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State-Specific Prevalence of Quit Attempts Among Adult Cigarette Smokers — United States, 2011–2017

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From 1965 to 2017, the prevalence of cigarette smoking among U.S. adults aged ≥18 years decreased from 42.4% to 14.0%, in part because of increases in smoking cessation (*1*,*2*). Increasing smoking cessation can reduce smoking-related disease, death, and health care expenditures (*3*). Increases in cessation are driven in large part by increases in quit attempts (*4*). Healthy People 2020 objective 4.1 calls for increasing the proportion of U.S. adult cigarette smokers who made a past-year quit attempt to ≥80% (*5*). To assess state-specific trends in the prevalence of past-year quit attempts among adult cigarette smokers, CDC analyzed data from the 2011–2017 Behavioral Risk Factor Surveillance System (BRFSS) surveys for all 50 states, the District of Columbia (DC), Guam, and Puerto Rico. During 2011–2017, quit attempt prevalence increased in four states (Kansas, Louisiana, Virginia, and West Virginia), declined in two states (New York and Tennessee), and did not significantly change in the remaining 44 states, DC, and two territories. In 2017, the prevalence of past-year quit attempts ranged from 58.6% in Wisconsin to 72.3% in Guam, with a median of 65.4%. In 2017, older smokers were less likely than younger smokers to make a quit attempt in most states. Implementation of comprehensive state tobacco control programs and evidence-based tobacco control interventions, including barrier-free access to cessation treatments, can increase the number of smokers who make quit attempts and succeed in quitting (*2*,*3*).

BRFSS is an annual state-based telephone (landline and cellular) survey of a randomly selected representative sample of noninstitutionalized U.S. adults aged ≥18 years.* During 2011–2017, BRFSS sample sizes ranged from 441,456 (2014) to 506,467 (2011). Median survey response rates ranged from 45.3% (2017) to 53.0% (2011) for landlines and from 27.9% (2011) to 47.2% (2015) for cellular phones.

Overall and age group–specific (18–24, 25–44, 45–64, and ≥65 years) prevalences of smokers who made quit attempts were calculated for 2011–2017 for the 50 states, DC, Guam, and Puerto Rico. Making a past-year quit attempt was defined as answering yes to the question, "During the past 12 months, have you stopped smoking for 1 day or longer because you were trying to quit smoking?" Past-year quit attempts were assessed among both current cigarette smokers† and former cigarette smokers who quit within the past year.§ Chi-square tests were performed to examine differences in past-year quit attempts between the years 2011 and 2017 ($p<0.05$). Logistic regression was used to assess overall changes in prevalence

* https://www.cdc.gov/brfss.

† Current cigarette smokers were defined as persons aged ≥18 years who reported smoking at least 100 cigarettes in their lifetime and smoking "every day" or "some days" at the time of the survey.

§ Former cigarette smokers were defined as persons aged ≥18 years who reported smoking at least 100 cigarettes in their lifetime and who do not smoke now. Quitting within the past year was defined as answering "within the past month," "within the past 3 months," "within the past 6 months," or "within the past year" to the question "How long has it been since you last smoked a cigarette, even one or two puffs?"

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during 2011–2017, controlling for sex, age group, and race/ethnicity (p<0.05). Quartiles were mapped and assessed by U.S. Census region.¶ All analyses were conducted using SAS-callable SUDAAN software (version 11.0.3; RTI International) to account for the complex survey sampling design.

In 2017, the prevalence of past-year quit attempts ranged from 58.6% (Wisconsin) to 72.3% (Guam), with a median of 65.4% (North Carolina) (Table 1). The lowest quartile of quit attempt prevalence (58.6%–62.5%) included six states in the Midwest, four in the South, three in the West, and one in the Northeast (Figure). In comparison, in 2011, the prevalence of past-year quit attempts ranged from 57.4% (West Virginia) to 71.6% (New York), with a median of 64.9% (Mississippi). The prevalence of past-year quit attempts was significantly higher in 2017 compared with 2011 in four states (Alabama, Hawaii, Kansas, Louisiana) and one territory (Guam) and significantly lower in two states (New York and Wisconsin). During 2011–2017, past-year quit attempts increased in four states (Kansas, Louisiana, Virginia, and West Virginia, p-value for trend<0.05), and declined in two states (New York and Tennessee, p-value for trend<0.05).

¶ *Northeast:* Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. *Midwest:* Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. *South:* Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. *West:* Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

In 2017, the prevalence of past-year quit attempts generally decreased with increasing age (Table 2). The median prevalence of past-year quit attempts was 76.4% among persons aged 18–24 years (Hawaii), 68.6% among persons aged 25–44 years (Kansas), 60.8% among persons aged 45–64 years (Illinois), and 55.8% among persons aged ≥65 years (DC) (Table 2).

Discussion

Among adult smokers in 2017, approximately 60%–70% had made a quit attempt in the past year, with variations in prevalences observed among states and territories. However, no state or territory met the national Healthy People 2020 objective 4.1 target of 80% (*5*). Moreover, only four states and one territory had a significantly higher prevalence of quit attempts in 2017 than in 2011, and only four states experienced a significant increase in quit attempt prevalence during this period. Most states experienced no change in quit attempt prevalence during 2011–2017. Finally, in 2017, past-year quit attempts generally decreased as respondent age increased across states and territories. The limited progress in increasing quit attempts reported in this study, together with the variation in quit attempt prevalence among states, underscores the importance of enhanced efforts to motivate and help smokers to quit.

A previous study, using 2001–2013 BRFSS data, found that the prevalence of past-year quit attempts among adult cigarette smokers increased significantly in 29 states and one territory during 2001–2010 and increased in one state and one territory while decreasing in one state during 2011–2013 (*6*). Another

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TABLE 1. Percentage of current and former smokers aged ≥18 years who reported a past-year quit attempt,* by state/territory — Behavioral Risk Factor Surveillance System, United States, 2011–2017

