reporting one or more unintentional falls in the past year and age-adjusted unintentional fall-related death† rate among adults aged ≥65 years, by demographic characteristics — Behavioral Risk Factor Surveillance System, 2020 and National Vital Statistics System, 2021, United States

Characteristic	No. reporting ≥1 fall§	Age-adjusted % reporting ≥1 fall (95% CI)	No. of deaths	Age-adjusted fall-related death* (95% CI)
Total	**14,058,840**	**27.6 (27.0–28.2)**	**38,742**	**78.0 (77.2–78.8)**
Sex				
Men	5,825,344	26.1 (25.2–27.0)	18,614	91.4 (90.1–92.7)
Women	8,233,496	28.9 (28.1–29.8)	20,128	68.3 (67.3–69.2)
Age group, yrs				
65–74	7,765,341	25.6 (24.9–26.4)	6,409	19.0 (18.6–19.5)
75–84	4,731,620	28.6 (27.5–29.8)	12,136	74.9 (73.6–76.2)
≥85	1,561,879	32.9 (31.0–34.9)	20,197	338.0 (333.3–342.6)
Race and ethnicity¶				
American Indian or Alaska Native	153,540	35.6 (28.9–42.3)	155	57.3 (48.1–66.5)
Asian	146,878	14.5 (9.8–19.2)	1058	43.7 (41.1–46.4)
Black or African American	1,100,915	22.6 (20.5–24.6)	1,572	35.1 (33.3–36.8)
Native Hawaiian or other Pacific Islander	9,373	21.6 (7.6–35.6)	28	47.1 (31.0–68.5)
White	11,244,263	28.8 (28.2–29.5)	33,915	89.4 (88.4–90.3)
Hispanic or Latino	968,611	24.3 (21.0–27.5)	1,875	43.1 (41.1–45.1)
Multiple races/Other race	193,665	26.1 (22.3–29.8)	94	23.6 (19.0–28.9)
Urban/Rural status**				
Large central metro	3,451,480	25.8 (24.2–27.4)	9,005	60.4 (59.2–61.7)††
Large fringe metro	3,379,369	27.2 (26.0–28.4)	9,714	69.9 (68.5–71.3)††
Medium metro	2,994,019	27.4 (26.3–28.5)	9,362	76.9 (75.4–78.5)††
Small metro	1,486,869	29.5 (27.9–31.0)	4,084	73.3 (71.0–75.5)††
Micropolitan (nonmetropolitan)	1,427,693	28.7 (27.5–29.8)	3,878	73.4 (71.1–75.7)††
Noncore (nonmetropolitan)	1,319,411	31.4 (30.0–32.8)	2,699	67.0 (64.4–69.5)††

* Percentages and rates were standardized to the 2000 U.S. Census Bureau standard population with age groups 65–74, 75–84, and ≥85 years using the direct method.
† *International Classification of Diseases, Tenth Revision* codes W00–W19 were used to identify an unintentional fall as the underlying cause of death.
§ Nationally representative weighted number of adults aged ≥65 years reporting at least one fall in the previous year.
¶ Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.
** Status follows CDC's National Center for Health Statistics 2013 Urban-Rural Classification Scheme for counties. https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf
†† The 2021 death rates by urban-rural continuum were crude rates because age-adjusted rates are currently not available in CDC WONDER. https://wonder.cdc.gov/wonder/help/ucd-expanded.html#Constraints-Rates

than among women (68.3). Death rates were higher among non-Hispanic White and non-Hispanic American Indian or Alaska Native persons than among other racial and ethnic groups. Crude§§ death rates were higher in medium metro counties than in all other counties.

State-specific age-adjusted percentages of older adults reporting falls in 2020 ranged from 19.9% in Illinois to 38.0% in Alaska (Figure) and were significantly higher than the national estimate of 27.6% in 18 states (Table 2). Percentages were significantly higher than the national percentage in approximately one half of Western and Midwestern states and one quarter of Northeastern and Southern states and DC. The percentage of women reporting falls was significantly higher than that for men in five states.

The 2021 age-adjusted fall-related death rates ranged from 30.7 per 100,000 older adults in Alabama to 176.5 in Wisconsin (Figure) and were significantly higher than the national estimate (78.0) in 26 states (Table 2). Rates were significantly higher than the national estimate in approximately 60% of Western, Midwestern, and Northeastern states and 30% of southern states and DC. Age-adjusted death rates were significantly higher among men than among women in 34 states (Table 2).

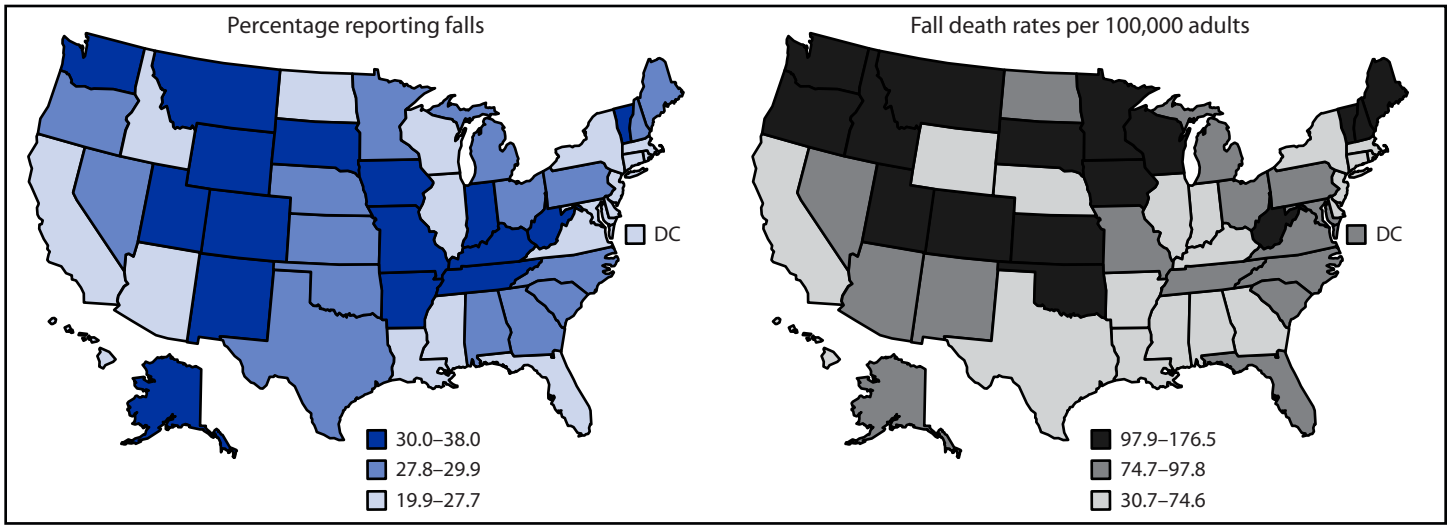
§§ 2021 death rates by urban-rural continuum were crude rates because age-adjusted rates are currently not available in CDC WONDER. https://wonder.cdc.gov/wonder/help/ucd-expanded.html#Constraints-Rates

Discussion

In 2020, 14 million older adults in the United States reported falling, and in 2021, a total of 38,742 died from falls. Nationally, and in states where there were statistically significant sex-specific differences, the percentages older adults reported nonfatal falls were higher among women than among men, whereas fall-related death rates were higher among men than among women.

Similar sex differences in nonfatal and fatal falls were observed in previous years (*2*,*3*). However, the reasons for such variation are not fully understood. Possible explanations include differences in attitudes toward fall prevention and circumstances leading to falls or fall injuries. Previous studies suggest that men might be less receptive than women to fall prevention messages, and less likely to participate in fall

FIGURE. Age-adjusted* percentage† of adults aged ≥65 years reporting one or more unintentional falls during the past year and age-adjusted unintentional fall-related death§ rate among adults aged ≥65 years, by state — Behavioral Risk Factor Surveillance System, 2020 and National Vital Statistics System, 2021, United States



Abbreviations: DC = District of Columbia; ICD-10 = *International Classification of Diseases, Tenth Revision*.
* Percentages and rates were standardized to the 2000 U.S. Census Bureau standard population with age groups 65–74, 75–84, and ≥85 years using the direct method.
† Percentages and rates were categorized by tertiles into three categories.
§ ICD-10 codes W00–W19 were used to identify unintentional fall as an underlying cause of death.

TABLE 2. Age-adjusted* percentage of adults aged ≥65 years reporting one or more unintentional falls in the past year and age-adjusted unintentional fall-related death† rate among adults aged ≥65 years, by sex, U.S. Census Bureau region, and state — Behavioral Risk Factor Surveillance System, 2020 and National Vital Statistics System, 2021, United States

	Age-adjusted % reporting ≥1 fall (95% CI)			Age-adjusted fall-related death rate* (95% CI)		
Jurisdiction	**Women**	**Men**	**Overall**	**Women**	**Men**	**Overall**
Overall	**28.9 (28.1–29.8)§**	**26.1 (25.2–27.0)§**	**27.6 (27.0–28.2)**	**68.3 (67.3–69.2)§**	**91.4 (90.1–92.7)§**	**78.0 (77.2–78.8)**
U.S. Census Bureau Northeast Census Region						
Overall	**27.1 (25.5–28.6)¶**	**25.3 (23.5–27.0)¶**	**26.2 (25.0–27.3)¶**	**58.0 (56.1–60.0)§,¶**	**84.9 (81.9–87.9)§,¶**	**68.9 (67.2–70.5)¶**
Connecticut	22.3 (19.3–25.4)¶	21.3 (17.8–24.9)¶	**21.8 (19.5–24.1)¶**	57.8 (50.1–65.5)§,¶	96.8 (84.3–109.2)§	**73.5 (66.8–80.3)**
Maine	30.0 (27.5–32.5)	29.4 (26.4–32.4)**	**29.6 (27.7–31.5)****	129.0 (110.7–147.2)**	124.0 (102.3–145.7)**	**128.0 (114.0–142.1)****
Massachusetts	26.8 (23.2–30.4)	25.6 (21.5–29.7)	**26.0 (23.3–28.6)**	78.9 (72.2–85.5)§,**	110.1 (100.0–120.1)§,**	**91.0 (85.4–96.6)****
New Hampshire	28.3 (25.4–31.1)	29.5 (25.9–33.0)	**28.8 (26.6–31.1)**	87.2 (71.6–102.8)§,**	127.4 (103.9–150.9)§,**	**103.6 (90.3–116.8)****
New Jersey	26.4 (23.3–29.5)	24.5 (21.1–27.9)	**25.6 (23.3–27.9)**	25.0 (21.7–28.3)§,¶	40.9 (35.6–46.1)§,¶	**31.5 (28.6–34.4)¶**
New York	26.5 (23.8–29.1)	24.1 (20.9–27.2)	**25.3 (23.3–27.3)¶**	42.4 (39.6–45.3)§,¶	59.8 (55.6–64.0)§,¶	**49.4 (47.0–51.8)¶**
Pennsylvania	28.6 (24.1–33.1)	27.0 (22.0–31.9)	**27.9 (24.6–31.3)**	74.3 (69.8–78.9)§,**	118.5 (111.4–125.7)§,**	**92.1 (88.2–96.1)****
Rhode Island	28.0 (24.2–31.8)	23.0 (18.9–27.1)	**25.8 (23.0–28.6)**	114.1 (94.4–133.9)**	133.2 (107.5–163.2)**	**121.5 (105.6–137.4)****
Vermont	33.9 (30.1–37.7)§,**	27.3 (23.7–30.8)§	**31.0 (28.3–33.6)****	118.6 (93.9–147.8)	139.7 (106.9–179.5)**	**129.0 (107.8–150.2)****
U.S. Census Bureau Midwest Census Region						
Overall	**28.0 (26.8–29.1)**	**27.5 (26.1–28.9)**	**27.7 (26.8–28.6)**	**83.0 (80.7–85.2)§,****	**106.6 (103.5–109.8)§,****	**92.9 (91.1–94.7)****
Illinois	20.8 (16.6–25.0)¶	18.8 (13.8–23.9)¶	**19.9 (16.7–23.1)¶**	50.8 (46.7–54.9)§,¶	78.7 (72.3–85.1)§,¶	**62.2 (58.6–65.7)¶**
Indiana	31.9 (29.1–34.8)**	29.5 (26.3–32.6)**	**30.8 (28.7–32.9)****	46.7 (41.2–52.3)§,¶	76.4 (67.5–85.3)§,¶	**58.2 (53.4–63.1)¶**
Iowa	30.8 (28.1–33.6)	29.8 (26.7–32.9)**	**30.4 (28.3–32.4)****	97.7 (86.8–108.6)**	106.0 (92.1–119.9)**	**102.6 (93.9–111.2)****
Kansas	30.9 (28.5–33.3)	29.0 (26.0–31.9)	**29.9 (28.1–31.8)****	88.1 (76.8–99.3)§,**	119.6 (103.7–135.6)§,**	**101.7 (92.3–111.0)****
Michigan	29.5 (26.6–32.5)	29.7 (26.0–33.4)	**29.4 (27.1–31.7)**	75.7 (70.1–81.2)§,**	103.4 (95.4–111.5)§,**	**87.2 (82.6–91.9)****
Minnesota	29.4 (27.1–31.7)	28.6 (26.0–31.2)	**29.1 (27.4–30.8)**	129.8 (119.9–139.7)§,**	158.4 (145.1–171.8)§,**	**141.8 (133.9–149.8)****
Missouri	31.5 (28.7–34.4)	31.1 (27.5–34.7)**	**31.3 (29.0–33.5)****	68.6 (61.8–75.3)§	86.3 (76.9–95.7)§	**75.7 (70.2–81.1)**
Nebraska	27.7 (25.5–29.9)	27.9 (25.3–30.6)	**27.8 (26.1–29.5)**	56.1 (45.5–68.6)§	74.9 (60.0–92.4)§,¶	**63.4 (54.2–72.5)¶**
North Dakota	28.3 (25.0–31.6)§	23.2 (19.6–26.8)§	**26.0 (23.6–28.4)**	82.0 (62.7–105.4)	103.2 (76.6–136.0)	**91.7 (74.7–108.6)**
Ohio	28.5 (26.0–31.0)	29.0 (26.1–31.9)	**28.5 (26.6–30.4)**	81.0 (75.7–86.2)§,**	98.3 (91.0–105.6)§	**88.4 (84.1–92.7)****
South Dakota	31.9 (27.3–36.5)	36.6 (29.9–43.3)**	**34.0 (30.0–38.0)****	131.7 (106.9–156.5)**	152.9 (121.6–189.8)**	**140.3 (120.5–160.1)****
Wisconsin	27.1 (23.1–31.0)	28.7 (24.0–33.3)	**27.5 (24.4–30.5)**	168.3 (157.4–179.1)**	184.7 (170.7–198.6)**	**176.5 (167.9–185.1)****

See table footnotes on the next page.

TABLE 2. (*Continued*) Age-adjusted* percentage of adults aged ≥65 years reporting one or more unintentional falls in the past year and age-adjusted unintentional fall-related death† rate among adults aged ≥65 years, by sex, U.S. Census Bureau region, and state — Behavioral Risk Factor Surveillance System, 2020 and National Vital Statistics System, 2021, United States

