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Vital Signs: Colorectal Cancer Screening Test Use — United States, 2018

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Abstract

Background: Colorectal cancer (CRC) is the second leading cause of cancer death in the United States of cancers that affect both men and women. Despite strong evidence that screening for CRC reduces incidence and mortality, CRC screening prevalence is below the national target. This report describes current CRC screening prevalence by age, various demographic factors, and state.

Methods: Data from the 2018 Behavioral Risk Factor Surveillance System survey were analyzed to estimate the percentages of adults aged 50–75 years who reported CRC screening consistent with the United States Preventive Services Task Force recommendation.

Results: In 2018, 68.8% of adults were up to date with CRC screening. The percentage up to date was 79.2% among respondents aged 65–75 years and 63.3% among those aged 50–64 years. CRC screening prevalence was lowest among persons aged 50–54 years (50.0%) and increased with age. Among respondents aged 50–64 years, CRC screening prevalence was lowest among persons without health insurance (32.6%) and highest among those with reported annual household income of ≥$75,000 (70.8%). Among respondents aged 65–75 years, CRC screening prevalence was lowest among those without a regular health care provider (45.6%), and highest among those with reported annual household income ≥$75,000 (87.1%). Among states, CRC screening prevalence was highest in Massachusetts (76.5%) and lowest in Wyoming (57.8%).

Discussion: CRC screening prevalence is lower among adults aged 50–64 years, although most reported having a health care provider and health insurance. Concerted efforts are needed to inform persons aged <50 years about the benefit of screening so that screening can start at age 50 years.

Introduction

Of cancers that affect both men and women, colorectal cancer (CRC) is the second leading cause of cancer death in the United States. In 2016, 141,270 cases were diagnosed, and 52,286 persons died from the disease (*1*). The U.S. Preventive Services Task Force recommends that adults at average risk (those who do not

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have a personal or family history of CRC or polyps, do not have inflammatory bowel disease, or a history of genetic syndromes associated with CRC) aged 50–75 years be screened for CRC by any of six available tests: 1) fecal occult blood test (FOBT), 2) fecal immunochemical test (FIT), 3) multitarget stool DNA (FIT-DNA), 4) computed tomographic colonography (CTC), 5) sigmoidoscopy, or 6) colonoscopy (*2*). Strong evidence exists that screening for CRC reduces incidence and mortality (*2*). Both CRC incidence and mortality have declined steadily over the past 30 years; the decline is attributable in part to the increasing percentage of adults aged 50–75 years who are up to date with CRC screening (i.e., have completed a CRC screening test within the recommended time interval) (*3*,*4*). Despite steady gains, the prevalence of CRC screening is lower than the stated national Healthy People 2020 target of 70.5%, and not all populations have achieved equivalent gains in CRC screening (*5*). This report describes current CRC screening among U.S. adults aged 50–75 years, by demographic characteristics and state.

Methods

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual, state-based, random-digit–dialed telephone survey of the civilian, noninstitutionalized adult population aged ≥18 years that collects information on health risk behaviors, preventive health practices, and health care access in the United States. The median response rate for the 2018 BRFSS combined landline and cellular phone survey was 49.9% (*6*). All states and the District of Columbia asked BRFSS respondents aged ≥50 years a series of questions about their CRC screening status.* Among 222,490 respondents aged 50–75 years, 16,127 (7.2%) declined to answer, had a missing answer, or answered "don't know/not sure" and were excluded from the analysis. Screening status (up to date with CRC screening†) was analyzed by age groups, various demographic characteristics, and state. Data were weighted to the age, sex, and racial/ethnic distribution of each state's adult population using intercensal estimates and were age-standardized to the 2018 BRFSS population. Chi-squared tests were used to evaluate significant (p<0.005) differences in screening compliance by

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[*] The following questions were asked as part of the Colorectal Cancer Screening module: "A blood stool test is a test that may use a special kit at home to determine whether the stool contains blood. Have you ever had this test using a home kit?," "How long has it been since you had your last blood stool test using a home kit?," "Sigmoidoscopy and colonoscopy are exams in which a tube is inserted in the rectum to view the colon for signs of cancer or other health problems. Have you ever had either of these exams?," "For a sigmoidoscopy, a flexible tube is inserted into the rectum to look for problems. A colonoscopy is similar, but uses a longer tube, and you are usually given medication through a needle in your arm to make you sleepy and told to have someone else drive you home after the test. Was your most recent exam a sigmoidoscopy or a colonoscopy?," and "How long has it been since you had your last sigmoidoscopy or colonoscopy?."

[†] Current U.S. Preventive Services Task Force recommendations for CRC screening include more detailed test type information than can be fully assessed using the data available in BRFSS. To best match the updated recommendations, "up to date" was defined as the percentage of adults aged 50–75 years who reported having had a blood stool test (FOBT or FIT) within the past year, a sigmoidoscopy within the past 5 years, and/or a colonoscopy within the past 10 years.

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age group (50–64 years and 65–75 years). A test for trend was used to evaluate a significant (p<0.005) relationship between age and up-to-date screening status. SAS-callable SUDAAN (version 9.4: RTI International) was used to analyze all data.

Results

In 2018, 68.8% of respondents reported they were up to date with CRC screening, including 79.2% of respondents aged 65–75 years and 63.3% of respondents aged 50–64 years (Table 1). Among all demographic groups studied, a significantly higher percentage of respondents aged 65–75 years reported being up to date with CRC screening than did respondents aged 50–64 years (p<0.005). The difference in the percentage of respondents who were up to date between those aged 65–75 years and those aged 50–64 years was largest (23.1 percentage points) among those without health insurance and smallest (11.1 percentage points) among respondents who identified as non-Hispanic other/multiracial. The percentage of respondents who were up to date was lowest among those aged 50–54 years (50.0%) and highest among those aged 70–75 years (81.3%); increasing age was significantly associated with an increasing percentage of persons who were up to date (p<0.005) (Figure).

Among younger respondents (those aged 50–64 years), reported CRC screening prevalence was lowest among those without a regular health care provider (32.7%) and those without health insurance (32.6%) and highest among those reporting an annual household income of ≥$75,000 (70.8%) and college graduates (70.7%) (Table 1). In this age group, the percentage of respondents who were up to date with CRC

TABLE 1. Percentage of respondents aged 50–75 years who reported being up to date* with colorectal cancer screening, by age group and selected characteristics — Behavioral Risk Factor Surveillance System (BRFSS), United States, 2018†

	Age group (yrs)		
Characteristic	**All (50–75) % (95% CI)**	**50–64 % (95% CI)**	**65–75§ % (95% CI)**
Total	**68.8 (68.3–69.3)**	**63.3 (62.7–63.9)**	**79.2 (78.5–79.8)**
Sex			
Men	67.0 (66.3–67.7)	61.1 (60.2–62.0)	78.2 (77.1–79.2)
Women	70.5 (69.9–71.2)	65.4 (64.5–66.2)	80.1 (79.2–80.9)
Race/Ethnicity			
White, non-Hispanic	71.0 (70.6–71.5)	65.7 (65.1–66.3)	80.7 (80.1–81.2)
Black, non-Hispanic	70.0 (68.5–71.5)	65.1 (63.2–66.9)	79.7 (76.8–82.3)
Asian/Pacific Islander, non-Hispanic	64.8 (60.7–68.7)	59.1 (54.0–64.0)	76.4 (69.8–81.9)
AI/AN, non-Hispanic	62.1 (58.6–65.5)	55.1 (50.5–59.6)	76.6 (71.7–80.8)
Other/Multiracial, non-Hispanic	65.1 (61.9–68.1)	61.3 (57.5–65.0)	72.4 (66.6–77.5)
Hispanic	56.1 (53.8–58.5)	50.6 (47.9–53.3)	68.5 (63.7–72.9)
Education			
Less than high school graduate	53.0 (51.2–54.9)	46.8 (44.6–49.0)	65.5 (62.2–68.6)
High school graduate/GED	65.7 (64.8–66.5)	59.8 (58.7–60.9)	76.7 (75.6–77.8)
Some college/technical school	71.4 (70.6–72.2)	66.0 (64.8–67.1)	81.1 (80.0–82.2)
College graduate	75.6 (74.9–76.2)	70.7 (69.8–71.6)	85.0 (84.2–85.8)
Annual household income ($)			
<15,000	58.0 (56.3–59.8)	53.4 (51.3–55.4)	66.9 (63.7–70.0)
15,000–34,999	62.2 (61.1–63.2)	54.5 (53.1–56.0)	75.2 (73.9–76.5)
35,000–49,999	67.5 (65.9–69.0)	60.1 (57.9–62.3)	80.3 (78.7–81.8)
50,000–74,999	72.6 (71.4–73.7)	66.2 (64.5–67.8)	83.8 (82.6–85.0)
≥75,000	76.1 (75.4–76.8)	70.8 (69.9–71.8)	87.1 (86.2–88.0)
Residence location			
Metropolitan¶	72.8 (71.6–73.9)	68.1 (66.5–69.7)	80.2 (78.8–81.4)
Nonmetropolitan	69.4 (68.4–70.4)	64.4 (63.0–65.8)	77.6 (76.3–78.7)
Health insurance status			
Yes	71.2 (70.8–71.7)	66.7 (66.0–67.3)	79.7 (79.0–80.3)
No	40.1 (37.3–43.0)	32.6 (30.5–34.7)	55.7 (48.7–62.5)
Regular health care provider status			
Yes	72.9 (72.4–73.4)	68.1 (67.5–68.8)	81.6 (81.0–82.3)
No	36.1 (34.6–37.7)	32.7 (31.1–34.4)	45.6 (42.2–49.0)

Abbreviations: AI/AN = American Indian/Alaska Native; CI = confidence interval; GED = general educational development certificate.

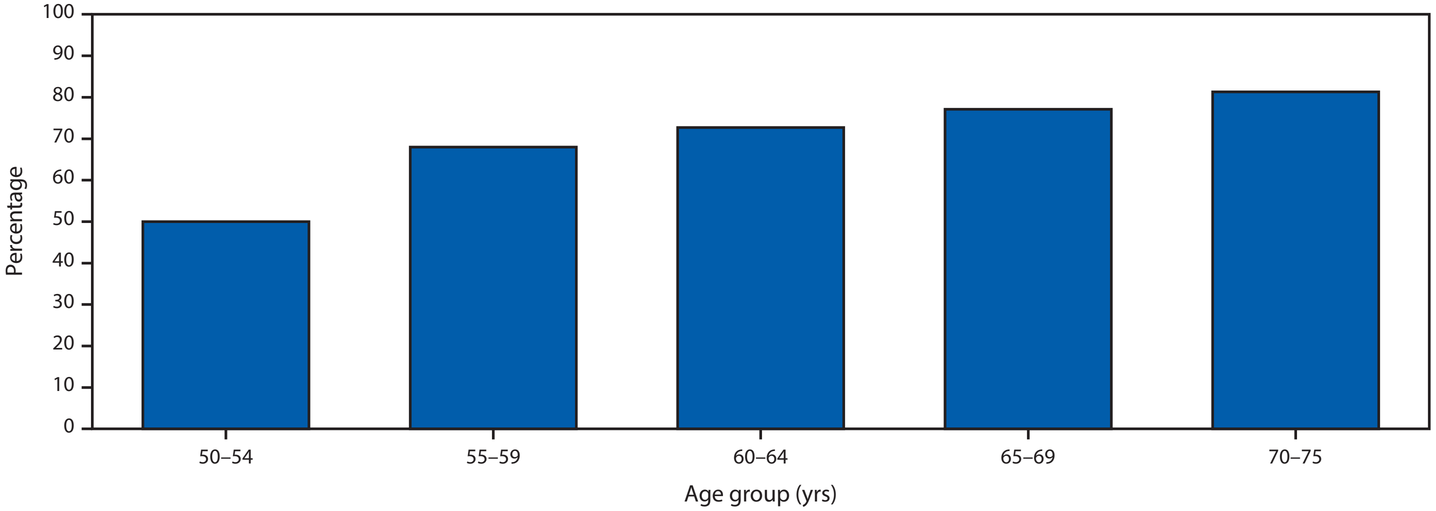
* Blood stool test within the past 1 year, sigmoidoscopy within the past 5 years, and/or colonoscopy within the past 10 years.