State/Territory	% (95% CI)						
	2011	2012	2013	2014	2015	2016	2017
Alabama†	62.6 (59.3–65.8)	64.5 (61.3–67.8)	68.9 (65.2–72.5)	71.6 (68.6–74.5)	67.8 (64.5–71.1)	64.3 (60.8–67.7)	67.5 (64.1–70.9)
Alaska	65.4 (61.1–69.8)	65.5 (61.4–69.5)	65.8 (61.9–69.7)	65.6 (61.5–69.8)	68.0 (62.7–73.3)	64.0 (58.3–69.7)	63.6 (57.2–70.0)
Arizona	63.8 (58.3–69.3)	66.3 (62.2–70.3)	67.3 (61.7–72.9)	66.1 (62.9–69.3)	65.2 (61.2–69.2)	63.2 (59.3–67.0)	66.6 (64.2–69.0)
Arkansas	64.5 (60.2–68.8)	65.5 (61.9–69.2)	62.9 (59.0–66.8)	63.8 (59.6–68.1)	70.6 (66.1–75.1)	63.2 (58.2–68.2)	66.7 (61.6–71.8)
California	66.8 (64.4–69.3)	63.4 (60.4–66.4)	67.3 (64.1–70.4)	65.3 (61.9–68.8)	66.8 (63.9–69.7)	69.5 (66.6–72.3)	68.0 (64.2–71.7)
Colorado	67.0 (64.2–69.8)	66.2 (63.5–68.8)	64.0 (61.3–66.6)	70.3 (67.8–72.9)	69.1 (66.1–72.1)	67.8 (65.3–70.4)	68.2 (65.2–71.1)
Connecticut	68.2 (64.3–72.1)	70.6 (67.3–73.9)	72.5 (69.1–75.8)	68.0 (64.1–71.9)	66.6 (63.2–70.0)	70.5 (67.3–73.7)	71.6 (68.2–74.9)
Delaware	68.0 (63.9–72.1)	62.5 (58.4–66.7)	60.2 (55.9–64.6)	65.7 (60.8–70.6)	68.2 (63.5–73.0)	64.1 (59.3–68.9)	71.0 (66.5–75.4)
District of Columbia	69.6 (64.7–74.4)	74.8 (69.7–80.0)	74.4 (69.6–79.1)	71.7 (65.4–77.9)	76.0 (70.1–81.9)	71.4 (67.0–75.8)	70.5 (65.8–75.2)
Florida	68.4 (65.6–71.2)	71.4 (67.9–75.0)	69.0 (66.6–71.4)	72.5 (69.7–75.3)	71.3 (68.0–74.5)	69.6 (67.4–71.9)	67.6 (64.4–70.9)
Georgia	67.7 (64.6–70.7)	66.1 (62.3–69.9)	65.1 (61.7–68.5)	72.0 (68.4–75.5)	71.8 (67.8–75.8)	67.6 (63.7–71.4)	64.3 (60.5–68.1)
Hawaii†	60.7 (56.5–64.9)	66.7 (62.6–70.8)	70.3 (66.5–74.1)	67.7 (64.0–71.5)	68.0 (64.0–72.0)	66.7 (62.9–70.5)	67.0 (63.1–70.8)
Idaho	65.0 (60.4–69.6)	63.1 (57.5–68.6)	68.9 (64.8–73.0)	65.6 (61.2–70.0)	66.3 (62.1–70.6)	61.4 (56.4–66.3)	62.2 (57.3–67.1)
Illinois	65.6 (61.3–69.8)	68.2 (64.0–72.4)	64.2 (60.1–68.3)	65.7 (61.5–69.9)	68.6 (64.5–72.7)	67.0 (62.8–71.2)	64.8 (60.7–68.9)
Indiana	63.0 (60.2–65.9)	63.0 (60.3–65.7)	63.6 (60.9–66.2)	63.8 (61.1–66.4)	64.7 (60.6–68.8)	62.3 (59.5–65.2)	62.0 (59.6–64.3)
Iowa	60.6 (57.4–63.8)	64.1 (61.0–67.3)	59.8 (56.5–63.2)	63.0 (59.9–66.2)	62.4 (58.6–66.3)	59.2 (55.6–62.9)	59.9 (56.9–63.0)
Kansas†,§	61.1 (59.1–63.0)	63.0 (60.4–65.7)	63.6 (61.9–65.4)	65.6 (63.4–67.9)	62.7 (60.9–64.6)	63.1 (60.5–65.7)	64.3 (62.4–66.2)
Kentucky	58.2 (55.3–61.1)	59.6 (56.7–62.4)	56.2 (53.3–59.1)	61.6 (58.5–64.7)	58.7 (55.1–62.3)	59.1 (56.1–62.1)	62.1 (58.7–65.5)
Louisiana†,§	65.0 (62.1–67.9)	64.4 (61.0–67.8)	65.9 (61.3–70.5)	71.1 (68.4–73.8)	66.0 (62.1–69.9)	66.8 (62.3–71.3)	69.7 (66.3–73.1)
Maine	64.5 (61.9–67.0)	66.5 (63.8–69.1)	64.0 (60.7–67.3)	62.3 (58.9–65.6)	63.9 (60.4–67.4)	63.5 (60.0–66.9)	62.2 (58.5–66.0)
Maryland	61.8 (58.1–65.4)	66.7 (63.3–70.2)	67.6 (64.4–70.7)	67.3 (63.3–71.3)	66.0 (61.4–70.7)	67.4 (64.5–70.3)	65.9 (62.4–69.3)
Massachusetts	67.2 (64.7–69.7)	67.7 (65.3–70.0)	67.5 (64.6–70.4)	71.5 (68.6–74.4)	68.0 (64.7–71.3)	67.6 (63.9–71.2)	64.6 (59.8–69.3)
Michigan	65.5 (62.6–68.5)	68.5 (65.7–71.2)	68.0 (65.5–70.4)	66.9 (63.9–69.9)	67.9 (65.2–70.7)	64.7 (62.2–67.1)	66.2 (63.6–68.8)
Minnesota	64.3 (61.8–66.8)	64.5 (61.9–67.0)	68.3 (65.2–71.4)	67.2 (65.2–69.3)	65.1 (62.8–67.4)	64.3 (62.2–66.5)	63.8 (61.4–66.1)
Mississippi	64.9 (62.0–67.8)	66.0 (62.8–69.2)	69.4 (66.2–72.6)	68.2 (63.9–72.5)	72.1 (68.6–75.6)	67.7 (63.9–71.4)	61.1 (56.8–65.5)
Missouri	58.6 (55.2–62.1)	60.9 (57.5–64.4)	63.8 (60.3–67.3)	59.9 (56.2–63.6)	64.3 (60.7–67.8)	61.4 (57.6–65.3)	59.7 (56.2–63.1)
Montana	58.2 (55.1–61.3)	61.3 (58.3–64.4)	60.9 (57.9–63.8)	64.7 (61.1–68.3)	63.4 (59.3–67.5)	62.5 (58.4–66.5)	60.6 (56.6–64.7)
Nebraska	62.0 (60.1–63.9)	62.9 (60.7–65.1)	64.0 (61.3–66.8)	65.2 (62.8–67.6)	65.8 (63.2–68.5)	61.6 (58.5–64.6)	63.9 (61.0–66.9)
Nevada	58.4 (53.9–62.9)	66.6 (62.5–70.6)	62.5 (57.1–67.8)	71.5 (66.5–76.4)	72.0 (66.4–77.7)	63.2 (58.4–68.0)	62.7 (57.2–68.2)
New Hampshire	61.9 (58.0–65.7)	66.0 (62.0–70.1)	66.8 (63.1–70.5)	66.5 (62.4–70.7)	65.6 (61.5–69.6)	64.0 (59.3–68.6)	63.7 (58.8–68.6)
New Jersey	68.7 (66.1–71.3)	69.6 (67.0–72.1)	71.0 (68.3–73.7)	71.2 (68.3–74.1)	70.8 (67.4–74.1)	68.8 (64.5–73.1)	71.3 (67.7–75.0)
New Mexico	69.5 (66.8–72.3)	63.9 (60.9–66.8)	63.1 (59.9–66.3)	68.7 (65.2–72.1)	69.5 (65.6–73.4)	68.5 (64.4–72.6)	65.5 (61.8–69.3)
New York†,¶	71.6 (68.5–74.7)	73.1 (69.6–76.5)	70.5 (67.4–73.6)	70.2 (66.7–73.8)	70.2 (67.5–72.9)	67.4 (65.0–69.9)	66.4 (63.3–69.5)
North Carolina	66.9 (63.9–69.8)	68.4 (66.1–70.8)	65.1 (62.2–68.1)	66.3 (63.3–69.3)	68.0 (64.8–71.1)	67.7 (64.5–70.9)	65.4 (61.3–69.6)
North Dakota	59.6 (55.7–63.4)	59.2 (55.0–63.3)	58.7 (55.1–62.2)	63.0 (59.0–66.9)	64.2 (60.1–68.3)	61.0 (57.3–64.7)	62.2 (58.7–65.8)
Ohio§	61.2 (58.3–64.0)	61.9 (59.5–64.4)	65.9 (63.3–68.4)	67.4 (64.3–70.4)	65.0 (61.8–68.2)	63.4 (60.5–66.2)	61.7 (58.9–64.6)
Oklahoma	62.8 (59.8–65.7)	66.4 (63.6–69.2)	64.9 (62.1–67.7)	66.9 (64.0–69.9)	63.4 (59.7–67.1)	63.6 (60.0–67.2)	65.9 (62.5–69.2)
Oregon	65.4 (61.8–69.0)	69.9 (66.2–73.7)	65.1 (61.3–69.0)	66.9 (62.9–70.9)	64.6 (60.6–68.5)	66.4 (62.7–70.0)	62.5 (58.8–66.2)
Pennsylvania	65.8 (63.3–68.3)	66.2 (64.0–68.5)	66.7 (64.2–69.1)	65.4 (62.6–68.2)	67.1 (63.5–70.7)	65.3 (61.8–68.7)	64.3 (60.9–67.6)
Rhode Island	68.1 (64.6–71.6)	65.5 (61.3–69.6)	69.5 (65.8–73.2)	70.2 (66.0–74.4)	67.3 (62.8–71.7)	67.1 (62.6–71.5)	69.6 (64.9–74.3)
South Carolina	65.0 (62.1–67.8)	68.6 (66.0–71.1)	67.4 (64.7–70.1)	68.4 (65.7–71.1)	68.0 (65.2–70.9)	68.9 (66.1–71.7)	65.8 (62.9–68.7)
South Dakota	63.6 (59.3–68.0)	60.5 (57.0–63.9)	63.1 (59.1–67.2)	62.5 (58.2–66.9)	64.1 (59.5–68.6)	62.5 (57.3–67.7)	64.5 (59.4–69.6)
Tennessee¶	66.2 (61.1–71.4)	66.6 (63.5–69.8)	66.8 (63.3–70.4)	64.3 (60.1–68.4)	62.1 (58.1–66.0)	65.0 (61.3–68.6)	60.3 (56.6–64.0)
Texas	69.4 (66.6–72.3)	67.3 (64.2–70.4)	69.9 (67.0–72.9)	72.2 (69.3–75.0)	67.6 (64.2–70.9)	71.1 (67.5–74.6)	70.7 (66.6–74.7)
Utah	70.0 (66.8–73.1)	71.7 (68.5–74.9)	69.5 (66.5–72.6)	71.1 (68.3–73.8)	65.5 (62.0–69.1)	69.3 (65.5–73.2)	66.4 (62.8–70.1)
Vermont	62.7 (59.0–66.5)	69.3 (65.6–72.9)	63.9 (60.1–67.6)	66.0 (62.6–69.4)	63.6 (59.9–67.4)	58.2 (54.1–62.4)	66.0 (62.1–70.0)
Virginia§	63.9 (60.2–67.7)	65.4 (62.1–68.8)	65.8 (62.8–68.8)	66.4 (63.5–69.4)	69.0 (65.8–72.1)	67.8 (64.9–70.8)	66.4 (63.2–69.5)
Washington	64.7 (61.4–68.0)	65.8 (63.3–68.3)	67.5 (64.7–70.3)	68.9 (65.7–72.0)	65.0 (62.3–67.7)	63.7 (61.0–66.4)	68.1 (65.4–70.8)
West Virginia§	57.4 (54.1–60.6)	56.1 (53.0–59.1)	59.7 (56.8–62.7)	59.1 (56.1–62.0)	60.5 (57.5–63.4)	60.8 (58.1–63.5)	61.6 (58.5–64.8)
Wisconsin†	67.0 (62.9–71.1)	68.3 (64.2–72.3)	71.3 (67.6–75.1)	66.3 (62.5–70.2)	66.8 (63.0–70.7)	67.6 (63.6–71.6)	58.6 (54.3–62.8)
Wyoming	61.3 (57.9–64.7)	61.6 (56.9–66.3)	62.7 (58.8–66.6)	63.0 (58.2–67.7)	63.3 (58.7–67.9)	60.3 (55.2–65.5)	65.0 (60.9–69.0)
Guam†	63.5 (58.5–68.6)	71.9 (66.8–76.9)	76.4 (71.6–81.2)	74.0 (69.1–78.9)	70.3 (63.9–76.7)	69.1 (62.0–76.3)	72.3 (66.6–77.9)
Puerto Rico	66.0 (62.1–70.0)	70.5 (66.5–74.4)	76.4 (72.1–80.8)	72.4 (68.1–76.7)	73.8 (68.9–78.6)	74.4 (69.7–79.1)	67.1 (61.5–72.7)
Median	**64.9**	**66.1**	**65.9**	**66.9**	**66.8**	**65.0**	**65.4**

