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Contact Lens Health Week — August 20–24, 2018

August 20–24, 2018, marks the fifth annual Contact Lens Health Week. In collaboration with partners from clinical, public health, industry, and regulatory sectors, CDC is promoting healthy contact lens wear and care practices to reduce the risk for eye infections among the approximately 45 million persons in the United States who wear contact lenses. Research after outbreaks of rare but serious eye infections in the United States has indicated that these infections occur most often in contact lens wearers who do not take proper care of their contact lenses, indicating a need to promote safer wear and care (*1*,*2*).

A report in this issue of *MMWR* reviews cases of contact lens–related eye infections associated with sleeping in contact lenses. Other reported habits in addition to sleeping while wearing lenses were swimming while wearing lenses and not replacing lenses and storage cases as often as recommended. Some of the patients sought care in an emergency department where it is more costly to receive care, and some of the infections led to serious adverse health outcomes.

Contact lenses can pose an infection risk, especially if they are not worn and cared for properly. Practicing proper contact lens hygiene is important for keeping contact lens wearers' eyes healthy.

Additional information on Contact Lens Health Week and the proper wear and care of contact lenses is available at https://www.cdc.gov/contactlenses.

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Corneal Infections Associated with Sleeping in Contact Lenses — Six Cases, United States, 2016–2018

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Contact lenses, when worn and cared for properly, are a safe and effective form of vision correction used by an estimated 45 million Americans. However, contact lens wearers are at risk for contact lens–related eye infections, especially when wearers do not practice proper contact lens wear and care habits. These infections, affecting the cornea and known as microbial keratitis (Figure), can lead to serious adverse health outcomes. Because contact lenses are regulated by the Food and Drug Administration (FDA) as medical devices, contact lens–related corneal infections should be reported to FDA as an adverse event. To illustrate their serious health implications, six cases of contact lens–related corneal infection, in which sleeping in lenses was reported as the main risk factor, are presented. Consequences of infection reported among the

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identified cases included the need for frequent administration of antibiotic eye drops, multiple follow-up medical appointments, and permanent eye damage. Health education measures directed toward contact lens wearers should emphasize raising awareness of the risks of sleeping in contact lenses as well as adherence to all recommendations for the wear and care of contact lenses. Additional measures are needed to educate eye care professionals about the need to report contact lens–related corneal infections to MedWatch, the FDA Safety Information and Adverse Event Reporting program (https://www.fda.gov/MedWatch/).

Outside of MedWatch, no formal surveillance for contact lens–related corneal infections exists in the United States; in 2010, an estimated 1 million outpatient and emergency department visits were reported for keratitis of all types (*1*). Despite this high estimated annual prevalence, over an 11-year period, only 1,075 reports of contact lens–related corneal infections were reported to FDA's MedWatch database (*2*). Among the many behaviors that increase the risk for a contact lens–related corneal infection, sleeping in lenses is one of the riskiest and one of the most commonly reported behaviors among adolescent and adult contact lens wearers (*3*). Approximately one third of contact lens wearers report sleeping or napping in their lenses. Sleeping in lenses, whether inadvertently, occasionally, or as part of a prescribed wearing schedule (i.e., extended wear lenses), increases the risk for contact lens–related eye infections six- to eightfold (*4*).

FIGURE. Findings characteristic of a contact lens–related corneal infection*

Photo/Deborah S. Jacobs, Jia Yin

* There is moderate injection, a notable paracentral white opacity with overlying ulceration, and surrounding haze.

In collaboration with the Eye and Contact Lens Association (formerly known as the Contact Lens Association of Ophthalmologists), six cases of contact lens–related corneal infections were identified that were diagnosed in the last 2 years in which sleeping in lenses was reported as a risk factor. Patients were evaluated and treated by practicing ophthalmologists in four major academic medical centers. Clinical presentation, risk factors, treatment, and outcomes were reviewed.

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Case Reports

Case 1. A man aged 34 years with a 17-year history of soft contact lens use was evaluated for left eye redness and blurry vision. He reported sleeping in his contact lenses 3–4 nights per week and swimming with contact lenses. He was treated for bacterial and fungal microbial keratitis for 2 months without improvement. He was evaluated at an academic medical center, where confocal microscopy, a technique that provides serial images of sections through the cornea,* revealed findings suggestive of *Acanthamoeba* keratitis. He was treated with topical polyhexamethylene biguanide and chlorhexidine hourly that was tapered over 6 months. The infection resolved with final spectacle-corrected visual acuity of 20/40, requiring rigid contact lenses for correction to 20/20.

Case 2. A man aged 59 years wore his soft contact lenses overnight during a 2-day hunting trip and developed eye pain on the third day. He used over-the-counter eye drops with minimal response. On initial evaluation, he was diagnosed with a corneal abrasion and treated with a bandage contact lens to promote healing, along with tobramycin/dexamethasone drops prescribed four times daily. With worsening symptoms, his treatment was changed to ofloxacin drops every 2 hours. While in the shower, he wiped his eyes with a towel, then heard a popping sound and felt a painful sensation in his left eye. He was referred to ophthalmology where a large perforated corneal ulcer was diagnosed. An urgent corneal transplant was performed to reestablish the integrity of the eye, and he was treated with broad-spectrum topical antibiotics postoperatively. He recovered useful vision, which improved to 20/25 after cataract surgery 1 year later.

Case 3. A woman aged 34 years was evaluated for 3 days of sharp right eye pain. She routinely slept in her soft contact lenses and used lenses for longer than the recommended monthly replacement schedule. She reported not seeing an eye care professional in years and refilling her contact lens prescription through an online contact lens retailer for at least 5 years. Examination of the right eye revealed a paracentral 1.5 mm infiltrate with surrounding edema and trace anterior chamber cells. Symptoms and signs were improved the day after treatment with topical moxifloxacin. She was instructed to continue moxifloxacin but failed to return for a 1-week follow-up appointment as instructed.

Case 4. A man aged 57 years was evaluated in the emergency department with bilateral reduced vision and eye pain. He reported wearing the same soft contact lenses continuously for approximately 2 weeks. He did not disinfect his lenses daily, slept in them on a regular basis, and did not replace them regularly. On examination, uncorrected visual acuity was light perception in the right eye and hand motion in the left eye. The right eye revealed a central corneal infiltrate and perforation of the cornea. The left eye revealed a central infiltrate with two infiltrates paracentrally and a hypopyon (leukocytes in the anterior chamber of the eye). He received a diagnosis of bilateral bacterial keratitis. Hourly fortified tobramycin and vancomycin drops were required for treatment. A corneal transplant was required to save the right eye. The left eye responded to topical therapy with visual acuity of 20/40 and a central stromal scar.

Case 5. An adolescent female aged 17 years who slept in a soft contact lens purchased without a prescription at a chain store developed a right corneal ulcer; a culture grew *Pseudomonas aeruginosa*. She was started on fortified tobramycin and vancomycin eye drops. Her vision was light perception in the right eye, and the cornea showed a central white dense ulcer, stromal infiltrates, and 0.5 mm hypopyon. On follow-up, her vision had improved to 20/100, pinhole to 20/60. She had a stromal scar with thinning.

Case 6. A man aged 18 years went to the emergency department with a 3-day history of pain, redness, light sensitivity, and tearing in his left eye. He had a 1-year history of wearing decorative soft contact lenses† obtained at a local store without a prescription. He also reported sleeping in his lenses. He was given fluoroquinolone eye drops in the emergency department and subsequently was seen at a local eye clinic, at which time bacterial keratitis was suspected. His vision was 20/25 in the right eye and 20/50 in the left. His left eye showed moderate injection with a central ulcer, edema, and moderate inflammatory reaction. Cultures were obtained, and hourly fortified cephalosporin and aminoglycoside drops were prescribed. Follow-up cultures of the patient's eye, his lenses, and lens case each yielded heavy growth of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. Ten days later his symptoms were better; vision in the left eye had improved to 20/25, but a stromal scar remained.

Discussion

This case series of contact lens–related corneal infections highlights the burden these infections place on contact lens wearers and the serious outcomes associated with them. All of the patients required treatment with antibiotic eye drops, sometimes requiring administration hourly for weeks or months. This finding is consistent with a previous analysis of administrative health care data, which indicated that 76% of keratitis patient encounters were associated with an antimicrobial prescription (*1*). Some of the patients described in this

*https://www.sciencedirect.com/science/article/pii/S0002939409004577?via%3Dihub.

† Decorative or cosmetic lenses are contact lenses that change the look of the eye but might not correct vision. These lenses can be daily disposable, soft daily, soft extended wear, or rigid gas permeable lenses.

series sought care in an emergency department, where it is more costly to receive care (*1*). One patient was lost to follow-up care, suggesting possible complete resolution of disease, but also highlighting the challenge of complying with medical care by patients who might be busy with work, school, or household obligations. Two patients required surgery, and most were left with permanent eye damage or vision loss. Contact lens wearers are younger on average than nonwearers and bear a burden of disease despite being viewed as healthy.

Exam findings in these patients were indicative of active infection including stromal opacification, anterior chamber reaction, and hypopyon. Cultures and diagnostic testing identified various organisms, including *Pseudomonas aeruginosa* and *Acanthamoeba* spp., which might suggest contamination of contact lenses and supplies with tap water.

In three of the six cases, contact lenses were purchased without a valid prescription. In one case, they were decorative lenses, which are lenses that alter the appearance of the eye (e.g., change the color) but might not improve vision. Decorative lenses, similar to lenses that are prescribed for vision correction, are classified as medical devices. The sale of all contact lenses is regulated and should require a valid prescription from an eye care professional. In the United States, contact lens prescriptions are valid for only 1–2 years, depending on the state. Visits with an eye care professional to renew a prescription serve as opportunities for reeducation about safe contact lens wear and care practices.

Sleeping in contact lenses is one of the most frequently reported contact lens risk behaviors and one with a high relative risk for corneal infection (*3*,*4*). Sleeping in lenses has been shown to be a risk factor regardless of lens material and frequency, with even occasional overnight use conferring risk (*5*,*6*). Although some contact lenses are approved by FDA for overnight wear, the increased risk for infection is acknowledged by their classification as a Class 3 medical device, which includes medical devices with the greatest risk for harm such as intraocular lenses and implantable pacemakers. Postmarketing surveillance of drugs and devices is important to the health and safety of the general public. Whereas medical device manufacturers are required to report adverse events, not all adverse events come to the attention of manufacturers (*7*). Patients and physicians can fill this gap.