† Data were weighted to the age, sex, and racial/ethnic distribution of each state's adult population using intercensal estimates and were age-standardized to the 2018 BRFSS population.

§ All reported data significantly different (p<0.005) by age group (50–64 years compared with 65–75 years).

¶ Metropolitan is defined as in the center city of a metropolitan statistical area (MSA) or outside the center city of an MSA but inside the county containing the center city. Nonmetropolitan is defined as inside a suburban county of the MSA, in an MSA that has no center city, or not in an MSA.

FIGURE. Percentage of respondents aged 50–75 years who reported being up to date* with colorectal cancer screening, by age — Behavioral Risk Factor Surveillance System (BRFSS), United States, 2018†,§



* Blood stool test within the past 1 year, sigmoidoscopy within the past 5 years, and/or colonoscopy within the past 10 years.
† Data were weighted to the age, sex, and racial/ethnic distribution of each state's adult population using intercensal estimates and age-standardized to the 2018 BRFSS population.
§ Test for trend is significantly different (p<0.005).

screening was higher among women (65.4%), those with health insurance (66.7%), those with a regular health care provider (68.1%), and those living in metropolitan areas (68.1%) than it was among men (61.1%), those without health insurance (32.6%), those without a regular health care provider (32.7%), and those living in non-metropolitan areas (64.4%). As education level and annual household income increased, the percentage of respondents who were up to date with CRC testing also increased.

Among older respondents (aged 65–75 years), reported screening prevalence was lowest among those without a regular health care provider (45.6%) and highest among those who reported annual household income ≥$75,000 (87.1%). Similar to respondents aged 50–64 years, the percentage up to date with screening was higher among women, those with health insurance, those with a health care provider, and those living in metropolitan areas and increased with increasing education and annual household income levels. Overall, 81% of respondents aged 50–64 years and 94% of those aged 65–75 years who had never been screened reported having health insurance.

Among states, Massachusetts had the highest percentage of all adults aged 50–75 years and those aged 50–64 years who were up to date with CRC screening (76.5% and 72.1%, respectively), whereas Wyoming had the lowest percentage (57.8% and 51.5%, respectively) (Table 2). Among adults aged 65–75 years, Rhode Island had the highest percentage who were up to date (84.9%) and Wyoming had the lowest (68.5%). The percentage of adults aged 50–64 years who were up to date was ≥70.5% in four states and <60% in 11 states. In contrast, among adults aged 65–75 years the percentage who were up to date exceeded 70.5% in 49 states and the District of Columbia.

Discussion

An estimated 68.8% of adults aged 50–75 years were up to date with CRC screening in 2018; however, screening prevalence among adults aged 50–64 years was 15.9 percentage points lower than that among persons aged 65–75 years. The percentage up to date with CRC screening varied widely across subgroups, with a 54.5 percentage-point difference between the subgroups with the highest (persons aged 65–75 years with reported annual household income ≥$75,000) and the lowest (persons aged 50–64 years without health insurance) screening prevalence. Up to date CRC screening status increased with increasing age, suggesting that many eligible adults are not receiving important screening that can prevent or detect CRC early, when treatment is more effective.

CRC screening has increased steadily among adults over the past twenty years, but screening prevalence has been consistently higher among those aged 65–75 years than among those aged 50–64 years (*7*). Visits to a primary care provider have been associated with participation in CRC screening (*8*–*10*). In one study, among Medicaid enrollees who had reached age 50 years within the study time frame, 75% had at least one primary care visit within 1 year, but only 17% were screened for CRC during that year. The percentage who initiated screening increased as the number of primary care visits within the

TABLE 2. Percentage of respondents aged 50–75 years who reported being up to date* with colorectal cancer screening, by age group and by state — Behavioral Risk Factor Surveillance System (BRFSS), United States, 2018†

State	Age group (yrs)		
	Total (50–75) % (95% CI)	**50–64 % (95% CI)**	**65–75 % (95% CI)**
United States	**68.8 (68.3–69.3)**	**63.3 (62.7–63.9)**	**79.2 (78.5–79.8)**
Alabama	69.5 (67.5–71.5)	64.0 (61.2–66.7)	79.3 (76.4–81.9)
Alaska	60.2 (56.6–63.7)	53.3 (48.6–58.0)	73.1 (68.1–77.6)
Arizona	65.2 (62.7–67.7)	59.6 (56.2–62.9)	76.4 (73.4–79.2)
Arkansas	65.5 (62.9–67.9)	58.8 (55.3–62.1)	77.7 (74.8–80.4)
California	70.9 (69.0–72.7)	64.8 (62.4–67.1)	82.4 (79.5–84.9)
Colorado	68.3 (66.6–70.0)	63.3 (61.1–65.6)	77.3 (75.0–79.5)
Connecticut	74.3 (72.8–75.8)	71.2 (69.2–73.1)	80.6 (78.3–82.7)
Delaware	72.2 (70.0–74.4)	67.5 (64.5–70.4)	80.5 (77.4–83.3)
District of Columbia	72.4 (70.0–74.7)	68.7 (65.4–71.8)	79.9 (76.6–82.8)
Florida	69.0 (66.8–71.2)	61.6 (58.5–64.6)	82.9 (80.2–85.3)
Georgia	68.1 (66.3–69.8)	61.7 (59.3–64.0)	80.8 (78.3–83.0)
Hawaii	74.1 (72.1–76.0)	70.2 (67.5–72.7)	81.0 (78.1–83.6)
Idaho	66.1 (63.0–69.0)	60.3 (56.0–64.3)	75.8 (72.2–79.2)
Illinois	66.7 (64.4–69.0)	62.6 (59.6–65.5)	74.8 (71.2–78.0)
Indiana	67.4 (65.5–69.2)	62.2 (59.7–64.5)	77.3 (74.8–79.7)
Iowa	70.9 (69.4–72.4)	66.5 (64.5–68.5)	78.2 (76.0–80.3)
Kansas	66.8 (65.2–68.3)	61.6 (59.5–63.6)	76.1 (74.0–78.1)
Kentucky	69.3 (66.9–71.6)	64.0 (60.8–67.0)	78.6 (75.2–81.7)
Louisiana	69.0 (66.4–71.5)	64.4 (61.0–67.6)	77.3 (73.3–80.9)
Maine	74.7 (73.1–76.3)	70.4 (68.0–72.6)	81.9 (79.9–83.8)
Maryland	72.1 (70.7–73.4)	67.7 (65.9–69.5)	81.3 (79.5–83.0)
Massachusetts	76.5 (74.5–78.4)	72.1 (69.5–74.6)	84.6 (81.8–87.0)
Michigan	73.8 (72.2–75.4)	69.3 (67.2–71.4)	81.4 (78.9–83.7)
Minnesota	73.3 (72.1–74.4)	68.8 (67.2–70.3)	81.3 (79.5–83.0)
Mississippi	62.3 (60.0–64.6)	55.2 (52.1–58.1)	75.6 (72.4–78.5)
Missouri	69.4 (67.1–71.6)	63.7 (60.6–66.7)	79.8 (77.0–82.4)
Montana	63.3 (60.8–65.8)	56.3 (52.9–59.6)	74.7 (71.1–78.0)
Nebraska	68.2 (66.6–69.8)	63.1 (60.9–65.3)	76.5 (74.4–78.5)
Nevada	60.4 (56.5–64.3)	53.8 (48.9–58.6)	74.2 (68.4–79.3)
New Hampshire	74.8 (72.8–76.6)	71.1 (68.5–73.7)	80.9 (78.3–83.3)
New Jersey	67.4 (63.3–71.3)	59.6 (54.2–64.8)	82.6 (77.0–87.1)
New Mexico	63.9 (61.6–66.2)	56.9 (53.8–59.8)	76.0 (73.1–78.8)
New York	69.5 (68.1–70.9)	64.9 (63.1–66.7)	78.2 (75.8–80.4)
North Carolina	70.9 (68.3–73.4)	64.9 (61.5–68.2)	81.7 (77.8–85.1)
North Dakota	66.9 (64.7–69.0)	61.7 (58.8–64.6)	76.3 (73.3–79.0)
Ohio	66.7 (65.1–68.4)	61.4 (59.2–63.6)	76.3 (74.2–78.4)
Oklahoma	62.0 (59.7–64.4)	54.9 (51.7–58.0)	75.2 (72.0–78.1)
Oregon	71.4 (69.1–73.6)	66.6 (63.5–69.6)	80.1 (76.8–83.0)
Pennsylvania	71.4 (69.1–73.5)	66.9 (64.1–69.7)	78.6 (75.4–81.5)
Rhode Island	75.7 (73.5–77.7)	71.0 (68.1–73.8)	84.9 (82.1–87.4)
South Carolina	69.6 (68.0–71.2)	63.5 (61.3–65.7)	80.5 (78.5–82.3)
South Dakota	68.1 (65.2–70.8)	63.8 (60.0–67.4)	76.0 (71.8–79.7)
Tennessee	68.3 (65.7–70.7)	61.5 (58.0–64.8)	81.2 (77.9–84.1)
Texas	59.6 (56.2–63.0)	54.0 (50.0–58.0)	71.6 (65.8–76.8)
Utah	69.8 (68.0–71.5)	64.2 (61.8–66.5)	80.1 (77.6–82.3)
Vermont	71.2 (69.1–73.1)	66.6 (64.1–69.1)	77.5 (74.5–80.2)
Virginia	69.3 (67.5–71.1)	63.8 (61.4–66.1)	80.0 (77.5–82.2)
Washington	70.7 (69.1–72.1)	65.7 (63.6–67.7)	79.3 (77.3–81.2)
West Virginia	67.2 (65.1–69.3)	62.2 (59.3–65.0)	76.6 (73.7–79.4)
Wisconsin	74.8 (72.4–77.1)	70.0 (66.9–73.0)	82.9 (79.4–85.9)
Wyoming	57.8 (55.4–60.1)	51.5 (48.3–54.6)	68.5 (65.3–71.7)

Abbreviation: CI = confidence interval.

* Blood stool test within the past 1 year, sigmoidoscopy within the past 5 years, and/or colonoscopy within the past 10 years.

† Data were weighted to the age, sex, and racial/ethnic distribution of each state's adult population using intercensal estimates and were age-standardized to the 2018 BRFSS population.

previous year increased (*9*). Having a primary care visit at age 49 years was associated with higher CRC screening initiation at age 50 years, but only 69% of patients saw a provider at age 49 years (*11*). Modeling studies have estimated that initiating screening at age 50 years results in larger decreases in population CRC incidence and mortality than when screening is started at age 55 years, suggesting that delayed or slow uptake of CRC screening might diminish the beneficial effect of screening on the population (*12*).

Although lack of health insurance has been strongly associated with low CRC screening prevalence (*7*), the majority of persons in this study who had never been screened reported having health insurance. Other patient barriers to CRC screening include lack of a provider recommendation, being offered colonoscopy only instead of a choice of tests, lack of awareness of the need to be screened, fear, expense, competing priorities, inability to take time off work if referred for a colonoscopy, and the perceived undesirable nature of screening tests (e.g., sampling and storing fecal matter for stool tests or completing a bowel preparation for colonoscopy) (*13*–*16*). Other factors positively associated with CRC screening include use of other preventive services such as cholesterol testing, receiving influenza vaccination, and mammography or cervical cancer screening. Factors negatively associated with CRC screening include provider workload and increasing distance to facilities that perform colonoscopy. Patient comorbid disease might be positively associated with CRC screening because these patients might see their health care provider more frequently, thus increasing the number of opportunities to offer screening, or negatively associated as patients with multiple comorbid diseases might be sicker and unable to participate in screening (*10*,*11*,*17*,*18*). Less is known about how these factors vary and consequently affect CRC screening by age.