Abbreviation: CI = confidence interval.

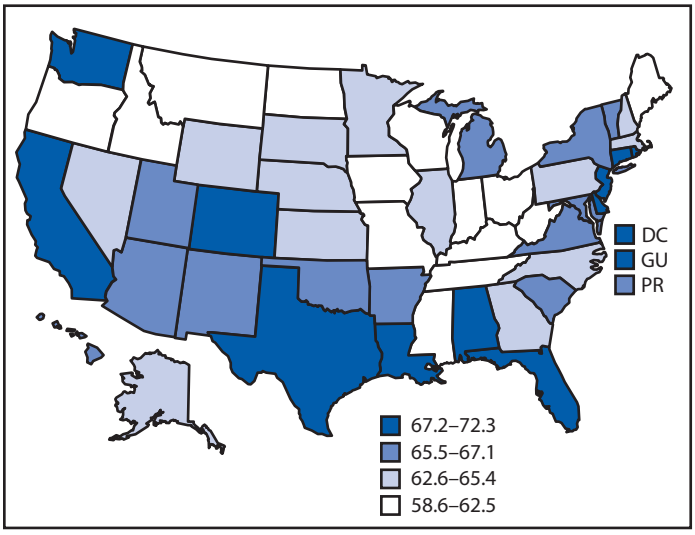
* Quit attempt percentages were calculated among current cigarette smokers who answered yes to the question "During the past 12 months, have you stopped smoking for 1 day or longer because you were trying to quit smoking?" and also among former cigarette smokers who answered "within the past month," "within the past 3 months," "within the past 6 months," or "within the past year" to the question "How long has it been since you last smoked a cigarette, even one or two puffs?"

† Statistically significant difference ($p<0.05$) between 2011 and 2017.

§ Statistically significant increasing linear trend during 2011–2017.

¶ Statistically significant decreasing linear trend during 2011–2017.

FIGURE. Percentage of current and former cigarette smokers aged ≥18 years who reported a past-year quit attempt* — Behavioral Risk Factor Surveillance System, United States, 2017†



Abbreviations: DC = District of Columbia; GU = Guam; PR = Puerto Rico.
* Quit attempt percentages were calculated among current cigarette smokers who answered yes to the question "During the past 12 months, have you stopped smoking for 1 day or longer because you were trying to quit smoking?" and also among former cigarette smokers who answered "within the past month," "within the past 3 months," "within the past 6 months," or "within the past year" to the question "How long has it been since you last smoked a cigarette, even one or two puffs?"
† Median = 65.4%.