The findings in this report are subject to at least three limitations. First, cases were chosen by practicing ophthalmologists (who can perform eye surgery), and are likely referred cases of contact lens–related eye infections that are more serious and might require surgical intervention. Therefore, the cases presented here are not necessarily representative of the typical contact lens–related eye infection. Second, as a case series, there are no definitive statements that can be made regarding the association of the reported risk factors and the contact lens–related eye infections. Finally, the patients in the cases reported here might have had an innate susceptibility to developing an eye infection; other contact lens wearers with the same habits might be able to sleep in lenses without adverse outcomes.

Cases of contact lens–related infections, such as those described here, should be reported as adverse events to the FDA Safety Information and Adverse Event Reporting Program at http://www.fda.gov/MedWatch. The Eye and Contact Lens Association is working to promote contact lens safety for patients by encouraging eye care professionals and patients to voluntarily report contact lens–related eye infections to FDA. Using the data accumulated in the adverse event reporting program, contact lens stakeholders (industry, regulatory authorities, eye care professionals, and public health) can work together to determine what improvements can be made to contact lenses, care products, manufacturer guidelines, and labeling. Health education measures directed toward contact lens wearers should emphasize raising awareness of the risks of sleeping in contact lenses as well as adherence to all recommendations for the wear and care of contact lenses.

Summary

What is already known about this topic?

Sleeping in contact lenses increases the risk for contact lens–related eye infections by six- to eightfold. Approximately one third of contact lens wearers report sleeping or napping in their lenses.

What is added by this report?

This report of six contact lens–related corneal infections associated with sleeping in lenses demonstrates that corneal infections might require surgical intervention and result in corneal damage and possible permanent vision loss.

What are the implications for public health practice?

It is important that contact lens wearers follow their eye care professional's recommendations for contact lens use, including use during sleep. Cases of contact lens–related infections should be reported as adverse events to the Food and Drug Administration's MedWatch (http://www.fda.gov/MedWatch).

Conflict of Interest

CDC receives an annual contribution from the Contact Lens Institute to support CDC's Healthy Contact Lens Program. The Contact Lens Institute had no involvement in the drafting or review of this report. No other conflicts of interest were reported.

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Prevalence of Disabilities and Health Care Access by Disability Status and Type Among Adults — United States, 2016

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Persons with disabilities face greater barriers to health care than do those without disabilities (*1*). To identify characteristics of noninstitutionalized adults with six specific disability types (hearing, vision, cognition, mobility, self-care, and independent living),* and to assess disability-specific disparities in health care access, CDC analyzed 2016 Behavioral Risk Factor Surveillance System (BRFSS) data. The prevalences of disability overall and by disability type, and access to health care by disability type, were estimated. Analyses were stratified by three age groups: 18–44 years (young adults), 45–64 years (middle-aged adults), and ≥65 years (older adults). Among young adults, cognitive disability (10.6%) was the most prevalent type. Mobility disability was most prevalent among middle-aged (18.1%) and older adults (26.9%). Generally, disability prevalences were higher among women, American Indians/Alaska Natives (AI/AN), adults with income below the federal poverty level (FPL), and persons in the South U.S. Census region. Disability-specific disparities in health care access were prevalent, particularly among young and middle-aged adults. These data might inform public health programs of the sociodemographic characteristics and disparities in health care access associated with age and specific disability types and guide efforts to improve access to care for persons with disabilities.

BRFSS is an ongoing state-based, random-digit–dialed telephone survey of noninstitutionalized U.S. adults aged ≥18 years.† The median survey response rate among the 50 states and the District of Columbia in 2016 was 47.0%.§ The 2016 BRFSS survey included questions about six disability types (hearing, vision, cognition, mobility, self-care, and 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. Four health care access measures (i.e., health insurance coverage, having a usual health care provider, receipt of a routine check-up within the past year, and having an unmet health care need because of cost) were included.** Prevalences (with 95% confidence intervals) were calculated for any disability and disability type by sex, race/ethnicity,†† FPL,§§ and U.S. Census region, and for health care access measures, by disability status and types. All analyses were stratified by age group (18–44, 45–64, and ≥65 years). Analyses accounted for the complex sampling design.

One in four noninstitutionalized U.S. adults (25.7%, representing an estimated 61.4 million persons) reported any disability (Table 1) (Figure). Mobility was the most prevalent disability type (13.7%), followed by cognition (10.8%), independent living (6.8%), hearing (5.9%), vision (4.6%), and self-care (3.7%). Prevalences of any disability, hearing, mobility, and independent living disabilities were higher among older adults, whereas prevalence of cognitive disability was highest

* Based on Section 4302 of the Affordable Care Act, the U.S. Department of Health and Human Services issued data collection standard guidance to include a standard set of disability identifiers in all national population health surveys. https://aspe.hhs.gov/datacncl/standards/aca/4302/index.pdf.

† https://www.cdc.gov/brfss/.

§ Response rates for BRFSS are calculated using the standard set by the American Association for Public Opinion Research response rate formula 4 (http://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf). The response rate is the number of respondents who completed the survey as a proportion of all eligible and likely eligible persons. https://www.cdc.gov/brfss/annual_data/2016/pdf/2016-sdqr.pdf.

¶ The interviewer first reads a preamble to the telephone survey respondent ("The following questions are about health problems or impairments you may have. Some people who are deaf or have serious difficulty hearing may or may not use equipment to communicate by phone."), followed by the six specific disability type questions. The questions are "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).

** Health insurance coverage was ascertained by a "yes" response to the question "Do you have any kind of health care coverage, including health insurance, prepaid plans such as health maintenance organizations, government plans such as Medicare, or Indian Health Service?" Having a usual health care provider was assessed first with the question "Do you have one person you think of as your personal doctor or health care provider?" Persons who responded "no" were asked the question "Is there more than one, or is there no person who you think of as your personal doctor or health care provider?" Responses for having a usual health care provider were dichotomized into one or more and none. Receipt of a routine check-up was assessed with the question "About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition." Responses for having had a routine check-up within the preceding 12 months were dichotomized into within the past year or not within the past year. Unmet health care need because of cost was ascertained by a "yes" response to the question "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?"

†† 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 2015 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%–<200% of FPL (near poor), 3) ≥200% of FPL (not poor), and 4) unknown.

TABLE 1. Weighted unadjusted prevalence estimates of disability among adults, by type of disability* and selected characteristics — Behavioral Risk Factor Surveillance System, 2016