There was substantial state variation in the percentage of adults aged 50–75 years who reported being up to date with CRC screening. Given that adults aged 50–64 years accounted for 60%–70% of the population of adults aged 50–75 years in each state, in general, states with the highest reported CRC screening prevalence for this age group also had the highest overall CRC screening prevalence. Variations in the percentage of the population without health insurance, who are racial/ethnic minorities, or who live in rural or frontier areas, as well as the availability of providers who perform colonoscopy and the number of primary care providers per capita, might also contribute to differences in CRC screening by state.

The findings in this report are subject to at least three limitations. First, CRC screening prevalence might be overestimated because BRFSS does not specify whether tests were done for screening or diagnostic purposes. Second, data are self-reported and not validated by medical record review. Third, response rates were low (49.9%), although the BRFSS weighting procedure accounts for nonresponse, and 7.2% of all respondents did not answer all of the questions and were excluded from the analysis.

CRC screening is a grade A recommendation from the U.S. Preventive Services Task Force, meaning that there is strong evidence it effectively decreases CRC incidence and mortality. A microsimulation modeling study found that increasing CRC screening prevalence to 80% had the potential to decrease CRC incidence and mortality by 22% and 33% respectively by 2030 (*19*). This would result in 277,000 new cases averted and 203,000 deaths prevented by 2030. These results assume that participants start screening at age 50 years and continue periodic screening as recommended through age 75 years.

Whereas 68.8% of the U.S. population aged 50–75 years reports being up to date with CRC screening, screening prevalence is lower among younger adults, especially those aged 50–54 years. To achieve further increases in CRC screening to maximize benefit, specific efforts to increase screening in persons aged 50–64 years are needed. Partnerships between public health and health care systems to implement evidence-based interventions such as those described in The Community Guide (*20*) (e.g., provider reminders, patient reminders, provider assessment and feedback, and reduction of structural barriers) can increase CRC screening even in hard-to-reach populations, as demonstrated by CDC’s Colorectal Cancer Control Program (CRCCP) (https://www.cdc.gov/cancer/crccp/about.htm). The CRCCP funds states, tribes, and universities to partner with primary care clinics to implement evidence-based interventions to increase CRC screening. Over 3 years, recipients partnered with approximately 600 clinics reaching approximately 1 million adults aged

Summary

What is already known about this topic?

Screening for colorectal cancer (CRC), the second leading cause of cancer death among cancers affecting men and women, reduces incidence and mortality. The percentage of persons who report being up to date with CRC screening has increased, but not equally among all populations.

What is added by this report?

In 2018, 68.8% of adults were up to date with CRC screening test use, but screening prevalence was 15.9 percentage points lower among those aged 50–64 years than among those aged 65–75 years.

What are the implications for public health practice?

Specific population-based efforts to increase CRC screening are needed so that screening might start at age 50 years and continue as recommended through age 75 years for maximum benefit.

50–75 years. Most clinics were Federally Qualified Health Centers, which provide health care in underserved areas. Implementation of evidence-based interventions resulted in an average 10 percentage-point increase in screening prevalence in participating clinics. Additional efforts might include educating adults about the benefit of screening well before age 50 years so that screening can start at age 50 years, providing education about insurance coverage for preventive services, providing clear communication about test options, and conducting research to identify and understand barriers and facilitators to CRC screening specific to this younger age group to inform effective interventions to increase screening.

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Investigation of Presumptive HIV Transmission Associated with Hospitalization Using Nucleotide Sequence Analysis — New York, 2017

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Since implementation of Standard Precautions* for the prevention of bloodborne pathogen transmission in 1985, health care–associated transmission of human immunodeficiency virus (HIV) in the United States has been rare (*1*). In October 2017, the New York City Department of Health and Mental Hygiene (NYCDOHMH) and the New York State Department of Health (NYSDOH) were notified by a clinician of a diagnosis of acute HIV infection in a young adult male (patient A) without recognized risk factors (i.e., he was monogamous, had an HIV-negative partner, and had no injection drug use) who had recently been hospitalized for a chronic medical condition. The low risk coupled with the recent hospitalization and medical procedures prompted NYSDOH, NYCDOHMH, and CDC to investigate this case as possible health care–associated transmission of HIV. Among persons with known HIV infection who had hospitalization dates overlapping those of patient A, one person (patient B) had an HIV strain highly similar to patient A's strain by nucleotide sequence analysis. The sequence relatedness, combined with other investigation findings, indicated a likely health care–associated transmission. Nucleotide sequence analysis, which is increasingly used for detecting HIV clusters (i.e., persons with closely related HIV strains) and to inform public health response (*2*,*3*), might also be used to identify possible health care–associated transmission of HIV to someone with health care exposure and no known HIV risk factors (*4*).

Investigation and Results

Medical record review and interview of patient A by NYCDOHMH and NYSDOH revealed a low risk for HIV acquisition (i.e., monogamous sex with an HIV-negative female partner and no injection drug use). In July 2017, upon admission to hospital 1 for complications of chronic kidney disease (99 days before diagnosis of HIV), patient A's HIV antigen/antibody rapid test was negative (Figure 1). In October 2017 (25 days before HIV diagnosis), patient A was readmitted to hospital 1 and started hemodialysis. During this admission, patient A underwent vascular access placement by outpatient interventional radiology at hospital 2, and hemodialysis was begun at hospital 1 the same day (22 days before diagnosis). Patient A was discharged 10 days later (12 days before diagnosis) and began hemodialysis at an outpatient dialysis facility 2 days later (10 days before diagnosis).

Patient A was readmitted to the same hospital 9 days later with a 5-day history of fever, sore throat, nausea, vomiting, and diarrhea. The next day, a diagnosis of acute HIV infection was laboratory-confirmed (i.e., HIV-1 and HIV-2 antibody plus HIV-1 p24 antigen test, a negative HIV-1/2 differentiation antibody test, and a detectable HIV-1 RNA qualitative test). The finding of detectable antigen and HIV-1 virus without detectable antibody indicated acute HIV infection (*5*,*6*) and suggested that infection likely occurred 10–22 days earlier, coinciding with the period from his admission to hospital 1 (day -22) (Figure 1) to beginning outpatient hemodialysis (day -10) (Figure 1). Patient A was referred to HIV care but was not prescribed antiretroviral treatment (ART). Sixty-six days after the HIV diagnosis, patient A died from complications related to chronic kidney disease (Figure 1).

Given the likely period when infection occurred was during patient A's hospitalization, NYSDOH initiated an infection control investigation. A total of 232 patients were identified who had undergone treatment at the same time as patient A on either the hospital 1 inpatient ward or in the hemodialysis unit, or the hospital 2 interventional radiology unit, or the outpatient hemodialysis unit. Using all of the person-identifying information provided by the facilities (i.e., first name, last name, and date of birth) and matching that information against the statewide NYSDOH HIV registry, of the 232, investigators identified 10 persons with previously diagnosed HIV infection. Three were inpatients on the hospital 1 ward with at least one coincident day with patient A's admission, five received outpatient hemodialysis in the same outpatient hemodialysis unit as patient A, and two received inpatient hemodialysis at hospital 1. Nine of the 10 had documented sustained HIV viral suppression with all viral load results <200 HIV RNA copies/mL throughout 2017. One person with HIV infection diagnosed decades earlier (patient B) was identified as having an increasing HIV viral load between spring and fall 2017. Patient B's HIV diagnosis was known to hospital 1, and patient B received antiretroviral drugs while in hospital 1. Patient B subsequently died in November 2017. Comparison with the HIV registry of a list of direct care staff members

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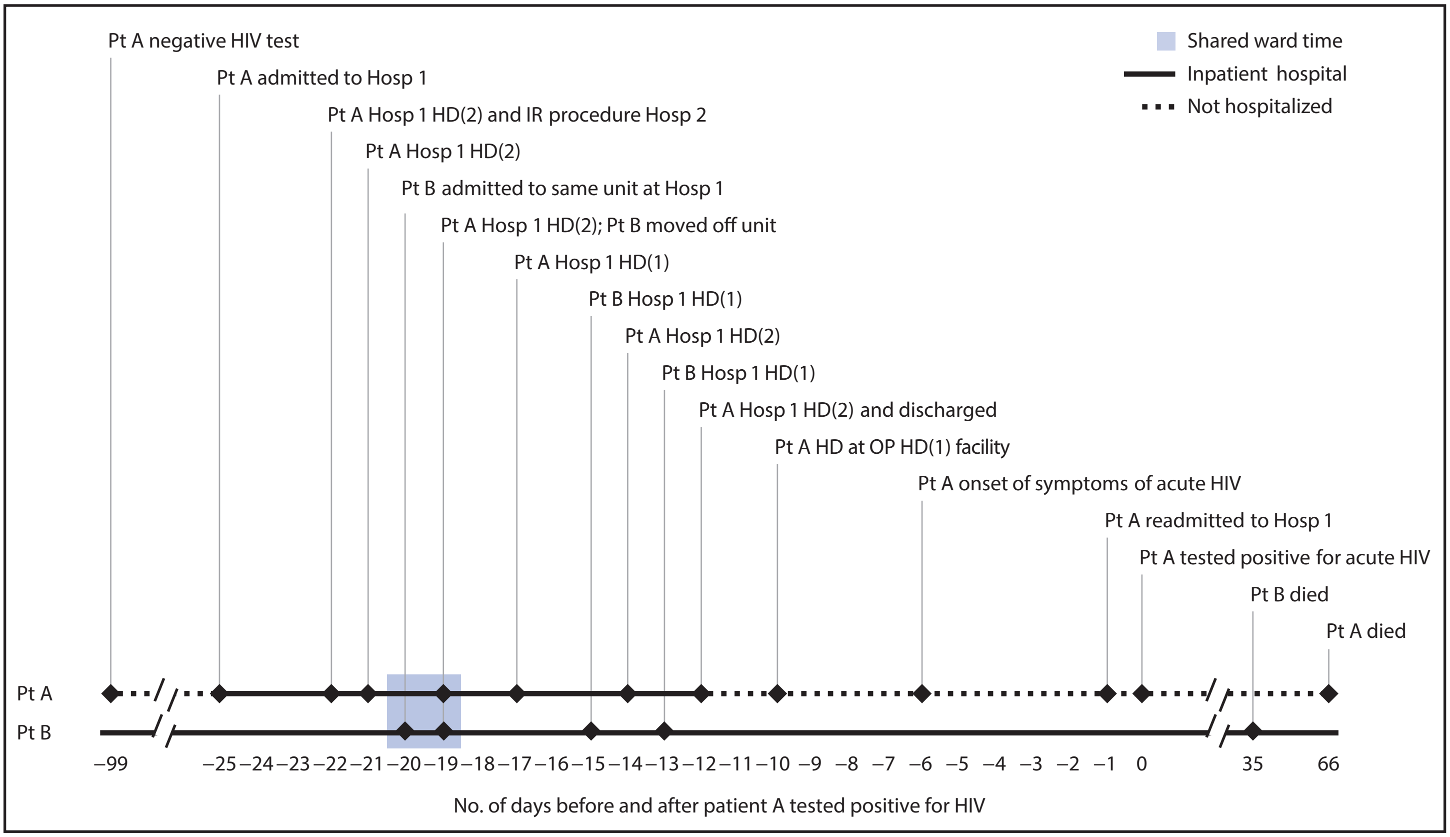
* https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html.

FIGURE 1. Timeline of key events and potential exposures for patients A and B, with likely health care–associated transmission* of human immunodeficiency virus (HIV) — New York, 2017



Abbreviations: HD(1) = hemodialysis machine 1; HD(2) = hemodialysis machine 2; Hosp = hospital; IR = interventional radiology; OP = outpatient; Pt A = patient A; Pt B = patient B.