Summary

What is already known about this topic?

Increasing the prevalence of quit attempts and successful quitting is important to increase smoking cessation and to reduce smoking-related disease, death, and costs.

What is added by this report?

In 2017, at least six in 10 adult smokers reported trying to quit in the past year in almost all states. In that year, the prevalence of past-year quit attempts ranged from 58.6% (Wisconsin) to 72.3% (Guam), with a state/territory median of 65.4%. During 2011–2017, quit attempt prevalence increased in four states and decreased in two states; quit attempt prevalence did not change significantly in the remaining 44 states, DC, and two territories over this period.

What are the implications for public health practice?

Increased implementation of proven tobacco control interventions, such as tobacco price increases, smoke-free policies, mass media campaigns, and barrier-free access to evidence-based cessation treatments, can increase the number of smokers who make a quit attempt and who succeed in quitting.

study that examined state-specific quit attempt prevalence by insurance status using 2014 BRFSS data found that, overall, adult smokers enrolled in Medicaid were more likely to make a past-year quit attempt than privately insured and uninsured smokers, although wide variations were observed in state-specific quit attempt prevalence (*7*).

The population quit rate is driven by two factors: prevalence of quit attempts and prevalence of successful quitting among smokers who make a quit attempt (*4*). Accordingly, increasing quit attempts is an important strategy to increase the population quit rate (*4*). CDC has identified increasing quit attempts as an important goal for state and national tobacco control efforts (*3*). Because most smokers make multiple quit attempts before succeeding, as many as 30 on average (*8*), tobacco dependence is viewed as a chronic, relapsing condition that requires repeated intervention (*9*). Smokers should be encouraged to keep trying to quit until they succeed, and health care providers should be encouraged to keep supporting smokers until they quit (*9*). Both smokers and providers can be reminded that, despite the barriers to quitting, three of five U.S. adults who ever smoked have quit successfully (*10*). In addition, providers and media campaigns can inform smokers that quitting is beneficial at any age, and that it is never too late to quit (*3*).

Proven tobacco control interventions, including tobacco price increases, comprehensive smoke-free laws, high-impact antitobacco mass media campaigns that promote free cessation resources like state quitlines, and barrier-free access to evidence-based cessation treatments, can work together to prompt smokers to make quit attempts and to give them a better chance of quitting successfully (*2*,*3*). Increases in quit attempts and successful cessation are also driven by comprehensive state cessation efforts, which include activities to 1) promote health systems change to integrate tobacco dependence treatment into routine clinical care; 2) improve cessation insurance coverage and increase use of covered cessation treatments; and 3) increase the reach and impact of state quitlines (*3*). Variations in the prevalence of smokers' quit attempts among states might reflect, in part, differences in the extent to which states have implemented these interventions.

The findings in this report are subject to at least four limitations. First, these findings might not be generalizable to the entire U.S. population because the survey design excluded persons who reside in institutional settings. Second, adults without cellular or landline telephone service are excluded from BRFSS surveys. Third, these data are self-reported, and are therefore subject to recall and social desirability biases, which might affect results overall and which might differ among states. Finally, BRFSS response rates vary by state; even after adjusting for nonresponse, low response rates can increase the potential for bias if there are systematic differences between respondents and nonrespondents.

TABLE 2. Percentage of current and former cigarette smokers aged ≥18 years who reported a past-year quit attempt,* by state/territory and age group — Behavioral Risk Factor Surveillance System, United States, 2017