Characteristic	No. of respondents†,§	Type of disability¶						
		Hearing	Vision	Cognition	Mobility	Self-care	Independent living	Any
		% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Total (18–44 yrs)	**121,674**	**2.0 (1.8–2.1)**	**2.7 (2.5–2.9)**	**10.6 (10.3–10.9)**	**4.8 (4.6–5.0)**	**1.7 (1.5–1.8)**	**4.5 (4.3–4.7)**	**16.6 (16.2–16.9)**
Sex								
Men	58,295	2.4 (2.2–2.6)	2.4 (2.2–2.6)	9.5 (9.0–9.9)	4.0 (3.8–4.3)	1.6 (1.4–1.8)	3.5 (3.3–3.8)	15.2 (14.7–15.7)
Women	63,356	1.6 (1.4–1.7)	3.0 (2.8–3.3)	11.7 (11.3–12.2)	5.6 (5.3–5.9)	1.7 (1.6–1.9)	5.5 (5.2–5.8)	17.9 (17.4–18.5)
Race/Ethnicity**								
White	80,322	2.0 (1.9–2.2)	2.2 (2.0–2.4)	10.9 (10.5–11.2)	4.5 (4.3–4.8)	1.6 (1.4–1.7)	4.8 (4.5–5.0)	16.3 (16.2–16.9)
Black	11,837	1.4 (1.2–1.7)	3.6 (3.1–4.2)	11.1 (10.2–12.0)	6.6 (6.0–7.4)	2.1 (1.7–2.6)	4.7 (4.1–5.5)	18.1 (17.0–19.3)
Hispanic	16,297	2.1 (1.8–2.5)	3.7 (3.3–4.3)	10.3 (9.5–11.1)	5.0 (4.5–5.5)	1.6 (1.4–1.9)	4.0 (3.5–4.5)	17.6 (16.6–18.5)
AI/AN	2,255	3.5 (2.4–5.0)	3.8 (2.8–5.2)	18.8 (15.9–22.1)	8.6 (6.8–10.9)	2.3 (1.5–3.7)††	8.4 (6.6–10.8)	27.7 (24.4–31.2)
Asian	4,754	0.8 (0.5–1.3)††	1.3 (0.9–1.8)	4.5 (3.7–5.6)	1.1 (0.7–1.6)	N/A§§	1.1 (0.8–1.6)	7.2 (6.2–8.4)
Other race/Multiracial	4,508	3.7 (2.8–4.9)	3.4 (2.7–4.3)	16.0 (14.1–18.1)	7.5 (6.3–9.1)	3.0 (2.2–4.1)	8.4 (6.9–10.1)	24.9 (22.7–27.3)
Federal poverty level (FPL)¶¶								
<100% of FPL (poor)	18,824	3.3 (2.9–3.7)	5.3 (4.8–5.8)	18.2 (17.3–19.1)	10.4 (9.7–11.1)	3.5 (3.1–3.9)	9.4 (8.7–10.1)	27.8 (26.7–28.9)
≥100%–<200% of FPL (near poor)	24,116	2.1 (1.8–2.3)	3.2 (2.8–3.6)	12.8 (12.1–13.6)	5.7 (5.2–6.2)	2.0 (1.7–2.3)	5.8 (5.3–6.3)	20.1 (19.2–21.0)
≥200% of FPL (not poor)	59,273	1.3 (1.2–1.4)	1.3 (1.1–1.5)	5.5 (5.2–5.9)	2.0 (1.9–2.3)	0.7 (0.6–0.8)	1.7 (1.5–1.9)	9.3 (8.9–9.7)
Unknown	19,461	2.3 (2.0–2.7)	3.2 (2.8–3.7)	13.4 (12.6–14.2)	5.4 (4.9–5.9)	2.0 (1.7–2.3)	5.5 (5.0–6.0)	19.9 (19.0–20.9)
U.S. Census region								
Northeast	23,348	1.4 (1.2–1.7)	2.4 (2.1–2.7)	9.5 (8.9–10.2)	4.2 (3.8–4.6)	1.5 (1.3–1.8)	4.4 (3.9–4.8)	15.3 (14.5–16.1)
Midwest	29,963	2.0 (1.7–2.2)	2.1 (1.9–2.4)	10.9 (10.3–11.5)	4.9 (4.5–5.3)	1.8 (1.5–2.0)	4.6 (4.2–5.0)	16.4 (15.7–17.1)
South	39,745	2.2 (2.0–2.5)	3.4 (3.1–3.8)	11.5 (11.0–12.1)	5.6 (5.3–6.0)	1.8 (1.6–2.0)	4.8 (4.5–5.2)	18.1 (17.5–18.8)
West	28,618	1.9 (1.7–2.2)	2.3 (2.1–2.7)	9.5 (8.9–10.1)	3.9 (3.5–4.3)	1.4 (1.2–1.7)	4.1 (3.7–4.5)	15.2 (14.5–15.9)
Total (45–64 yrs)	**174,413**	**5.9 (5.6–6.1)**	**6.1 (5.9–6.4)**	**11.9 (11.6–12.2)**	**18.1 (17.7–18.5)**	**5.5 (5.3–5.7)**	**8.2 (7.9–8.5)**	**28.6 (28.2–29.1)**
Sex								
Men	76,489	7.6 (7.3–8.0)	5.8 (5.4–6.2)	10.2 (9.8–10.6)	16.1 (15.5–16.6)	5.5 (5.2–5.9)	6.9 (6.6–7.4)	27.1 (26.5–27.7)
Women	97,910	4.2 (3.9–4.4)	6.4 (6.1–6.8)	13.5 (13.0–13.9)	20.1 (19.5–20.6)	5.4 (5.2–5.8)	9.4 (9.0–9.8)	30.1 (29.5–30.7)
Race/Ethnicity**								
White	135,958	5.9 (5.7–6.2)	4.6 (4.4–4.8)	10.8 (10.5–11.1)	16.2 (15.9–16.6)	4.7 (4.5–4.9)	7.4 (7.1–7.6)	26.2 (25.8–26.7)
Black	14,851	5.0 (4.4–5.8)	9.6 (8.7–10.6)	14.5 (13.5–15.6)	25.3 (24.0–26.6)	7.9 (7.1–8.7)	10.5 (9.7–11.4)	35.5 (34.1–37.0)
Hispanic	10,400	6.0 (5.1–7.0)	11.2 (10.0–12.5)	14.4 (13.2–15.7)	21.8 (20.4–23.4)	7.4 (6.5–8.4)	9.5 (8.6–10.6)	35.5 (33.7–37.2)
AI/AN	2,910	14.3 (11.7–17.2)	11.5 (9.7–13.6)	23.9 (20.7–27.3)	33.3 (29.9–36.9)	10.3 (8.4–12.7)	16.6 (14.0–19.5)	49.2 (45.5–52.8)
Asian	2,836	2.9 (1.9–4.4)††	N/A§§	6.4 (4.6–8.8)	7.6 (5.7–10.2)	N/A§§	4.4 (2.7–7.1)††	15.3 (12.5–18.4)
Other race/Multiracial	4,216	8.8 (7.2–10.8)	9.3 (7.5–11.6)	20.4 (16.6–24.9)	28.6 (24.7–32.9)	11.3 (7.9–16.0)	17.1 (13.4–21.7)	41.6 (37.6–45.6)
Federal poverty level (FPL)¶¶								
<100% of FPL (poor)	16,128	9.0 (8.2–9.8)	16.4 (15.2–17.6)	30.0 (28.5–31.5)	42.3 (40.7–44.0)	15.7 (14.5–17.0)	22.8 (21.4–24.2)	57.9 (56.3–59.6)
≥100%–<200% of FPL (near poor)	30,911	8.7 (8.0–9.4)	9.9 (9.1–10.8)	18.5 (17.6–19.3)	29.1 (28.1–30.1)	9.1 (8.5–9.7)	13.3 (12.6–14.0)	44.5 (43.3–45.7)
≥200% of FPL (not poor)	102,245	4.1 (3.8–4.3)	2.4 (2.2–2.6)	5.4 (5.1–5.7)	8.9 (8.5–9.3)	2.1 (1.9–2.3)	3.2 (3.0–3.5)	16.6 (16.1–17.1)
Unknown	25,129	6.8 (6.3–7.4)	7.5 (6.8–8.2)	14.3 (13.4–15.1)	20.9 (19.9–21.8)	5.9 (5.4–6.5)	9.6 (9.0–10.3)	31.9 (30.8–33.1)
U.S. Census region								
Northeast	37,594	4.8 (4.4–5.3)	4.9 (4.5–5.4)	10.2 (9.6–10.8)	16.0 (15.2–16.8)	4.6 (4.2–5.1)	7.3 (6.8–7.8)	25.6 (24.7–26.5)
Midwest	42,247	5.9 (5.6–6.3)	5.1 (4.7–5.5)	10.9 (10.4–11.5)	16.9 (16.3–17.6)	5.0 (4.6–5.4)	7.3 (6.9–7.7)	27.0 (26.3–27.8)
South	57,726	6.7 (6.3–7.2)	7.6 (7.1–8.1)	13.7 (13.1–14.3)	21.5 (20.9–22.2)	6.6 (6.2–7.1)	9.6 (9.1–10.1)	32.7 (31.9–33.5)
West	36,846	5.2 (4.7–5.6)	5.6 (5.1–6.2)	11.1 (10.4–11.8)	15.3 (14.5–16.1)	4.8 (4.3–5.3)	7.4 (6.8–8.1)	25.8 (24.9–26.8)

See table footnotes on the next page.

among middle-aged (11.9%) and young adults (10.6%), and lowest among older adults (9.5%). Among middle-aged and older adults, the prevalences of vision disability (6.1% and 6.6%, respectively) and self-care disability (5.5% in both) were similar. Among all age groups, the prevalences of any disability and of each type were higher among women than among men, with the exceptions of hearing and self-care. The reported prevalence of hearing disability was higher among men than among women for all age groups (young adults: men = 2.4% versus women = 1.6%; middle-aged adults: 7.6% versus 4.2%; and older adults: 19.4% versus 11.3%), and the reported prevalences of self-care disability were approximately the same. Generally, among young and middle-aged adults, the highest prevalences of any disability and of each type were reported among AI/AN and persons in the "other race/multiracial" group, whereas the lowest prevalences were reported among Asians. Among older adults, approximately half of AI/AN (54.9%), Hispanics (50.5%), and persons in the "other race/multiracial" group (49.9%) reported any disability. Within each age group, the prevalences of any and each

TABLE 1. (*Continued*) Weighted unadjusted prevalence estimates of disability among adults, by type of disability* and selected characteristics — Behavioral Risk Factor Surveillance System, 2016

Characteristic	No. of respondents†,§	Type of disability¶ Hearing % (95% CI)	Vision % (95% CI)	Cognition % (95% CI)	Mobility % (95% CI)	Self-care % (95% CI)	Independent living % (95% CI)	Any % (95% CI)
Total (≥65 yrs)	**162,724**	**14.9 (14.5–15.3)**	**6.6 (6.4–6.9)**	**9.5 (9.2–9.9)**	**26.9 (26.5–27.4)**	**5.5 (5.2–5.8)**	**9.8 (9.4–10.1)**	**41.7 (41.1–42.2)**
Sex								
Men	64,224	19.4 (18.7–20.1)	6.2 (5.8–6.7)	8.8 (8.3–9.4)	22.8 (22.1–23.5)	5.1 (4.7–5.5)	6.5 (6.1–7.0)	40.9 (40.0–41.7)
Women	98,488	11.3 (10.8–11.7)	7.0 (6.6–7.3)	10.1 (9.7–10.6)	30.3 (29.6–30.9)	5.8 (5.4–6.2)	12.3 (11.8–12.8)	42.3 (41.6–43.0)
Race/Ethnicity**								
White	138,816	15.5 (15.1–15.9)	5.9 (5.6–6.2)	8.4 (8.1–8.7)	25.5 (25.0–25.9)	4.6 (4.3–4.8)	8.8 (8.5–9.1)	40.2 (39.6–40.7)
Black	10,022	10.2 (8.7–11.9)	8.8 (7.8–10.0)	12.3 (11.0–13.7)	33.6 (31.6–35.6)	8.4 (7.3–9.7)	13.3 (11.9–14.8)	46.7 (44.6–48.8)
Hispanic	4,583	14.0 (12.1–16.3)	10.8 (9.2–12.5)	15.5 (13.4–17.7)	33.3 (30.7–36.1)	9.4 (7.8–11.3)	15.4 (13.4–17.6)	50.5 (47.7–53.4)
AI/AN	1,702	25.3 (21.2–29.9)	8.9 (6.9–11.5)	17.0 (13.8–20.7)	37.5 (33.0–42.2)	10.0 (7.6–13.1)	14.9 (12.1–18.2)	54.9 (50.0–59.8)
Asian	1,739	9.6 (5.7–15.7)††	N/A§§	9.4 (5.6–15.4)††	22.5 (16.7–29.6)	N/A§§	5.1 (3.0–8.6)††	34.8 (28.2–42.1)
Other race/Multiracial	3,073	17.9 (14.7–21.6)	8.5 (6.6–11.0)	14.4 (11.9–17.3)	34.6 (30.9–38.6)	8.8 (6.6–11.5)	12.9 (10.1–16.4)	49.9 (45.8–54.0)
Federal poverty level (FPL)¶¶								
<100% of FPL (poor)	7,962	18.1 (16.2–20.1)	13.7 (12.1–15.6)	18.2 (16.5–20.0)	43.5 (41.1–45.9)	12.0 (10.6–13.7)	19.5 (17.8–21.4)	59.6 (57.1–62.0)
≥100%–<200% of FPL (near poor)	41,124	17.4 (16.6–18.3)	9.3 (8.7–10.0)	13.2 (12.4–14.0)	36.4 (35.3–37.5)	7.8 (7.1–8.5)	13.7 (12.9–14.5)	53.1 (52.0–54.1)
≥200% of FPL (not poor)	79,774	12.8 (12.2–13.3)	4.1 (3.7–4.4)	5.5 (5.1–5.9)	18.7 (18.0–19.3)	3.0 (2.7–3.3)	5.1 (4.8–5.5)	31.9 (31.1–32.6)
Unknown	33,864	15.5 (14.7–16.4)	6.8 (6.3–7.3)	11.2 (10.5–12.0)	28.4 (27.4–29.5)	6.0 (5.4–6.8)	12.0 (11.2–12.8)	43.7 (42.5–44.8)
U.S. Census region								
Northeast	31,466	12.9 (12.1–13.8)	5.7 (5.1–6.3)	8.2 (7.5–9.0)	26.2 (25.1–27.3)	5.2 (4.6–5.9)	9.2 (8.5–10.0)	39.3 (38.1–40.5)
Midwest	39,575	15.0 (14.4–15.6)	5.9 (5.5–6.4)	8.2 (7.8–8.7)	25.2 (24.5–26.0)	4.7 (4.3–5.1)	9.0 (8.5–9.5)	40.3 (39.4–41.1)
South	56,913	15.8 (15.1–16.5)	7.8 (7.3–8.3)	11.1 (10.6–11.7)	28.8 (28.0–29.6)	6.0 (5.5–6.4)	11.0 (10.4–11.5)	44.3 (43.4–45.2)
West	34,770	14.9 (13.9–15.9)	6.2 (5.5–7.0)	9.1 (8.3–10.1)	26.1 (24.8–27.5)	5.6 (4.9–6.5)	8.8 (8.1–9.7)	40.4 (39.0–41.8)
Total (all age groups)	**458,811**	**5.9 (5.7–6.0)**	**4.6 (4.5–4.8)**	**10.8 (10.6–11.0)**	**13.7 (13.5–13.9)**	**3.7 (3.6–3.8)**	**6.8 (6.7–6.9)**	**25.7 (25.4–25.9)**

Abbreviations: AI/AN = American Indian/Alaska Native; CI = confidence interval; N/A = not available.