* Estimated from the period during which acute HIV infection can be detected.

from 1) the hospital 1 ward and hemodialysis unit, 2) the hospital 2 interventional radiology unit, and 3) the outpatient hemodialysis unit yielded no matches.

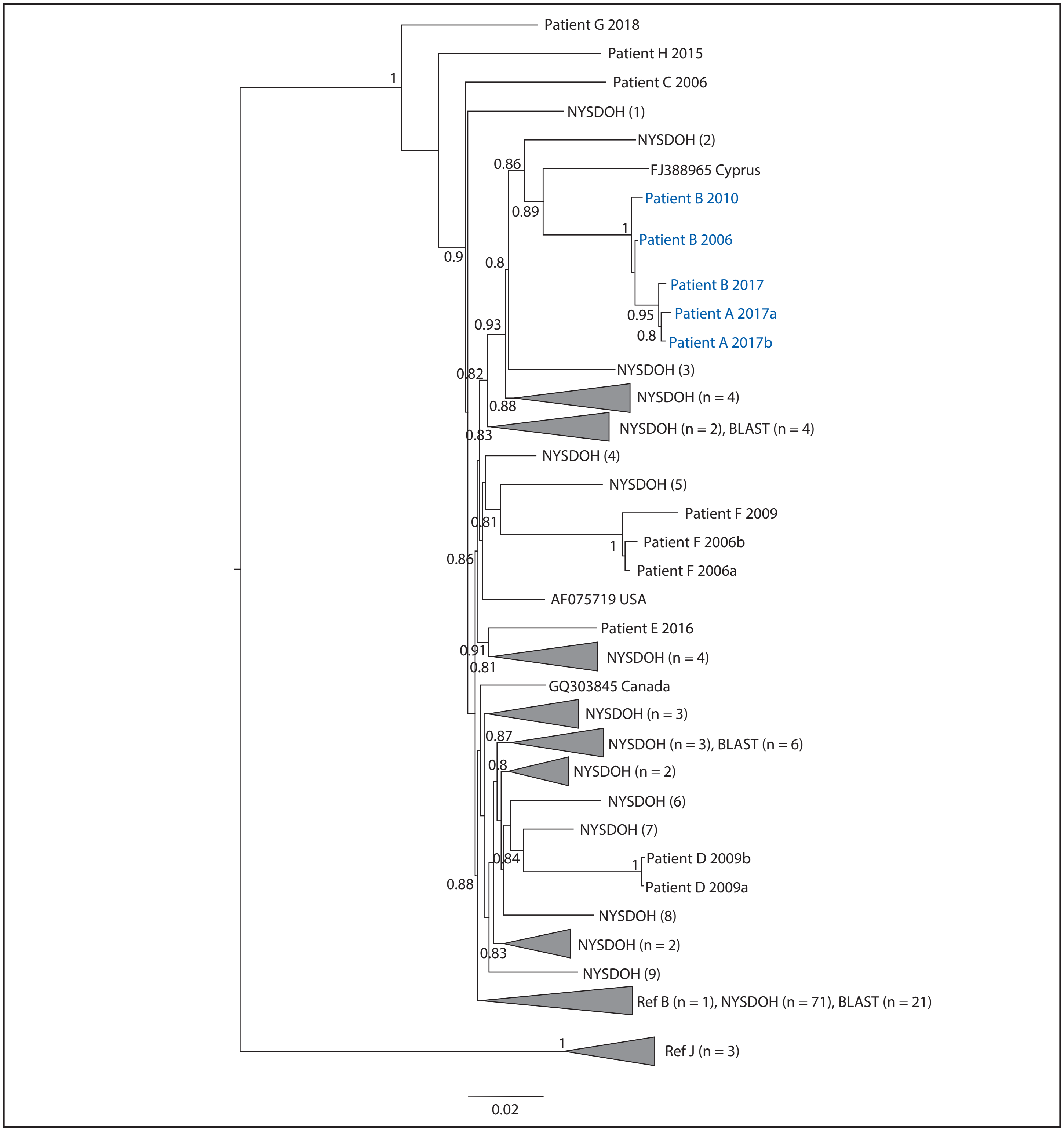
HIV-1 polymerase (*pol*) sequences generated through standard HIV drug resistance testing and reported as part of HIV surveillance were analyzed by NYSDOH to identify molecular relatedness (*2*,*3*). Patient A and eight of the 10 matched persons, including patient B, had at least one HIV *pol* sequence reported to NYSDOH. Patient A had a November 2017 sequence, and patient B had *pol* sequences available from 2006 and 2010. CDC also generated HIV *pol* sequences from remnant specimens from patients A and B collected in 2017 less than 30 days apart (*6*,*7*).

All *pol* sequences from patients A and B showed >98% nucleotide identity, with the patient A and patient B sequences from 2017 sharing over 99% identity. HIV-1 sequences for the other nine patients were not closely related to those from patients A or B, showing <96% nucleotide identity (Figure 2). HIV-1 sequences from samples collected from patients A and B were not closely genetically related to those of the 295,000 NYSDOH sequences, 400,000 *pol* sequences available to CDC, or 800,000 HIV sequences at GenBank (as of May 9, 2019). Phylogenetic analysis of the 15 sequences from all 11 patients using maximum likelihood methods showed that all five sequences from patients A and B clustered together strongly in a monophyletic clade with high confidence and with the three 2017 sequences also forming a tight subcluster with high confidence (Figure 2) (*7*).

Medical record review established that, in October 2017, patients A and B were on the same inpatient ward of hospital 1 for 25 hours (shared ward time) (Figure 1). Patients A and B also received inpatient hemodialysis in the same hemodialysis unit. However, they never received hemodialysis on the same day, nor did patient A follow patient B on the same hemodialysis machine. Patient B had no interventional radiology procedures during the hospitalization.

NYSDOH conducted site visits focused on infection control practices at hospital 1's inpatient ward and hemodialysis unit, hospital 2's interventional radiology unit, and the outpatient hemodialysis unit. Observations made on hospital 1's inpatient ward and hemodialysis unit and hospital 2's interventional radiology unit did not identify any directly observed infection

FIGURE 2. Maximum likelihood phylogeny* of HIV polymerase sequences from patients A and B compared with sequences from other patients and persons in the NYSDOH, CDC, and public databases


Patient G 2018
1
Patient H 2015
Patient C 2006
NYSDOH (1)
NYSDOH (2)
0.86
FJ388965 Cyprus
Patient B 2010
0.89
1
Patient B 2006
0.9
0.8
Patient B 2017
0.95
Patient A 2017a
0.8
Patient A 2017b
0.93
NYSDOH (3)
0.82
NYSDOH (n = 4)
0.88
NYSDOH (n = 2), BLAST (n = 4)
0.83
NYSDOH (4)
NYSDOH (5)
Patient F 2009
0.81
1
Patient F 2006b
0.86
Patient F 2006a
AF075719 USA
Patient E 2016
0.91
NYSDOH (n = 4)
0.81
GQ303845 Canada
NYSDOH (n = 3)
0.87
NYSDOH (n = 3), BLAST (n = 6)
0.8
NYSDOH (n = 2)
NYSDOH (6)
NYSDOH (7)
0.84
1
Patient D 2009b
0.88
Patient D 2009a
NYSDOH (8)
NYSDOH (n = 2)
0.83
NYSDOH (9)
Ref B (n = 1), NYSDOH (n = 71), BLAST (n = 21)
1
Ref J (n = 3)
0.02

Abbreviations: BLAST = Basic Local Alignment Search Tool; HIV = human immunodeficiency virus; NYSDOH = New York State Department of Health.

* Branch length is related to the number of nucleotide substitutions. The more substitutions a sequence has, the longer its branch will be. More evolved sequences will be further from their ancestor. Some nodes are collapsed for better visualization of the whole tree and are depicted as triangles with the number of taxa shown in parentheses. GenBank accession numbers for sequences identified by BLAST analysis are provided when nodes are not collapsed. Confidence values for the branching pattern were assessed with the Shimodaira-Hasegawa (SH) test and are given as probabilities to the left of each branching node. SH values <0.8 are not shown.

Summary

What is already known about this topic?

Health care–associated human immunodeficiency virus (HIV) transmission is uncommon in the United States. Adherence to Standard Precautions can help to prevent health care–related spread of bloodborne pathogens.

What is added by this report?

In this investigation of an acute HIV infection in a patient with chronic kidney disease who received care in a hospital and other health care settings, epidemiologic and nucleotide sequence data support likely health care–associated transmission.

What are the implications for public health practice?

Investigators of acute HIV infection in persons with recent health care exposure and no known risk factors for HIV might consider the possibility of health care–associated transmission and conduct nucleotide sequence analysis.

control lapses, nor were opportunities for transmission identified in the hemodialysis unit or interventional radiology unit. The site visits included interviews with clinical providers and other key personnel. Hospital 1 pharmacy records indicated the only medications prescribed to both patients were intravenous saline flushes and injectable darbepoetin. Patient A did not receive narcotics on the hospital 1 ward. Hospital 1 used 3 mL and 10 mL prefilled, plastic-wrapped, sealed, saline syringes stored in locked clean utility rooms. Darbepoetin (used to treat anemia related to chronic kidney disease) was supplied in patient-specific, prefilled, single-use syringes of various strengths delivered by the hospital A pharmacy to the hemodialysis unit. All other medications were tracked and dispensed via a biometric-controlled and password-controlled automated dispensing system.

Patients A and B had no known social contact, and no specific mechanism for transmission between these patients was confirmed. However, the epidemiologic evidence and high degree of viral genetic relatedness were most compatible with transmission having occurred at hospital 1 during mid-October 2017 (Figure 1).

Public Health Response

NYSDOH recommended a notification of potential exposure to bloodborne pathogens at hospital 1 for any patient who had an injection, infusion, or other invasive procedure while an inpatient on the same unit in hospital 1 or who received inpatient hemodialysis at hospital 1 during the period when both patients A and B were inpatients at hospital 1 (days -20 to -12 before patient A tested positive for HIV) (Figure 1). The hospital mailed letters to the 36 living patients meeting NYSDOH criteria; the letters described potential HIV exposure and offered free testing for HIV as well as for hepatitis B and hepatitis C viruses, although neither patient had hepatitis B or hepatitis C infections. Ongoing surveillance has not identified any additional cases related to this investigation.

Discussion

In this investigation of acute HIV infection with a narrow transmission window, low reported behavioral risks associated with HIV acquisition and the timing and results of HIV testing indicate the infection likely occurred when patient A was hospitalized. Analysis of HIV nucleotide sequence data for persons with overlapping health care exposures helped to identify a possible source of infection.

The inpatient hemodialysis unit, interventional radiology unit, and outpatient hemodialysis unit were excluded as likely transmission locations because of an absence of a source patient or opportunity for transmission. Although no specific infection control lapses were directly observed, the epidemiologic data and nucleotide sequence analyses provide support for possible health care–associated transmission while both patients were hospital 1 inpatients on the same ward. However, the possibility cannot be excluded that transmission involved a person (hospitalized or not) with undiagnosed HIV infection or a person with diagnosed HIV infection without an available HIV-1 *pol* sequence for comparison.

This incident serves as a reminder of the importance of strict adherence to Standard Precautions within health care settings. It also underscores the utility of sequence analysis to identify transmission to persons with no known HIV risk factors through uncommon health care routes that might otherwise go unrecognized.