State/Territory	% (95% CI)			
	18–24 yrs	25–44 yrs	45–64 yrs	≥65 yrs
Alabama	79.3 (66.9–87.9)	69.5 (63.3–75.1)	64.2 (59.1–69.0)	57.7 (50.1–65.0)
Alaska	70.8 (45.9–87.3)	60.1 (49.4–70.0)	66.9 (58.3–74.4)	58.5 (45.6–70.4)
Arizona	78.8 (69.7–85.8)	74.1 (69.9–77.9)	59.7 (56.1–63.2)	52.6 (47.5–57.6)
Arkansas	72.7 (46.9–88.9)	73.8 (65.1–81.0)	60.5 (53.2–67.3)	50.1 (40.9–59.3)
California	78.4 (68.2–86.0)	65.1 (59.0–70.8)	70.1 (64.0–75.7)	66.3 (55.6–75.5)
Colorado	70.7 (60.2–79.3)	74.0 (69.4–78.1)	63.2 (58.2–68.0)	52.3 (45.2–59.4)
Connecticut	76.7 (62.8–86.6)	79.0 (73.2–83.9)	65.3 (60.2–70.0)	58.7 (50.0–66.8)
Delaware	84.5 (69.7–92.8)	77.4 (69.9–83.5)	63.1 (56.0–69.7)	55.9 (43.5–67.6)
District of Columbia	78.1 (53.9–91.6)	65.7 (57.2–73.3)	74.9 (68.6–80.2)	71.2 (61.4–79.3)
Florida	85.5 (75.5–91.8)	69.9 (63.8–75.3)	65.8 (60.7–70.5)	57.4 (49.3–65.1)
Georgia	74.1 (58.0–85.5)	67.1 (60.6–72.9)	61.0 (55.0–66.6)	55.4 (47.1–63.5)
Hawaii	76.4 (61.2–87.0)	70.7 (64.7–76.0)	62.1 (56.0–67.9)	50.0 (39.0–61.1)
Idaho	78.9 (64.5–88.5)	64.8 (56.3–72.4)	55.3 (47.1–63.3)	55.5 (44.6–66.0)
Illinois	60.5 (40.2–77.7)	70.1 (63.5–75.9)	60.8 (54.6–66.6)	60.3 (51.4–68.7)
Indiana	71.4 (62.1–79.2)	62.6 (58.4–66.5)	60.4 (57.1–63.7)	52.9 (47.7–58.1)
Iowa	63.6 (50.5–75.0)	63.5 (58.4–68.2)	56.1 (51.6–60.6)	55.1 (47.7–62.4)
Kansas	76.8 (70.2–82.3)	68.6 (65.5–71.6)	57.5 (54.5–60.5)	52.5 (47.8–57.2)
Kentucky	72.3 (56.9–83.7)	67.7 (62.4–72.6)	53.0 (47.5–58.3)	62.2 (53.9–69.8)
Louisiana	68.1 (55.1–78.8)	74.4 (69.0–79.2)	65.5 (59.9–70.7)	64.2 (54.7–72.7)
Maine	80.8 (57.8–92.8)	62.5 (56.2–68.4)	59.8 (54.5–65.0)	54.3 (46.6–61.8)
Maryland	65.5 (49.1–78.8)	69.5 (63.3–75.0)	62.0 (57.2–66.6)	65.0 (57.8–71.5)
Massachusetts	70.3 (50.9–84.5)	70.0 (61.6–77.3)	59.4 (51.9–66.5)	59.1 (46.6–70.6)
Michigan	76.6 (66.4–84.4)	67.2 (62.7–71.5)	64.1 (60.2–67.8)	61.3 (54.8–67.4)
Minnesota	71.5 (62.0–79.5)	67.2 (63.2–70.9)	60.0 (56.4–63.4)	55.8 (50.1–61.3)
Mississippi	85.7 (67.1–94.6)	56.2 (48.2–63.9)	62.5 (56.5–68.0)	53.5 (44.7–62.0)
Missouri	71.4 (60.0–80.6)	59.4 (53.3–65.3)	57.8 (52.6–62.9)	52.8 (45.0–60.5)
Montana	60.7 (45.0–74.4)	66.2 (59.8–72.1)	57.8 (51.3–64.1)	48.9 (40.1–57.7)
Nebraska	75.1 (65.2–82.9)	68.6 (63.8–73.0)	57.1 (52.4–61.7)	51.2 (43.9–58.4)
Nevada	76.3 (52.4–90.4)	67.0 (57.5–75.3)	60.9 (51.6–69.5)	51.2 (40.1–62.2)
New Hampshire	72.9 (53.7–86.1)	61.8 (52.8–70.0)	62.3 (56.1–68.1)	63.6 (54.5–71.7)
New Jersey	77.9 (57.7–90.1)	76.0 (69.7–81.3)	64.9 (59.4–70.0)	69.2 (60.9–76.5)
New Mexico	69.9 (54.5–81.8)	70.0 (63.5–75.7)	64.3 (58.3–69.8)	51.5 (43.4–59.4)
New York	70.8 (55.8–82.4)	68.9 (63.9–73.6)	64.4 (59.7–68.8)	59.9 (52.2–67.1)
North Carolina	68.2 (53.4–80.1)	71.3 (64.1–77.6)	58.6 (51.8–65.0)	63.8 (53.0–73.3)
North Dakota	84.4 (72.3–91.8)	67.8 (61.7–73.3)	47.4 (42.2–52.6)	54.6 (47.6–61.5)
Ohio	73.3 (61.7–82.4)	63.4 (58.5–68.0)	58.8 (54.5–62.9)	53.8 (47.5–60.1)
Oklahoma	75.0 (62.7–84.2)	68.0 (62.3–73.1)	63.3 (58.0–68.2)	52.8 (45.6–59.8)
Oregon	58.9 (43.7–72.6)	69.2 (63.3–74.6)	57.9 (51.9–63.7)	55.4 (45.7–64.7)
Pennsylvania	80.6 (69.7–88.2)	66.6 (60.7–72.0)	58.9 (53.8–63.9)	57.6 (48.0–66.6)
Rhode Island	80.8 (59.0–92.5)	68.7 (59.5–76.6)	68.4 (62.2–74.0)	65.8 (56.4–74.1)
South Carolina	72.5 (60.0–82.3)	69.1 (64.0–73.8)	63.1 (58.8–67.3)	55.8 (49.5–61.8)
South Dakota	76.9 (61.2–87.5)	68.7 (59.4–76.7)	58.0 (50.2–65.5)	52.0 (41.3–62.5)
Tennessee	77.8 (64.5–87.1)	62.9 (56.5–68.8)	55.5 (50.0–60.9)	49.1 (40.8–57.5)
Texas	78.0 (62.1–88.5)	70.5 (64.2–76.1)	70.6 (63.5–76.8)	59.7 (47.2–71.1)
Utah	76.9 (65.7–85.3)	69.6 (64.1–74.7)	58.4 (51.8–64.7)	56.4 (44.6–67.6)
Vermont	86.5 (72.0–94.1)	64.3 (57.3–70.7)	62.4 (56.2–68.3)	60.3 (51.2–68.8)
Virginia	80.4 (68.4–88.6)	71.6 (66.3–76.3)	59.0 (53.9–64.0)	53.6 (46.2–60.8)
Washington	77.3 (66.0–85.7)	72.4 (68.1–76.4)	61.6 (57.1–65.8)	60.3 (53.6–66.7)
West Virginia	84.7 (73.5–91.7)	62.0 (56.6–67.0)	56.4 (51.9–60.8)	50.4 (43.2–57.5)
Wisconsin	66.4 (49.2–80.2)	58.8 (51.7–65.6)	56.3 (49.9–62.5)	57.7 (47.2–67.6)
Wyoming	73.7 (60.6–83.6)	67.4 (60.6–73.6)	59.5 (52.9–65.7)	57.5 (48.5–66.0)
Guam	96.0 (87.8–98.8)	71.8 (62.0–80.0)	64.9 (55.3–73.5)	61.8 (37.6–81.2)
Puerto Rico	87.3 (73.0–94.6)	75.2 (66.3–82.4)	53.6 (43.9–63.0)	54.3 (39.0–68.7)
Median	**76.4**	**68.6**	**60.8**	**55.8**

Abbreviation: CI = confidence interval.

* Quit attempt percentages were calculated among current cigarette smokers who answered yes to the question "During the past 12 months, have you stopped smoking for 1 day or longer because you were trying to quit smoking?" and also among former cigarette smokers who answered "within the past month," "within the past 3 months," "within the past 6 months," or "within the past year" to the question "How long has it been since you last smoked a cigarette, even one or two puffs?"

The variation in quit attempt prevalences among states described in this report suggests that states have an opportunity to further increase the prevalence of quit attempts. Increased implementation of proven tobacco control interventions (e.g., tobacco price increases, smoke-free policies, media campaigns, and barrier-free access to cessation treatments) can increase the number of smokers who make a quit attempt and who succeed in quitting (*2*,*3*). Implementation of these interventions might also reduce the variation in quit attempt prevalences among states observed in this study. Increasing quit attempts among adult smokers can help drive increases in smoking cessation. In addition, it is important to continue tracking cessation behaviors, including quit attempts, among states and territories to monitor future trends in these behaviors.

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Successive Norovirus Outbreaks at an Event Center — Nebraska, October–November, 2017

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In October 2017, the Nebraska Department of Health and Human Services (NDHHS) was notified by a local health department of a gastrointestinal illness outbreak among attendees of a wedding reception at facility A, an event center. Shortly thereafter, state and local public health officials began receiving reports of similar gastrointestinal illness among attendees of subsequent facility A events. An investigation was initiated to identify cases, establish the cause, assess possible transmission routes, and provide control recommendations. Overall, 159 cases consistent with norovirus infection (three confirmed and 156 probable) were identified among employees of facility A and attendees of nine facility A events during October 27–November 18, 2017. The investigation revealed a public vomiting episode at the facility on October 27 and at least one employee involved with preparing and serving food who returned to work <24 hours after symptom resolution, suggesting that a combination of contaminated environmental surfaces and infected food handlers likely sustained the outbreak. Recommendations regarding sanitation and excluding ill employees were communicated to facility A management. However, facility A performed minimal environmental cleaning and did not exclude ill employees. Consequently, transmission continued. To prevent persistent norovirus outbreaks in similar settings, public health officials should ensure that involved facilities implement a comprehensive prevention strategy as early as possible that includes extensive sanitation and strict exclusion of ill food handlers for at least 48 hours after symptom resolution (*1*).