Jurisdiction	Age-adjusted % reporting ≥1 fall (95% CI)			Age-adjusted fall-related death rate* (95% CI)		
	Women	Men	Overall	Women	Men	Overall
U.S. Census Bureau South Census Region						
Overall	**29.6 (28.3–30.8)§**	**25.6 (24.2–27.1)§**	**27.8 (26.8–28.7)**	**67.2 (65.7–68.8)§**	**90.6 (88.5–92.8)§**	**77.1 (75.8–78.4)**
Alabama	29.9 (26.2–33.6)	25.7 (21.5–29.9)	**28.1 (25.3–30.8)**	26.3 (21.6–31.0)§,¶	37.3 (30.3–44.2)§,¶	**30.7 (26.8–34.7)¶**
Arkansas	33.6 (30.4–36.8)**	32.9 (28.9–36.8)**	**33.1 (30.7–35.6)****	45.7 (37.6–53.7)¶	53.9 (43.3–64.5)¶	**49.3 (42.8–55.7)¶**
Delaware	28.1 (23.4–32.8)	23.2 (18.3–28.1)	**26.0 (22.6–29.4)**	43.4 (31.2–58.9)¶	54.2 (38.0–75.1)¶	**48.2 (38.1–60.2)¶**
District of Columbia	30.0 (25.0–35.1)	29.8 (24.5–35.1)	**29.9 (26.1–33.6)**	59.9 (40.4–85.5)§	113.5 (78.1–159.4)§	**80.4 (61.9–102.7)**
Florida	27.3 (23.9–30.6)§	20.8 (17.1–24.6)§,¶	**24.4 (21.9–26.9)¶**	77.6 (74.2–81.1)§,**	99.1 (94.6–103.6)§,**	**87.3 (84.5–90.1)****
Georgia	27.9 (24.6–31.2)	29.3 (25.6–33.1)	**28.4 (25.9–30.8)**	48.8 (43.8–53.7)§,¶	73.1 (65.7–80.6)§,¶	**58.8 (54.6–63.0)¶**
Kentucky	31.3 (26.8–35.8)	30.9 (25.3–36.5)	**31.2 (27.7–34.7)****	49.7 (42.7–56.8)§,¶	76.1 (65.4–86.7)§,¶	**60.6 (54.6–66.6)¶**
Louisiana	30.7 (26.0–35.4)	27.8 (23.1–32.5)	**29.4 (26.0–32.8)**	44.9 (38.2–51.6)§,¶	75.9 (65.1–86.7)§,¶	**57.6 (51.7–63.5)¶**
Maryland	26.7 (24.1–29.3)	23.2 (20.6–25.8)¶	**25.1 (23.3–27.0)¶**	72.1 (65.0–79.2)§	100.5 (90.0–111.1)§	**83.7 (77.7–89.6)**
Mississippi	27.8 (25.0–30.6)	25.0 (21.4–28.6)	**26.5 (24.3–28.8)**	63.4 (53.6–73.3)	73.8 (60.4–87.1)¶	**67.9 (59.9–75.8)¶**
North Carolina	30.7 (26.6–34.8)	26.4 (22.2–30.6)	**28.9 (25.9–31.9)**	85.3 (79.2–91.3)§,**	111.5 (102.8–120.1)§,**	**95.9 (90.9–100.9)****
Oklahoma	31.3 (27.8–34.7)	27.5 (23.5–31.4)	**29.6 (27.0–32.3)**	118.4 (106.7–130.1)§,**	146.7 (131.0–162.5)§,**	**130.6 (121.2–140.1)****
South Carolina	29.5 (25.4–33.6)	27.6 (22.5–32.7)	**28.5 (25.3–31.7)**	68.1 (60.5–75.7)§	92.2 (81.4–103.0)§	**78.1 (71.9–84.4)**
Tennessee	35.0 (30.5–39.4)§,**	26.5 (21.4–31.5)§	**31.2 (27.9–34.5)****	74.2 (67.3–81.2)§	103.8 (93.6–114.1)§,**	**85.9 (80.1–91.7)****
Texas	30.8 (26.4–35.2)	27.0 (22.3–31.7)	**29.0 (25.8–32.3)**	57.9 (54.4–61.3)§,¶	75.1 (70.4–79.8)§,¶	**65.1 (62.3–67.9)¶**
Virginia	28.0 (25.3–30.7)	24.6 (21.4–27.8)	**26.4 (24.3–28.5)**	64.7 (58.8–70.6)§	100.1 (91.2–109.1)§	**79.4 (74.4–84.4)**
West Virginia	33.1 (29.9–36.3)**	33.1 (29.2–37.0)**	**33.1 (30.6–35.6)****	120.3 (104.3–136.3)§,**	152.1 (130.5–173.6)§,**	**133.7 (120.8–146.6)****
U.S. Census Bureau West Census Region						
Overall	**30.4 (27.9–32.9)§**	**26.1 (23.6–28.7)§**	**28.4 (26.6–30.1)**	**64.3 (62.3–66.3)§,¶**	**83.9 (81.3–86.6)§,¶**	**72.8 (71.2–74.4)¶**
Alaska	40.3 (33.8–46.8)**	35.6 (29.2–42.0)**	**38.0 (33.4–42.6)****	78.3 (51.6–113.9)	81.2 (51.5–121.9)	**80.1 (59.6–105.3)**
Arizona	27.5 (24.1–30.8)	27.0 (23.5–30.5)	**27.3 (24.8–29.7)**	83.3 (76.2–90.4)**	88.9 (80.8–97.0)	**86.1 (80.7–91.4)****
California	30.6 (25.6–35.7)§	23.2 (18.0–28.4)§	**27.1 (23.4–30.7)**	34.0 (32.0–36.0)§,¶	55.6 (52.5–58.7)§,¶	**43.1 (41.3–44.8)¶**
Colorado	30.0 (27.2–32.9)	31.2 (28.1–34.2)**	**30.5 (28.5–32.6)****	117.1 (106.6–127.6)§,**	150.0 (135.6–164.4)§,**	**130.7 (122.2–139.2)****
Hawaii	22.9 (19.6–26.2)¶	19.8 (16.1–23.5)¶	**21.5 (19.0–24.0)¶**	34.8 (26.3–45.2)§,¶	61.4 (47.9–77.4)§,¶	**45.5 (37.6–53.3)¶**
Idaho	28.2 (24.4–32.0)	25.5 (21.5–29.5)	**26.8 (24.1–29.6)**	115.4 (97.4–133.4)**	123.0 (102.0–144.0)**	**119.7 (106.0–133.5)****
Montana	31.8 (28.6–35.1)	30.0 (26.4–33.5)**	**31.0 (28.6–33.4)****	118.3 (96.6–139.9)**	119.4 (95.8–147.1)**	**117.8 (101.7–133.9)****
Nevada	29.3 (22.6–36.1)	31.1 (23.8–38.3)	**29.9 (24.9–35.0)**	63.1 (52.6–73.5)§	94.2 (80.0–108.3)§	**77.3 (68.7–85.9)**
New Mexico	33.7 (30.0–37.3)**	33.1 (28.5–37.7)**	**33.4 (30.5–36.3)****	88.0 (74.7–101.3)**	94.7 (78.5–110.9)	**90.8 (80.5–101.1)****
Oregon	30.5 (26.6–34.4)	26.8 (22.7–31.0)	**29.0 (26.1–31.8)**	121.5 (110.3–132.7)**	125.1 (111.7–138.5)**	**123.8 (115.2–132.4)****
Utah	31.2 (28.3–34.1)	28.8 (25.8–31.8)	**30.0 (27.9–32.1)****	99.6 (84.7–114.4)§,**	127.4 (108.4–146.4)§,**	**112.1 (100.3–124.0)****
Washington	32.6 (29.7–35.5)**	29.8 (26.8–32.8)**	**31.4 (29.3–33.5)****	105.4 (97.2–113.7)§,**	122.8 (112.2–133.4)§,**	**113.4 (106.9–119.9)****
Wyoming	32.4 (28.8–36.1)	30.1 (25.8–34.4)	**31.3 (28.6–34.1)****	62.2 (41.7–89.3)	78.4 (52.1–113.3)	**70.2 (53.3–90.7)**

* Percentages and rates were standardized to the 2000 U.S. Census Bureau Standard population with age groups 65–74, 75–84, and ≥85 years using the direct method.
† *International Classification of Diseases, Tenth Revision* codes W00–W19 were used to identify an unintentional fall as the underlying cause of death.
§ Statistically significant difference between women and men at p<0.05.
¶ Statistically lower than the national estimate at p<0.05.
** Statistically higher than the national estimate at p<0.05.

prevention programs (*4*). Men are more likely than women to sustain fall-related injuries on ice or snow and while using ladders or other elevation equipment (*5*). In addition, the modifiable risk factors leading to fall-related injuries might differ between men and women (*6*).

State differences might be explained by variations in populations at high risk for falls. Because older adult falls have multiple risk factors, research into state-to-state variation in risk factor prevalences (e.g., chronic conditions, disability, and alcohol consumption), access to fall prevention activities and health care, and social determinants of health related to falls could help explain state differences.

In 2020, approximately one in four older adults reported at least one fall. Even in Illinois, the state with the lowest estimate of nonfatal falls, approximately one fifth of older adults reported falling. The 2020 estimate of nonfatal falls during the first year of the COVID-19 pandemic was similar to that during previous years (*3*). On average, 100 older adults died every day because of falls in 2021. The 2021 estimate of fatal falls was higher than those during the previous 20 years (*7*). Age-adjusted death rates have been increasing annually for at least 2 decades (*7*). A trend analysis using data from 2019 through 2023 (i.e., end of the COVID-19 pandemic as a public health emergency) might help identify whether death rates were affected by the pandemic.

Limitations

The findings in this report are subject to at least six limitations. First, BRFSS data are self-reported and could be subject to recall bias. Second, BRFSS does not include persons in long-term care

Summary

What is already known about this topic?

Unintentional falls are the leading cause of injury and deaths from injury among adults aged ≥65 years (older adults).

What is added by this report?

In 2020, the percentage of older adults who reported falling during the previous year ranged from 19.9% in Illinois to 38.0% in Alaska. In 2021, the unintentional fall–related death rate among older adults ranged from 30.7 per 100,000 population in Alabama to 176.5 in Wisconsin.

What are the implications for public health practice?

Although common, falls among older adults are preventable. Health care providers can talk with patients about their fall risk and how falls can be prevented.

facilities, who are at higher risk for falls. Third, additional differences might not have been identified because of small BRFSS sample sizes after stratification by sex and state. Fourth, the median response rate for the 2020 BRFSS data was 47.9%, however BRFSS data are weighted to adjust for nonresponse bias. Fifth, because the latest fall-related data in BRFSS were from 2020, nonfatal estimates from the same calendar year as the fatal estimates (2021) were not available. Finally, mortality data might be subject to misclassifications of race or ethnicity of the decedent, and might lead to over- or underestimating the rates in some groups.[¶¶]

Implications for Public Health Practice

CDC's Stopping Elderly Accidents, Deaths and Injuries (STEADI) initiative (https://www.cdc.gov/steadi/about.html) recommends that health care providers screen older adults for risk of falling, assess those at risk to identify modifiable risk factors, and intervene with effective strategies (e.g., physical therapy, home modification, and medication management) to address each risk factor. Evaluation of STEADI-based fall prevention in New York found that older adults at risk for falls who received strategies to address fall risk factors were less likely to be hospitalized for a fall than were those who did not (*8*). Health care providers can consider motivational interviewing techniques to understand attitudes toward prevention strategies (*9*) and inquire about daily activities that can increase their patients' fall risks. Everyone, including state, tribal, and local health departments and organizations working with older adults can help older adults self-screen for their risk of falling, using the online falls free checkup,[***] and encourage older adults to speak to their health care provider.

[¶¶] https://wonder.cdc.gov/wonder/help/ucd-expanded.html
[***] https://www.ncoa.org/article/falls-free-checkup

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Possible Exposures Among Mpox Patients Without Reported Male-to-Male Sexual Contact — Six U.S. Jurisdictions, November 1–December 14, 2022

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Abstract

The extent to which the 2022 mpox outbreak has affected persons without a recent history of male-to-male sexual contact (MMSC) is not well understood. During November 1–December 14, 2022, CDC partnered with six jurisdictional health departments to characterize possible exposures among mpox patients aged ≥18 years who did not report MMSC during the 3 weeks preceding symptom onset. Among 52 patients included in the analysis, 14 (27%) had a known exposure to a person with mpox, including sexual activity and other close intimate contact (eight) and household contact (six). Among 38 (73%) patients with no known exposure to a person with mpox, self-reported activities before illness onset included sexual activity and other close intimate contact (17; 45%), close face-to-face contact (14; 37%), attending large social gatherings (11; 29%), and being in occupational settings involving close skin-to-skin contact (10; 26%). These findings suggest that sexual activity remains an important route of mpox exposure among patients who do not report MMSC.

Introduction

During infectious disease outbreaks, there are often cases for which a source of infection cannot be identified. The 2022 mpox outbreak disproportionately affected adult gay, bisexual, and other men who have sex with men; however, approximately 30% of U.S. mpox patients did not report male-to-male sexual contact (MMSC)[†] (*1*,*2*). During May–October 2022, increases in mpox cases among persons with missing exposure data or no reported MMSC highlighted a need to understand the extent to which the outbreak has affected other populations, as well as additional potential routes of *Monkeypox virus* (MPXV) transmission, to aid in the development and implementation of public health prevention guidance (*1*).

Methods

Data on confirmed and probable mpox cases are electronically reported to CDC by U.S. jurisdictional health departments as part of national mpox surveillance, using a standardized case report form[§] or through the National Notifiable Diseases Surveillance System.[¶] CDC analyzed data on confirmed and probable mpox cases among persons aged ≥18 years reported by six jurisdictional health departments[**] during November 1–December 14, 2022, for whom MMSC during the 3 weeks preceding symptom onset was unknown, not reported, or not applicable. A desk review was conducted using jurisdiction-level mpox, HIV, and sexually transmitted infection surveillance data not previously reported to CDC to obtain information on demographic and clinical characteristics and possible exposures during the 3 weeks before symptom onset, including sexual activity and close intimate contact,[††] caregiving,[§§] household contact,[¶¶] attendance at small[***] and large[†††] social gatherings, shared transportation,[§§§] close face-to-face contact,[¶¶¶] occupational settings,[****] and recreational drug use.[††††] After the desk review, a subset of patients was

[*] These authors contributed equally to this report.

[†] MMSC is defined as cisgender male-to-cisgender male sexual (e.g., oral or anal sex) or intimate contact (e.g., cuddling, kissing, touching partner's genitals or anus, or sharing sex toys) within 3 weeks of symptom onset.

[§] https://www.cdc.gov/poxvirus/mpox/health-departments/case-reporting.html

[¶] https://www.cdc.gov/nndss/index.html

[**] Health departments in California (excluding Los Angeles County), Georgia, Louisiana, New York City, Pennsylvania (excluding Philadelphia), and Philadelphia.

[††] Sexual activity includes vaginal, oral, or anal sex, and close intimate contact includes cuddling, kissing, touching a partner's genitals or anus, or sharing sex toys.

[§§] Caregiving is assistance with routine everyday tasks and the social and health needs of another person provided by unpaid family members or friends or paid caregivers and can include touching skin or skin-to-skin contact; handling food, utensils, cups, or dishes; handling clothing, bedding, bed linens, or towels; handling personal care items; handling, dispensing, or administering medication or medical equipment; taking care of other family members, children, or dependents; and taking care of pets or related activities.

[¶¶] Household contact includes living together in the same dwelling (e.g., household or shared dormitory room).

[***] Small social settings include spending time indoors or outdoors either with one other person or in a small group of nine or fewer persons, including oneself.

[†††] Large social settings include spending time indoors or outdoors at large events or celebrations, in food or entertainment venues, or in a large group of 10 or more persons, including oneself.

[§§§] Shared transportation includes carpooling; sharing a personally owned car, taxi, or rideshare service; using a bus, subway or light rail, railroad or train, airplane; or other transportation modalities.

[¶¶¶] Close face-to-face contact includes interactions with another person within a 6 ft (1.8 m) radius, excluding physical contact.

[****] Occupational settings include one's workplace or where contact occurs during the course of one's job, including health care facilities and sex work.

[††††] Recreational drug use includes using or sharing bubblers, vapes, bongs, pipes, other smoking devices, needles or syringes, injection equipment or "works," or other related items.

contacted up to three times for an in-depth reinterview guided by a standardized questionnaire; those who were unable to be reinterviewed were retained in the analysis if sufficient data from the desk review were available. Patients without a known exposure to a person with mpox were interviewed about activities and interactions during the 3 weeks preceding symptom onset to identify possible sources of infection. Disease intervention specialists or epidemiologists at the local or federal level conducted the desk reviews and reinterviews. Data were analyzed using R statistical software (version 4.1.1; R Foundation). This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.[§§§§]

[§§§§] 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

Results

During November 1–December 14, 2022, a total of 932 mpox cases were reported to CDC; among these, 122 (13%) were reported from the six jurisdictions participating in the investigation and met the initial inclusion criteria. Upon desk review or reinterview, patients 1) who did not have mpox (one), 2) for whom MMSC was reported or could not be ruled out (65), or 3) who were missing all exposure data (four) were excluded from further analysis (Supplementary Figure, https://stacks.cdc.gov/view/cdc/132208). Among the remaining 52 (6%) patients, the median age was 36 years (range = 18–70 years) (Table). Among 48 patients reporting race and ethnicity, 24 (50%) were non-Hispanic Black or African American (Black), 16 (33%) were Hispanic or

TABLE. Characteristics of patients aged ≥18 years with mpox who did not report male-to-male sexual contact, by known or unknown exposure to a person with suspected or confirmed mpox — United States, November 1–December 14, 2022

Characteristic (no. with available data)	No. (%)* All (N = 52)	Any known exposure to a person with suspected or confirmed mpox: Yes (n = 14)	Any known exposure to a person with suspected or confirmed mpox: No (n = 38)
Median age, yrs (range)	**36 (18–70)**	37 (22–56)	36 (18–70)
Race and ethnicity (48)†			
American Indian or Alaska Native	**0 (—)**	0 (—)	0 (—)
Asian	**2 (4.2)**	1 (8.3)	1 (2.8)
Black or African American	**24 (50.0)**	7 (58.3)	17 (47.2)
Native Hawaiian or other Pacific Islander	**0 (—)**	0 (—)	0 (—)
White	**5 (10.4)**	1 (8.3)	4 (11.1)
Hispanic or Latino	**16 (33.3)**	3 (25.0)	13 (36.1)
Multiracial or other race or ethnicity	**0 (—)**	0 (—)	0 (—)
Prefer to not answer	**1 (2.1)**	0 (—)	1 (2.8)
Missing	**4**	2	2
Gender identity (52)			
Cisgender man	**32 (61.5)**	5 (35.7)	27 (71.1)
Cisgender woman	**15 (28.8)**	6 (42.9)	9 (23.7)
Transgender man	**0 (—)**	0 (—)	0 (—)
Transgender woman	**3 (5.8)**	2 (14.3)	1 (2.6)
Another gender identity	**1 (1.9)**	0 (—)	1 (2.6)
Prefer not to answer	**1 (1.9)**	1 (7.1)	0 (—)
Missing	**0**	0	0
Sexual orientation (45)			
Heterosexual	**30 (66.7)**	9 (75.0)	21 (63.6)
Lesbian or gay	**7 (15.6)**	1 (8.3)	6 (18.2)
Bisexual	**6 (13.3)**	2 (16.7)	4 (12.1)
Other	**2 (4.4)**	0 (—)	2 (6.1)
Missing	**7**	2	5
Occupation (42)			
Employed	**26 (61.9)**	10 (76.9)	16 (55.2)
Unemployed	**10 (23.8)**	3 (23.1)	7 (24.1)
Retired	**2 (4.8)**	0 (—)	2 (6.9)
Living with a disability	**3 (7.1)**	0 (—)	3 (10.3)
Student	**1 (2.4)**	0 (—)	1 (3.4)
Missing	**10**	1	9
Housing (32)			
Housing secure	**28 (87.5)**	7 (87.5)	21 (87.5)
Housing insecure§	**4 (12.5)**	1 (12.5)	3 (12.5)
Missing	**20**	6	14
Rash during illness (49)			
Yes	**48 (98.0)**	13 (100)	35 (97.2)
No	**1 (2.0)**	0 (—)	1 (2.8)
Missing	**3**	1	2
First location of rash¶			
Genitals	**21 (47.7)**	6 (54.5)	15 (45.5)
Legs	**15 (34.1)**	3 (27.3)	12 (36.4)
Arms	**14 (31.8)**	4 (36.4)	10 (30.3)
Trunk	**13 (29.5)**	3 (27.3)	10 (30.3)
Hands	**9 (20.5)**	2 (18.2)	7 (21.2)
Face	**9 (20.5)**	0 (—)	9 (27.3)
Head	**5 (11.4)**	1 (9.1)	4 (12.1)
Perianal	**4 (9.1)**	2 (18.2)	2 (6.1)
Neck	**3 (6.8)**	1 (9.1)	2 (6.1)
Feet	**3 (6.8)**	1 (9.1)	2 (6.1)
Mouth	**0 (—)**	0 (—)	0 (—)
Lips or oral mucosa	**0 (—)**	0 (—)	0 (—)
Missing or not applicable	**8**	3	5
Received ≥1 dose of JYNNEOS vaccine (30)			
Yes	**3 (10.0)**	1 (16.7)	2 (8.3)
No	**27 (90.0)**	5 (83.3)	22 (91.7)
Missing	**22**	8	14
Person with HIV by self-report (32)			
Yes	**8 (25.0)**	1 (14.3)	7 (28.0)
No	**24 (75.0)**	6 (85.7)	18 (72.0)
Missing	**20**	7	13

* Percentages calculated using nonmissing data.
† All racial groups listed are non-Hispanic; Hispanic or Latino persons could be of any race.
§ Housing insecurity was defined as being unhoused or living in a congregate setting (e.g., dormitory, shelter, or hotel or motel).
¶ First locations of rash are not mutually exclusive.