* 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 who declined to answer, reported "don't know," and other missing responses were excluded from the analyses.

† Respondents with missing information on disability are not included; all groups might not add to the same respondent total or to the overall total.

§ Unweighted sample size.

¶ Each disability type might not be independent; a respondent might have two or more disability types.

** 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.

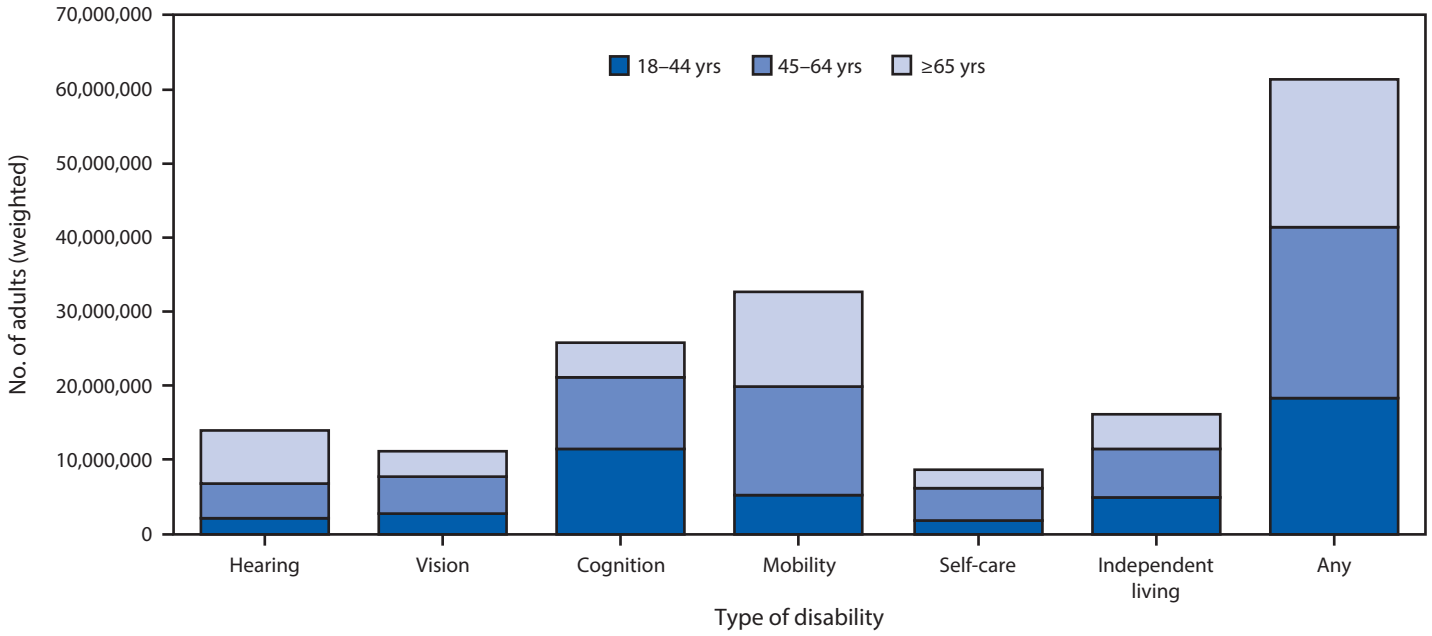
§§ Estimate not available because relative standard error >0.30.

¶¶ Poverty categories are based on the ratio of the respondent's annual household income to the appropriate simplified 2015 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%–<200% of FPL (near poor), 3) ≥200% of FPL (not poor), and 4) unknown.

disability type declined with decreasing poverty. Across all age groups, higher prevalences of any disability and of each type were generally reported in the South compared with other U.S. Census regions.

In 2016, for each disability type, prevalences of health insurance coverage, having a usual health care provider, and receiving a check-up during the preceding 12 months increased with increasing age group, whereas, with the exception of persons with a vision disability, the prevalence of having an unmet health care need because of cost decreased (Table 2). Young and middle-aged adults with a vision disability had the lowest prevalences of having health insurance coverage (74.9% and 81.3%, respectively), a usual health care provider (64.0% and 82.3%, respectively), and, among younger adults, of having received a check-up during the preceding 12 months (58.0%). Within these age groups, adults with a self-care disability had the highest prevalences of having health insurance coverage (83.1% and 88.8%, respectively) and a usual health care provider (76.3% and 89.0%, respectively), similar to middle-aged adults with an independent living disability (89.0%). The prevalences of having received a routine check-up during the past 12 months were higher among young adults with a mobility disability (69.1%) and middle-aged adults with a self-care disability (81.6%). Having a health care need that was unmet because of cost considerations was most prevalent among younger adults with an independent living disability (36.7%) and middle-aged adults with a vision disability (35.5%), and was least prevalent among younger and middle-aged adults with a hearing disability (31.2% and 24.1%, respectively). Most health care access measures were similar by disability type among older adults, with the exception of having an unmet health care need because of cost, which ranged from 7.3% (hearing) to 14.0% (self-care).

FIGURE. Estimated number of adults with any disability, by specific type of disability and age group — Behavioral Risk Factor Surveillance System, 2016



Discussion

This is the first report of disability prevalence measured using the U.S. Department of Health and Human Services six-question set through BRFSS and that examines sociodemographic characteristics and disparities in health care access by age group and disability type. In 2016, one in four noninstitutionalized U.S. adults reported any disability; a previous CDC report found a disability in one in five U.S. adults (*2*). The higher disability prevalence reported here likely resulted from the addition of the hearing disability question in 2016. The reported prevalence of hearing disability (5.9%) is consistent with other reports (*3*–*5*), and there were negligible (i.e., <1%) increases in prevalences of the other five disability types from 2013 to 2016.

Social determinants of health, such as sex, race/ethnicity, socioeconomic status, geographic location, and access to and use of quality health services influence the health and well-being of populations (*6*). Consistent with previous research (*2*), this analysis identified disparities in prevalences of any disability and disability type by sex, race/ethnicity, socioeconomic status, and geographic region. Women reported higher prevalences of any disability and of each disability type (except hearing and self-care) than did men. Higher prevalences of disability were reported by persons living in poverty; middle-aged adults living in poverty reported nearly five times the prevalence of mobility disability as did those who reported household income ≥200% of FPL. In this study, persons residing in the South U.S. Census region generally reported higher prevalences of disability. Chronic conditions associated with leading causes of disability (i.e., arthritis and heart trouble) (*7*) and associated lifestyle factors (e.g., smoking, overweight and obesity, and hypertension), are more prevalent in the South than in other U.S. Census regions.[¶¶] The multiple determinants of health underscore the need for cross-sector approaches to effectively mitigate health inequities experienced by persons with disabilities.

Similar to previous research (*8*,*9*), this analysis identified disability-specific disparities in health care access, particularly among young and middle-aged adults. Disability-specific factors, such as severity of disability, age at disability onset, or having multiple disability types or comorbidities might partially explain why persons in these age groups, and those reporting self-care and mobility disabilities, had higher prevalences of access to care than did those reporting vision and hearing disabilities (*5*,*9*). Among persons aged ≥65 years, the primary disparity was in unmet health care need because of cost; adults reporting self-care disability had nearly twice the prevalence of cost-related unmet health care need than did those reporting hearing disability. By age 65 years, approximately 98% of Americans have access to Medicare coverage (*10*) and might have increased access to health care services. Nonetheless, older adults reporting self-care disability might face more financial strain because of a higher level of medical need compared with persons without such disability (*1*).