Investigation and Results

On October 30, 2017, public health officials became aware of approximately 30 persons who developed gastrointestinal illness after attending a wedding reception (event 1) on October 27 at facility A. Norovirus was suspected based on ill attendees' reports of developing diarrhea, vomiting, abdominal cramps, and fever approximately 12–48 hours after the event. On November 6, investigators learned of similar gastrointestinal illness among attendees at five subsequent facility A events (events 2–6), at which point an Internet-based questionnaire that assessed symptom history, events attended, and food items consumed was developed. E-mail addresses for facility A employees were provided by facility management. Investigators worked with event organizers to disseminate the questionnaire to attendees of the first six events held at facility A during the investigation period, as well as four subsequent events that were also ultimately affected by the outbreak. A case-control study was performed. A probable case was defined as the occurrence of diarrhea (≥3 loose stools within 24 hours) or vomiting and at least one other symptom (nausea, abdominal cramps, diarrhea, or vomiting) in a facility A employee or an event attendee who reported illness onset 6–72 hours after attending a facility A event on or after October 27. Confirmed cases met the probable case definition and had norovirus RNA detected in a stool specimen by real-time reverse transcription–polymerase chain reaction (RT-PCR) (*2*). Controls were identified as facility A employees who were not ill and were exposed to facility A during the study period or event attendees who were not ill and attended an event during the study period. Estimated attack rates (ARs) were calculated per event, using host-estimated number of attendees as denominators.

Ten events that included food service provided by facility A were held at the facility during October 27–November 18, 2017. Overall, 378 persons from nine events completed questionnaires, including 18 of 25 (72%) employees and 360 of 1,383 (26%) event attendees (Table). Only one questionnaire response among 70 attendees was received for the tenth event and was thus excluded from analysis. Overall, 159 persons (six employees and 153 event attendees) reported illness meeting the probable (156) or confirmed (three) case definition (Figure); 186 controls were identified. Comparison of food items consumed by case-patients and controls was limited because the only items available at all nine events were water, ice, and drink garnishes; however, no item was significantly associated with illness. Estimated ARs for the first six events, which occurred before any public health intervention, ranged from 7% to 35% per event (median = 18.5%) (Table).

The investigation uncovered a witnessed episode of vomiting in a public area near the event space by an event attendee. The episode occurred at the beginning of the October 27 event (event 1) on carpeting in the lobby at the entrance to the event hall and might have represented the initial introduction of norovirus into facility A. Although no testing of environmental surfaces was conducted to confirm, it is possible this vomiting contaminated environmental surfaces.

On November 7, investigators learned that the carpeting where vomiting occurred on October 27 had been swept with a vacuum cleaner and inadequately sanitized; the agent used

TABLE. Attendee questionnaire response rates and estimated gastroenteritis attack rates per facility A event — Nebraska, October–November 2017

Facility A event	Event date	Estimated no. of attendees*	Total no. (%) of respondents	Cases	Estimated attack rate (%)
Event 1	Oct 27	115	43 (37)	33†	29
Event 2	Oct 28	130	42 (32)	22	17
Event 3	Oct 28	20	13 (65)	7	35
Event 4	Nov 2	10	2 (20)	2	20
Event 5	Nov 3	120	24 (20)	18	15
Event 6	Nov 4	128	16 (13)	9	7
Event 7	Nov 10	150	46 (31)	6	4
Event 8	Nov 11	360	127 (35)	53§	15
Event 9	Nov 18	350	47 (13)	3	1
Total	—	**1,383**	**360 (26)**	**153**	**11**

* Estimated from lists provided by event hosts.
† Includes two laboratory-confirmed cases.
§ Includes one laboratory-confirmed case.

did not have efficacy against norovirus. Investigators recommended sanitizing environmental surfaces with a sodium hypochlorite (chlorine bleach) solution or a disinfectant specifically registered by the Environmental Protection Agency (EPA) as effective against norovirus*,† and excluding ill employees from work until ≥48 hours after symptom resolution (*1*). However, cases of gastroenteritis occurred at two events that were held on November 10 (event 7) and 11 (event 8) after these recommendations were made; estimated ARs at event 7 and event 8 were 4% (six of 150 attendees) and 15% (53 of 360 attendees), respectively, indicating ongoing transmission. Investigators subsequently learned of an employee who left work when she became ill at 10:00 a.m. on November 7, with nausea, vomiting, fever, headache, and myalgias, and returned to work preparing and serving food on November 8, <24 hours later.

Stool specimens from three ill persons were tested. Norovirus genogroup II was detected by real-time RT-PCR from all three stool specimens tested; further genetic sequencing by Nebraska Public Health Laboratory and CDC confirmed that all three specimens yielded the same norovirus genotype, GII.P12-GII.3. Two of the case-patients in whom norovirus was laboratory-confirmed attended the October 27 event (event 1), and the third attended the event on November 11 (event 8).

Public Health Response

After initial public health recommendations to use disinfectants registered by the EPA and exclude ill employees failed to halt transmission (*1*), several discussions were held with facility A management during the period leading up to a planned event on November 18 (event 9). The recommendation for strict employee exclusion was reiterated on November 15, along with ideas for minimizing pressures on employees to work while ill, such as offering paid sick leave and bringing in staff members from a different location to work the event. Consideration was given to postponing the upcoming event or finding an alternative location for it. Facility A hired a professional cleaning service experienced with norovirus eradication to sanitize the facility on November 16 and 17. After thorough sanitation and strict employee exclusion were implemented, the event held on November 18 (event 9) had an estimated AR of 1% (three of 350 attendees), indicating reduced transmission (Table). No further illnesses in facility A employees or event attendees were reported to public health officials.