Latino (Hispanic), and five (10%) were non-Hispanic White. Thirty-two (62%) patients were cisgender men, 15 (29%) were cisgender women, and three (6%) were transgender women. Among 45 patients reporting sexual orientation, 30 (67%) were heterosexual, seven (16%) were gay or lesbian, and six (13%) were bisexual. Among 42 patients reporting occupation, 26 (62%) were employed, 10 (24%) were unemployed, and six (14%) were categorized as other (e.g., student). Among 32 patients reporting housing information, four (13%) were not securely housed or were living in a congregate setting.

Overall, 48 (98%) of 49 patients with available information reported rash during their illness; the most frequently reported first rash location was the genitals (48%), followed by the legs (34%), arms (32%), and trunk (30%). Among 32 patients reporting HIV status, eight (25%) had HIV infection. Information on receipt of JYNNEOS vaccine was available for 30 patients, three (10%) of whom had received ≥1 dose.[¶¶¶¶]

Patients with Known MPXV Exposures

Fourteen (27%) patients reported a known exposure to a person with suspected or confirmed mpox; among these, eight[*****] reported sexual activity and other close intimate contact, and six[†††††] reported household contact (Figure) (Supplementary Table 1, https://stacks.cdc.gov/view/cdc/132206).

One household cluster involving three transmission events was identified. The index patient (patient A), a cisgender man, was exposed after being arrested and detained in a jail cell with up to seven other persons, including one who reportedly had characteristic mpox lesions on the arms and who shared a cell with patient A for >10 hours. This person shared a water fountain, bench, and toilet facilities with patient A, who was detained for 5 days and experienced the onset of symptoms the day after his release. After returning home, patient A had sex with his female partner (patient B), whose symptoms commenced 1 week later. Patients A and B share a residence with an adult woman (patient C) and a preschool-aged child,[§§§§§] both of whom acquired mpox. Patient C's symptom onset occurred 2 weeks after that in patient B; the child's illness began 1 week after that in patient C (the child's primary caregiver).

Other reported exposures among patients with a known exposure to a person with mpox included shared transportation (three), close face-to-face contact (two), caregiving (two), occupational setting (one), and attendance at a large social gathering where an mpox patient was present (one). In the suspected caregiving exposure, patient D reported cleaning her son's[¶¶¶¶¶] home while he was in the hospital after receiving an mpox diagnosis. Patient D lived in a separate residence and reported having no direct contact with her son at his home. Patient D reported inconsistently wearing gloves after learning of her son's diagnosis and later developed mpox lesions on her hand.

In the suspected occupational setting exposure, patient E, a property manager, was exposed to a client with mpox. Patient E reported skin-to-skin contact, close face-to-face interactions within 6 ft (1.8 m), and handling objects shared with or potentially contaminated by the client. Neither used personal protective equipment (PPE); patient E was informed of the client's diagnosis by a person with direct knowledge about it.

In another case, close face-to-face contact was suspected as a source of exposure: patient F met a friend with a diagnosis of mpox at an indoor bar or restaurant (i.e., large social gathering). Whether the friend was acutely ill during the meeting is unclear. They had close face-to-face contact within 6 ft (1.8 m) for 1.5 hours without the use of face masks or other PPE. Patient F did not report skin-to-skin contact with the friend, nor did they share food or drinks.

Patients Without Known MPXV Exposures

Thirty-eight (73%) patients had no known exposure to a person with suspected or confirmed mpox, among whom 17 (45%) reported recent sexual activity or other close intimate contact (Figure) (Supplementary Table 2, https://stacks.cdc.gov/view/cdc/132207). Six of 17 patients reported sex only with a partner or spouse who did not have mpox, suggesting sexual activity might not have been their source of infection. In addition to sexual activity, patients with unknown exposures reported close face-to-face contact (14; 37%), attending large social gatherings (11; 29%) (including gyms, restaurants, bars, and clubs), and being in occupational settings involving close skin-to-skin contact (10; 26%) during the 3 weeks before symptom onset. Only one patient reported potential exposure through casual contact or fomites (i.e., large social gathering, occupational setting, or shared transportation) without also reporting sexual activity or close face-to-face contact. This patient lived alone and reported going to a bar, using a rideshare

[¶¶¶¶] Receipt of ≥1 dose of JYNNEOS vaccine could have occurred before or after rash onset.

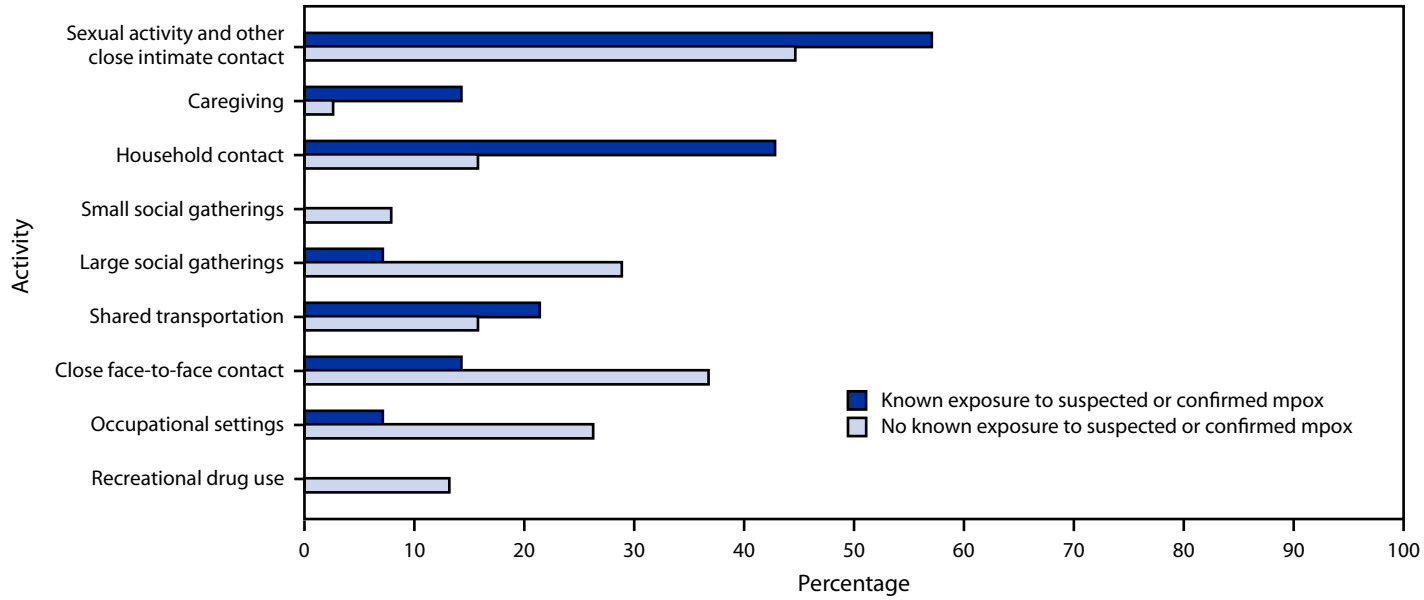
[*****] Seven of eight patients had available data on where rash first appeared on their body. Among those seven, only one patient reported that their rash did not start on their genitals or perianal area. The locations of first rash appearance reported by patients included genitals (four), perianal area (one), and both genitals and perianal area (one).

[†††††] Four of six patients had available data on where rash first appeared on their body. Only one had a rash that started on their genitals.

[§§§§§] Because of age, the child did not meet the initial inclusion criteria and was not included in this investigation.

[¶¶¶¶¶] The son of patient D was not included in the investigation, likely because his symptom onset date occurred before November 1, 2022, or because MMSC was reported.

FIGURE. Self-reported activities* of mpox patients aged ≥18 years who did not report male-to-male sexual contact, by known† or unknown§ exposure to a person with suspected or confirmed mpox — United States, November 1–December 14, 2022



* Activities during the 3 weeks preceding symptom onset are not mutually exclusive.
† Percentages calculated out of 14.
§ Percentages calculated out of 38.

service, and having no close contact with anyone during the 3 weeks before the onset of illness.

Discussion

Among 52 mpox patients without MMSC in this study, possible mpox exposures in a range of settings were identified. Sexual or other intimate contact was the most common exposure. This finding is consistent with findings from other studies (*1–4*), suggesting that during the current U.S. mpox outbreak, sexual transmission or close skin-to-skin contact with a person with suspected or confirmed mpox is the predominant mode of transmission. However, other transmission modes, including household transmission, were reported.

The household mpox cluster described in this report involving three transmission events and possible transmission via contaminated household objects and surfaces (*5*,*6*) underscores the need for public health agencies to consider outreach and mpox transmission prevention education for patients in household settings (*7*,*8*). Messaging for uninfected persons sharing or visiting a living space where a person with mpox resides should consider emphasizing maintenance of adequate hand hygiene; adhering to home cleaning and disinfection guidelines; and avoiding touching potentially contaminated surfaces or sharing personal items including bedding, clothing, towels, or utensils. Vaccination against mpox is also recommended for persons who have been exposed to mpox or those who are at increased risk for MPXV infection (*9*).

For patients without a known exposure to a person with mpox, a variety of activities and interactions with others was reported; however, it was not possible to determine the likely source of infection for most of them. Several of these patients reported close contact with one or more persons who might have had an unrecognized or undisclosed case of mpox at the time of the contact. Mpox can be transmitted before symptoms become apparent (*10*). Persons who have had close contact with a person with mpox should monitor themselves for symptoms for 21 days from the date of their last exposure, be vaccinated against mpox as soon as possible after the exposure, and seek immediate attention from a health care provider if they develop a new or unexplained rash or other symptoms of mpox (*9*).

Similar to patients identified in other studies (*1–4*), patients in this study were disproportionately Black and Hispanic. In addition, approximately one quarter of patients were unemployed, and more than one in 10 were not securely housed. Deploying JYNNEOS vaccine and focusing outreach and education to communities disproportionately affected by mpox should be prioritized to minimize health disparities. Coordinating with health departments, community-based organizations, and other partners can help achieve health equity in the current mpox outbreak.

Summary

What is already known about this topic?

During the 2022 U.S. mpox outbreak, approximately 30% of mpox patients had missing exposure data or no reported male-to-male sexual contact (MMSC).

What is added by this report?

Among 52 mpox patients who did not report MMSC from six jurisdictions, 14 (27%) had a known exposure to a person with mpox; these exposures included sexual activity (eight) and household contact (six). Among 38 (73%) patients with no known exposure to a person with mpox, behaviors preceding illness included sexual activity (17; 45%), close face-to-face contact (14; 37%), attending large social gatherings (11; 29%), and being in occupational settings (10; 26%).

What are the implications for public health practice?

Although a small proportion of mpox patients did not report MMSC, possible mpox exposures among these patients involved exposures or other behaviors known to potentially transmit *Monkeypox virus*, including sexual activity (other than MMSC) or other close skin-to-skin contact.

Limitations

The findings in this report are subject to at least three limitations. First, all exposure data are self-reported and might be subject to recall and social desirability biases. Second, data included in this analysis are from six jurisdictions and might not be representative of other jurisdictions. Finally, the small sample size and high level of missingness for some variables might limit generalizability and highlight the need for further investigation of possible exposures among mpox patients who did not report recent sexual activity or close intimate contact.

Implications for Public Health Practice

Although a small proportion of mpox patients did not report MMSC, possible mpox exposures among these patients involved exposures or other behaviors known to potentially transmit MPXV, including sexual activity (other than MMSC) or other close skin-to-skin contact.

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Drug Overdose Deaths with Evidence of Counterfeit Pill Use — United States, July 2019–December 2021

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Abstract

Using data from CDC's State Unintentional Drug Overdose Reporting System, this report describes trends in overdose deaths with evidence of counterfeit pill use during July 2019–December 2021 in 29 states and the District of Columbia (DC) and characteristics of deaths with and without evidence of counterfeit pill use during 2021 in 34 states and DC. The quarterly percentage of deaths with evidence of counterfeit pill use more than doubled from 2.0% during July–September 2019 to 4.7% during October–December 2021, and more than tripled in western jurisdictions (from 4.7% to 14.7%). Illicitly manufactured fentanyls were the only drugs involved (i.e., caused death) in 41.4% of deaths with evidence of counterfeit pill use and 19.5% of deaths without evidence. Decedents with evidence of counterfeit pill use, compared with those without evidence, were younger (57.1% versus 28.1% were aged <35 years), more often Hispanic or Latino (18.7% versus 9.4%), and more frequently had a history of prescription drug misuse (27.0% versus 9.4%). Smoking was the most common noningestion drug use route among deaths with evidence of counterfeit pill use (39.5%). Overdose prevention messaging that highlights the dangers of pills obtained illicitly or without a prescription (because they might be counterfeit), encourages drug product testing by persons using drugs, and is tailored to persons most at risk (e.g., younger persons) could help prevent overdose deaths.

Introduction

Drug overdose deaths are at historically high levels in the United States, with a preliminary estimate of more than 105,000 deaths in 2022 (*1*). The proliferation of counterfeit pills, which are not manufactured by pharmaceutical companies, but are typically made to look like legitimate pharmaceutical pills (frequently oxycodone or alprazolam), is complicating the illicit drug market and potentially contributing to these deaths* (*2*). Counterfeit pills often contain illicitly manufactured fentanyls (IMFs), illicit benzodiazepines (e.g., bromazolam, etizolam, and flualprazolam), or other illicit drugs, and can increase overdose risk because the pills might expose persons to drugs they did not intend to use.

Methods

Jurisdictions participating in CDC's State Unintentional Drug Overdose Reporting System (SUDORS)† entered information about unintentional and undetermined intent drug overdose deaths from death certificates, postmortem toxicology reports, and medical examiner and coroner reports. Quarterly percentages of overdose deaths with evidence of counterfeit pill use were calculated among 30 jurisdictions§ with complete data for July 2019–December 2021. Further, decedent demographics, the drugs involved, and the circumstances of overdose deaths with and without evidence of counterfeit pill use were examined among 35 jurisdictions¶ with complete data for 2021. Evidence of counterfeit pill use was determined by reviewing free-text narratives that describe each death in SUDORS. Deaths were flagged for review by text searches indicating potential evidence, and narratives were separately reviewed by two coauthors.**

* https://www.dea.gov/press-releases/2022/12/20/drug-enforcement-administration-announces-seizure-over-379-million-deadly

† https://www.cdc.gov/drugoverdose/fatal/sudors.html

§ Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Kansas, Kentucky, Maine, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, and West Virginia. Arkansas, Illinois, Pennsylvania, and Washington reported deaths from counties that accounted for ≥75% of drug overdose deaths in the respective state in 2017, per SUDORS funding requirements; all other jurisdictions reported deaths from the full jurisdiction. Jurisdictions were included if complete data (including medical examiner or coroner reports for ≥75% of deaths) were available for all of July 2019–December 2021. Analysis was restricted to decedents with an available medical examiner or coroner report.

¶ In addition to the 30 jurisdictions included in trend analyses, analyses of decedent demographics, drugs involved, and circumstances of overdose deaths with and without evidence of counterfeit pill use also included Iowa, Louisiana, Maryland, Michigan, and Nebraska. Arkansas, Illinois, Louisiana, Pennsylvania, and Washington reported deaths from counties that accounted for ≥75% of drug overdose deaths in the respective state in 2017, per SUDORS funding requirements; all other jurisdictions reported deaths from the full jurisdiction. Jurisdictions were included if complete data (including medical examiner or coroner reports for ≥75% of deaths) were available for all of January–December 2021. Analysis was restricted to decedents with an available medical examiner or coroner report.