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Screening for Alcohol Use and Brief Counseling of Adults — 13 States and the District of Columbia, 2017

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Binge drinking* is a leading preventable public health problem. From 2006 to 2010, binge drinking contributed to approximately 49,000 annual deaths resulting from acute conditions (e.g., injuries and violence) (*1*). Binge drinking also increases the risk for adverse health conditions, including some chronic diseases (e.g., breast cancer) and fetal alcohol spectrum disorders (*2*). In 2004, 2013, and again in 2018, for all U.S. adults aged ≥18 years in primary care, the U.S. Preventive Services Task Force (USPSTF) recommended alcohol screening and brief intervention (alcohol SBI) or counseling for persons whose screening indicated drinking in excess of recommended limits or in ways that increase risk for poor health outcomes (*3–5*). However, previous CDC surveillance data indicate that patients report rarely talking to their provider about alcohol use,† and alcohol SBI is traditionally delivered through conversation. CDC recently analyzed 2017 data from the Behavioral Risk Factor Surveillance System (BRFSS) survey's five-question module, which asked adults in 13 states§ and the District of Columbia (DC) about the delivery of alcohol SBI during their most recent checkup in the past 2 years. Overall, 81.4% of adults (age-standardized estimate) reported being asked about alcohol use by a health professional in person or on a form during a checkup in the past 2 years, but only 37.8% reported being asked a question about binge-level alcohol consumption, which is included on USPSTF recommended instruments (*3*). Among module respondents who were asked about alcohol use at a checkup in the past 2 years and reported current binge drinking (past 30 days) at time of survey, only 41.7% were advised about the harms of drinking too much at a checkup in the past 2 years, and only 20.1% were advised to reduce or quit drinking at a checkup in the past 2 years. These findings suggest that missed opportunities remain for health care providers to intervene with patients who report binge drinking. Working to implement alcohol SBI at a systems level, including the provision of the new Healthcare Effectiveness Data Information Set (HEDIS) measure, Unhealthy Alcohol Use Screening and Follow-Up, can improve alcohol SBI's use and benefit in primary care.

BRFSS is an ongoing state-based, random-digit–dialed telephone survey of the noninstitutionalized U.S. adult population aged ≥18 years in all 50 states, DC, and participating U.S. territories. Information is collected on various health conditions, health practices, and risk behaviors, including alcohol use. CDC analyzed 2017 data from the 13 states and DC that administered an optional alcohol SBI module. All BRFSS respondents are asked about the timing of their last routine checkup. Those who had a checkup in the past 2 years were asked alcohol SBI module questions.¶ All module respondents were asked four questions: 1) "You told me earlier that your last routine checkup was [within the past year/within the past 2 years]. At that checkup, were you asked in person or on a form if you drink alcohol?"; 2) "Did the health care provider ask you in person or on a form how much you drink?"; 3) "Did the health care provider specifically ask whether you drank (5 for men/4 for women) or more alcoholic drinks on an occasion?"; and 4) "Were you offered advice about what level of drinking is harmful or risky for your health?" Persons who responded affirmatively to any of the first three questions (alcohol use screening–related) were also asked "Healthcare providers may also advise patients to drink less for various reasons. At your last routine checkup, were you advised to reduce or quit your drinking?" to assess brief counseling. BRFSS assesses current binge drinking by report of drinking four (women) or five (men) or more drinks on one or more occasions during the past 30 days.

Analyses were conducted to account for BRFSS's complex sampling design. Weighted crude and age-standardized prevalence estimates of responses to alcohol SBI module questions were calculated. Estimates were stratified by demographic characteristics and selected drinking patterns. Subanalyses were performed among alcohol SBI module respondents who indicated that they had been asked at least one of three alcohol use screening–related questions in the past 2 years and who reported current binge drinking (in the past 30 days) at time of survey. Only age-standardized estimates are included in the text of this report. Wald chi-squared tests were used to determine significant within-group differences. SUDAAN (version 11.0.3; RTI International) was used for analyses. Only significant differences are reported. The median cooperation rate** for the 14 sites was 71.7%, and median response rate was 43.8%.

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* The National Institute on Alcohol Abuse and Alcoholism defines binge drinking as a pattern of drinking that brings blood alcohol concentration levels to 0.08 g/dL. This typically occurs after four drinks for women and five drinks for men, in approximately 2 hours. https://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.pdf.

† https://www.cdc.gov/vitalsigns/alcohol-screening-counseling/index.html.

§ Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Kansas, Nebraska, Nevada, New Hampshire, Tennessee, and Wisconsin.

¶ The module lead-in question was "Healthcare providers may ask during routine checkups about behaviors like alcohol use, whether you drink or not. We want to know about their questions."

Overall, 81.4% of module respondents indicated being asked by their health care provider about alcohol use in person or by form, 71.8% reported being asked how much they drink, and 37.8% reported being asked about binge drinking (Table 1). The prevalence of module respondents being asked about binge drinking was higher among males (40.1%) and persons with less than a high school diploma (46.2%) than among females (36.0%) and persons with higher levels of education (36.1% [college or technical school] to 37.1% [high school diploma]). A higher percentage of persons with a household income <200% of the federal poverty level were asked about binge drinking than were persons with an income ≥200% of the federal poverty level. Hispanic adults reported being asked about binge drinking more than other racial/ethnic groups. Prevalence of being asked about binge drinking was also higher among module respondents who reported binge drinking (47.3%) than among those who did not (36.1%).

Among module respondents who were asked at least one of the alcohol use screening–related questions at a checkup in the past 2 years and reported current binge drinking (past 30 days) at time of survey, only 41.7% were advised about the harms of drinking too much at a checkup in the past 2 years, and only 20.1% were advised to reduce or quit drinking at a checkup in the past 2 years (Table 2). Among module respondents who were asked at least one of the alcohol use screening–related questions and reported current binge drinking in the past 30 days at time of survey, the prevalence of being advised to reduce drinking at a checkup in the past 2 years was higher among males (24.1%), persons with a disability (28.2%), persons with less than a high school education (38.2%), persons with income <100% of the federal poverty level (37.5%), and those without health insurance coverage (36.2%) than among their counterparts. Prevalence was also higher among Hispanic adults (28.5%) than among white adults (16.8%).

Discussion

In 2017, although 81% of U.S. adults reported being asked by their health care provider about alcohol use, only 38% reported being asked about binge drinking during a checkup in the past 2 years, based on BRFSS data from 13 states and DC. Fewer than half (42%) of module respondents who were asked about alcohol use at a checkup in the past 2 years and reported current binge drinking (past 30 days) at time of survey were advised of harmful drinking levels; almost 80% (four of five persons) received no advice to reduce their drinking (only 20% were advised to reduce their drinking). Previous overall 2014 estimates, using the BRFSS alcohol SBI module from 17 states and DC (*6*), were similar to overall 2017 findings, but not directly comparable because of differences in states repeating the module in 2014 and 2017 (only five states implemented the module both years). State-level trend analysis might occur in future reports. An assessment of binge-level consumption is included on USPSTF-recommended screening tools (*5*).

Screening alone is not effective at reducing binge drinking (*5*). Brief counseling involves feedback based on screening results, a conversation about the dangers of excessive drinking on the patient's health, and development of a plan to reduce drinking if the patient chooses to do so (*5*,*7*). Behavioral counseling is a necessary component of alcohol SBI for reduction in consumption and adherence to drinking limits (*5*). Persons with dependence are to be referred to treatment, but referral might not occur, or patients might not accept the referral, obtain treatment, or respond to treatment (*5*,*7*). The Substance Abuse and Mental Health Services Administration, which has long promoted SBI through grant programs, has a treatment locator†† to assist with the referral process. A 2018 USPSTF review found that "Among adults identified through screening, counseling interventions to reduce unhealthy alcohol use were associated with reductions in alcohol use (by a mean of 1.6 drinks/wk) and in the odds of exceeding recommended drinking limits (by 40%) and heavy use episodes (by 33%) at 6 to 12 months of follow-up….Among pregnant women, counseling interventions were associated with an odds ratio of 2.26 for remaining abstinent from alcohol during pregnancy." (*5*).

The demographic differences in this report might be a consequence of some adults having more contact with health systems, such as those with a disability (*8*) or veterans, which could increase their likelihood of receipt of alcohol SBI. In addition, screening practices might vary in health care systems that have systematically implemented alcohol SBI (e.g., U.S. Department of Veterans Affairs and federally qualified health centers) (*9*).

Health system changes, such as the acceptance of a new 2018 HEDIS measure: Unhealthy Alcohol Use Screening and Follow-Up,§§ might increase the provision of alcohol SBI.

** The cooperation rate is the number of complete and partial complete interviews divided by the number of contacted and eligible respondents.

†† https://findtreatment.samhsa.gov/.

§§ The 2018 Healthcare Effectiveness Data Information Set (HEDIS) measure, Unhealthy Alcohol Use Screening and Follow-Up, was approved as a first-year measure in June 2017 by the National Committee for Quality Assurance as a 2018 HEDIS measure. The testing and submission of this measure into HEDIS was supported by the Substance Abuse and Mental Health Services Administration. The measure uses standardized tools for alcohol SBI and for those who screen positive, the percentage who receive brief counseling or other follow-up within 2 months of the positive screen is documented. https://www.ncqa.org/hedis/reports-and-research/hedis-measure-unhealthy-alcohol-use-screening-and-follow-up/.

TABLE 1. Weighted crude and age-standardized[*] percentages of U.S. adults who reported being asked an alcohol use screening–related question by a health care provider at last routine checkup in the past 2 years — Behavioral Risk Factor Surveillance System, 13 states[†] and the District of Columbia, 2017