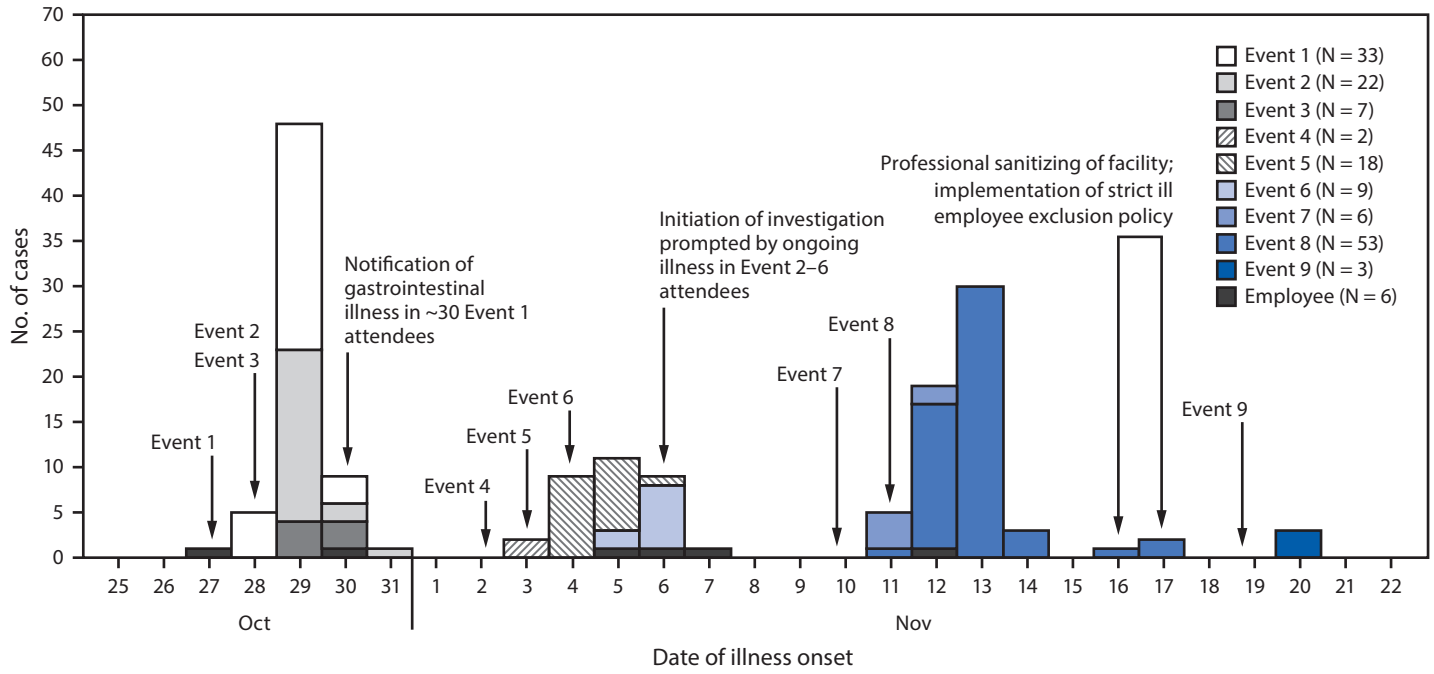
Discussion

Norovirus, the most common cause of outbreak-associated acute gastroenteritis worldwide, is highly efficient at causing human disease (*3*). The virus is extremely contagious, with a low infectious dose capable of causing infection with as few as 18–2,800 virus particles (*4*,*5*). In addition, large numbers of virus can be shed by infected persons, even those with asymptomatic infections (*1*). Norovirus is resistant to many common commercial disinfectants and is able to persist on environmental surfaces for up to 2 weeks (*6*).

Transmission occurs through several different routes, and multiple transmission routes can coexist during norovirus outbreaks (*6*,*7*). In addition to foodborne and direct person-to-person spread, transmission can also occur through ingestion of aerosolized particles and through contact with contaminated environmental surfaces, which are believed to harbor the virus and play a role in sustaining outbreaks (*8*,*9*). Multiple outbreaks caused by foodborne sources and subsequently perpetuated by environmental contamination or person-to-person spread have

* https://www.epa.gov/sites/production/files/2018-04/documents/list_g_disinfectant_list_3_15_18.pdf.
† Per CDC guidance, "this list should be interpreted with caution because the efficacy of these products is determined by using the surrogate feline calicivirus, which exhibits different physiochemical properties than human norovirus and therefore might not reflect a similar disinfection efficacy profile." https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6003a1.htm.

FIGURE. Probable and confirmed cases of norovirus gastroenteritis associated with facility A event attendees (N = 153) and employees (N = 6), by event and illness onset date*,† — Nebraska, October–November 2017



* One laboratory-confirmed norovirus case on October 29, 2017, October 30, 2017, and November 13, 2017.
† One employee returned to work <24 hours after symptom resolution on November 7, 2017.

been described (*7*,*10*). In addition, when contaminated food items are implicated in outbreaks, infected food handlers are often involved (*1*).

In this setting of successive outbreaks at the same event center, norovirus was likely transmitted through a combination of persistently contaminated environmental surfaces and ill food handlers (*7*). The investigation findings indicate that the initial public vomiting episode likely contaminated the carpeting at the entrance to the event hall. Inadequate sanitizing of the area and aerosolization of the virus resulting from subsequent vacuuming could both have led to further spread. Although no environmental testing was done, investigators suspect that widespread environmental contamination was likely present (*9*). Transmission was halted only after the facility was thoroughly cleaned and a strict ill employee exclusion policy was enforced.

The findings in this report are subject to at least two limitations. First, because the total number of attendees at each facility A event was not known, investigators had to rely on host estimations. Accordingly, calculation of exact ARs was precluded. Similarly, questionnaire distribution to individual attendees was facilitated by each event's host. As a result, investigators had no way of knowing how many attendees successfully received the invitation to complete the Internet-based questionnaire, and accuracy of corresponding AR calculations might have been affected. Because methodology for calculating ARs was consistent across all events, the potential of adversely affecting comparison of event-specific ARs was likely limited. However, the limitation was believed to introduce enough bias to preclude a cohort analysis. Second, environmental sampling that might have helped elucidate possible transmission routes was not done. By the time public health officials learned of the outbreak's ongoing nature, 10 days had passed since the initial public vomiting episode. Because results of environmental testing would not have changed the recommendation for extensive sanitation, such testing was not prioritized.

Mitigation efforts for ongoing norovirus outbreaks in similar settings should include a comprehensive prevention strategy that attempts to address all possible routes of norovirus transmission. In this setting, control measures that included extensive environmental decontamination and strict exclusion of all ill food handlers for ≥48 hours after symptom resolution were needed to halt the outbreak. Public health officials can also verify that facilities involved in similar persistent outbreaks are implementing recommended public health interventions.

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Summary

What is already known about this topic?

Norovirus, an extremely contagious cause of gastroenteritis, can be transmitted by infected food workers and is difficult to remove from contaminated surfaces.

What is added by this report?

An investigation into an ongoing gastrointestinal illness outbreak identified 159 persons reporting illness meeting the case definition; laboratory testing confirmed norovirus cases. Public health recommendations were not strictly followed, and transmission continued for approximately 2 weeks. Halting transmission required a coordinated approach involving thorough environmental decontamination and a strict ill employee exclusion policy.

What are the implications for public health practice?

Mitigation efforts for ongoing norovirus outbreaks in similar settings should include a comprehensive prevention strategy that addresses all possible routes of norovirus transmission.

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Notes from the Field

Hurricane Florence–Related Emergency Department Visits — North Carolina, 2018

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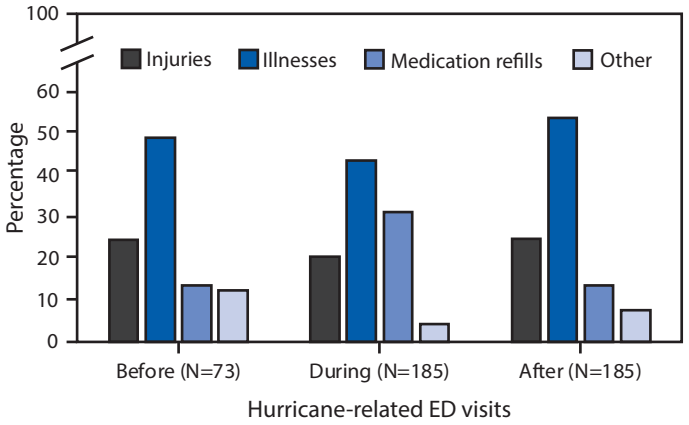
On September 14, 2018, Hurricane Florence made landfall near Wrightsville Beach, North Carolina, as a Category 1 hurricane. Parts of eastern North Carolina experienced 20–30 inches of rain over 80 hours, a record-breaking storm surge of 9 to 13 feet, and maximum sustained wind speeds of approximately 80 miles per hour (*1*,*2*). Surveillance for health outcomes during hurricanes, including emergency department (ED) visits, informs decisions regarding resource allocation and interventions and identifies opportunities to improve emergency preparedness for future disasters.