** To identify evidence of counterfeit pill use, deaths were flagged if the SUDORS counterfeit pills checkbox was checked or text narratives describing each death contained certain substrings (e.g., "counterf" or "M-30"). Narratives for flagged deaths were coded to have evidence of counterfeit pill use (and types) or not; coding discrepancies were resolved by collective consensus of coauthors. Deaths were flagged using substring searches for variations on oxycodone brand names if no oxycodone (or metabolites) were detected by postmortem toxicology testing; the same approach was used for alprazolam. Because oxycodone and alprazolam are the drugs most commonly mimicked by counterfeit pills, counterfeit pill type was coded as oxycodone, alprazolam, or unspecified (e.g., witnesses reported that the decedent used "counterfeit pills" but did not indicate the type of pharmaceutical pills mimicked), and the pills were categorized mutually exclusively for analyses: oxycodone but no alprazolam, alprazolam but no oxycodone, both oxycodone and alprazolam, or unspecified.

Evidence of counterfeit pill use included 1) pills found at the overdose scene that were identified as counterfeit (e.g., by witnesses, law enforcement, medical examiners, or coroners); 2) pills that tested positive for drugs other than what they appeared to contain; 3) pills appearing as oxycodone with no oxycodone detected on postmortem toxicology, or appearing as alprazolam with no alprazolam detected; 4) unmarked pills; and 5) witness report that the decedent used pills, but none of the drugs detected by toxicology testing are available in legitimate pill form. Analyses were performed using SAS software (version 9.4; SAS Institute). This activity was reviewed by CDC and conducted consistent with applicable federal law and CDC policy.[††]

Results

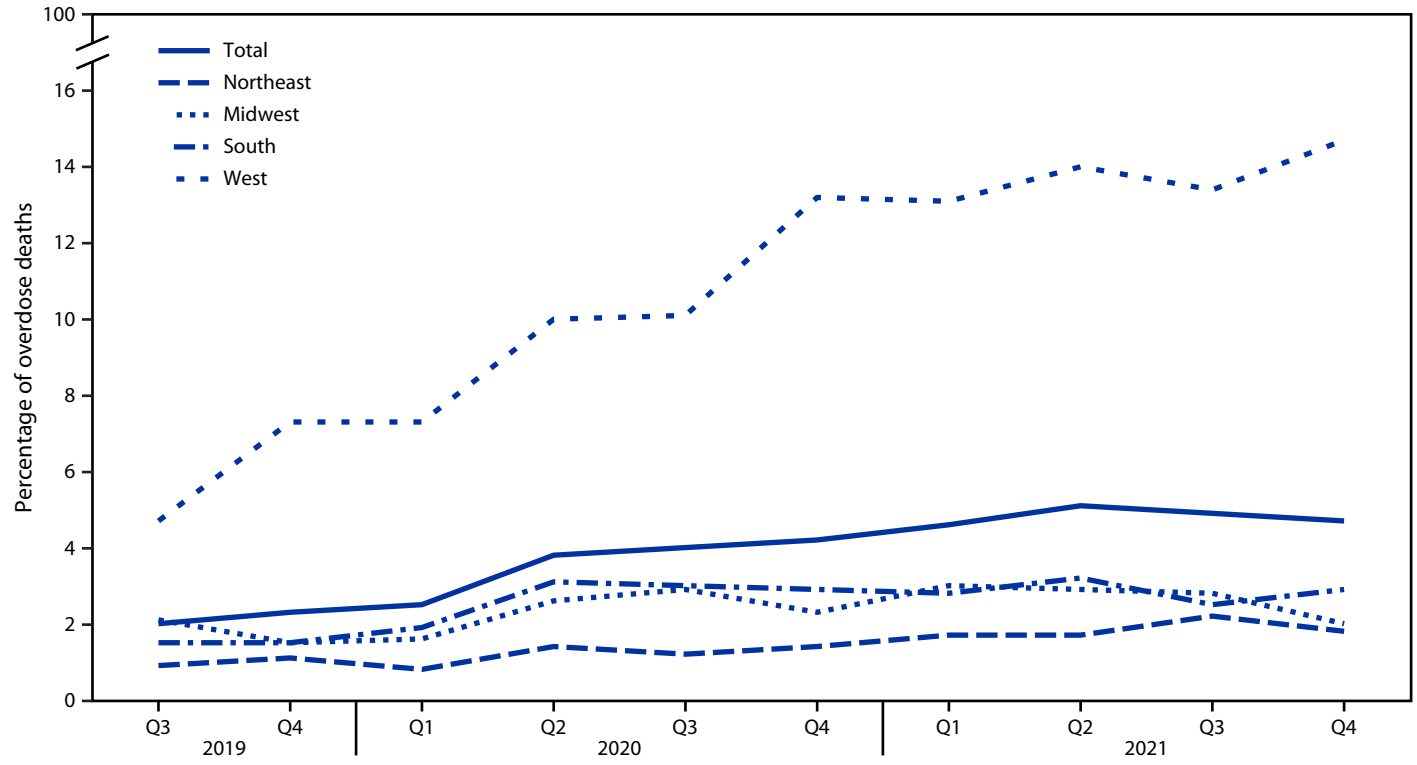
During July 2019–December 2021, a total of 106,293 overdose deaths occurred among 30 jurisdictions. The overall quarterly percentage of overdose deaths with evidence of counterfeit pill use increased from 2.0% during July–September 2019 to 4.7% during October–December 2021 (Figure), driven by an increase from 4.7% to 14.7% in western jurisdictions.[§§] Percentages remained below 4% in all other regions.

Among 54,768 overdose deaths during January–December 2021 in 35 jurisdictions, 2,437 (4.4%) had evidence of counterfeit pill use (Table 1). Decedents with evidence of counterfeit pill use were younger than those without evidence (57.1% versus 28.1% were aged <35 years) and a higher percentage was Hispanic or Latino (Hispanic) (18.7% versus 9.4%). More than one half (55.8%) of overdose deaths with evidence of counterfeit pill use occurred in western jurisdictions compared with 16.3% of deaths without evidence of counterfeit pill use.

[††] 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

[§§] U.S. Census Bureau regions were used to stratify jurisdictions into geographic regions (https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf). Trend analyses included eight of nine jurisdictions, five of 12 jurisdictions, nine of 17 jurisdictions, and eight of 13 jurisdictions in the Northeast, Midwest, South, and West U.S. Census Bureau regions, respectively. Analyses of overdose characteristics included eight of nine jurisdictions, eight of 12 jurisdictions, 11 of 17 jurisdictions, and eight of 13 jurisdictions in the Northeast, Midwest, South, and West regions, respectively.

FIGURE. Percentage of drug overdose deaths with evidence of counterfeit pill use, by quarter* and U.S. Census Bureau region† — State Unintentional Drug Overdose Reporting System, 30 jurisdictions, July 2019–December 2021



Abbreviations: Q1 = quarter 1; Q2 = quarter 2; Q3 = quarter 3; Q4 = quarter 4.

* Quarters were defined as Q1 (January 1–March 31), Q2 (April 1–June 30), Q3 (July 1–September 30), and Q4 (October 1–December 31).

† Analysis included some, but not all, of the jurisdictions in each U.S. Census Bureau region. *Northeast*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Vermont; *Midwest*: Illinois, Kansas, Minnesota, Ohio, and South Dakota; *South*: Arkansas, Delaware, District of Columbia, Georgia, Kentucky, North Carolina, Oklahoma, Virginia, and West Virginia; *West*: Alaska, Arizona, Colorado, Nevada, New Mexico, Oregon, Utah, and Washington.

TABLE 1. Characteristics of drug overdose deaths with and without evidence of counterfeit pill use — State Unintentional Drug Overdose Reporting System, 35 jurisdictions,* 2021

Characteristic	Evidence of counterfeit pill use, no. (%)		Total, no. (%)
	Yes n = 2,437	No n = 52,331	N = 54,768
Sex			
Female	684 (28.1)	15,391 (29.4)	**16,075 (29.4)**
Male	1,753 (71.9)	36,940 (70.6)	**38,693 (70.6)**
Median age, yrs (IQR)	**32 (25–42)**	**43 (33–54)**	**42 (33–54)**
Age group, yrs†			
<15	9 (0.4)	96 (0.2)	**105 (0.2)**
15–24	545 (22.4)	2,978 (5.7)	**3,523 (6.4)**
25–34	837 (34.3)	11,624 (22.2)	**12,461 (22.8)**
35–44	544 (22.3)	13,542 (25.9)	**14,086 (25.7)**
45–54	284 (11.7)	11,377 (21.7)	**11,661 (21.3)**
55–64	178 (7.3)	9,932 (19.0)	**10,110 (18.5)**
≥65	40 (1.6)	2,776 (5.3)	**2,816 (5.1)**
Race or ethnicity†			
American Indian or Alaska Native, non-Hispanic	77 (3.2)	830 (1.6)	**907 (1.7)**
Asian, non-Hispanic	15 (0.6)	274 (0.5)	**289 (0.5)**
Black or African American, non-Hispanic	336 (13.9)	11,015 (21.2)	**11,351 (20.8)**
Native Hawaiian or other Pacific Islander, non-Hispanic	4 (0.2)	41 (0.1)	**45 (0.1)**
White, non-Hispanic	1,485 (61.2)	34,487 (66.2)	**35,972 (66.0)**
Hispanic or Latino	454 (18.7)	4,893 (9.4)	**5,347 (9.8)**
Multiple races, non-Hispanic	54 (2.2)	475 (0.9)	**529 (1.0)**
U.S. Census Bureau region§			
Northeast	237 (9.7)	12,693 (24.3)	**12,930 (23.6)**
Midwest	322 (13.2)	12,855 (24.6)	**13,177 (24.1)**
South	517 (21.2)	18,270 (34.9)	**18,787 (34.3)**
West	1,361 (55.8)	8,513 (16.3)	**9,874 (18.0)**
Drugs involved¶			
Any opioid	2,348 (96.3)	42,917 (82.0)	**45,265 (82.6)**
Any IMFs**	2,267 (93.0)	37,807 (72.2)	**40,074 (73.2)**
IMFs only††	1,009 (41.4)	10,226 (19.5)	**11,235 (20.5)**
Heroin§§	126 (5.2)	6,596 (12.6)	**6,722 (12.3)**
Any stimulant	964 (39.6)	29,020 (55.5)	**29,984 (54.7)**
Cocaine	428 (17.6)	15,148 (28.9)	**15,576 (28.4)**
Methamphetamine	561 (23.0)	14,629 (28.0)	**15,190 (27.7)**
Prescription stimulants¶¶	45 (1.8)	935 (1.8)	**980 (1.8)**
Any benzodiazepine	334 (13.7)	6,505 (12.4)	**6,839 (12.5)**
Illicit benzodiazepines***	128 (5.3)	733 (1.4)	**861 (1.6)**
Common IMF adulterants detected†††			
Acetaminophen	69 (3.1)	701 (1.9)	**770 (1.9)**
Caffeine	617 (27.3)	6,675 (17.9)	**7,292 (18.4)**
Diphenhydramine	116 (5.1)	3,394 (9.1)	**3,510 (8.9)**
Levamisole	40 (1.8)	919 (2.5)	**959 (2.4)**
Lidocaine	30 (1.3)	930 (2.5)	**960 (2.4)**
Xylazine	48 (2.1)	2,963 (7.9)	**3,011 (7.6)**
Drug use history			
Prescription drug misuse§§§	657 (27.0)	4,917 (9.4)	**5,574 (10.2)**
Illicit drug use¶¶¶	945 (38.8)	21,586 (41.2)	**22,531 (41.1)**
Noningestion route of drug use****			
Injection	280 (11.5)	10,270 (19.6)	**10,550 (19.3)**
Smoking	962 (39.5)	9,071 (17.3)	**10,033 (18.3)**
Snorting	817 (33.5)	7,415 (14.2)	**8,232 (15.0)**
Other circumstances or decedent history			
Previous overdose	359 (14.7)	5,724 (10.9)	**6,083 (11.1)**
Naloxone administered†	651 (26.7)	10,858 (20.8)	**11,509 (21.1)**
Overdosed at home†	1,586 (67.3)	30,248 (62.6)	**31,834 (62.8)**
Potential bystander present†††, §§§§	1,572 (64.5)	23,246 (44.4)	**24,818 (45.3)**
Fatal drug use witnessed§§§§	614 (25.2)	4,088 (7.8)	**4,702 (8.6)**

See table footnotes on the next page.

TABLE 1. (*Continued*) Characteristics of drug overdose deaths with and without evidence of counterfeit pill use — State Unintentional Drug Overdose Reporting System, 35 jurisdictions,* 202

Abbreviations: IMF = illicitly manufactured fentanyl; SUDORS = State Unintentional Drug Overdose Reporting System.

* Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, and West Virginia. Arkansas, Illinois, Louisiana, Pennsylvania, and Washington reported deaths from counties that accounted for ≥75% of drug overdose deaths in the respective state in 2017, per SUDORS funding requirements; all other jurisdictions reported deaths from the full jurisdiction. Jurisdictions were included if complete data (including medical examiner or coroner reports for ≥75% of deaths) were available for all of January–December 2021. Analysis was restricted to decedents with an available medical examiner or coroner report.

† Missing values were excluded from calculations of percentages. Percentages might not sum to 100% because of rounding.

§ Analysis included some, but not all, of the jurisdictions in each U.S. Census Bureau region. *Northeast*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Vermont; *Midwest*: Illinois, Iowa, Kansas, Michigan, Minnesota, Nebraska, Ohio, and South Dakota; *South*: Arkansas, Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Maryland, North Carolina, Oklahoma, Virginia, and West Virginia; *West*: Alaska, Arizona, Colorado, Nevada, New Mexico, Oregon, Utah, and Washington.

¶ A drug was considered involved if it was listed as a cause of death on the death certificate or in the medical examiner or coroner report. Percentages sum to >100% because drug categories are not mutually exclusive.

** Fentanyl was classified as likely illicitly manufactured using toxicology, scene, and witness evidence. For the 8% of deaths involving fentanyl that had insufficient evidence for classification as illicit or prescription, fentanyl was classified as illicit because the vast majority of fentanyl overdose deaths involve illicit fentanyl. All fentanyl analogs except alfentanil, remifentanil, and sufentanil, which have legitimate human medical use, were included as IMFs.

†† IMFs were the only drugs listed as cause of death by medical examiners or coroners on the death certificate. Ethanol was not considered a drug for this analysis; some deaths included as IMFs only involved ethanol.

§§ Drug entries coded as heroin were heroin and 6-acetylmorphine. In addition, morphine was coded as heroin if detected along with 6-acetylmorphine or if the scene, toxicology, or witness evidence indicated presence of known heroin adulterants or impurities (including quinine, procaine, xylazine, noscapine, papaverine, thebaine, or acetylcodeine), injection, illicit drug use, or a history of heroin use.

¶¶ Drug entries coded as prescription stimulants were amphetamine (in the absence of methamphetamine), armodafinil, atomoxetine, dextroamphetamine, levoamphetamine, lisdexamfetamine, mephentermine, methylphenidate, modafinil, and propylhexedrine. Also included as prescription stimulants were brand names and metabolites of these drugs.

*** Drug entries coded as illicit benzodiazepines were 4′-chloro deschloroalprazolam, adinazolam, alpha-hydroxyetizolam, bromazolam, clonazolam, delorazepam, deschloroetizolam, diclazepam, etizolam, flualprazolam, flubromazepam, flubromazolam, metizolam, nitrazolam, nordiclazepam, and pyrazolam.

††† Limited to IMF-involved deaths among jurisdictions with toxicology reports available for ≥75% of deaths during this period (resulting in the same 35 jurisdictions) and to deaths with an available toxicology report (deaths with evidence of counterfeit pill use: 2,258; deaths without evidence of counterfeit pill use: 37,352; and overall: 39,610).

§§§ Includes history of prescription opioid or prescription benzodiazepine misuse.

¶¶¶ Includes history of IMF, heroin, cocaine, or methamphetamine use.

**** Only noningestion routes of drug use are presented because the counterfeit pill definition depended largely on scene or witness evidence of pill use. SUDORS guidance is to endorse evidence of ingestion when pills are found or reported to be used, if no indication of use by another method (e.g., crushed for snorting). Therefore, evidence of ingestion would be falsely elevated among decedents with evidence of counterfeit pill use. The percentage of deaths with no route of use evidence would be falsely elevated for the same reason; therefore, that information is not presented. Evidence of injection, smoking, and snorting are not mutually exclusive; a death could have evidence of more than one of these routes.

†††† For SUDORS, a potential bystander is defined as a person aged ≥11 years who was physically nearby either during or shortly preceding a drug overdose and potentially had an opportunity to intervene or respond to the overdose. This definition includes any persons in the same structure (e.g., same room or same building, but different room) as the decedent during that time; a family member who was in another room during the fatal incident would be considered a potential bystander if they might have had an opportunity to provide lifesaving measures (e.g., naloxone administration), if adequate resources were available, and if they were aware that an overdose event could occur. Persons in different self-contained parts of larger buildings (e.g., a different apartment in the same apartment building) would not be considered potential bystanders.

§§§§ Criteria used to define evidence of counterfeit pill use are related to this circumstance; therefore, it might be overrepresented in deaths with evidence of counterfeit pill use.

Higher percentages of deaths with evidence of counterfeit pill use involved IMFs¶¶ (93.0% versus 72.2%) and illicit benzodiazepines*** (5.3% versus 1.4%) compared with deaths without evidence. IMFs were the only drugs involved in 41.4% of deaths with evidence of counterfeit pill use versus 19.5% of deaths without such evidence. Xylazine was detected less often among IMF-involved deaths with evidence of counterfeit pill use (2.1%) than among other IMF-involved deaths (7.9%). A higher percentage of decedents with evidence of counterfeit pill use compared with those without evidence had a history of prescription drug misuse (27.0% versus 9.4%). Smoking was the most common noningestion drug use route††† among

¶¶ Fentanyl was classified as likely illicitly manufactured using toxicology, scene, and witness evidence. For the 8% of deaths involving fentanyl that had insufficient evidence for classification as illicit or prescription, fentanyl was classified as illicit because the vast majority of fentanyl overdose deaths involve illicit fentanyl. All fentanyl analogs except alfentanil, remifentanil, and sufentanil, which have legitimate human medical use, were included as IMFs.