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

TABLE 2. Weighted unadjusted prevalence estimates for four health care access measures among adults with any disability, by age group and disability type* — Behavioral Risk Factor Surveillance System, 2016

Age group (yrs)	Characteristic	No. of respondents†	Type of disability§						
			Hearing	Vision	Cognition	Mobility	Self-care	Independent living	Any
			% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
18–44	**Health insurance coverage**								
	Yes	16,446	76.9 (73.7–79.7)	74.9 (72.1–77.5)	78.6 (77.2–79.8)	82.0 (80.3–83.6)	83.1 (79.9–85.9)	81.2 (79.3–83.0)	78.9 (77.8–79.9)
	No	3,690	23.1 (20.1–26.3)	25.1 (22.5–27.9)	21.5 (20.2–22.8)	18.0 (16.4–19.7)	16.9 (14.1–20.2)	18.8 (17.0–20.7)	21.2 (20.1–22.2)
	Usual health care provider								
	Yes	14,188	64.4 (61.1–67.5)	64.0 (61.0–66.9)	66.1 (64.6–67.5)	74.1 (72.1–76.0)	76.3 (72.8–79.5)	70.4 (68.2–72.4)	66.3 (65.2–67.5)
	No	5,967	35.6 (32.5–38.9)	36.0 (33.1–39.0)	34.0 (32.5–35.4)	25.9 (24.0–27.9)	23.7 (20.5–27.2)	29.7 (27.6–31.8)	33.7 (32.6–34.9)
	Unmet health care need because of cost during past 12 mos.								
	Yes	6,234	31.2 (28.3–34.2)	34.8 (32.0–37.7)	33.4 (32.0–34.8)	35.6 (33.6–37.7)	36.2 (32.9–39.6)	36.7 (34.6–38.9)	31.4 (30.3–32.5)
	No	13,957	68.8 (65.8–71.7)	65.2 (62.3–68.0)	66.6 (65.2–68.0)	64.4 (62.3–66.4)	63.8 (60.4–67.1)	63.3 (61.1–65.4)	68.6 (67.5–69.7)
	Routine check-up within past 12 mos.								
	Yes	12,509	60.5 (57.3–63.7)	58.0 (54.9–61.0)	61.4 (59.9–62.9)	69.1 (67.0–71.1)	67.9 (64.2–71.4)	64.4 (62.1–66.5)	61.7 (60.5–62.9)
	No	7,324	39.5 (36.3–42.7)	42.0 (39.0–45.1)	38.6 (37.1–40.1)	30.9 (28.9–33.0)	32.1 (28.6–35.8)	35.7 (33.5–37.9)	38.3 (37.1–39.5)
45–64	**Health insurance coverage**								
	Yes	44,085	87.1 (85.4–88.6)	81.3 (79.3–83.1)	86.3 (85.2–87.4)	88.4 (87.6–89.2)	88.8 (87.4–90.2)	88.4 (87.2–89.5)	87.0 (86.3–87.7)
	No	4,918	13.0 (11.4–14.6)	18.7 (16.9–20.7)	13.7 (12.6–14.8)	11.6 (10.8–12.4)	11.2 (9.8–12.6)	11.6 (10.5–12.9)	13.0 (12.3–13.7)
	Usual health care provider								
	Yes	43,142	84.9 (83.1–86.4)	82.3 (80.4–84.1)	85.3 (84.1–86.4)	88.3 (87.5–89.1)	89.0 (87.6–90.2)	89.0 (87.9–90.0)	85.8 (85.1–86.5)
	No	5,835	15.2 (13.6–16.9)	17.7 (15.9–19.6)	14.7 (13.6–15.9)	11.7 (10.9–12.5)	11.0 (9.8–12.4)	11.0 (10.0–12.1)	14.2 (13.5–14.9)
	Unmet health care need because of cost during past 12 mos.								
	Yes	11,506	24.1 (22.4–25.9)	35.5 (33.3–37.8)	31.8 (30.5–33.2)	27.2 (26.2–28.3)	31.9 (29.9–34.1)	31.9 (30.2–33.6)	25.9 (25.1–26.8)
	No	37,472	75.9 (74.1–77.6)	64.5 (62.2–66.7)	68.2 (66.8–69.5)	72.8 (71.7–73.8)	68.1 (65.9–70.1)	68.1 (66.4–69.8)	74.1 (73.2–74.9)
	Routine check-up within past 12 mos.								
	Yes	37,876	74.5 (72.7–76.2)	75.0 (73.1–76.9)	76.8 (75.6–78.0)	80.3 (79.4–81.2)	81.6 (80.0–83.1)	80.9 (79.6–82.2)	77.0 (76.1–77.7)
	No	10,596	25.5 (23.8–27.3)	25.0 (23.1–26.9)	23.2 (22.0–24.4)	19.7 (18.8–20.6)	18.4 (16.9–20.0)	19.1 (17.8–20.4)	23.1 (22.3–23.9)
≥65	**Health insurance coverage**								
	Yes	65,481	97.9 (97.4–98.3)	97.0 (96.1–97.8)	97.4 (96.8–97.9)	97.7 (97.4–98.0)	97.7 (96.9–98.2)	97.0 (96.2–97.6)	97.8 (97.6–98.1)
	No	1,191	2.1 (1.7–2.6)	3.0 (2.2–3.9)	2.6 (2.1–3.2)	2.3 (2.0–2.6)	2.4 (1.8–3.1)	3.0 (2.4–3.8)	2.2 (1.9–2.4)
	Usual health care provider								
	Yes	63,068	94.7 (94.1–95.3)	93.4 (92.4–94.3)	93.4 (92.4–94.3)	95.8 (95.4–96.2)	95.7 (94.7–96.5)	95.6 (95.0–96.2)	94.9 (94.5–95.3)
	No	3,491	5.3 (4.7–5.9)	6.6 (5.7–7.6)	6.6 (5.7–7.6)	4.2 (3.8–4.6)	4.3 (3.5–5.3)	4.4 (3.8–5.0)	5.1 (4.7–5.5)
	Unmet health care need because of cost during past 12 mos.								
	Yes	4,838	7.3 (6.7–8.0)	12.8 (11.4–14.3)	13.7 (12.5–14.9)	9.3 (8.7–10.0)	14.0 (12.3–15.9)	12.1 (10.9–13.4)	8.2 (7.7–8.7)
	No	61,761	92.7 (92.0–93.3)	87.2 (85.7–88.6)	86.4 (85.1–87.5)	90.7 (90.0–91.3)	86.0 (84.1–87.7)	87.9 (86.6–89.1)	91.8 (91.3–92.3)
	Routine check-up within past 12 mos.								
	Yes	58,551	90.1 (89.3–90.9)	89.0 (87.7–90.2)	89.0 (87.9–90.0)	91.0 (90.3–91.5)	90.1 (88.6–91.3)	89.4 (88.3–90.5)	90.2 (89.7–90.7)
	No	7,157	9.9 (9.1–10.7)	11.0 (9.8–12.3)	11.0 (10.0–12.1)	9.1 (8.5–9.7)	10.0 (8.7–11.4)	10.6 (9.5–11.7)	9.8 (9.3–10.3)

Abbreviation: CI = confidence interval.

* 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 who declined to answer, reported "don't know," and other missing responses were excluded from the analyses.

† Unweighted sample size.

§ Each disability type might not be independent; a respondent might have two or more disability types.

The findings in this report are subject to at least four limitations. First, BRFSS data are cross-sectional, and causality among sociodemographic characteristics, health care access, and disability cannot be inferred. Second, disability estimates are likely underestimates because BRFSS is only administered to noninstitutionalized adults and excludes persons living in long-term care facilities, such as older adults who might have higher disability prevalences. This could, in part, explain the higher prevalence estimates of cognitive disability among middle-aged and young adults compared with older adults, and the similar estimates of vision disability and self-care disability among middle-aged and older adults. In addition, questions used to assess hearing, vision, cognition, and mobility disabilities were designed to capture serious difficulty in these basic actions; thus, adults with milder difficulties might not be identified. Third, BRFSS data were self-reported and might be subject to self-report biases. Finally, nonresponse bias remains a possibility, although the weighting methodology used by BRFSS adjusts for nonresponse bias.

Prevalence of disability varied by age group and sociodemographic characteristics. Health care access varied by age group and disability type. Identifying disparities in access to health care highlights disability types and selected demographic groups***

*** Disability and Health Data System (https://dhds.cdc.gov/), an online, interactive data tool developed and maintained by CDC, presents yearly state-level data on prevalence of disability as well as approximately 30 demographic and health indicators, including health care access, for adults with disabilities overall and by type.

Summary

What is already known about this topic?

In 2013, based on questions to assess five disability types (i.e., vision, cognition, mobility, self-care, and independent living), one in five U.S. adults reported a disability.

What is added by this report?

In 2016, using the U.S. Department of Health and Human Services six-question set, one in four (61 million) U.S. adults reported any disability; nearly 6% reported hearing disability. Adults with disabilities, particularly those aged 18–44 and 45–64 years, experienced disparities in health care access by disability type.

What are the implications for public health practice?

Public health programs might benefit from the information provided in this report to develop and improve interventions, accessibility, and outreach to reduce disparities in health care access.

that might benefit most from interventions that improve health care access, receipt of needed health services, and coordinated care. These have the potential to improve health behaviors, prevent secondary conditions, delay the progression of disability, or, through early detection of disease, permit early intervention that might improve health outcomes. Improved understanding of disability-specific differences in health care access and the provision of medical care might improve the specificity and effectiveness of interventions, accessibility, and outreach to reduce disability-specific disparities in health care access.

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Conflict of Interest

No conflicts of interest were reported.

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Prevalence of Five Health-Related Behaviors for Chronic Disease Prevention Among Sexual and Gender Minority Adults — 25 U.S. States and Guam, 2016

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In recent decades, public health awareness of health disparities among lesbian, gay, bisexual, and transgender (LGBT) populations has increased (*1*). *Healthy People 2020* included objectives to improve health of LGBT persons.[†] Five key health-related behaviors were found to be likely associated with reduced all-cause mortality: never smoking, performing regular physical activity, consuming no or moderate amounts of alcohol, having a normal body weight, and obtaining sufficient sleep daily (*2*). CDC estimated these five health-related behaviors among adults aged ≥21 years by sexual orientation and transgender status using data from the 2016 Behavioral Risk Factor Surveillance System (BRFSS) in 25 U.S. states and Guam. Patterns of these five health-related behaviors varied by sexual orientation among men and women, and among transgender adults. Lesbian and bisexual women were less likely to engage in all five health-related behaviors than were heterosexual women (5.4% and 6.9%, respectively, versus 10.6%). Compared with cisgender[§] adults, male-to-female transgender adults were less likely to engage in any two of five health-related behaviors (12.3% versus 18.6%). Male-to-female transgender adults, however, were more likely to engage in any three of five health-related behaviors than were female-to-male transgender adults (47.2% versus 28.2%). The number of health-related behaviors did not differ between gay or bisexual men and heterosexual men. Continued efforts are needed to target LGBT populations for overall well-being, including strategies for health promotion and engagement in health-related behaviors.

BRFSS is an annual state-based, random-digit–dialed telephone survey of noninstitutionalized U.S. adults aged ≥18 years, which collects information on health-related topics.[¶] In 2016, the median response rate of the combined landline and cellular telephone surveys from the 25 states[**] and Guam that participated in the sexual orientation and gender identity module was 42.8%.[††] Based on the self-reported responses of adults aged ≥21 years,[§§] sexual orientation was defined as being straight (heterosexual), lesbian or gay, bisexual, and other, and gender identity was defined as being not transgender (cisgender), transgender male-to-female, transgender female-to-male, and transgender nonconforming.