	Asked about alcohol use (affirmative to question 1)			Asked how much alcohol (affirmative to question 2)			Asked about binge drinking (affirmative to question 3)		
Characteristic	Sample size	Crude % (95% CI)	Age-standardized % (95% CI)	Sample size	Crude % (95% CI)	Age-standardized % (95% CI)	Sample size	Crude % (95% CI)	Age-standardized % (95% CI)
Total	**65,887**	**79.7 (79.0–80.5)**	**81.4 (80.7–82.1)**	**65,913**	**70.0 (69.2–70.8)**	**71.8 (70.9–72.6)**	**59,215**	**35.7 (34.8–36.6)**	**37.8 (36.9–38.8)**
Sex									
Male	27,725	79.7 (78.6–80.8)	81.0 (79.9–82.1)	27,663	70.1 (68.9–71.3)	71.5 (70.3–72.7)	24,942	37.9 (36.6–39.3)	40.1 (38.6–41.5)
Female	38,114	79.7 (78.7–80.7)	81.8 (80.9–82.7)	38,200	69.9 (68.8–71.0)	72.2 (71.0–73.3)	34,223	33.8 (32.5–35.0)	36.0 (34.6–37.3)
Age group (yrs)									
18–24	3,018	82.3 (79.7–84.7)	—	2,953	65.5 (62.3–68.5)	—	2,750	30.6 (27.7–33.6)	—
25–34	5,122	88.7 (86.9–90.3)	—	5,032	80.9 (78.7–82.9)	—	4,385	48.9 (46.2–51.7)	—
35–44	6,867	86.7 (85.1–88.2)	—	6,785	79.2 (77.1–81.1)	—	5,713	45.7 (43.2–48.3)	—
45–64	25,175	80.6 (79.4–81.8)	—	24,982	71.8 (70.4–73.1)	—	21,977	35.9 (34.4–37.3)	—
≥65	25,705	67.3 (65.7–68.9)	—	26,161	57.4 (55.8–58.9)	—	24,390	24.8 (23.4–26.3)	—
Race/Ethnicity[§]									
White	49,451	79.9 (79.1–80.6)	83.2 (82.5–84.0)	49,605	71.6 (70.8–72.4)	75.2 (74.3–76.1)	43,948	31.6 (30.6–32.5)	35.7 (34.5–36.9)
Black	5,993	76.2 (73.3–78.8)	77.2 (74.7–79.6)	5,967	64.9 (61.8–67.8)	65.7 (62.9–68.4)	5,632	36.5 (33.7–39.5)	36.8 (34.0–39.7)
Hispanic	5,381	83.8 (82.1–85.3)	82.4 (80.7–84.0)	5,307	70.7 (68.6–72.7)	69.7 (67.6–71.8)	4,985	46.6 (44.2–49.0)	46.9 (44.6–49.2)
A/PI	1,158	71.8 (66.4–76.5)	71.7 (66.3–76.6)	1,150	61.4 (55.9–66.5)	61.9 (56.5–67.1)	1,084	31.8 (27.0–37.1)	32.1 (27.3–37.3)
AI/AN	1,271	82.0 (77.6–85.6)	82.8 (78.6–86.3)	1,264	71.7 (66.4–76.4)	73.6 (68.9–77.9)	1,203	42.6 (36.8–48.6)	45.1 (39.8–50.5)
Other race/ Multiracial	1,586	81.7 (77.7–85.2)	82.5 (78.5–85.9)	1,573	74.0 (69.1–78.4)	75.2 (70.8–79.2)	1,417	37.4 (32.0–43.1)	38.4 (33.1–43.9)
Education level									
Less than high school diploma	4,315	77.2 (74.9–79.3)	78.1 (75.6–80.5)	4,279	62.5 (59.7–65.1)	63.6 (60.6–66.6)	4,163	45.4 (42.5–48.3)	46.2 (43.2–49.3)
High school diploma	16,753	76.9 (75.4–78.3)	78.9 (77.4–80.2)	16,824	64.5 (62.8–66.1)	67.3 (65.6–68.9)	15,766	34.0 (32.4–35.7)	37.1 (35.3–39.0)
College or technical school	44,641	81.5 (80.6–82.4)	83.2 (82.4–84.1)	44,630	74.1 (73.1–75.1)	75.8 (74.8–76.8)	39,121	34.0 (32.9–35.1)	36.1 (34.9–37.3)
Federal poverty level, %[¶]									
<100	5,896	79.0 (76.9–81.0)	78.1 (75.9–80.1)	5,850	66.6 (64.1–69.0)	65.9 (63.4–68.3)	5,570	44.0 (41.3–46.7)	44.0 (41.4–46.6)
100–199	12,773	77.5 (75.8–79.1)	80.2 (78.5–81.8)	12,842	66.6 (64.7–68.5)	69.7 (67.7–71.6)	12,049	37.8 (35.8–39.9)	41.1 (38.8–43.5)
≥200	36,949	82.3 (81.3–83.2)	83.9 (82.9–84.9)	36,873	74.5 (73.4–75.6)	75.6 (74.4–76.7)	32,219	33.7 (32.5–34.9)	36.0 (34.6–37.4)
Unknown	10,269	74.2 (72.1–76.3)	76.6 (74.3–78.7)	10,348	61.8 (59.4–64.1)	65.2 (62.5–67.8)	9,377	31.4 (29.2–33.8)	35.8 (33.0–38.8)
Veteran									
Yes	9,017	79.4 (77.3–81.4)	86.6 (84.2–88.7)	9,071	71.2 (68.8–73.5)	78.8 (75.0–82.1)	8,277	37.2 (35.0–39.6)	48.5 (44.4–52.7)
No	56,801	79.8 (79.0–80.5)	80.9 (80.2–81.7)	56,772	69.9 (69.0–70.7)	71.2 (70.3–72.1)	50,876	35.5 (34.5–36.5)	37.1 (36.1–38.2)
Disability status[**]									
Yes	20,225	75.0 (73.7–76.3)	79.4 (78.0–80.8)	20,356	64.6 (63.1–66.0)	69.4 (67.6–71.1)	19,149	34.3 (32.8–35.8)	38.8 (36.9–40.8)
No	45,143	81.6 (80.7–82.4)	82.2 (81.4–83.1)	45,055	72.2 (71.2–73.2)	72.9 (71.9–73.9)	39,614	36.4 (35.3–37.5)	37.6 (36.4–38.7)
Health insurance coverage									
Yes	62,282	79.8 (79.0–80.6)	81.9 (81.2–82.7)	62,369	70.5 (69.6–71.3)	72.8 (71.9–73.7)	55,905	34.9 (34.0–35.8)	37.4 (36.3–38.4)
No	3,416	78.9 (76.2–81.3)	76.9 (74.1–79.5)	3,359	65.7 (62.6–68.6)	62.8 (59.6–65.8)	3,141	45.8 (42.5–49.1)	44.5 (41.2–47.8)
Reported current drinking									
Yes	35,154	85.0 (84.1–85.8)	85.8 (84.9–86.6)	34,990	78.6 (77.5–79.6)	79.2 (78.2–80.2)	30,432	39.4 (38.1–40.7)	40.7 (39.3–42.1)
No	30,076	73.5 (72.3–74.6)	76.4 (75.2–77.6)	30,271	59.8 (58.5–61.1)	63.1 (61.7–64.5)	28,198	31.5 (30.3–32.8)	34.7 (33.3–36.2)
Reported binge drinking[††]									
Yes	7,807	89.3 (87.9–90.6)	88.7 (87.2–90.0)	7,725	83.8 (82.1–85.4)	83.6 (81.8–85.2)	6,741	47.9 (45.2–50.5)	47.3 (44.7–50.0)
No	57,042	78.0 (77.2–78.9)	80.2 (79.4–81.0)	57,162	67.6 (66.7–68.5)	69.8 (68.8–70.8)	51,553	33.5 (32.6–34.5)	36.1 (35.0–37.2)

Abbreviations: AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander; CI = confidence interval; FPL = federal poverty level.

[*] Estimates are age-standardized to the 2000 projected population for the United States.

[†] Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Kansas, Nebraska, Nevada, New Hampshire, Tennessee, and Wisconsin.

[§] Persons in all racial groups were non-Hispanic. Persons who self-identified as Hispanic might have been of any race.

[¶] Poverty categories are based on the ratio of the respondent's annual household income to the appropriate simplified 2016 federal poverty threshold (given family size: number of adults (1–14) in the household and number of children in the household) defined by the U.S. Census Bureau. This ratio is multiplied by 100 to be expressed as a percentage, and federal poverty thresholds were then used to categorize respondents into four FPL categories: 1) <100% of FPL (poor), 2) ≥100%–<200% of FPL (near poor), 3) ≥200% of FPL (not poor), and 4) unknown.

[**] Respondents were asked "Are you deaf or do you have serious difficulty hearing?" (hearing); "Are you blind or do you have serious difficulty seeing, even when wearing glasses?" (vision); "Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?" (cognition); "Do you have serious difficulty walking or climbing stairs?" (mobility); "Do you have difficulty dressing or bathing?" (self-care); and "Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?" (independent living). Respondents were identified as having one of the disability types if they answered "yes" to the relevant question. Persons who responded "yes" to at least one disability question were identified as having any disability. Persons who responded "no" to all six questions were identified as having no disability. Missing responses and respondents who answered "don't know" or who declined to answer were excluded.

[††] Respondents who reported consuming four or more drinks on at least one occasion during the preceding 30 days for women and five or more drinks for men. An occasion is generally defined as 2–3 hours.

TABLE 2. Weighted crude and age-standardized[*] estimates of being advised about harmful or risky drinking levels and to reduce the level of drinking, among U.S. adults who reported being asked an alcohol use screening–related question by a health care provider at last routine checkup in the past 2 years and reported current binge drinking in the past 30 days at time of survey[†] — Behavioral Risk Factor Surveillance System, 13 states[§] and the District of Columbia, 2017

	Adults who were asked an alcohol use screening–related question[¶] and reported current binge drinking in the past 30 days at time of survey					
	Advised about level of drinking harmful/risky to health[¶]			Advised to reduce drinking[¶]		
Characteristic	**Sample size**	**Crude % (95% CI)**	**Age-standardized % (95% CI)**	**Sample size**	**Crude % (95% CI)**	**Age-standardized % (95% CI)**
Total	**6,811**	**41.8 (39.1–44.4)**	**41.7 (39.0–44.4)**	**6,943**	**20.6 (18.6–22.6)**	**20.1 (18.2–22.2)**
Sex						
Male	3,924	47.4 (44.0–50.8)	46.7 (43.2–50.3)	4,004	24.9 (22.3–27.8)	24.1 (21.5–26.8)
Female	2,883	32.7 (28.9–36.7)	33.8 (29.9–37.9)	2,935	13.6 (11.0–16.5)	13.7 (10.9–17.1)
Age group (yrs)						
18–24	655	43.2 (35.6–51.2)	—	665	16.6 (12.2–22.2)	—
25–34	1,187	42.4 (37.1–47.8)	—	1,214	20.8 (16.8–25.4)	—
35–44	1,186	37.6 (31.5–44.0)	—	1,213	17.1 (13.5–21.4)	—
45–64	2,754	42.7 (38.8–46.7)	—	2,812	25.9 (22.4–29.8)	—
≥65	1,029	43.3 (35.2–51.7)	—	1,039	15.7 (10.9–22.3)	—
Race/Ethnicity[**]						
White	5,046	40.9 (38.1–43.8)	40.9 (38.0–43.9)	5,161	16.8 (15.0–18.9)	16.8 (14.9–19.0)
Black	511	43.0 (34.2–52.3)	44.8 (35.7–54.4)	514	20.1 (14.5–27.1)	19.9 (15.0–25.9)
Hispanic	720	42.6 (36.3–49.1)	42.6 (35.2–50.4)	729	28.8 (23.4–34.8)	28.5 (23.4–34.2)
A/PI	105	45.9 (29.3–63.4)	50.5 (33.9–67.1)	104	19.9 (10.7–33.9)[††]	N/A[§§]
AI/AN	161	58.7 (41.6–74.0)	57.8 (44.8–69.7)	163	N/A[§§]	27.9 (17.2–41.9)[††]
Other race/Multiracial	189	35.6 (24.2–49.0)	34.9 (24.4–47.1)	190	23.6 (13.8–37.4)[††]	24.6 (15.1–37.5)[††]
Education level						
Less than high school diploma	340	61.9 (52.5–70.4)	63.8 (54.4–72.3)	343	42.4 (33.2–52.2)	38.2 (30.0–47.1)
High school diploma	1,659	40.4 (35.1–45.8)	40.5 (35.5–45.8)	1,682	22.0 (18.1–26.4)	21.1 (17.6–25.2)
College or technical school	4,806	38.5 (35.7–41.4)	38.4 (35.5–41.4)	4,912	16.0 (14.0–18.2)	16.0 (13.9–18.3)
Federal poverty level, %[¶¶]						
<100	578	44.9 (37.3–52.8)	41.9 (34.9–49.3)	583	36.2 (28.9–44.1)	37.5 (30.8–44.8)
100–199	1,076	47.9 (41.0–54.9)	47.9 (41.1–54.7)	1,088	21.8 (17.2–27.2)	21.5 (17.6–26.1)
≥200	4,532	39.0 (36.0–42.2)	39.4 (36.3–42.7)	4,632	16.5 (14.5–18.8)	16.3 (14.2–18.8)
Unknown	625	42.4 (33.6–51.7)	39.8 (33.3–46.8)	640	21.7 (15.5–29.4)	23.6 (17.6–30.9)
Veteran						
Yes	856	52.1 (45.1–59.1)	53.5 (45.8–61.1)	873	21.3 (16.3–27.4)	21.5 (16.1–28.0)
No	5,951	40.6 (37.8–43.4)	40.8 (37.8–43.9)	6,066	20.5 (18.4–22.7)	19.8 (17.7–22.1)
Disability status[***]						
Yes	1,451	50.1 (44.3–56.0)	49.2 (43.7–54.7)	1,472	28.7 (24.1–33.9)	28.2 (23.6–33.3)
No	5,330	39.5 (36.6–42.5)	39.3 (36.3–42.3)	5,440	18.4 (16.3–20.7)	17.8 (15.8–19.9)
Health insurance coverage						
Yes	6,287	41.6 (38.8–44.4)	41.4 (38.6–44.3)	6,407	19.3 (17.3–21.4)	18.9 (16.9–21.0)
No	507	44.3 (36.9–52.1)	48.6 (40.7–56.6)	518	33.1 (26.1–41.0)	36.2 (28.2–45.1)

Abbreviations: AI/AN = American Indian/Alaska Native; A/PI = Asian/Pacific Islander; CI = confidence interval; FPL = federal poverty level; N/A = not available.

[*] Estimates are age-standardized to the 2000 projected population for the United States.