*** Drug entries coded as illicit benzodiazepines were 4′-chloro deschloroalprazolam, adinazolam, alpha-hydroxyetizolam, bromazolam, clonazolam, delorazepam, deschloroetizolam, diclazepam, etizolam, flualprazolam, flubromazepam, flubromazolam, metizolam, nitrazolam, nordiclazepam, and pyrazolam.

††† Smoking as a route of drug use indicates that the decedent inhaled drugs through the mouth. In SUDORS, evidence of smoking includes witness reports of smoking and drug paraphernalia at the overdose scene associated with smoking or inhalation such as pipes, stems, tinfoil, and vape pens. Only noningestion routes of drug use are presented because the counterfeit pill definition depended largely on scene or witness evidence of pill use. SUDORS guidance is to endorse evidence of ingestion when pills are found or reported to be used, if no indication of use by another method (e.g., crushed for snorting). Therefore, evidence of ingestion would be falsely elevated among decedents with evidence of counterfeit pill use. The percentage of deaths with no route of drug use evidence would be falsely elevated for the same reason; therefore, that information is not presented. Route of drug use is intended to capture illicit drug use or prescription drug misuse; however, evidence of route cannot be linked with specific drug use.

deaths with evidence of counterfeit pill use (39.5%) and was highest in western jurisdictions (55.1%).

More than one half of deaths with evidence of counterfeit pill use had evidence of counterfeit oxycodone, either alone (55.2%) or with evidence of counterfeit alprazolam (3.9%) (Table 2). When evidence of counterfeit oxycodone was documented, compared with evidence of counterfeit alprazolam only, higher percentages of decedents were Hispanic (oxycodone only: 19.9%, both oxycodone and alprazolam: 17.9%, alprazolam only: 7.0%). The highest percentages of deaths with evidence of counterfeit oxycodone only (66.4%) and both counterfeit oxycodone and alprazolam (43.2%)

TABLE 2. Characteristics of drug overdose deaths with evidence of counterfeit pill use, by counterfeit pill type — State Unintentional Drug Overdose Reporting System, 35 jurisdictions,* 2021

Characteristic	Counterfeit pill type,† no. (%) N = 2,437			
	Oxycodone only n = 1,346	Alprazolam only n = 415	Oxycodone and alprazolam n = 95	Unspecified n = 581
Sex				
Female	382 (28.4)	135 (32.5)	21 (22.1)	146 (25.1)
Male	964 (71.6)	280 (67.5)	74 (77.9)	435 (74.9)
Median age, yrs (IQR)	32 (25–42)	33 (26–41)	26 (22–35)	34 (27–43)
Age group, yrs§				
<15	6 (0.4)	1 (0.2)	0 (—)	2 (0.3)
15–24	324 (24.1)	86 (20.7)	38 (40.0)	97 (16.7)
25–34	452 (33.6)	147 (35.4)	32 (33.7)	206 (35.5)
35–44	279 (20.7)	105 (25.3)	11 (11.6)	149 (25.6)
45–54	163 (12.1)	41 (9.9)	8 (8.4)	72 (12.4)
55–64	98 (7.3)	30 (7.2)	4 (4.2)	46 (7.9)
≥65	24 (1.8)	5 (1.2)	2 (2.1)	9 (1.5)
Race or ethnicity§				
American Indian or Alaska Native, non-Hispanic	50 (3.7)	7 (1.7)	1 (1.1)	19 (3.3)
Asian, non-Hispanic	6 (0.4)	6 (1.4)	1 (1.1)	2 (0.3)
Black or African American, non-Hispanic	203 (15.2)	58 (14.0)	14 (14.7)	61 (10.6)
Native Hawaiian or other Pacific Islander, non-Hispanic	2 (0.1)	0 (—)	1 (1.1)	1 (0.2)
White, non-Hispanic	780 (58.3)	307 (74.0)	58 (61.1)	340 (58.9)
Hispanic or Latino	266 (19.9)	29 (7.0)	17 (17.9)	142 (24.6)
Multiple races, non-Hispanic	31 (2.3)	8 (1.9)	3 (3.2)	12 (2.1)
U.S. Census Bureau region¶				
Northeast	100 (7.4)	79 (19.0)	11 (11.6)	47 (8.1)
Midwest	138 (10.3)	86 (20.7)	17 (17.9)	81 (13.9)
South	214 (15.9)	175 (42.2)	26 (27.4)	102 (17.6)
West	894 (66.4)	75 (18.1)	41 (43.2)	351 (60.4)
Drugs involved**				
Any opioid	1,312 (97.5)	385 (92.8)	94 (98.9)	557 (95.9)
Any IMFs††	1,302 (96.7)	333 (80.2)	92 (96.8)	540 (92.9)
IMFs only§§	671 (49.9)	79 (19.0)	31 (32.6)	228 (39.2)
Heroin¶¶	36 (2.7)	43 (10.4)	6 (6.3)	41 (7.1)
Any stimulants	464 (34.5)	203 (48.9)	39 (41.1)	258 (44.4)
Cocaine	207 (15.4)	100 (24.1)	24 (25.3)	97 (16.7)
Methamphetamine	270 (20.1)	107 (25.8)	16 (16.8)	168 (28.9)
Prescription stimulants***	17 (1.3)	16 (3.9)	1 (1.1)	11 (1.9)
Any benzodiazepines	149 (11.1)	102 (24.6)	26 (27.4)	57 (9.8)
Illicit benzodiazepines†††	20 (1.5)	71 (17.1)	18 (18.9)	19 (3.3)
IMFs and stimulants	433 (32.2)	158 (38.1)	37 (38.9)	238 (41.0)
IMFs and illicit benzodiazepines	19 (1.4)	55 (13.3)	16 (16.8)	18 (3.1)
Pills marked as M-30§§§	889 (66.0)	NA	31 (32.6)	NA
Drug use history				
Any opioids	648 (48.1)	163 (39.3)	47 (49.5)	265 (45.6)
Prescription opioids	311 (23.1)	54 (13.0)	25 (26.3)	73 (12.6)
IMFs	201 (14.9)	27 (6.5)	6 (6.3)	102 (17.6)
Heroin	147 (10.9)	92 (22.2)	14 (14.7)	99 (17.0)
Benzodiazepines	86 (6.4)	114 (27.5)	29 (30.5)	45 (7.7)
Cocaine	174 (12.9)	46 (11.1)	12 (12.6)	86 (14.8)
Methamphetamine	178 (13.2)	44 (10.6)	5 (5.3)	122 (21.0)

See table footnotes on the next page.

TABLE 2. (*Continued*) Characteristics of drug overdose deaths with evidence of counterfeit pill use, by counterfeit pill type — State Unintentional Drug Overdose Reporting System, 35 jurisdictions,* 2021

Abbreviations: IMF = illicitly manufactured fentanyl; NA = not applicable; SUDORS = State Unintentional Drug Overdose Reporting System.

* Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, and West Virginia. Arkansas, Illinois, Louisiana, Pennsylvania, and Washington reported deaths from counties that accounted for ≥75% of drug overdose deaths in the respective state in 2017, per SUDORS funding requirements; all other jurisdictions reported deaths from the full jurisdiction. Jurisdictions were included if complete data (including medical examiner or coroner reports for ≥75% of deaths) were available for all of January–December 2021. Analysis was restricted to decedents with an available medical examiner or coroner report.

† Categories are mutually exclusive: counterfeit oxycodone without counterfeit alprazolam, counterfeit alprazolam without counterfeit oxycodone, both counterfeit oxycodone and alprazolam, or unspecified counterfeit pill type (e.g., witness reported that the decedent used "counterfeit pills" but did not indicate the type of pharmaceutical pills mimicked).

§ Missing values were excluded from calculations of percentages. Percentages might not sum to 100% because of rounding.

¶ Analysis included some, but not all, of the jurisdictions in each U.S. Census Bureau region. *Northeast*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, and Vermont; *Midwest*: Illinois, Iowa, Kansas, Michigan, Minnesota, Nebraska, Ohio, and South Dakota; *South*: Arkansas, Delaware, District of Columbia, Georgia, Kentucky, Louisiana, Maryland, North Carolina, Oklahoma, Virginia, and West Virginia; *West*: Alaska, Arizona, Colorado, Nevada, New Mexico, Oregon, Utah, and Washington.

** A drug was considered involved if it was listed as a cause of death on the death certificate or in the medical examiner or coroner report. Percentages sum to >100% because drug categories are not mutually exclusive.

†† Fentanyl was classified as likely illicitly manufactured using toxicology, scene, and witness evidence. For the 8% of deaths involving fentanyl that had insufficient evidence for classification as illicit or prescription, fentanyl was classified as illicit because the vast majority of fentanyl overdose deaths involve illicit fentanyl. All fentanyl analogs except alfentanil, remifentanil, and sufentanil, which have legitimate human medical use, were included as IMFs.

§§ IMFs were the only drugs listed as cause of death by medical examiners or coroners on the death certificate. Ethanol was not considered a drug for this analysis; some deaths included as IMFs only involved ethanol.

¶¶ Drug entries coded as heroin were heroin and 6-acetylmorphine. In addition, morphine was coded as heroin if detected along with 6-acetylmorphine or if the scene, toxicology, or witness evidence indicated resence of known heroin adulterants or impurities (including quinine, procaine, xylazine, noscapine, papaverine, thebaine, or acetylcodeine), injection, illicit drug use, or a history of heroin use.

*** Drug entries coded as prescription stimulants were amphetamine (in the absence of methamphetamine), armodafinil, atomoxetine, dextroamphetamine, levoamphetamine, lisdexamfetamine, mephentermine, methylphenidate, modafinil, and propylhexedrine. Also included as prescription stimulants were brand names and metabolites of these drugs.

††† Drug entries coded as illicit benzodiazepines were 4′-chloro deschloroalprazolam, adinazolam, alpha-hydroxyetizolam, bromazolam, clonazolam, delorazepam, deschloroetizolam, diclazepam, etizolam, flualprazolam, flubromazepam, flubromazolam, metizolam, nitrazolam, nordiclazepam, and pyrazolam.

§§§ Counterfeit pills that often contain IMFs or other illicit drugs are frequently marked with "M-30" to mimic legitimate oxycodone 30-mg pills. Pills marked M-30 found at the overdose scene or reportedly used by the decedent were defined as counterfeit oxycodone pills if no oxycodone was detected by postmortem toxicology testing.

occurred in western jurisdictions. Decedents were youngest when there was evidence of both counterfeit oxycodone and alprazolam; among these deaths, 40.0% occurred among persons aged 15–24 years and 73.7% occurred among persons aged <35 years. IMFs were the only drugs involved in 49.9%, 19.0%, and 32.6% of deaths with evidence of counterfeit oxycodone, counterfeit alprazolam, and both oxycodone and alprazolam, respectively. Nearly one in five deaths with evidence of counterfeit alprazolam (alprazolam only: 17.1%, both alprazolam and oxycodone: 18.9%), and 1.5% of deaths with evidence of counterfeit oxycodone only involved illicit benzodiazepines.

Discussion

This report highlights four key findings. First, although the overall percentage of overdose deaths with evidence of counterfeit pill use remained below 6%, it more than doubled from July–September 2019 (2.0%) to October–December 2021 (4.7%); the percentage more than tripled in western jurisdictions. Second, the percentage of deaths with evidence of counterfeit pill use involving only IMFs was more than double the percentage among deaths without evidence of counterfeit pill use. Third, decedents with evidence of counterfeit pill use more often were younger, Hispanic, and had prescription drug misuse history, compared with those without evidence of counterfeit pill use. Finally, smoking was the most common noningestion route of drug use among deaths with evidence of counterfeit pill use.

Evidence of counterfeit pill use more than tripled in western jurisdictions, indicating IMFs, which are frequently present in counterfeit pills, are infiltrating drug markets in western U.S. states. Historically, white-powder IMFs have been less prevalent in western states because of difficulty mixing with predominantly black tar heroin prevalent in that region (*3*). The highest percentages of deaths with evidence of counterfeit oxycodone use (both alone and with counterfeit alprazolam) were in western jurisdictions, whereas nearly one half of deaths with evidence of counterfeit alprazolam use only were in southern jurisdictions. This finding suggests that exposure to different types of counterfeit pills and drugs might vary by region. Prevention and education materials that incorporate local drug seizure data and information about regional drug markets might be particularly effective at highlighting relevant counterfeit pill types and reducing deaths.

A substantial proportion of deaths with evidence of counterfeit pill use involved only IMFs. Because counterfeit pills often contain IMFs, and only IMFs were involved in these deaths, it suggests that the counterfeit pills that were used likely contained the drugs that caused death. Common IMF adulterants (e.g., xylazine) differed for deaths with and without evidence

of counterfeit pill use, suggesting potential different sources for IMFs in pills versus powder. Potency and purity of IMFs might also vary by form,[§§§] which can affect overdose risk. Nearly one in five deaths with evidence of counterfeit alprazolam use involved illicit benzodiazepines, which have varying and unpredictable potency (*4*). Effective overdose prevention messaging would stress that persons should only use legitimate pharmaceutical pills that are prescribed to them, and emphasize that pills obtained illicitly or without a prescription might contain highly potent drugs. Access to fentanyl test strips[¶¶¶] and drug-checking services[****] to facilitate drug product testing can help persons who use pills be aware of their contents, and implement appropriate harm reduction measures such as having naloxone available and never using drugs while alone, as indicated in CDC's Stop Overdose resources.[††††]

Decedents with evidence of counterfeit pill use were considerably younger, more often Hispanic (particularly with evidence of counterfeit oxycodone), and more frequently had a history of prescription drug misuse than those without evidence of counterfeit pill use. Counterfeit pills have been marketed toward younger persons,[§§§§] who might have more recently started using drugs and have lower tolerance. Younger persons might also exhibit more risk-taking behaviors than do older persons, and engage less with harm reduction services (*5*). The higher percentage of Hispanic decedents could reflect the younger age of this population and the demographics of western states where evidence of counterfeit pill use was more common; nonetheless, it might still have implications for access to and use of prevention messaging materials and harm reduction services. It is important to ensure that prevention messaging and harm reduction outreach are tailored to younger persons and the Hispanic population to address potential engagement, language, or other barriers. The Drug Enforcement Administration's One Pill Can Kill campaign, which highlights the dangers of counterfeit pills, has provided materials tailored to parents and caregivers, with some translated into Spanish.[¶¶¶¶] The higher percentage of decedents with prescription drug misuse history among deaths with evidence of counterfeit pill use, compared with those without such evidence, could indicate a transition from using prescribed medications to obtaining pills illicitly. Discontinued access to prescription drugs might increase overdose risk and negative health outcomes (*6*); providers should screen patients for opioid misuse or use disorder when opioid prescriptions are changed and link to evidence-based treatments, including medications for opioid use disorder as outlined in the 2022 CDC Clinical Practice Guideline for Prescribing Opioids for Pain (*7*).

Smoking was the most common noningestion route of drug use among deaths with evidence of counterfeit pill use and was more than twice as common among deaths with evidence of counterfeit pill use than among those without evidence; in western jurisdictions, >50% of deaths with evidence of counterfeit pill use had evidence of smoking. The higher percentage of deaths with evidence of drug use by smoking might reflect recent general shifts from injecting drugs to smoking them in western states (*8*) or could be specific to counterfeit pill use methods (*9*). Injection is often considered the riskiest route of drug use; although there are additional risks inherent in injecting drugs (e.g., bloodborne infections), other routes such as smoking can carry similar overdose risk because of rapid drug absorption (*10*). Harm reduction services that expand outreach to persons using drugs by methods other than injection, such as smoking, and provide education about safer smoking practices and risks related to smoking, might be most successful at addressing diverse drug use patterns.

Limitations

The findings in this report are subject to at least three limitations. First, analyses might not be generalizable beyond the included jurisdictions. Second, counterfeit pill use documentation relied upon completeness of medical examiner and coroner reports and is likely underestimated; underestimation likely varies within and between jurisdictions. Finally, the definition for evidence of counterfeit pill use included pills found or reported to be at the overdose scene; some overdose deaths might be included as having evidence even if the decedent did not use the pills.

Implications for Public Health Practice

Counterfeit pills can expose new populations to highly potent drugs such as IMFs and illicit benzodiazepines, and persons using pills might not be aware of their contents. Drug overdose prevention and education efforts that are tailored to persons most at risk and include outreach to those who do not frequent traditional harm reduction services, might be most successful. Overdose deaths might be reduced with effective prevention messaging by federal, state, and local public health entities that 1) highlights the dangers of pills obtained illicitly or without a prescription, 2) emphasizes the importance of taking only pills that were prescribed, and 3) encourages drug product testing.

[§§§] https://www.dea.gov/sites/default/files/2022-05/FPP%20Report%20January%202022.pdf
[¶¶¶] https://www.cdc.gov/stopoverdose/fentanyl/fentanyl-test-strips.html
[****] https://aspe.hhs.gov/sites/default/files/documents/79e1975d5921d309ed924148ef019417/drug-checking-programs.pdf
[††††] https://www.cdc.gov/stopoverdose/index.html
[§§§§] https://www.dea.gov/press-releases/2022/08/30/dea-warns-brightly-colored-fentanyl-used-target-young-americans ; https://www.dea.gov/sites/default/files/2022-03/20220208-DEA_Social%20Media%20Drug%20Trafficking%20Threat%20Overview.pdf
[¶¶¶¶] https://www.dea.gov/sites/default/files/2022-11/DEA-OPCK_Parent%20flyer_V2.pdf; https://www.dea.gov/onepill-toolbox

Summary

What is already known about this topic?