The prevalence and 95% confidence intervals of demographic characteristics (age, race/ethnicity, education, marital status, current employment status, household income, and home ownership) and of engaging in the five health-related behaviors was estimated by sexual orientation status for men and women separately, and by transgender status. The health-related behaviors[¶¶] included 1) not currently cigarette smoking, 2) moderate or no drinking, 3) having a normal body weight, 4) engaging in any leisure-time physical activity, and 5) sleeping ≥7 hours, on average, during a 24-hour period. The number of the five health-related behaviors reported were categorized into five groups (0/1, 2, 3, 4, or 5). Because of small sample sizes, some categories of demographic characteristics and counts of health-related behaviors were collapsed when analyzing transgender status. Chi-squared tests were used to compare an overall difference for nominal variables and to test a trend difference for ordinal variables by sexual orientation in men and women, and by transgender status. Pairwise tests

* Deceased.

† https://www.healthypeople.gov/2020/topics-objectives/topic/lesbian-gay-bisexual-and-transgender-health.

§ Cisgender is related to a person whose gender identity corresponds with sex at birth.

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

** Twenty-five states include California, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kentucky, Louisiana, Massachusetts, Minnesota, Mississippi, Missouri, Nevada, New York, Ohio, Pennsylvania, Rhode Island, Texas, Vermont, Virginia, Washington, and Wisconsin.

†† Behavioral Risk Factor Surveillance System 2016 Summary Data Quality Report (https://www.cdc.gov/brfss/annual_data/2016/pdf/2016-sdqr.pdf).

§§ The minimum legal drinking age in the United States is 21 years (https://www.cdc.gov/alcohol/fact-sheets/minimum-legal-drinking-age.htm).

¶¶ Not currently smoking cigarettes was defined as respondents reporting not smoking ≥100 cigarettes during their lifetime or having smoked ≥100 cigarettes during their lifetime but not currently smoking at the time of the survey interview. Moderate or no drinking was defined as respondents reporting no alcohol drinking or drinking ≤2 alcoholic drinks per day for men and ≤1 alcoholic drinks per day for women and respondents reporting no binge drinking and heavy drinking during the 30 days preceding the interview. Binge drinking was defined as ≥5 drinks on one occasion for men and ≥4 drinks for women. Heavy drinking was defined as ≥15 drinks/week for men and ≥8 drinks /week for women during the 30 days preceding the interview. Having a normal body weight was defined as a body mass index ≥18.5 kg/m2 and <25 kg/m2. Any leisure-time physical activity was defined based on an affirmative answer to a question, "During the past month, other than your regular job, did you participate in any physical activities or exercises, such as running, calisthenics, golf, gardening, or walking for exercise?" Sleeping ≥7 hours during a 24-hour period was calculated based on number of hours respondents answered to a question, "On average, how many hours of sleep do you get in a 24-hour period?" Additional information is available at https://www.cdc.gov/brfss/annual_data/2016/pdf/2016_calculated_variables_version4.pdf and https://www.cdc.gov/brfss/annual_data/2016/pdf/codebook16_llcp.pdf.

with linear contrasts were used to assess group differences with statistical significance set at p<0.05. Statistical software that accounts for survey weights and complex survey designs was used to conduct all analyses. All comparisons presented were statistically significant.

In 2016, among 86,185 men who answered the sexual orientation question, 92.7% reported being heterosexual, 2.2% reported being gay, and 1.5% reported being bisexual; among 114,842 women, 91.7% reported being heterosexual, 1.3% reported being lesbian, and 2.3% reported being bisexual (Table 1). Overall, sexual minority adults were younger than their heterosexual counterparts. Being a college graduate was more prevalent among gay men (42.0%) than among heterosexual men (27.9%) and bisexual men (23.3%). Among women, having a household income ≥$75,000 was less prevalent among bisexual women (18.9%) than among lesbian women (33.4%) and heterosexual women (27.4%), and being currently unemployed was more prevalent among bisexual women (35.3%) than among lesbian women (26.6%) and heterosexual women (28.4%). Overall, being single and renting a home were more prevalent among sexual minority adults.

Compared with heterosexual men, gay men had a lower prevalence of not currently smoking cigarettes (77.0% versus 81.4%) and moderate or no drinking (51.8% versus 60.8%), but had a higher prevalence of performing any leisure-time exercise (82.0% versus 77.9%); gay men also had a higher prevalence of having a normal body weight (40.3%) than did bisexual (29.8%) and heterosexual men (25.0%). The prevalence of not currently smoking cigarettes, moderate or no alcohol consumption, and getting ≥7 hours' sleep during a 24-hour period was higher among heterosexual women (86.0%, 66.2%, and 65.9%, respectively) than among lesbian (75.0%, 50.6%, and 55.3%, respectively) and bisexual women (71.7%, 47.1%, and 56.1%, respectively). Engaging in any leisure-time exercise was more prevalent among lesbian (80.6%) and bisexual women (77.6%) than among heterosexual women (73.8%); however, having a normal body weight was less prevalent among lesbian women (30.4%) than among heterosexual women (37.0%); the difference in prevalence between heterosexual women and bisexual women (35.8%) was not statistically significant. In addition, the prevalence of reporting zero or one health-related behavior was higher among lesbian (10.0%) and bisexual (10.7%) women than among heterosexual women (4.9%), and the prevalence of reporting all five health-related behaviors was lower among lesbian (5.4%) and bisexual (6.9%) women than among heterosexual women (10.6%) (Table 1).

Among 200,874 adults from the 25 states and Guam who answered the gender identity question, 98.3% reported being cisgender, 0.2% reported being male-to-female transgender, and 0.1% each reported being female-to-male transgender and transgender nonconforming (Table 2). Being a college graduate was more prevalent among cisgender adults (27.9%) than among transgender male-to-female adults (9.8%). Being single was more prevalent among transgender female-to-male (40.3%) and transgender nonconforming adults (55.4%) than cisgender adults (24.4%). The prevalence of having household income of <$25,000 and renting versus owning a home was higher among transgender adults than among cisgender adults.

The prevalence of performing any leisure-time exercise was higher among cisgender adults (75.5%) than among male-to-female transgender adults (56.7%). More than three quarters (77.4%) of male-to-female transgender adults reported sleeping ≥7 hours during a 24-hour period compared with cisgender adults (65.0%), female-to-male transgender adults (58.9%), and transgender nonconforming adults (52.9%). In addition, male-to-female transgender adults had a lower prevalence of engaging in any two of five health-related behaviors (12.3%) than did cisgender adults (18.6%), but had a higher prevalence of engaging in any three of five health-related behaviors (47.2%) than did female-to-male transgender adults (28.2%) (Table 2).

Discussion

The findings from this study support those of other studies showing that disparities in sociodemographic characteristics and health-related behaviors exist among the LGBT populations (*3*–*5*). In this study, the disparities were more pronounced among sexual orientation minority adults than they were among transgender adults.

Sociodemographic characteristics and health-related behaviors followed similar yet distinct patterns in the LGBT populations. For example, both home ownership and being married were less prevalent among the LGBT populations than among heterosexual or cisgender adults. However, although results showed that gay men had achieved a higher education level than their heterosexual and bisexual counterparts, this might not necessarily suggest better health-related outcomes or behaviors than those among heterosexual men (*3*). On the other hand, among LGBT populations, bisexual women were found to have higher burdens of health inequalities, which could be related to disadvantaged socioeconomic status, as described in the study findings, or other barriers to health care (*4*). In a study based on 2010 BRFSS data from ten U.S. states, bisexual women were more likely to report fair or poor health status, drink while driving, have asthma, and use equipment for disability, and less likely to seek care owing to cost, than were lesbian women (*6*).

Consistent with findings from previous studies (*3*,*4*), gay men and lesbian and bisexual women were more likely to be

TABLE 1. Distribution of demographics and health-related behaviors, among adults aged ≥21 years, by sexual orientation* — Behavioral Risk Factor Surveillance System, 25 U.S. states and Guam, 2016