The North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) is a syndromic surveillance system, collecting data from all 124 civilian EDs in North Carolina. NC DETECT receives data from EDs daily in near real-time on patient demographics, chief complaint, triage notes, diagnosis codes, vital signs, and disposition. NC DETECT was queried to identify Hurricane Florence–related ED visits, defined as ED visits during September 7–28, 2018, resulting from forces of the disaster (e.g., wind and flooding) or direct consequences of these forces (e.g., structural collapse), disruption of normal services, storm preparation or cleanup, stress or anxiety from the storm, or need for shelter. The query was modified from previous hurricane queries in NC DETECT to capture Hurricane Florence–related ED visits with "hurricane," "Florence," "flood," or "storm" in the chief complaint or triage notes.* Record-level data, including patient demographics, chief complaint, and triage notes, were abstracted. Three epidemiologists at the North Carolina Division of Public Health independently reviewed ED visits identified from the keyword query. Visits that indicated the hurricane was a contributing factor and fit the case definition, by reviewer consensus, were considered hurricane-related and were included in the analysis. The reviewers then further classified these hurricane-related ED visits, by consensus, into one of four health categories: injuries, illnesses, medication refills, or other. Percentages of ED visits in each category were compared for periods before (September 7–13), during (September 14–17), and after (September 18–28) Hurricane Florence. Log-binomial models were used to estimate prevalence ratios (PRs) and 95% confidence intervals (CIs) using SAS (version 9.4; SAS Institute).

The hurricane-specific keyword query identified 850 ED visits from 59 EDs; 443 were hurricane-related, including 73 before, 185 during, and 185 after Hurricane Florence. The median age of patients with a hurricane-related ED visit was 50 years (interquartile range = 35–64 years). Among the 73 visits before Hurricane Florence, 25% (18) of hurricane-related ED visits were for injuries, 49% (36) were for illnesses, and 14% (10) were for medication refills (Figure). A similar pattern was observed for hurricane-related ED visits occurring after Hurricane Florence. However, among the 185 visits occurring during Hurricane Florence, 31% (58) of ED visits were for medication refills. Medication refill ED visits were significantly more prevalent during Hurricane Florence, compared with before (PR = 2.3; 95% CI = 1.2–4.2) and after (PR = 2.3; 95% CI = 1.5–3.5), whereas the prevalence of injury and illness ED visits were similar across all periods. After adjustment for age, sex, race, and insurance coverage, medication refill ED visits remained more prevalent during Hurricane Florence, compared with both before and after. Based on descriptions contained in the free text chief complaint and triage notes, disruption of normal services (e.g., closed pharmacies) accounted for 69% (40 of 58) of hurricane-related ED visits for medication refills during the hurricane.

The North Carolina Department of Public Safety disseminated public health messaging regarding emergency kits, evacuation plans, home preparation, and travel safety before, during, and after Hurricane Florence (*3*,*4*). This messaging advised that

FIGURE. Hurricane-related emergency department (ED) visits before, during, and after* Hurricane Florence — North Carolina, September 7–28, 2018



* Based on dates of service, ED visits were categorized as before (September 7–13); during (September 14–17); or after (September 18–28).

* The keyword query excluded ED visits with "thyroid" to avoid capturing visits related to thyroid storm condition.

prescription medicines should be included in home emergency kits. However, during the hurricane, 31% of hurricane-related ED visits were for medication refill. Therefore, it is important that effective messaging to the public, health care providers, and pharmacists before hurricanes emphasize that medications should be refilled to last throughout the storm. North Carolina law permits coverage for extra prescription medication refills during a state of emergency.† Proactive automated pharmacy notifications encouraging patients to refill medications before a potential natural disaster have resulted in small increases in medication refills (*5*). This approach might reduce medication refill ED visits during future natural disasters. In addition, the keyword query used for surveillance of Hurricane Florence–related ED visits in North Carolina could be applied in CDC's National Syndromic Surveillance Program BioSense Platform and easily modified for use in other states and for other types of natural disasters. This action could enhance natural disaster surveillance nationwide and lead to further query refinement and data analysis that can benefit public health.

† Coverage for extra prescriptions during a state of emergency or disaster. Chap 58 Sect 58-3-228, North Carolina General Statutes, North Carolina General Assembly (2018). https://www.ncleg.net/EnactedLegislation/Statutes/HTML/BySection/Chapter_58/GS_58-3-228.html.

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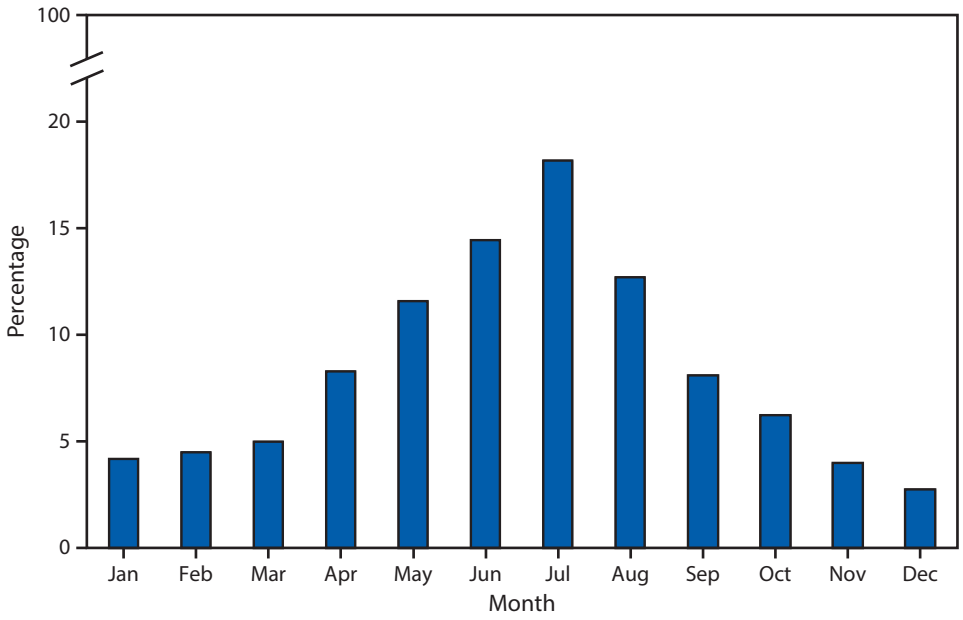
QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage Distribution of Deaths Involving Injuries from Recreational and Nonrecreational Use of Watercraft,* by Month — United States, 2015–2017



* During 2015–2017, there were 1,389 deaths involving injuries from recreational and nonrecreational use of watercraft. Deaths were identified using *International Classification of Diseases, Tenth Revision* (ICD-10) underlying cause of death codes V90–V94 (water transport). Water transport includes both recreational and nonrecreational use of motorized (e.g., merchant ship, ferry, passenger ship, fishing boat, and jet ski) and nonmotorized (e.g., canoe, kayak, inflatable craft, surfboard, and windsurfer) watercraft. Deaths resulted from drowning, submersion, and other types of injuries. All water transport deaths are unintentional.

During 2015–2017, there were 1,389 deaths involving injuries from recreational and nonrecreational use of watercraft (an average of 463 deaths per year). The percentage of deaths that occurred by month ranged from 2.7% in December to 18.2% in July. The majority of deaths (57%) occurred during May–August.

Source: National Center for Health Statistics, National Vital Statistics System, Mortality File. http://www.cdc.gov/nchs/nvss/deaths.htm.

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