Counterfeit pill availability in the United States is increasing; drug overdose deaths are at historically high levels.

What is added by this report?

Evidence of counterfeit pill use in overdose deaths more than doubled from July–September 2019 to October–December 2021, and tripled in western U.S. states. Decedents with evidence of counterfeit pill use, compared with those without such evidence, were younger, more often Hispanic or Latino, and more frequently had a history of prescription drug misuse and drug use by smoking.

What are the implications for public health practice?

Overdose prevention messaging that highlights the dangers of pills obtained illicitly or without a prescription, encourages drug product testing by persons using drugs, and is tailored to persons most at risk (e.g., younger persons) could help prevent overdose deaths.

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Outbreak of Multidrug-Resistant Tuberculosis — Kansas, 2021–2022

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Abstract

An outbreak of multidrug-resistant (MDR) tuberculosis (TB) involved 13 persons in four households in a low-income, under-resourced urban Kansas community during November 2021–November 2022. A majority of the seven adults identified in the Kansas outbreak were born outside the United States in a country that had experienced an MDR TB outbreak with the same genotype during 2007–2009, whereas most of the six children in the Kansas outbreak were U.S.-born. Prompt identification, evaluation, and treatment of persons with MDR TB and their contacts is essential to limiting transmission.

Introduction

Tuberculosis (TB) incidence in Kansas is low; 37–43 TB cases were reported annually during 2019–2021. However, in 2022, the number of reported TB cases increased to 52 (*1*). Driving this increase was an outbreak of multidrug-resistant (MDR) TB involving 13 persons in four households in a low-income, underserved urban community. By definition, MDR TB is resistant to at least isoniazid and rifampin, two of the most effective anti-TB medications.* In 2021, MDR TB was present at initial diagnosis for only 77 (1.0%) of 7,882 TB cases reported in the United States (*2*).

Investigation and Results

The first person identified in this outbreak was an infant hospitalized in November 2021 with pulmonary and meningeal TB. Rifampin resistance was initially detected by DNA amplification of the *rpoB* gene mutation (*3*) and subsequently confirmed by DNA sequencing and growth-based drug susceptibility testing methods, which indicated additional resistance to isoniazid, pyrazinamide, and ethambutol (i.e., all four medications that constitute first-line therapy), but no resistance to second-line anti-TB medications. An investigation conducted by the local public health department (*4*) identified four additional members of the same household (household A) with MDR TB, including a severely ill adult with smear-positive pulmonary cavitary disease, who had been symptomatic since June 2021.

In January 2022, a young child from a second household (household B) was hospitalized with pulmonary TB and lymphadenitis. *Mycobacterium tuberculosis* was isolated from a culture of a cervical lymph node biopsy specimen. Culture-based testing demonstrated the same drug susceptibility pattern as that identified in the persons in household A. After observing a cough in the young child's mother, who was pregnant at the time, hospital personnel evaluated her, and she received a diagnosis of pulmonary MDR TB. During the contact investigation, local public health department staff members identified an additional four household members with MDR TB; one who was a severely ill young adult with pulmonary cavitary lesions who had been symptomatic since at least September 2021.

Further investigation led to the discovery that households A and B were in the same apartment complex, and that members of the two households socialized extensively. Adults from the two households also shared a car to commute to the same workplace. Two additional apartment households in a different neighborhood (households C and D) were also found to be connected to these families. A young teenager in household C who had spent time in both households A and B received a diagnosis of pulmonary MDR TB and extrapulmonary TB vasculitis. An extensive contact investigation involving other household contacts, a school, and a workplace was conducted. Contacts were tested when initially identified and were tested again with an interferon-gamma release assay blood test or tuberculin skin test 8 weeks after their most recent exposure to any household member with TB (*4*).

Initially, infections appeared to be limited to persons within the four households associated with this outbreak. However, an unexpected *M. tuberculosis* genotype match in a child with MDR TB in a neighboring state (household E) was identified in July 2022, bringing the total case count for this outbreak to 14. Additional investigation confirmed that the young adult from household B was also known to household E and had spent time in the home of household E while infectious.

In total, 13 persons with MDR TB disease were identified in Kansas, and one in a neighboring state, during November 2021–November 2022 (Table). Nine of the 13 were culture-confirmed, and five had clinically verified disease. The most recent person found to have extrapulmonary TB was in November 2022. In Kansas, nine household contacts received diagnoses of latent TB infection (LTBI), including four in household A, two in household C, and three in household D.

* https://www.cdc.gov/tb/publications/factsheets/drtb/mdrtb.htm

Within this Kansas outbreak, seven household members were tested and found to not have TB disease or LTBI (one in household B, one in household C, and five in household D).

The public health investigations suggested a common social network among associated households. Whole-genome sequencing was conducted through CDC's National TB Molecular Surveillance Center for persons with culture-confirmed TB in this outbreak. Whole-genome single nucleotide polymorphism (wgSNP) analysis demonstrated that the isolates differed by up to three single nucleotide polymorphisms, supporting the hypothesis that the outbreak represented transmission within this social network. In addition, wgSNP analysis indicated a close genetic relationship to *M. tuberculosis* isolates from previous outbreaks in the Federated States of Micronesia during 2007–2009 (*5*) and Guam during 2009–2016; some adults in the Kansas City outbreak also lived in the Federated States of Micronesia and Guam during these previous outbreaks. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.[†]

Public Health Response

The immediate public health response focused on the identification, isolation, and treatment of persons with MDR TB. All household contacts were evaluated for TB disease and LTBI with an interferon-gamma release assay blood test or tuberculin skin test, chest imaging, and sputum testing. After expert consultation through the Heartland National Tuberculosis Center,[§] individualized treatment regimens were developed for each person with active TB disease and administered via daily, in-person directly observed therapy. Most adults (median age = 29 years) and an older teenager in household A received a 26-week regimen of bedaquiline, pretomanid, linezolid, and moxifloxacin (BPaLM) (*6*,*7*). The pregnant woman received bedaquiline, linezolid, moxifloxacin, and clofazimine, and then after delivery and cessation of breastfeeding, transitioned to the BPaLM regimen for an additional 6 months of therapy.

The infant, young child, other children, and young teenager presented a unique treatment challenge because BPaLM has not been studied in children aged <15 years (*6*). Three of these children (aged 9–13 years) received a 26-week regimen of bedaquiline, linezolid, moxifloxacin, and delamanid. Delamanid, an MDR TB medication used in Europe,[¶] was authorized for compassionate use by the Food and Drug Administration after review by the Kansas Department of Health and Environment's Institutional Review Board. The infant and young child's treatment regimens included bedaquiline, cycloserine, levofloxacin, and linezolid. The length of treatment was individualized and dependent on clinical improvement. Adherence was excellent among all persons who entered treatment, and as of September 2023, 13 of the 14 persons with MDR TB disease have completed treatment. One adult who received a clinical diagnosis of extrapulmonary TB disease declined treatment despite extensive measures on the part of public health and clinicians. Local public health staff members continue to maintain careful communication and relationship with this person, should they

TABLE. Persons with multidrug-resistant tuberculosis (N = 14) or latent tuberculosis infection (N = 9), by household — Kansas City, Kansas, 2021–2022

Location, household, patient	Diagnosis mo/yr	TB status or disease site
Kansas City, Kansas		
Household A		
Infant	Nov 2021	Pulmonary and meningeal disease
Older teenager	Nov 2021	Pulmonary and extrapulmonary disease
Adult*	Nov 2021	Pulmonary and extrapulmonary disease
Adult	Nov 2021	Latent infection
Adult	Nov 2021	Latent infection
Adult	Mar 2022	Latent infection
Adult	May 2022	Pulmonary and extrapulmonary disease
Adult	May 2022	Extrapulmonary disease
Adult	Aug 2022	Latent infection
Household B		
Young child	Jan 2022	Pulmonary and extrapulmonary disease
Pregnant woman	Feb 2022	Pulmonary disease
Young adult[†]	Mar 2022	Pulmonary and extrapulmonary disease
Adult	Mar 2022	Pulmonary and extrapulmonary disease
Child	Apr 2022	Pulmonary and extrapulmonary disease
Child	Apr 2022	Extrapulmonary disease
Household C		
Young teenager	Mar 2022	Pulmonary and extrapulmonary disease
Adult	Mar 2022	Latent infection
Adult	Mar 2022	Latent infection
Adult	Nov 2022	Extrapulmonary disease
Household D		
Adult	Apr 2022	Latent infection
Adult	Apr 2022	Latent infection
Adult	Apr 2022	Latent infection
Neighboring state		
Household E		
Child	Jul 2022	Pulmonary and extrapulmonary disease

Abbreviation: TB = tuberculosis.

* This adult's tuberculosis symptoms began in June 2021; this patient was thought to be the source of infection for the infant in the household.

† The young adult's tuberculosis symptoms began no later than September 2021; this patient was thought to be the source of infection for both the young child in the household and the child in a neighboring state.

† 45 C.F.R. part 46, 21C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501et seq.

§ https://www.cdc.gov/tb/education/tb_coe/default.htm

¶ https://www.who.int/publications/i/item/9789240063129

desire treatment, or should their disease progress further and pose a health risk to the community.

The nine household members identified with LTBI began a 6-month regimen of daily moxifloxacin (*8*), also administered via daily in-person directly observed therapy. Monitoring also included laboratory testing and chest imaging at the start and end of treatment. All nine persons completed treatment without developing disease or complications. All persons treated for both TB disease and LTBI will continue close monitoring by public health clinicians every 6 months for ≥ 2 years after treatment completion; monitoring will include a chest radiograph, review of signs and symptoms, and a physical exam.

Discussion

MDR TB outbreaks have been exceptionally rare in the United States since the 1990s (*9*). Typically, MDR TB in the United States occurs sporadically among non–U.S.-born persons (*2*). This outbreak involved multiple U.S.-born children who became infected while living in Kansas, contributing to a national increase in pediatric children with tuberculosis reported in 2022 (*1*). Compared with drug-susceptible TB, MDR TB is associated with increased morbidity and cost related to both disease and medication-associated factors (*10*). Treating the persons affected by this outbreak required careful monitoring of those persons receiving newer MDR TB drugs to ensure cure and reduce risk for further drug resistance.

Identifying one person as the single source for this outbreak is difficult. Both sentinel events of TB disease in the infant and young child included a plausible source within the household (i.e., a non–U.S.-born adult with a lengthy illness course and infectious period). At least one of these adults was likely infected overseas years earlier and then experienced progression to active TB disease after moving to Kansas. Unfortunately, neither of the plausible source persons received a diagnosis for many months, leading to further transmission.

Implications for Public Health Practice

This outbreak in an urban, at-risk community resulted in tremendous financial, staffing, and capacity strain on the local public health department, where capacity was already diminished after nearly 2 years of COVID-19 pandemic response; however, recent collaborations established during COVID-19 prevention activities led to many positive working relationships with community partners such as the schools and hospitals, which facilitated efficient coordination of the outbreak response. This outbreak is also a cautionary tale, reminding other low TB incidence jurisdictions that sustained declines in TB incidence are not assured. Successful TB treatment and prevention requires ongoing identification and treatment of LTBI and a swift multifaceted public health response for each person newly diagnosed with TB.

Summary

What is already known about this topic?

U.S. multidrug-resistant (MDR) tuberculosis (TB) is uncommon and usually occurs in non–U.S.-born persons who likely acquired infection years earlier while living in other countries.

What is added by this report?

An MDR TB outbreak involving 13 persons with active disease and nine with latent TB infections was identified within four Kansas households in 2021 and included multiple U.S.-born children who became infected in Kansas. One person in a neighboring state with an epidemiologic connection to the Kansas outbreak was identified. Controlling this outbreak required newer MDR TB drugs not often used in the United States.

What are the implications for public health practice?

This outbreak underscores the importance of prompt identification and appropriate treatment of TB disease and latent infection, especially MDR TB.

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Vital Signs: Maternity Care Experiences — United States, April 2023

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Abstract

On August 22, 2023, this report was posted as an MMWR Early Release on the MMWR website (https://www.cdc.gov/mmwr).

Introduction: Maternal deaths increased in the United States during 2018–2021, with documented racial disparities. Respectful maternity care is a component of quality care that includes preventing harm and mistreatment, engaging in effective communication, and providing care equitably. Improving respectful maternity care can be part of multilevel strategies to reduce pregnancy-related deaths.

Methods: CDC analyzed data from the PN View Moms survey administered during April 24–30, 2023, to examine the following components of respectful care: 1) experiences of mistreatment (e.g., violations of physical privacy, ignoring requests for help, or verbal abuse), 2) discrimination (e.g., because of race, ethnicity or skin color; age; or weight), and 3) reasons for holding back from communicating questions or concerns during maternity (pregnancy or delivery) care.

Results: Among U.S. mothers with children aged <18 years, 20% reported mistreatment while receiving maternity care for their youngest child. Approximately 30% of Black, Hispanic, and multiracial respondents and approximately 30% of respondents with public insurance or no insurance reported mistreatment. Discrimination during the delivery of maternity care was reported by 29% of respondents. Approximately 40% of Black, Hispanic, and multiracial respondents reported discrimination, and approximately 45% percent of all respondents reported holding back from asking questions or discussing concerns with their provider.

Conclusions and implications for public health practice: Approximately one in five women reported mistreatment during maternity care. Implementing quality improvement initiatives and provider training to encourage a culture of respectful maternity care, encouraging patients to ask questions and share concerns, and working with communities are strategies to improve respectful maternity care.

Introduction

From 2018 to 2021, the maternal death rate in the United States increased from 17.4 to 32.9 per 100,000 live births (*1*). Native Hawaiian and other Pacific Islander, Black, and American Indian and Alaska Native persons have the highest rates of pregnancy-related deaths.* Approximately 80% of pregnancy-related deaths are preventable.† Preventing pregnancy-related deaths requires a multilevel approach that includes ensuring quality care for all pregnant and postpartum persons (*2*). Standards of quality maternity care include respectful maternity care (*3*), defined as "care organized for and provided to all women in a manner that maintains their dignity, privacy, and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labor and childbirth" (*4*). Respectful, equitable, and supportive care is included as a component in all Alliance for Innovation on Maternal Health (AIM)§ patient safety bundles to improve person-centered and equitable care. Negative experiences during maternity care are more prevalent among women from some racial and ethnic minority groups (*5*). Maternal mortality review committees have identified discrimination as one factor contributing to pregnancy-related deaths (*6*,*7*). The concepts of mistreatment, engaging with effective communication, and discrimination have been used to evaluate respectful maternity care (*8*). CDC analyzed data from the PN View Moms survey, an opt-in consumer audience panel survey of U.S. mothers with children aged <18 years living at home. The survey examined maternity care experiences, including satisfaction with care, experiences of mistreatment and discrimination, and whether respondents held back from asking questions or discussing concerns with health care providers.

Methods

CDC obtained data from Porter Novelli through a subscription license. No personally identifying information was included in the data file provided to CDC. The option to complete the PN View Moms survey online was shared with 7,607

* https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm
† https://www.cdc.gov/reproductivehealth/maternal-mortality/erase-mm/data-mmrc.html
§ https://saferbirth.org/patient-safety-bundles/

opt-in panel members[¶]; 2,407 (32%) mothers responded. The survey was administered in English during April 24–30, 2023. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.[**] The analysis was conducted using data from 2,402 respondents (five respondents aged ≥65 years were excluded). Respondent characteristics were described, including respondent age, race and ethnicity,[††] highest level of educational attainment,[§§] health insurance during delivery,[¶¶] and age of the youngest child living at home.

Respondents were asked about their maternity care experiences during pregnancy or delivery of their youngest child. Satisfaction with care was defined as a response of very or somewhat satisfied with maternity care.[***] Any mistreatment during maternity care was measured using seven validated questions to determine mistreatment (*5*), such as violations of physical privacy, ignoring requests for help, or verbal abuse. Satisfaction with care and mistreatment experiences were summarized overall and stratified by race and ethnicity and health insurance at time of delivery. Respondents were asked about experiences of discrimination while receiving maternity care and could select multiple reasons for the discrimination they experienced, such as race, ethnicity, skin color, age, or weight[†††]; these estimates were tabulated and presented overall and by race and ethnicity. Holding back from communicating questions or concerns during maternity care was evaluated by asking "During your pregnancy or delivery of your youngest child, did you hold back from asking questions or discussing your concerns for any of the following reasons" (with an option to note if they did not hold back). Respondents could select one or more reasons for holding back from communicating questions or concerns. Descriptive statistics were calculated using Stata software (version 17.0; StataCorp). No inferential statistical analyses were performed.

Results

Nearly two thirds of respondents (65.5%) reported that their youngest child was aged ≥5 years (Table 1). More than two thirds (69.6%) of respondents were White, 10.7% were Black, 10.2% Hispanic, 4.8% Asian, 2.8% multiracial, and 1.5% American Indian, Alaska Native, Native Hawaiian, or Pacific Islander. More than half of respondents (56.5%) were privately insured, and 32.6% were insured by Medicaid at the time of delivery of their youngest child. Overall, 90.5% of respondents were satisfied with the care they received during pregnancy (Table 2). Approximately one in five (20.4%) respondents reported experiencing at least one type of mistreatment. The most commonly reported experiences of mistreatment were being ignored by health care providers, having requests for help refused, or not responded to (9.7%); being shouted at or scolded by health care providers (6.7%); having their physical privacy violated (5.1%); and being threatened with withholding of treatment or being forced to accept treatment they did not want (4.6%). Among respondents who reported any mistreatment, 75.1% were satisfied with the care they received during pregnancy. Black, Hispanic, and multiracial respondents reported the highest prevalences of mistreatment (30.0%, 29.3%, and 27.3%, respectively). Among insurance categories, 28.1% of respondents with no insurance and 26.1% of those with public insurance at the time of delivery reported mistreatment.