		Male† (n = 86,185)				Female§ (n = 114,842)			
		Straight	Gay	Bisexual	Other/Don't know/Refused	Straight	Lesbian	Bisexual	Other/Don't know/Refused
		(N = 80,987)	(N = 1,748)	(N = 1,139)	(N = 2,311)	(N = 107,599)	(N = 1,190)	(N = 1,969)	(N = 4,084)
Characteristic	No. (%)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Overall	**201,027 (100)**	**92.7 (92.3–93.0)**	**2.2 (2.0–2.4)**	**1.5 (1.4–1.7)**	**3.7 (3.4–4.0)**	**91.7 (91.3–92.0)**	**1.3 (1.1–1.4)**	**2.3 (2.1–2.5)**	**4.8 (4.5–5.1)**
Age group (yrs)									
21–24	6,304 (6.9)	6.8 (6.5–7.2)	11.6 (8.6–15.5)	13.5 (10.4–17.2)	4.8 (3.2–7.1)	6.4 (6.0–6.8)	12.2 (7.3–19.7)	23.4 (20.1–27.0)	5.4 (3.9–7.6)
25–34	19,092 (17.1)	17.6 (17.0–18.1)	24.8 (21.1–28.8)	29.6 (24.1–35.6)	16.0 (12.8–19.7)	15.8 (15.3–16.3)	22.5 (17.8–28.0)	35.9 (32.2–39.7)	15.5 (13.0–18.3)
35–44	22,712 (17.1)	17.6 (17.1–18.1)	13.8 (11.2–17.0)	15.1 (11.7–19.3)	20.4 (17.0–24.4)	16.5 (16.1–17.0)	16.9 (12.2–23.1)	18.1 (15.2–21.4)	18.7 (15.9–21.9)
45–54	32,514 (18.4)	18.8 (18.3–19.4)	21.8 (18.5–25.5)	14.7 (11.6–18.4)	16.0 (13.3–19.2)	18.3 (17.8–18.8)	21.1 (16.8–26.2)	10.5 (8.4–13.0)	16.1 (13.7–18.9)
55–64	45,703 (18.5)	18.8 (18.3–19.3)	17.1 (13.7–21.2)	14.5 (11.4–18.3)	18.4 (15.2–22.2)	18.7 (18.3–19.2)	13.8 (11.1–16.9)	6.0 (4.7–7.6)	16.3 (13.5–19.7)
≥65	72,269 (22.1)	20.3 (19.9–20.8)	10.8 (8.7–13.4)	12.7 (9.8–16.4)	24.3 (20.9–28.1)	24.3 (23.8–24.8)	13.5 (8.4–20.8)	6.2 (4.9–7.9)	27.9 (25.2–30.7)
Race/Ethnicity									
White, non-Hispanic	155,778 (63.1)	64.7 (64.0–65.4)	66.1 (61.2–70.7)	59.5 (53.8–64.9)	27.3 (24.2–30.7)	64.6 (63.9–65.2)	58.4 (50.9–65.5)	65.9 (61.9–69.6)	28.7 (26.0–31.5)
Black, non-Hispanic	13,884 (10.6)	9.8 (9.4–10.2)	8.9 (6.5–12.1)	14.2 (10.6–18.7)	6.4 (4.7–8.6)	11.6 (11.2–12.1)	13.5 (9.9–18.1)	10.0 (7.9–12.7)	7.2 (5.8–9.0)
Hispanic	13,968 (17.6)	16.8 (16.2–17.5)	14.2 (11.3–17.8)	17.3 (13.2–22.4)	51.5 (47.0–56.0)	15.9 (15.4–16.5)	16.7 (11.2–24.1)	14.6 (11.7–18.0)	47.6 (44.0–51.3)
Other, non-Hispanic	9,459 (7.2)	7.2 (6.8–7.6)	9.0 (5.8–13.9)	7.0 (4.8–9.9)	14.3 (10.9–18.5)	6.6 (6.1–7.0)	—¶	5.7 (4.0–8.0)	15.9 (12.6–19.8)
Multiracial	4,618 (1.4)	1.5 (1.3–1.7)	1.7 (1.1–2.7)	—¶	—¶	1.3 (1.2–1.5)	—¶	3.9 (2.8–5.3)	0.6 (0.4–0.9)
Education									
Less than HS	15,216 (14.8)	14.1 (13.5–14.7)	5.0 (3.2–7.7)	14.9 (11.2–19.7)	51.7 (47.4–56.1)	12.8 (12.4–13.4)	12.0 (7.8–18.0)	10.8 (8.4–13.9)	45.9 (42.4–49.5)
HS diploma or GED	54,997 (27.0)	28.9 (28.3–29.5)	20.8 (16.7–25.5)	26.6 (22.3–31.5)	20.4 (17.4–23.8)	25.9 (25.4–26.4)	20.7 (15.4–27.3)	23.9 (20.9–27.2)	25.7 (22.6–29.0)
Some college	53,257 (30.5)	29.1 (28.5–29.8)	32.2 (28.1–36.7)	35.2 (29.7–41.0)	14.6 (11.8–17.8)	32.7 (32.1–33.3)	34.2 (27.6–41.5)	39.3 (35.4–43.4)	16.6 (14.2–19.2)
College graduate	76,931 (27.7)	27.9 (27.4–28.4)	42.0 (37.8–46.2)	23.3 (19.7–27.3)	13.3 (11.3–15.6)	28.6 (28.1–29.1)	33.0 (27.9–38.7)	25.9 (23.1–29.0)	11.8 (10.2–13.7)
Marital status									
Married	106,354 (54.3)	57.6 (56.9–58.3)	19.5 (16.5–22.9)	30.9 (26.1–36.1)	59.1 (54.8–63.1)	53.4 (52.8–54.1)	30.1 (24.7–36.1)	29.2 (25.9–32.8)	47.4 (43.8–51.1)
Single**	34,844 (24.4)	25.9 (25.2–26.5)	71.5 (67.6–75.1)	54.5 (49.1–59.9)	24.9 (21.5–28.6)	20.6 (20.1–21.2)	52.8 (45.9–59.6)	51.3 (47.4–55.2)	21.3 (18.6–24.2)
Others	58,698 (21.4)	16.5 (16.1–17.0)	9.0 (6.8–11.7)	14.6 (11.6–18.2)	16.1 (13.5–19.0)	26.0 (25.4–26.5)	17.1 (11.6–24.4)	19.5 (16.5–22.8)	31.3 (28.4–34.4)
Employment††									
Currently employed	99,608 (58.2)	66.8 (66.2–67.4)	66.3 (61.8–70.6)	61.8 (56.2–67.1)	64.7 (60.7–68.5)	50.9 (50.2–51.5)	60.3 (53.1–67.0)	59.9 (56.0–63.7)	35.4 (32.1–38.9)
Not currently employed	36,923 (22.2)	14.1 (13.6–14.6)	20.3 (17.0–24.1)	25.2 (20.5–30.6)	15.2 (12.6–18.2)	28.4 (27.8–29.0)	26.6 (21.1–33.0)	35.3 (31.6–39.1)	44.7 (41.1–48.3)
Retired	63,211 (19.6)	19.1 (18.6–19.6)	13.4 (10.1–17.5)	13.0 (9.9–16.9)	20.1 (17.2–23.3)	20.7 (20.3–21.2)	13.1 (8.2–20.4)	4.8 (3.6–6.3)	19.9 (17.7–22.3)
Household income ($)									
<25,000	44,739 (23.3)	19.6 (19.0–20.1)	22.6 (19.2–26.4)	29.0 (24.4–34.1)	40.9 (36.7–45.2)	24.6 (24.1–25.2)	27.3 (21.4–34.2)	33.6 (30.0–37.5)	43.2 (39.8–46.7)
≥25,000–34,999	18,289 (8.8)	8.7 (8.3–9.1)	5.9 (4.4–7.9)	14.5 (10.7–19.3)	11.5 (8.9–14.8)	9.0 (8.6–9.3)	7.4 (4.9–11.1)	8.3 (6.6–10.3)	6.5 (5.3–7.9)
≥35,000–50,000	24,742 (11.7)	12.4 (11.9–12.8)	14.2 (10.4–19.2)	11.7 (8.8–15.3)	7.9 (5.8–10.7)	11.4 (11.0–11.8)	9.3 (6.9–12.3)	12.5 (9.9–15.8)	6.7 (4.9–8.9)
≥50,000–74,999	28,138 (13.0)	14.1 (13.7–14.6)	14.9 (12.1–18.1)	7.2 (5.4–9.5)	6.8 (4.7–9.8)	12.8 (12.4–13.3)	12.5 (9.1–16.9)	11.2 (8.9–14.0)	3.2 (2.1–4.9)
≥$75,000	57,018 (29.5)	34.2 (33.6–34.8)	34.2 (30.3–38.3)	24.1 (19.6–29.3)	9.3 (7.5–11.5)	27.4 (26.9–28.0)	33.4 (26.9–40.7)	18.9 (16.2–22.0)	5.4 (4.2–6.9)
Don't know/Refused	28,101 (13.7)	11.1 (10.7–11.5)	8.2 (6.2–10.8)	13.6 (10.0–18.1)	23.5 (20.4–27.0)	14.7 (14.3–15.2)	10.1 (7.1–14.1)	15.4 (12.9–18.4)	35.1 (31.7–38.5)
Home ownership									
Own	145,421 (72.5)	73.3 (72.7–73.8)	60.7 (56.3–64.9)	56.2 (50.5–61.8)	55.8 (51.4–60.2)	74.2 (73.7–74.8)	67.4 (61.4–72.9)	46.8 (42.7–50.9)	58.0 (54.5–61.4)
Rent	47,743 (27.5)	26.7 (26.2–27.3)	39.3 (35.1–43.7)	43.8 (38.2–49.5)	44.2 (39.8–48.6)	25.8 (25.2–26.3)	32.6 (27.1–38.6)	53.2 (49.1–57.3)	42.0 (38.6–45.5)
Health–related behaviors§§									
No current cigarette smoking	169,483 (83.7)	81.4 (80.9–81.9)	77.0 (73.0–80.6)	77.1 (72.3–81.2)	84.4 (80.8–87.4)	86.0 (85.6–86.4)	75.0 (68.6–80.4)	71.7 (68.2–75.0)	94.3 (92.7–95.5)
Moderate or no drinking	131,609 (63.8)	60.8 (60.1–61.5)	51.8 (47.3–56.3)	59.1 (53.7–64.3)	71.1 (66.6–75.1)	66.2 (65.6–66.8)	50.6 (43.7–57.5)	47.1 (43.2–51.1)	86.1 (83.6–88.3)
Having a normal weight	58,649 (31.2)	25.0 (24.4–25.6)	40.3 (35.7–45.1)	29.8 (25.3–34.8)	25.2 (21.8–29.1)	37.0 (36.4–37.6)	30.4 (25.0–36.4)	35.8 (32.0–39.8)	36.4 (32.5–40.6)
Any leisure-time physical activity	150,477 (75.3)	77.9 (77.4–78.5)	82.0 (78.4–85.0)	78.1 (73.2–82.3)	63.2 (58.8–67.4)	73.8 (73.3–74.4)	80.6 (75.7–84.7)	77.6 (74.2–80.7)	59.5 (56.0–63.0)
Sleeping ≥7 hours/ 24-hour period	134,453 (65.0)	64.2 (63.6–64.9)	63.9 (59.1–68.4)	59.3 (53.8–64.6)	68.2 (63.8–72.2)	65.9 (65.3–66.5)	55.3 (48.0–62.3)	56.1 (52.2–60.0)	67.2 (63.8–70.5)
No. of health–related behaviors									
0 and 1	9,163 (5.8)	6.6 (6.3–7.0)	6.5 (4.6–9.2)	8.5 (5.9–12.2)	6.1 (4.3–8.4)	4.9 (4.6–5.2)	10.0 (6.5–15.0)	10.7 (8.5–13.6)	2.6 (1.6–4.2)
2	31,368 (18.6)	20.0 (19.5–20.6)	17.9 (15.0–21.2)	20.4 (16.3–25.3)	20.1 (15.7–25.3)	17.2 (16.7–17.7)	23.0 (16.7–30.8)	26.7 (23.0–30.8)	11.7 (9.8–14.1)
3	64,600 (35.2)	36.7 (36.1–37.4)	37.2 (33.0–41.7)	36.2 (31.1–41.6)	36.5 (31.9–41.4)	33.7 (33.1–34.3)	37.2 (30.3–44.6)	32.5 (28.8–36.4)	35.6 (31.7–39.7)
4	60,702 (31.7)	29.8 (29.2–30.5)	30.1 (25.6–35.0)	26.7 (21.8–32.1)	29.9 (25.9–34.2)	33.7 (33.1–34.3)	24.4 (19.7–29.9)	23.2 (19.9–26.8)	38.7 (34.4–43.1)
5	17,696 (8.7)	6.8 (6.5–7.2)	8.2 (6.2–10.9)	8.3 (6.0–11.3)	7.4 (5.7–9.6)	10.6 (10.1–11.0)	5.4 (3.5–8.1)	6.9 (5.2–9.0)	11.4 (9.2–14.0)

See table footnotes on the next page.