[†] Respondents who reported consuming four or more drinks on at least one occasion during the preceding 30 days for women and five or more drinks for men. An occasion is generally defined as 2–3 hours.

[§] Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Kansas, Nebraska, Nevada, New Hampshire, Tennessee, and Wisconsin.

[¶] At a checkup in the past 2 years.

[**] Persons in all racial groups were non-Hispanic; persons who self-identified as Hispanic might have been of any race.

[††] Relative standard error = 0.20–0.30.

[§§] Estimate not available because relative standard error >0.30.

[¶¶] Poverty categories are based on the ratio of the respondent's annual household income to the appropriate simplified 2016 federal poverty threshold (given family size: number of adults (1–14) in the household and number of children (≥0) in the household) defined by the U.S. Census Bureau. This ratio is multiplied by 100 to be expressed as a percentage, and federal poverty thresholds were then used to categorize respondents into four FPL categories: 1) <100% of FPL (poor), 2) ≥100% to <200% of FPL (near poor), 3) ≥200% of FPL (not poor), and 4) unknown.

[***] Respondents were asked "Are you deaf or do you have serious difficulty hearing?" (hearing); "Are you blind or do you have serious difficulty seeing, even when wearing glasses?" (vision); "Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?" (cognition); "Do you have serious difficulty walking or climbing stairs?" (mobility); "Do you have difficulty dressing or bathing?" (self-care); and "Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?" (independent living). Respondents were identified as having one of the disability types if they answered "yes" to the relevant question. Persons who responded "yes" to at least one disability question were identified as having any disability. Persons who responded "no" to all six questions were identified as having no disability. Missing responses and respondents who answered "don't know" or who declined to answer were excluded.

Further, federal agencies have promoted broad implementation of alcohol SBI, including CDC's funding initiatives to organizations working on fetal alcohol spectrum disorder,[¶¶] the development of training and implementation resources,[***] and cross-agency, medical, and private sector partnerships.

The 2015–2020 Dietary Guidelines for Americans recommends that if alcohol is consumed, it should be in moderation (up to one drink a day for women, two for men) and only by adults of legal drinking age.[†††] The 2015–2020 Dietary Guidelines for Americans and the National Institute for Alcohol Abuse and Alcoholism also indicate or advise that some persons should not drink alcohol at all, including pregnant women (*10*) or those who might be pregnant or persons who have certain medical conditions or are taking medications that can interact with alcohol (*10*).

The findings in this report are subject to at least four limitations. First, BRFSS data are self-reported, which can result in recall and social desirability biases around the period of recall for the checkup. Second, data in this report were from 14 sites, and thus, these results cannot be used to estimate the prevalence of alcohol SBI across all states and territories. Third, although respondents indicated current binge drinking in response to a BRFSS survey question, whether they reported binge drinking to their health care provider at time of checkup in the past 2 years is unknown; many respondents reported not being asked about binge drinking at a checkup in the past 2 years. Finally, the survey median response rate was only 43.8%, which increases the possibility of response bias.

Binge drinking among U.S. adults continues to be a leading preventable cause of considerable morbidity and mortality (*1*). Alcohol SBI is an effective clinical preventive service for reducing excess alcohol use,[§§§] including binge consumption (*3*,*5*,*7*). This report suggests that alcohol SBI is not being fully implemented as recommended. If alcohol SBI is implemented as recommended by USPSTF (*3*,*5*,*7*) and coupled with population-level interventions recommended by the U.S. Community Preventive Services Task Force for the prevention of excessive drinking (e.g., increasing alcohol taxes and regulating alcohol outlet density[¶¶¶]), an opportunity exists to also reduce alcohol-related morbidity and mortality. Working to implement alcohol SBI at a systems level, including the provision of the new HEDIS measure, Unhealthy Alcohol Use Screening and Follow-Up, can improve alcohol SBI's use and benefit in primary care.

Summary

What is already known about this topic?

Binge drinking increases the risk for adverse health conditions and death. Alcohol screening and brief intervention (SBI), recommended by the U.S. Preventive Services Task Force (USPSTF) for all adults in primary care, is effective in reducing binge drinking.

What is added by this report?

In 2017, 81% of survey respondents were asked by their health care provider about alcohol consumption and 38% about binge drinking at a checkup in the past 2 years. Among those asked about alcohol use and who reported current binge drinking, 80% received no advice to reduce their drinking.

What are the implications for public health practice?

Implementation of alcohol SBI as recommended by USPSTF, coupled with population-level evidence-based interventions, can reduce binge drinking among U.S. adults.

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Notes from the Field

Opioid-Involved Overdose Deaths with Fentanyl or Fentanyl Analogs Detected — 28 States and the District of Columbia, July 2016–December 2018

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Christine L. Mattson, PhD[1]; Mbabazi Kariisa, PhD[1]

Approximately two thirds of the 70,237 U.S. drug overdose deaths reported in 2017 involved opioids (*1*). Since 2013, opioid-involved overdose deaths involving illicitly manufactured fentanyl has sharply increased (*1*,*2*). Fentanyl analogs are structurally similar to fentanyl but vary in potency, are primarily illicitly distributed, and require specific postmortem toxicology testing for detection.* Deaths involving fentanyl analogs, particularly carfentanil, increased in 10 states during 2016–2017 and often co-occurred with fentanyl (*3*). CDC funded 32 states and the District of Columbia (DC) to enhance postmortem toxicology testing and abstract data from death certificates and medical examiner and coroner reports on opioid-involved overdose deaths of unintentional and undetermined intent through the State Unintentional Drug Overdose Reporting System (SUDORS).† Twelve states have collected data since July 2016, and an additional 20 states and DC began collecting data in July 2017 as part of a rapid expansion of SUDORS. This analysis 1) reports rapid changes in opioid-involved overdose deaths with fentanyl§ and fentanyl analogs detected during July 2016–December 2018 among 10 states with available SUDORS data¶ and 2) provides a description of the most recent data on deaths with fentanyl and fentanyl analogs detected among 28 states and DC.** Tracking specific drugs involved in overdose deaths is critical because the risk for overdose for fentanyl and fentanyl analogs varies substantially. There are considerable differences in potency, dose, purity, and co-use patterns among drug products.††

During July 2016–December 2018, a total of 26,104 opioid-involved overdose deaths were reported in the 10 states, including 5,083 (19.5%) for which at least one fentanyl analog was detected. Among these deaths, more than 15 different fentanyl analogs were identified, with more than one analog detected in some deaths; the five most commonly detected were acetylfentanyl (2,178 deaths; 8.3% of opioid-involved overdose deaths), carfentanil (1,724; 6.6%), furanylfentanyl (497; 1.9%), cyclopropylfentanyl (371; 1.4%), and acrylfentanyl (353; 1.4%). Deaths associated with carfentanil, furanylfentanyl, cyclopropylfentanyl, and acrylfentanyl peaked at different times (Figure). Deaths with carfentanil detected peaked twice, in September 2016 (87 deaths) and in April 2017 (235). Deaths with furanylfentanyl detected peaked in January 2017 (100), those with acrylfentanyl detected peaked in February 2017 (122), and those with cyclopropylfentanyl detected peaked in September 2017 (49). Deaths with these four analogs detected decreased to fewer than five each by December 2018. In contrast, acetylfentanyl was increasingly detected in opioid-involved overdose deaths over time, reaching 179 in December 2018. Fentanyl deaths increased by 25.8%, from 3,086 during July–December 2016 to 3,881 during July–December 2018.

During July–December 2018, in 28 states and DC, one or more fentanyl analogs were detected in 2,824 (19.4%) of 14,571 opioid-involved overdose deaths. The most commonly detected analogs during that period were acetylfentanyl (2,363; 16.2% of opioid-involved overdose deaths), a combined group of "fluorofentanyls"§§ (269; 1.8%), butyrylfentanyl (86; 0.6%), methoxyacetylfentanyl (85; 0.6%), and valerylfentanyl (71; 0.5%). Excluding acetylfentanyl, all other fentanyl analogs were detected in <5% of opioid-involved overdose deaths. Fentanyl was detected in 73.9% of opioid-involved overdose deaths.

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* Fentanyl analogs, also known as fentanyl-related substances, are synthetic opioids similar in chemical structure to fentanyl but modified to produce distinct substances. Fentanyl analogs vary in potency, with some more potent than fentanyl (e.g., carfentanil and 3-methylfentanyl) and others with potency similar to or less than that of fentanyl (e.g., acetylfentanyl and furanylfentanyl). https://www.deadiversion.usdoj.gov/drug_chem_info/frs.pdf.

† SUDORS funded 32 states and DC to collect detailed information on toxicology, route of administration, and other risk factors that might be associated with a fatal opioid-involved overdose. SUDORS was part of CDC's Enhanced State Opioid Overdose Surveillance program. SUDORS data are reported to CDC twice yearly, documenting deaths that occur during the first half (January–June) and the second half (July–December) of each calendar year. Data for this report were downloaded on October 30, 2019, and might differ from earlier or future reports because states continually update death data and investigations of suspected drug overdose deaths might involve lengthy investigations. https://www.cdc.gov/drugoverdose/foa/state-opioid-mm.html.

§ A positive test for fentanyl indicates the use of prescription fentanyl, illicitly manufactured fentanyl, or both. Previous reports have established that most overdose deaths testing positive for fentanyl are related to the use of illicitly manufactured fentanyl. https://www.cdc.gov/mmwr/volumes/67/wr/mm6734a2.htm.

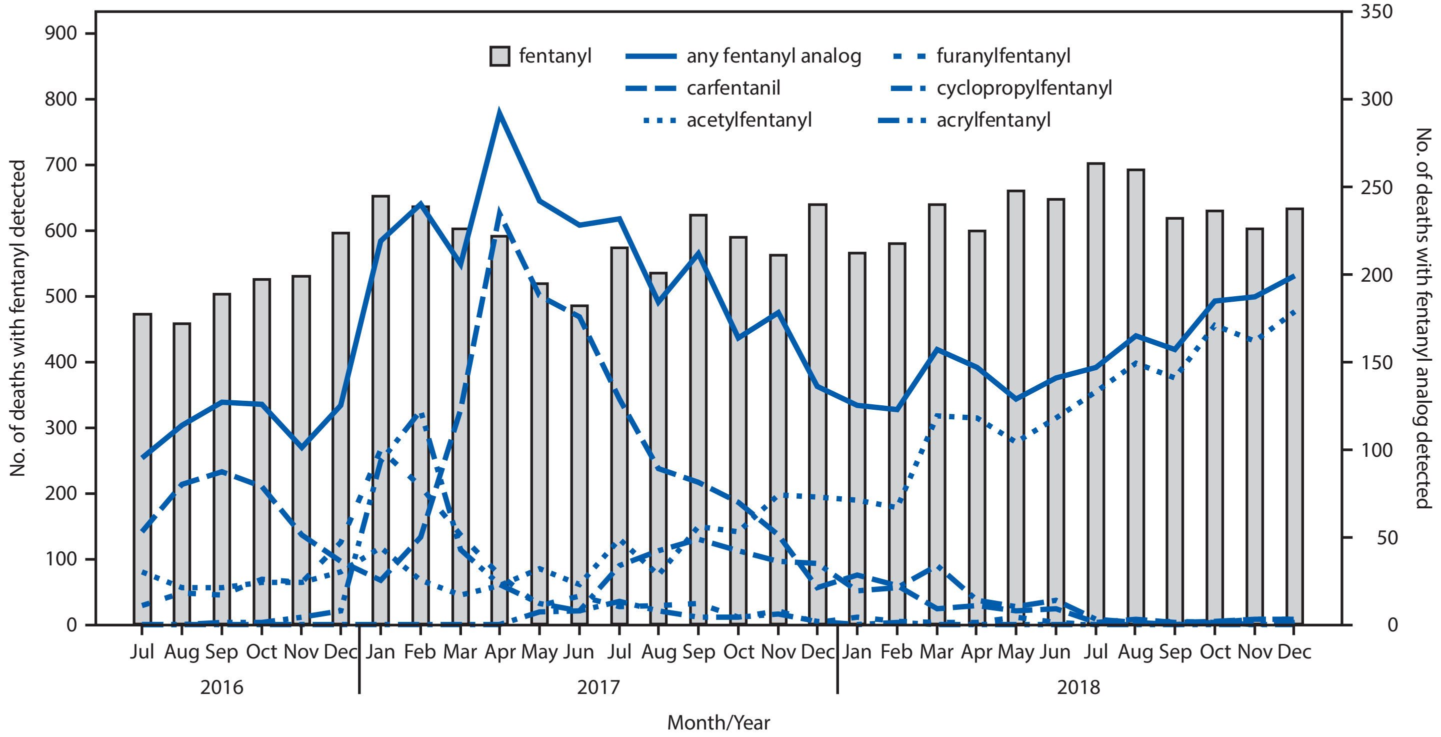
¶ The 10 states included are Kentucky, Maine, Massachusetts, Missouri, New Hampshire, New Mexico, Ohio, Oklahoma, Rhode Island, and Wisconsin. Data were considered validated if data quality checking processes identified no substantial issues with the number of deaths entered (e.g., unable to obtain data from a portion of the state) or quality of data entered on required SUDORS variables.