Overall, 28.9% of respondents reported experiencing at least one form of discrimination during maternity care (Table 3), with highest prevalences reported by Black (40.1%), multiracial (39.4%), and Hispanic (36.6%) respondents. Overall, the most commonly reported reasons for discrimination were

[¶] PN View Moms surveys are designed by Porter Novelli Public Services. They are programmed and fielded by Big Village (https://big-village.com/insights/caravan-omnibus-surveys/) using opt-in panel members from the Lucid platform (https://luc.id/quality/). Data quality checks are incorporated during both sampling and survey administration. Lucid uses a variety of tracking measures to confirm respondent identity and prevent duplicate responses.

[**] 45 C.F.R. part 46; 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d), 5 U.S.C. Sect. 552a, 44 U.S.C. Sect. 3501 et seq.

[††] PN View Moms survey is not a federal data collection. Race and ethnicity data were categorized in the following manner based on the way data were collected: Hispanic includes all persons who selected Hispanic ethnicity. Race categories are non-Hispanic. White includes White, Middle Eastern, and North African. Black includes Black or African American, Caribbean American, and African. Asian includes Asian American, South Asian, East Asian, and Southeast Asian. Porter Novelli collects race data using the category "Indigenous American/First Nations," which includes Native American, American Indian, Alaska Native, Pacific Islander, and Native Hawaiian, and is referred to in this report as "American Indian, Alaska Native, Pacific Islander, or Native Hawaiian." Multiracial includes respondents that selected more than one race; another race includes those who did not select any race or ethnicity categories.

[§§] Highest level of formal education completed at time of survey was defined as less than high school, high school diploma or equivalent, or more than a high school diploma. More than a high school diploma includes respondents with some college education, an associate degree or technical school, a bachelor's degree, a master's degree, or a professional degree or doctorate.

[¶¶] Private insurance includes respondents with health insurance from the Healthcare.gov Healthcare Marketplace and Tricare or other military insurance; public insurance includes those on Medicaid, Medicare, Indian Health Service, or any other tribal insurance; and no insurance includes respondents who did not have insurance at any time during their youngest child's birth and those who self-paid.

[***] Respondents rated their overall satisfaction with the care they received during their pregnancy or delivery of their youngest child as 1) very satisfied, 2) somewhat satisfied, 3) neither satisfied nor dissatisfied, 4) somewhat dissatisfied, or 5) very dissatisfied.

[†††] Respondents were asked, "While getting health care during your pregnancy or delivery with your youngest child, did you experience discrimination or were you prevented from doing something, hassled, or made to feel inferior because of any of the following?" Reasons included race, ethnicity or skin color, disability status, immigration status, age, weight, income, sexual orientation, religion, language or accent, type or lack of health insurance, difference in opinion about right care for mother or baby, substance use, involvement with the justice system (jail or prison), and other reason.

TABLE 1. Sociodemographic characteristics of mothers — PN View Moms survey, United States, April 2023*

Characteristic	No. (%)†
Total	**2,402 (100.0)**
Respondent age group, yrs	
<20	6 (0.3)
20–29	346 (14.4)
30–39	1,054 (43.9)
40–49	731 (30.4)
≥50	265 (11.0)
Age group of youngest child, yrs	
<1	132 (5.5)
1–4	697 (29.0)
≥5	1,573 (65.5)
Race and ethnicity§	
White	1,671 (69.6)
Black	257 (10.7)
Hispanic	246 (10.2)
Asian	115 (4.8)
American Indian, Alaska Native, Pacific Islander, or Native Hawaiian	35 (1.5)
Multiracial	66 (2.8)
Another race	12 (0.5)
Health insurance during delivery¶	
Private insurance	1,356 (56.5)
Medicaid	782 (32.6)
Medicare or tribal insurance	200 (8.3)
No insurance	64 (2.7)
Highest level of educational attainment**	
Less than high school	83 (3.5)
High school diploma or equivalent	547 (22.8)
More than high school diploma	1,772 (73.8)
U.S. Census Bureau region††	
Northeast	422 (17.6)
Midwest	518 (21.6)
South	835 (34.8)
West	627 (26.1)

* Survey was administered in English during April 24–30, 2023.
† Percentages might not sum to 100 because of rounding.
§ PN View Moms survey is not a federal data collection. Race and ethnicity data were categorized in the following manner based on the way data were collected: Hispanic includes all persons who selected Hispanic ethnicity. Race categories are non-Hispanic. White includes White, Middle Eastern, and North African. Black includes Black or African American, Caribbean American, and African. Asian includes Asian American, South Asian, East Asian, and Southeast Asian. Porter Novelli collects race data using the category "Indigenous American/First Nations," which includes Native American, American Indian, Alaska Native, Pacific Islander, and Native Hawaiian, and is referred to in this report as "American Indian, Alaska Native, Pacific Islander, or Native Hawaiian." Multiracial includes respondents that selected more than one race; another race includes those who did not select any race or ethnicity categories.
¶ Private insurance includes respondents with health insurance from Healthcare.gov Health Insurance Marketplace and Tricare or other military insurance; public insurance includes those on Medicaid, Medicare, Indian Health Service, or any other tribal insurance; and no insurance includes respondents who did not have insurance at any time during their youngest child's birth and those who self-paid.
** Highest level of formal education completed at time of survey was defined as less than high school, high school diploma or equivalent, or more than a high school diploma. More than a high school diploma includes respondents with some college education, an associate degree or technical school, a bachelor's degree, a master's degree, or a professional degree or doctorate.
†† https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

age (10.1%), weight (9.7%), and income (6.5%); reasons varied by race and ethnicity. For example, among Black respondents, the most common reasons were weight (13.2%), race, ethnicity, or skin color (12.9%), and age (12.8%). Among multiracial respondents, the most common reasons were age (16.7%), difference in opinion with caregivers about the right care for oneself or one's baby (12.1%), race, ethnicity, or skin color (10.6%), income (10.6%), and substance use (10.6%). Among Hispanic respondents, the most common reported reasons for discrimination were age (11.4%), weight (10.2%), and income (8.9%).

Approximately one half (44.7%) of all respondents reported holding back from asking questions or discussing concerns with their provider during maternity care (Table 4). The most common reasons included thinking that what they were feeling was normal (28.8%), feeling embarrassed and not wanting to make a big deal (21.5%), having someone close tell them it was normal (21.2%), and worrying that their maternity care provider might think they were being difficult (20.7%).

Discussion

Approximately one in five surveyed women reported mistreatment and approximately 30% reported discrimination during maternity care. These experiences were more common among Black, Hispanic, and multiracial mothers. Approximately one half of respondents reported holding back from discussing questions and concerns during maternity care. These findings highlight the gaps in delivering respectful maternity care and underscore the need for improvement. Respectful maternity care is a component of quality care and can be integrated into broader strategies to reduce pregnancy-related deaths (*3*).

Although approximately 90% of respondents reported satisfaction with maternity care received, this estimate was lower among those who experienced mistreatment. Women might report satisfaction with the maternity care received overall and concurrently recall discrete instances of mistreatment. Women who feel safe, supported, and respected are more likely to have positive pregnancy experiences (*9*). Higher patient-centered maternity care scores are associated with lower risk for pregnancy complications (*10*). Improving respectful maternity care can improve the experiences of mothers during pregnancy and delivery care.

Negative maternity care experiences might influence health care utilization; for example, experiences of racial discrimination are associated with less than adequate prenatal care and not receiving a postpartum visit (*11*). Evaluation of measures of respectful maternity care, the impact of interventions to improve respectful care, and the effectiveness of respectful maternity care interventions on maternal health outcomes

TABLE 2. Reported satisfaction with and mistreatment during maternity care (pregnancy or delivery) received for youngest child overall, by race and ethnicity* and insurance coverage† at time of delivery — PN View Moms survey, United States, April 2023§

	Race and ethnicity, %							Insurance coverage		
Responses to survey questions	All	White	Black	Hispanic	Asian	American Indian, Alaska Native, Pacific Islander, or Native Hawaiian	Multiracial	Private	Public	None
Total, no.	**2,402**	**1,671**	**257**	**246**	**115**	**35**	**66**	**1,356**	**982**	**64**
Satisfaction during pregnancy¶										
Very or somewhat satisfied	**90.5**	90.9	91.1	88.6	93.0	94.3	78.8	94.1	86.1	81.3
Neither satisfied nor dissatisfied	**4.7**	3.9	5.8	8.1	5.2	—**	6.1	2.5	7.2	10.9
Very or somewhat dissatisfied	**4.9**	5.2	3.1	3.3	1.7	5.7	15.2	3.4	6.7	7.8
Satisfaction during delivery										
Very or somewhat satisfied	**89.2**	89.3	89.1	88.2	94.8	91.4	80.3	92.8	84.6	82.8
Neither satisfied nor dissatisfied	**4.6**	4.0	5.5	6.9	5.2	2.9	7.6	2.7	6.4	15.6
Very or somewhat dissatisfied	**6.2**	6.8	5.5	4.9	—**	5.7	12.1	4.5	9.0	1.6
Mistreatment during pregnancy††										
Any	**20.4**	**17.8**	**30.0**	**29.3**	**14.8**	**20.0**	**27.3**	**15.9**	**26.1**	**28.1**
Your private or personal information was shared without your consent	**4.0**	3.1	7.0	7.7	5.2	2.9	—**	3.3	5.0	3.1
Your physical privacy was violated (i.e., being uncovered or having people in the delivery room without your consent)	**5.1**	4.1	7.0	9.8	2.6	8.6	7.6	4.1	6.1	9.4
Health care providers (doctors, midwives, or nurses) shouted at or scolded you	**6.7**	6.2	9.0	7.7	5.2	8.6	10.6	5.9	7.8	7.8
Health care providers threatened to withhold treatment or to force you to accept treatment you did not want	**4.6**	4.1	6.6	3.7	5.2	8.6	7.6	4.4	4.8	6.3
Health care providers threatened you in any other way	**3.8**	2.9	5.8	6.5	4.4	—**	6.1	2.5	5.4	4.7
Health care providers ignored you, refused your request for help, or failed to respond to requests for help in a reasonable amount of time	**9.7**	9.0	11.7	13.0	4.4	5.7	19.7	7.6	12.6	9.4
You experienced physical abuse (including aggressive physical contact, inappropriate sexual conduct, refusal to provide anesthesia for an episiotomy, etc.)	**3.6**	2.8	7.0	6.5	3.5	2.9	1.5	2.4	5.2	4.7

* PN View Moms survey is not a federal data collection. Race and ethnicity data were categorized in the following manner based on the way data were collected: Hispanic includes all persons who selected Hispanic ethnicity. Race categories are non-Hispanic. White includes White, Middle Eastern, and North African. Black includes Black or African American, Caribbean American, and African. Asian includes Asian American, South Asian, East Asian, and Southeast Asian. Porter Novelli collects race data using the category "Indigenous American/First Nations," which includes Native American, American Indian, Alaska Native, Pacific Islander, and Native Hawaiian, and is referred to in this report as "American Indian, Alaska Native, Pacific Islander, or Native Hawaiian." Multiracial includes respondents that selected more than one race; another race includes those who did not select any race or ethnicity categories.

† Private insurance includes respondents with health insurance from Healthcare.gov Health Insurance Marketplace and Tricare or other military insurance; public insurance includes those on Medicaid, Medicare, Indian Health Service or any other tribal insurance; and no insurance includes respondents who did not have insurance at any time during their youngest child's birth and those who self-paid.

§ Survey was administered in English during April 24–30, 2023.

¶ Respondents rated their overall satisfaction with the care they received during their pregnancy or delivery of their youngest child as: Very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, and very dissatisfied.

** No respondents.

†† Question was asked as, "Did you experience any of the following issues or behaviors during your pregnancy or delivery of your youngest child?" https://pubmed.ncbi.nlm.nih.gov/31182118/

in U.S. settings is needed (*8*). Studies outside of the United States have found that multilevel interventions that include approaches to improving health system practices and policies, addressing health care provider attitudes and behaviors, and engaging the local community have significantly improved respectful maternity care (*12*).

Health care systems can encourage a culture of respectful maternity care by implementing training for health care providers on recognizing unconscious bias and stigma, shared-decision making, improving interactions and communication with patients, and cultural awareness.§§§,¶¶¶,**** The AIM

§§§ Institute for Perinatal Quality Improvement. Speak Up Program. https://www.perinatalqi.org/page/SPEAKUP

¶¶¶ Association of Women's Health, Obstetric and Neonatal Nurses Respectful Maternity Care Implementation Toolkit 2022. https://www.awhonn.org/respectful-maternity-care-implementation-toolkit/

**** TEAMBIRTH, Ariadne Laboratories. https://www.ariadnelabs.org/delivery-decisions-initiative/teambirth/

TABLE 3. Reported experiences of discrimination* while receiving health care during pregnancy or delivery of youngest child, overall and by race and ethnicity† — PN View Moms survey, United States, April 2023§

Responses to questions regarding discrimination	Racial and ethnic group, %						
	All	White	Black	Hispanic	Asian	American Indian, Alaska Native, Pacific Islander, or Native Hawaiian	Multiracial
Total, no.	**2,402**	**1,671**	**257**	**246**	**115**	**35**	**66**
Any experience of discrimination	**28.9**	26.0	40.1	36.6	22.6	31.4	39.4
Reported reason¶							
My race, ethnicity, or skin color	**4.0**	1.6	12.9	7.3	6.1	8.6	10.6
My disability status	**2.3**	1.7	3.9	4.1	1.7	2.9	4.6
My immigration status	**1.3**	0.8	4.3	1.2	3.5	2.9	—**
My age	**10.1**	9.5	12.8	11.4	7.0	8.6	16.7
My weight	**9.7**	9.2	13.2	10.2	8.7	14.3	7.6
My income	**6.5**	5.9	10.1	8.9	2.6	2.9	10.6
My sexual orientation	**1.5**	1.0	3.1	3.7	1.7	—**	—**
My religion	**2.3**	1.9	4.3	4.1	0.9	2.9	3.0
My language or accent	**2.3**	1.2	5.8	3.3	8.7	—**	1.5
My type or lack of health insurance	**4.6**	4.4	6.2	5.3	0.9	2.9	9.1
A difference in opinion with my caregivers about the right care for myself or my baby	**5.6**	5.2	9.0	5.7	2.6	—**	12.1
My use of substances (alcohol, tobacco, or other drugs)	**3.8**	3.8	3.1	3.7	1.7	8.6	10.6
My involvement with the justice system (jail or prison)	**1.4**	1.0	3.1	2.9	—**	—**	1.5
Other	**0.6**	0.8	0.8	—**	—**	—**	—**

* Respondents were asked, "While getting health care during your pregnancy or delivery with your youngest child, did you experience discrimination or were you prevented from doing something, hassled, or made to feel inferior because of any of the following?"

† PN View Moms survey is not a federal data collection. Race and ethnicity data were categorized in the following manner based on the way data were collected: Hispanic includes all persons who selected Hispanic ethnicity. Race categories are non-Hispanic. White includes White, Middle Eastern, and North African. Black includes Black or African American, Caribbean American, and African. Asian includes Asian American, South Asian, East Asian, and Southeast Asian. Porter Novelli collects race data using the category "Indigenous American/First Nations," which includes Native American, American Indian, Alaska Native, Pacific Islander, and Native Hawaiian, and is referred to in this report as "American Indian, Alaska Native, Pacific Islander, or Native Hawaiian." Multiracial includes respondents that selected more than one race; another race includes those who did not select any race or ethnicity categories.

§ Survey was administered in English during April 24–30, 2023.

¶ Respondents were allowed to select more than one reason for the discrimination they experienced.

** No respondents.

patient safety bundles, which are standardized practices used in birthing facilities to reduce severe illness and death, all include the provision of safe, respectful, equitable, and supportive care. Perinatal quality collaboratives, which are state or multistate networks of teams working to improve the quality of care for mothers and babies, have implemented quality improvement initiatives to address birth equity and improve respectful care.[††††,§§§§] Routine measurement of patient experiences of respectful care can guide the development, implementation, and evaluation of initiatives to improve respectful care and their contribution toward improving patient outcomes (*8*).

Engaging patients with effective communication is a component of respectful care. Nearly one half of respondents reported holding back from asking questions or discussing concerns with their provider during maternity care. The most common mistreatment experience reported by mothers was a health care provider ignoring them, refusing their request for help, or not responding to their request for help. The Hear Her campaign[¶¶¶¶] provides resources for pregnant and postpartum women and their support networks to share concerns with providers and to recognize urgent maternal warning signs that signal an immediate need to seek care. The campaign also promotes the need for providers to actively listen to their patients' concerns and provide culturally appropriate, respectful care. Clinical organizations representing health care providers have highlighted the importance of providing respectful maternity care to improve outcomes for mothers and children by ensuring effective communication and shared decision-making with patients and their families and strengthening coordinated care teams (*13*).

This analysis found variation in mistreatment during maternity care by race, ethnicity, and insurance status at time of delivery. Black, Hispanic, and multiracial mothers reported the highest prevalences of experiencing any discrimination during maternity care. Experiences of racial discrimination are associated with pregnancy complications (*14*), and bias

†††† Oklahoma Perinatal Quality Improvement Collaborative Team Birth Initiative. https://opqic.org/teambirth/

§§§§ Illinois Perinatal Quality Collaboratives Birth Equity. https://ilpqc.org/birthequity/

¶¶¶¶ https://www.cdc.gov/hearher/index.html

TABLE 4. Respondent reasons for holding back from asking questions or discussing concerns during pregnancy or delivery of youngest child (N = 2,402) — PN View Moms survey, United States, April 2023*

Survey responses regarding asking questions or discussion about pregnancy or delivery concerns	No. (%)
I did not hold back from talking to a health care provider when I had questions or concerns†	1,329 (55.3)
Any reason selected for holding back from talking to a health care provider when I had questions or concerns	1,073 (44.7)
Reasons for holding back from asking questions or discussing concerns during pregnancy or delivery§	
I thought what I was feeling was normal for pregnancy	309 (28.8)
I didn't want to make a big deal about it or was embarrassed to talk about it	231 (21.5)
My friends or family told me it was a normal part of pregnancy or that they had the same experience	227 (21.2)
I thought my maternity care provider might think I was being difficult	222 (20.7)
My maternity care provider seemed rushed	186 (17.3)
I didn't feel confident that I knew what I was talking about	186 (17.3)
I forgot to mention it	169 (15.8)
I didn't think my concern was important enough	162 (15.1)
I was scared to talk about it	155 (14.4)
I didn't feel comfortable talking about my body or what I was feeling	147 (13.7)
I wanted maternity care that differed from what my maternity care provider recommended	105 (9.8)
I had another reason not listed	84 (7.8)
I didn't want to spend any more money on health care	75 (7.0)

* Survey was administered in English during April 24–30, 2023.
† Respondents who selected this option were not asked about reasons for holding back from asking questions or discussing concerns with a health care provider.
§ Respondents could select more than one reason. Percentages were calculated using the overall number of persons who reported a reason for holding back from asking questions or discussing concerns with a health care provider (n = 1,073) as the denominator.

and stigma related to obesity and low income during obstetric care have been documented (*15*,*16*). The equitable delivery of respectful patient-centered maternity care has been proposed as one strategy to reduce disparities in maternal mortality (*17*). Recruitment and retention of providers with diverse backgrounds that mirror the population served, midwifery models of care, and doulas have been shown to improve patient experiences for racial and ethnic minority groups (*2*). For example, doula support is associated with higher levels of respectful care (measured by experiences related to decision-making, support, and communication during childbirth), particularly for mothers who are publicly insured and identify as members of certain racial and ethnic groups (*18*). Engaging community-based organizations can raise awareness of respectful care and identify opportunities to incorporate respectful care into initiatives aiming to reduce disparities in pregnancy-related deaths (*2*,*19*). Maternal mortality review committees can identify racism and discrimination during reviews of pregnancy-related deaths and develop recommendations for prevention (*20*), providing critical data for centering health equity and reducing disparities.

Summary

What is already known about this topic?

Maternal deaths increased in the United States during 2018–2021, with documented racial disparities. Respectful maternity care (e.g., preventing mistreatment, communicating effectively, and providing care equitably) can be integrated into strategies that aim to improve quality of care and reduce pregnancy-related deaths.

What is added by this report?

Approximately one in five mothers overall, and approximately 30% of Black, Hispanic, and multiracial mothers reported mistreatment (e.g., violations of physical privacy or verbal abuse) during maternity care. Approximately 40% of Black, Hispanic, and multiracial mothers reported discrimination during maternity care, and 45% of all mothers reported holding back from asking questions or discussing concerns with their provider.

What are the implications for public health practice?

Approaches to improving respectful maternity care include multilevel interventions involving health systems, providers, patients, and communities.

Limitations

The findings in this report are subject to at least seven limitations. First, the survey was opt-in, did not use probability sampling, and was not weighted; thus, these data are likely not representative of the U.S. birthing population. Second, the participation rate was <50%, and some subgroups comprised a small number of respondents. Third, because experiences were self-reported, the responses are subject to social desirability bias. Fourth, only maternity care experiences for the youngest child were evaluated, and experiences might have differed for other births or pregnancy outcomes. Fifth, most women were reporting on experiences during the pregnancy or delivery of a child aged ≥5 years; such responses are subject to recall bias and might not represent more recent experiences. Sixth, data for race were collected using a combined category for all American Indian, Alaska Native, Native Hawaiian, and Pacific Island mothers, precluding further disaggregation. Finally, because the survey was fielded in English only, these data do not include the maternity care experiences of those not fluent in English.

Implications for Public Health Practice

Improving respectful care is an important component of strategies to reduce pregnancy-related deaths. Health care systems can implement quality improvement initiatives to standardize care and support providers with training on discrimination, stigma and unconscious bias, cultural awareness, and communication techniques in the context of broader quality improvement initiatives. Health professionals interacting with patients at all points

of maternity care play a role in improving patient experiences during maternity care and providing respectful maternity care equitably. Health communication campaigns and community engagement can include the perspectives of patients, families, and communities to raise awareness to incorporate the components of respectful maternity care, as well as how pregnant and postpartum women and their support system can communicate their questions and concerns. These campaigns and community engagement can also encourage providers to listen to and address their patients' concerns.

Acknowledgments

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Notes from the Field

Outbreak of Norovirus Illness Caused by Consumption of Oysters Harvested from Galveston Bay, Texas — November–December 2022

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On December 7, 2022, the Texas Department of State Health Services (DSHS) Public Health Region 6/5 South (PHR 6/5S) and DSHS Consumer Protection Division were notified by Galveston County Health District of 10 consumer complaints of illness after consumption of raw (nine complaints) and smoked (one) oysters at local restaurants during November 27–December 4. Signs and symptoms began within 8 hours after consumption and included diarrhea, nausea, or vomiting. Initially, no consumers sought medical care. Oyster tags from three associated restaurant inspections determined that oysters were from Oyster Harvest Area TX 1 (TX 1) in Galveston Bay, Texas.

Also on December 7, the Florida Department of Health contacted DSHS to report its investigation of 37 cases of gastrointestinal illness associated with raw oyster consumption. The investigation also identified several TX 1 oyster tags. On December 8, 2022, representatives from the DSHS Foodborne Illness Team, Seafood and Aquatic Life Operations Branch, Consumer Protection Division, PHR 6/5S, and Galveston County Health District met to discuss the increase in reports of oyster-related gastrointestinal illness. It was determined that TX 1 had been the only area open for shellfish harvesting in Galveston Bay since December 1, 2022. Based on the increased reports of gastrointestinal illness and National Shellfish Sanitation Program (NSSP) guidelines, DSHS Consumer Protection Division closed TX 1 on December 8 and recalled all oysters harvested in TX 1 during November 17–December 7 (*1*,*2*). On December 9, the Florida Department of Health notified DSHS that three associated clinical specimens had tested positive for norovirus GII (Figure).

DSHS compiled resources for local health departments, restaurants, and consumers to provide education on the transmission and prevention of norovirus and proper disinfection protocols (Figure) and informed the Interstate Shellfish Sanitation Conference, which notified other member states. An outbreak-associated case was defined as the onset of diarrhea, nausea, or vomiting within 72 hours after consumption of oysters harvested from TX 1 during November 17–December 7, 2022 (the recall period). A press release was issued, which led to additional consumer complaints and highlighted the importance of public communication regarding foodborne outbreaks.

Noroviruses are a highly contagious group of gastrointestinal viruses and the leading cause of foodborne illness in the United States (*3*). Norovirus is primarily transmitted through direct contact with an infected person's stool, consumption of contaminated food or water, or direct contact with contaminated surfaces (*3*). Approximately 2,500 norovirus outbreaks are reported in the United States annually (*3*). Although reporting of sporadic cases is not required, norovirus outbreaks are reportable to both DSHS and CDC (*3*,*4*). As a result, norovirus outbreaks are primarily detected when persons report illness or health care providers report a suspected outbreak.

Investigation and Outcomes

During November 28–December 7, PHR 6/5S in southeast Texas reported 50 outbreak-associated norovirus cases from six counties. These cases represented 16% of the 322 cases reported nationwide from eight states* in association with this outbreak (*5*); 41 (82%) of the ill persons in Texas lived in Galveston County (*5*). Many reports were anonymous, which made collecting additional details or determining health department jurisdiction challenging. Restaurant address was used as a proxy in cases for which the patient's home address was not available. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.†

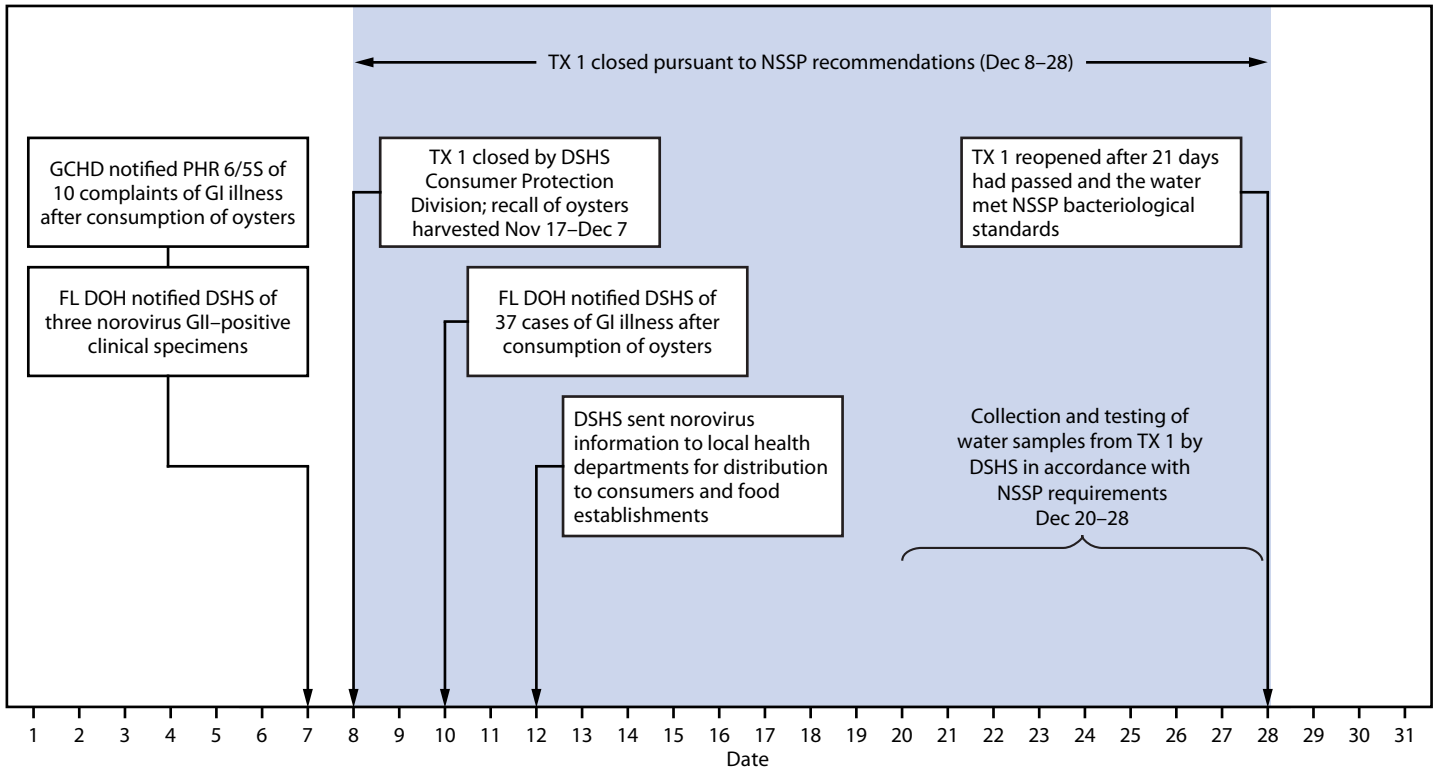
Among the 50 outbreak-associated cases among persons who lived within PHR 6/5S, the median age was 54 years (range = 28–83 years), 17 (34%) cases occurred in men, and 17 (34%) in women; the sex of 16 (32%) patients was unknown. The median incubation period was 1 day (range = 0–3 days); diarrhea was reported by 48 of 50 (96%) patients and vomiting by 42 (84%). No hospitalizations were reported.

Preliminary Conclusions and Actions

TX 1 remained closed for 21 days while water sampling and bacteriologic testing were conducted during December 20–28, pursuant to NSSP recommendations.§ On December 28, 2022, the water met NSSP bacteriologic water quality standards, and TX 1 was reopened for harvesting (Figure). This outbreak underscores the importance of timely public communication and prompt investigation of enteric disease reports in quickly identifying an outbreak source and facilitating appropriate interventions.

* Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Tennessee, and Texas.
† 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.
§ https://www.fda.gov/food/federalstate-food-programs/national-shellfish-sanitation-program-nssp

FIGURE. Investigation of reports of gastrointestinal illness after oyster consumption — Texas Oyster Harvest Area 1, Galveston Bay, Texas, December 2022



Abbreviations: DSHS = Texas Department of State Health Services; FL DOH = Florida Department of Health; GCHD = Galveston County Health District; GI = gastrointestinal; NSSP = National Shellfish Sanitation Program; PHR 6/5S = Public Health Region 6/5 South; TX 1 = Texas Oyster Harvest Area 1.

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Erratum

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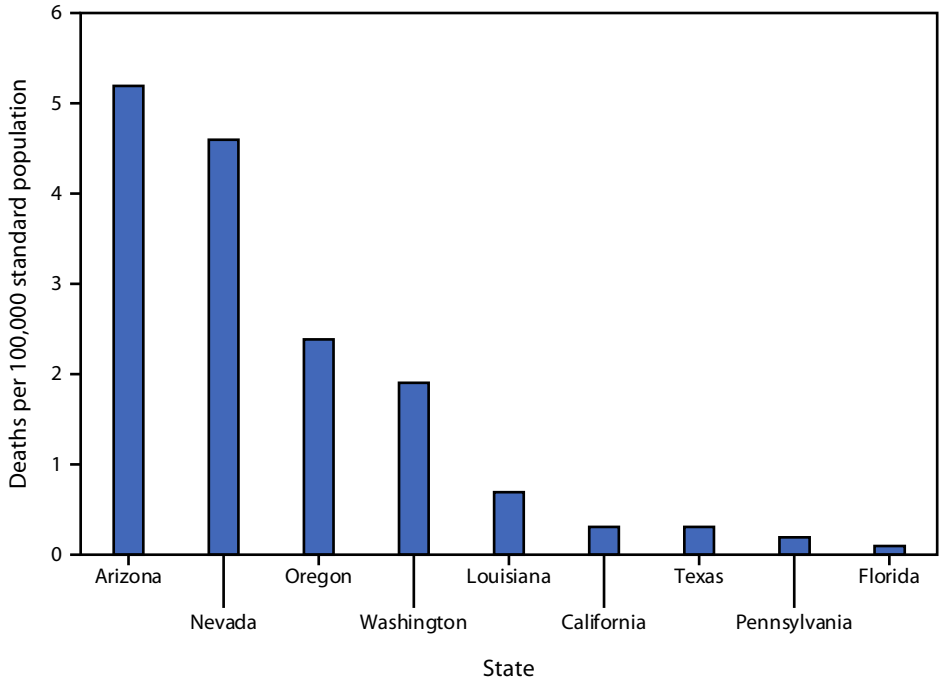
In the report "Appliances Used by Consumers to Prepare Frozen Stuffed Chicken Products — United States, May–July 2022," on page 1511, in the fifth paragraph, the second and third sentences should have read, "**Respondents reporting preparing the product, compared with those who did not prepare the product, included a higher proportion of men (50.8% versus 44.4%), and a lower proportion of respondents aged ≥60 years (29.1% versus 35.1%).** A lower **proportion** of respondents who lived in the U.S. Census Bureau West Region (21.8% **versus 27.4%)** reported preparing the product, **compared with those who did not prepare the product."**

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Age-Adjusted Rates of Death Involving Exposure to Excessive Heat* Among States with the Highest Numbers of Deaths† — National Vital Statistics System, United States, 2021



* Deaths attributed to exposure to excessive natural heat as the underlying or contributing cause of death were identified using *International Classification of Diseases, Tenth Revision* codes P81.0 (environmental hyperthermia of newborn), T67 (effects of heat and light), and X30 (exposure to excessive natural heat, [i.e., hyperthermia]). Deaths with underlying cause code W92 (exposure to excessive heat of man-made origin, such as malfunctioning heating appliances) were excluded.

† In 2021, a total of 1,600 U.S. heat-related deaths occurred; the age-adjusted heat-related death rate was 0.4 deaths per 100,000 population. Among states with 20 or more deaths, the nine states with the highest number of deaths were Arizona (426), Washington (171), Nevada (166), California (143), Oregon (133), Texas (93), Louisiana (38), Florida (30), and Pennsylvania (26). States with the highest rates can vary from year to year, reflecting variation in weather patterns.

The 2021 age-adjusted heat-related death rate for the United States was 0.4 deaths per 100,000 population. A total of 1,600 deaths were reported, and nine states accounted for >75% (1,226) of those deaths. Arizona recorded 426 deaths and had the highest rate (5.2 per 100,000), followed by Nevada (4.6), Oregon (2.4), Washington (1.9), and Louisiana (0.7). Rates for the remaining states ranged from 0.1 (Florida) to 0.3 (California and Texas).

Source: National Center for Health Statistics, National Vital Statistics System, Multiple Cause of Death File, 2021. https://www.cdc.gov/nchs/nvss/deaths.htm

Reported by: Arialdi Miniño, MPH, avm9@cdc.gov.

For more information on this topic, CDC recommends the following link: https://www.cdc.gov/nceh/toolkits/extremeheat/

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format. To receive an electronic copy each week, visit *MMWR* at *https://www.cdc.gov/mmwr/index.html*.

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