** The 29 jurisdictions included are Alaska, Connecticut, DC, Delaware, Georgia, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Missouri, Nevada, New Hampshire, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

†† https://www.cdc.gov/drugoverdose/data/fentanyl.html.

§§ Because of the rapid emergence of fentanyl analogs in overdose deaths, fentanyl analogs detected on forensic toxicology laboratory tests were entered into SUDORS using a dropdown menu (preferred) or direct entry into a text field for substances not in the menu. Consequently, certain analogs cannot be distinguished in the current data and have therefore been combined into a group of analogs with "fluoro" appearing in the name: fluorobutyrylfentanyl, 4/para-fluorobutyrylfentanyl, fluoroisobutyrylfentanyl, and 4/para-fluoroisobutyrylfentanyl.

FIGURE. Number of opioid-involved overdose deaths with fentanyl or the five most common fentanyl analogs detected — State Unintentional Drug Overdose Reporting System, 10 states,* July 2016–December 2018



* Kentucky, Maine, Massachusetts, Missouri, New Hampshire, New Mexico, Ohio, Oklahoma, Rhode Island, and Wisconsin.

The declines in overdose deaths with the fentanyl analogs carfentanil, furanylfentanyl, acrylfentanyl, and cyclopropylfentanyl detected contributed to previously reported declines in opioid-involved overdose deaths during 2018 among 25 states, even as deaths with fentanyl detected increased over time (*4*). This suggests a shift away from illicit fentanyl analog distribution to distribution of illicitly manufactured fentanyl.¶¶ Increased acetylfentanyl detection must be interpreted cautiously. Specifically, acetylfentanyl might be a byproduct or contaminant in illicitly manufactured fentanyl products rather than being intentionally distributed*** (*5*). Although fentanyl analog–associated deaths occurred infrequently by the end of 2018, recent reports indicate that fentanyl analogs might reemerge. An Ohio county reported sharp increases in carfentanil-involved deaths in 2019, and Ontario, Canada, issued a 2019 alert reporting increases in carfentanil-involved overdose deaths.††† Timely toxicologic surveillance is critical to accurately detect opioid-involved overdose deaths and, in turn, to inform interventions that could mitigate health consequences of rapid illicit drug market changes.

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Jurisdictions participating in CDC's Enhanced State Opioid Overdose Surveillance (ESOOS) program and providing data in the State Unintentional Drug Overdose Reporting System, including state and jurisdictional health departments, vital registrar offices, and coroner and medical examiner offices; ESOOS team, Division of Overdose Prevention, National Center for Injury Prevention and Control, CDC.

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¶¶ With few exceptions, fentanyl analogs are illicitly distributed because they do not have a legitimate medical use in humans. The three fentanyl analogs with legitimate human medical use are alfentanil, remifentanil, and sufentanil.

*** For nearly all (98.6%) deaths with acetylfentanyl detected during July 2016–December 2018, fentanyl was also detected.

††† http://medicalexaminer.cuyahogacounty.us/pdf_medicalexaminer/en-US/HeroinFentanylReports/011920-HeroinFentanylReport.pdf; https://www.hamilton.ca/public-health/reporting/hamilton-opioid-information-system.

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Notes from the Field

Carbapenemase-Producing *Klebsiella pneumoniae* in a Ventilator-Capable Skilled Nursing Facility — Maricopa County, Arizona, July–November 2018

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On August 2, 2018, Maricopa County (Arizona) Department of Public Health (MCDPH) identified two isolates of carbapenemase-producing *Klebsiella pneumoniae* (KPC-KP), a type of carbapenemase-producing carbapenem-resistant Enterobacteriaceae (CP-CRE), from urine specimens collected on July 17 and July 23 from two residents of a ventilator-capable unit in a skilled nursing facility. CP-CRE are multidrug-resistant organisms typically isolated from persons with a health care exposure (*1*,*2*). Invasive CP-CRE infections are associated with a 50% case-fatality rate (*3*); however, only 31%–63% of asymptomatic carriers are identified with clinical cultures (*4*,*5*) and might serve as sources of CP-CRE transmission. Both residents at this skilled nursing facility had indwelling urinary catheters and urinary tract infections, resided in neighboring rooms, and were dependent on nursing care for their activities of daily living; one resident was mechanically ventilated. The Antibiotic Resistance Laboratory Network Mountain Region laboratory in Austin, Texas, performed pulsed-field gel electrophoresis (PFGE) on the two clinical isolates, which were found to have indistinguishable PFGE patterns, suggesting health care–associated transmission. MCDPH and the Arizona Department of Health Services (ADHS) investigated the cluster to prevent additional cases.

MCDPH recommended that the ventilator-capable unit perform contact screening for KPC-KP colonization by rectal swab and culture. The skilled nursing facility had 192 resident beds, 48 (25%) of which were in the ventilator-capable unit; the average length of stay was 14 days. A case was defined as isolation of KPC-KP with a PFGE pattern indistinguishable from that of the two index patients from any specimen source collected from a resident of the ventilator-capable unit during July–November 2018. Contacts were defined as residents residing for ≥3 days in the same ventilator-capable unit as either of the two index patients. On August 13, among 42 identified contacts, six (14%) declined screening, seven (17%) had been discharged, two (5%) were deceased, and one (2%) had a recent infection with a different carbapenem-resistant organism. Among the remaining 26 (62%) residents who were screened, KPC-KP isolates were detected in five (19%) asymptomatic contacts, three of which had indistinguishable PFGE patterns from those of the two index patients.

On September 6, MCDPH and ADHS conducted a site visit to the facility to observe infection control practices with emphasis on the ventilator-capable unit and recommend targeted control measures. Observations included missed opportunities for hand hygiene before and after physical contact with residents and lapses in aseptic technique during routine sterile procedures. MCDPH recommended housing residents with CP-CRE infection in the same ward or in the same room when possible; implementing contact precautions with room restriction for residents with CP-CRE infection who are mechanically ventilated, have tracheostomies, or have uncontained body fluids; requiring staff members to perform hand hygiene with alcohol-based hand sanitizer before and after physical contact with residents; increasing access to alcohol-based hand sanitizer by installing additional dispensers; and offering trainings to staff members for commonly performed sterile procedures.

On November 5, contacts were rescreened to determine whether recommended control measures were successful in containing the cluster. Twenty-eight residents, none of whom had had KPC-KP isolates detected previously, were identified using the previous criteria for rescreening; nine (32%) declined and 19 (68%) consented, 10 of whom had been screened previously. All 19 (100%) rescreened cultures were negative for KPC-KP. Both index patients were treated with antibiotics for KPC-KP urinary infections, and neither died. Following this investigation, one patient had multiple urine specimens collected in which a KPC-KP isolate was identified, suggesting urinary colonization.

Among 26 screened ventilator-capable unit contacts, the investigation identified three (12%) additional cases of KPC-KP colonization with an isolate that had an indistinguishable PFGE pattern from that of the two index patients, which supported health care–associated transmission. Closer adherence to CDC recommendations that could prevent health care–associated KPC-KP transmission include housing together residents with infection, improving adherence to hand hygiene, using gowns and gloves when interacting with residents who require mechanical ventilation or have tracheostomies, and implementing contact precautions for uncontained body fluids (*6*).

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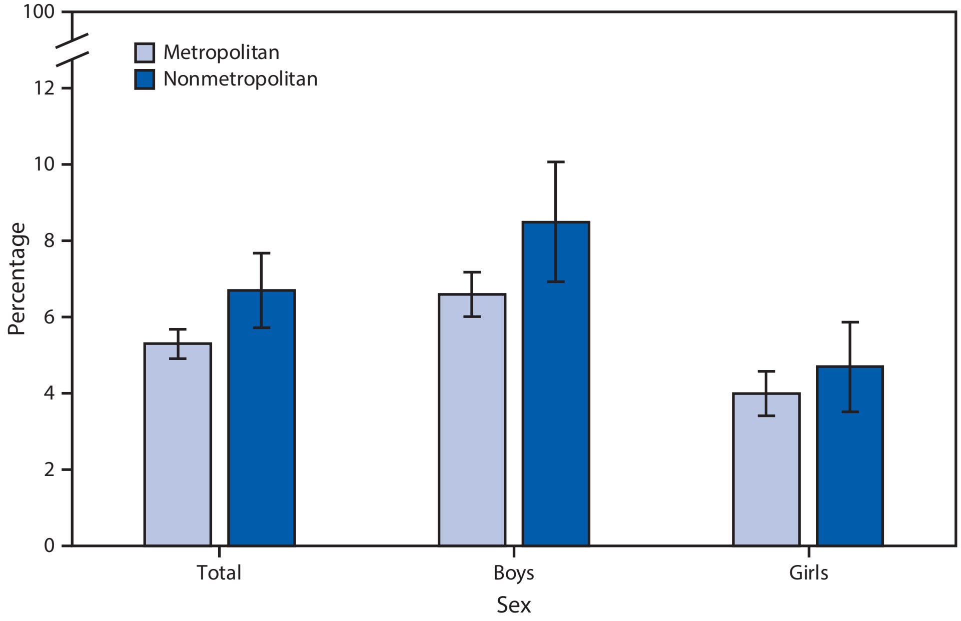
QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage* of Children and Adolescents Aged 4–17 Years with Serious Emotional or Behavioral Difficulties,† by Sex and Urbanization Level§ — National Health Interview Survey, 2016–2018¶



* With 95% confidence intervals indicated by error bars.

† Serious emotional or behavioral difficulties is determined by parents' response of "yes, definite difficulties" or "yes, severe difficulties" to the survey question "Overall, do you think that (child) has difficulties in any of the following areas: emotions, concentration, behavior, or being able to get along with people?"

§ Urbanization level is based on the Office of Management and Budget's February 2013 delineation of metropolitan statistical areas (MSAs), in which each MSA must have at least one urbanized area of ≥50,000 inhabitants. Areas with <50,000 inhabitants are grouped into the nonmetropolitan category.

¶ Estimates are based on household interviews of a sample of the civilian, noninstitutionalized U.S. population and are derived from the National Health Interview Survey's Sample Child component.

During 2016–2018, the percentage of children and adolescents aged 4–17 years with serious emotional or behavioral difficulties was higher among those living in nonmetropolitan areas (6.7%) than among those living in metropolitan areas (5.3%). Among boys, those living in nonmetropolitan areas (8.5%) were more likely to have serious emotional or behavioral difficulties than those living in metropolitan areas (6.6%), but the difference among girls was smaller and not significant. Among children and adolescents living in either metropolitan or nonmetropolitan areas, boys were more likely than girls to have serious emotional or behavioral difficulties.

Source: National Health Interview Survey, 2016–2018. https://www.cdc.gov/nchs/nhis/index.htm.

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