TABLE 1. (*Continued*) Distribution of demographics and health-related behaviors, among adults aged ≥21 years, by sexual orientation* — Behavioral Risk Factor Surveillance System, 25 U.S. states and Guam, 2016

Abbreviations: CI = confidence interval; GED = general educational development high school equivalency diploma; HS = high school.

* Sexual orientation is based on responses to a question, "Do you consider yourself to be straight, lesbian, gay, bisexual, other, or don't know/not sure?"

† Significant associations (p<0.05) between status of sexual orientation and characteristics included age, education, household income (Cochran-Mantel-Haenszel chi-squared for trends), marital status, employment, home ownership, not currently smoking cigarettes, moderate or no drinking, and having a normal weight (Cochran-Mantel-Haenszel chi-squared for general association). Other/Don't know/Refused was not included in the test.

§ Significant associations (p<0.05) between status of sexual orientation and characteristics included age, household income, number of health–related behaviors (Cochran-Mantel-Haenszel chi-squared for trends), race/ethnicity, marital status, employment, home ownership, not currently smoking cigarettes, moderate or no drinking, any leisure-time exercise, and sufficient sleep (≥7 hours) (Cochran-Mantel-Haenszel chi-squared for general association). Other/Don't know/Refused was not included in the comparison.

¶ Data are suppressed if relative standard error >0.3 or sample size <50. Relative standard error was calculated as a ratio of standard error and mean of the estimate.

** Single includes those who were never married or a member of an unmarried couple.

†† Employment status is defined as retired, and employed if responses are "currently employed for wages" or "currently self-employed," "Not employed" included adults who were currently out of work, a homemaker, a student, or unable to work.

§§ Not a current cigarette smoker were respondents who reported not having smoked 100 cigarettes or more in their lifetime or having smoked at least 100 cigarettes in their lifetime but not smoking at the time of the survey. Moderate or no drinking in the past 30 days was defined as respondents' self–reported no alcohol drinking or drinking ≤2 alcoholic drinks per day for men and ≤1 alcoholic drink per day for women, and not binge drinking or heavy drinking. Binge drinking was defined as drinking ≥5 drinks on one occasion for men and ≥4 drinks on one occasion for women. Heavy drinking was defined as drinking ≥15 drinks per week for men and ≥8 drinks per week for women in the past 30 days. Having a normal body weight was defined as body mass index ≥18.5 kg/m^2 and <25 kg/m^2. Any leisure-time physical activity was defined as an affirmative response to a question, "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?" Sufficient sleep was defined ≥7 hours in response to the question, "On average, how many hours of sleep do you get in a 24-hour period?"

current cigarette smokers and were less likely to be moderate drinkers or nondrinkers compared with their heterosexual counterparts. A recent study of media usage by sexual orientation and smoking status found that LGBT adults had more access to Internet and social media than did heterosexual adults (*6*), suggesting that tobacco cessation campaigns could consider multiple educational social media channels to reach out to the LGBT community (*7*).

In this study, lesbian and bisexual women were less likely to report engagement in all five health-related behaviors than were heterosexual women, including being less likely to sleep ≥7 hours during a 24-hour period. Although another study reported no significant difference in sleep duration, the same study noted lesbian and bisexual women were more likely to have poorer quality of sleep with respect to having trouble falling or staying asleep, or taking medication to help sleep than were heterosexual women (*8*). In addition, lesbian women were less likely to have a normal body weight than were heterosexual women. One study found that lesbian and bisexual women were more likely to accept obesity and overweight than were heterosexual women (*9*). Successful intervention studies aiming at reducing overweight and obesity among lesbian and bisexual women have been reported, and more tailored intervention studies are needed to support evidence-based strategies to improve health-related behaviors especially among targeted populations (*10*).

The findings in this report are subject to at least four limitations. First, BRFSS responses are self-reported and, therefore, are subject to reporting and social desirability biases, which might result in underreporting of LGBT status. Second, the findings were limited to 25 U.S. states and Guam and, therefore, might not be generalizable to the entire U.S. population. Third, because of data availability limitations, any leisure-time physical activity was assessed as a single category. Finally, nonresponse bias remains a possibility, although the weighting methodology used by BRFSS adjusts for the nonresponse bias.

Whereas ongoing state-based surveillance data are important to monitor health-related behaviors and outcomes among LGBT populations, the multifaceted causes of health inequality among these populations require further investigation. Continued efforts are needed to plan and implement strategies supported by public health agencies, health care systems, and work sites, as well as targeted strategies in multilevel community-based interventions with social support and educational programs to improve health equity, including engagement in health-related behaviors among LGBT populations.

Summary

What is already known about this topic?

A higher prevalence of current cigarette smoking and alcohol consumption was observed among U.S. lesbian, gay, and bisexual US adults.

What is added by this report?

Compared with heterosexual women (10.6%), the prevalence of not currently smoking cigarettes, moderate or no drinking, maintaining a normal body weight, performing any leisure-time physical activity, and sleeping ≥7 hours per day was lower among lesbian (5.4%) and bisexual women (6.9%). Male-to-female transgender adults had a lower prevalence of engaging in any two of five health-related behaviors (12.3%) than did cisgender adults (18.6%), but had a higher prevalence of engaging in any three of five health-related behaviors (47.2%) than did female-to-male transgender adults (28.2%).

What are the implications for public health practice?

Implementation of targeted strategies to increase community-based health intervention programs and mass media campaigns to improve health-related behaviors of lesbian, gay, bisexual, and transgender adults are needed.

TABLE 2. Distribution of demographics and health-related behaviors, among adults aged ≥21 years, by transgender status* — Behavioral Risk Factor Surveillance System, 25 U.S. states and Guam, 2016

Characteristic	No. (%)	Cisgender† (N = 197,966) % (95% CI)	Transgender, male-to-female (N = 344) % (95% CI)	Transgender, female-to-male (N = 234) % (95% CI)	Transgender, nonconforming (N = 167) % (95% CI)	Don't know/Refused (N = 2,163) % (95% CI)
Overall	**200,874 (100)**	**98.3 (98.1–98.4)**	**0.2 (0.2–0.3)**	**0.1 (0.1–0.2)**	**0.1 (0.1–0.1)**	**1.3 (1.2–1.4)**
Age group (yrs)§						
21–44	48,079 (41.1)	41.1 (40.7–41.6)	45.8 (33.5–58.6)	53.5 (41.6–65.0)	66.6 (54.8–76.6)	29.3 (25.0–34.0)
45–64	78,160 (36.8)	36.9 (36.4–37.3)	39.5 (26.9–53.7)	28.0 (19.2–38.0)	23.4 (15.1–34.5)	36.9 (32.0–42.2)
≥65	72,207 (22.1)	22.0 (21.7–22.3)	14.7 (9.4–22.4)	19.0 (12.9–27.0)	—¶	33.7 (29.5–38.3)
Race/Ethnicity						
White, non-Hispanic	155,668 (63.1)	63.5 (63.0–63.9)	50.2 (37.3–63.0)	56.4 (43.5–68.5)	46.8 (34.4–59.7)	36.1 (31.9–40.5)
Black, non-Hispanic	13,873 (10.6)	10.6 (10.3–10.9)	—¶	—¶	—¶	9.8 (7.5–12.7)
Hispanic	13,953 (17.6)	17.4 (17.0–17.8)	—¶	—¶	—¶	35.2 (30.3–40.4)
Other, non-Hispanic	14,070 (8.7)	8.5 (8.2–8.9)	—¶	—¶	—¶	18.9 (14.0–24.9)
Education§						
Less than HS	15,192 (14.7)	14.4 (14.1–14.8)	32.8 (20.4–48.3)	—¶	—¶	36.8 (32.0–41.9)
HS diploma or GED	54,934 (27.0)	27.0 (26.6–27.3)	28.8 (20.3–39.0)	33.9 (24.1–45.5)	29.4 (18.1–43.9)	28.8 (24.3–33.7)
Some college	53,220 (30.5)	30.7 (30.2–31.1)	28.6 (18.0–42.3)	34.5 (23.0–48.1)	38.2 (26.2–51.8)	18.7 (15.3–22.7)
College graduate	76,905 (27.7)	27.9 (27.6–28.3)	9.8 (6.2–15.2)	—¶	19.8 (12.5–29.9)	15.7 (13.1–18.6)
Marital status**						
Married	106,277 (54.3)	54.3 (53.9–54.8)	47.7 (34.9–60.8)	33.0 (23.1–44.6)	27.4 (18.5–38.5)	55.0 (50.1–59.7)
Single††	34,824 (24.4)	24.4 (24.0–24.8)	34.3 (23.7–46.6)	40.3 (28.5–53.2)	55.4 (42.6–67.6)	18.1 (14.8–21.8)
Others	58,646 (21.4)	21.3 (20.9–21.6)	18.1 (12.1–26.1)	26.8 (17.9–38.0)	—¶	27.0 (23.1–31.2)
Employment§§						
Currently employed	99,548 (58.2)	58.3 (57.9–58.8)	61.4 (49.7–72.0)	51.7 (39.6–63.6)	50.8 (37.7–63.7)	46.2 (41.3–51.2)
Not currently employed	36,894 (22.2)	22.1 (21.7–22.5)	24.2 (16.2–34.4)	30.9 (21.4–42.5)	—¶	27.8 (23.4–32.8)
Retired	63,149 (19.6)	19.6 (19.2–19.9)	14.4 (9.1–21.9)	17.3 (11.3–25.7)	—¶	26.0 (22.4–30.0)
Household income ($)						
<25,000	44,686 (23.3)	23.1 (22.8–23.5)	36.4 (25.9–48.2)	43.7 (32.0–56.2)	41.2 (28.6–55.0)	27.3 (23.5–31.3)
25,000–74,999	71,127 (33.5)	33.7 (33.3–34.1)	30.6 (18.3–46.4)	30.8 (21.5–41.9)	35.1 (23.7–48.4)	20.6 (16.7–25.2)
≥75,000	56,997 (29.5)	29.9 (29.5–30.3)	14.1 (8.9–21.7)	—¶	—¶	8.2 (6.3–10.7)
Don't know/Refused	28,064 (13.7)	13.3 (13.0–13.6)	—¶	—¶	—¶	43.9 (39.1–48.8)
Home ownership**						
Own	145,317 (72.5)	72.7 (72.3–73.0)	55.8 (42.7–68.1)	53.4 (41.0–65.4)	53.3 (39.0–67.0)	64.3 (59.5–68.7)
Rent	47,701 (27.5)	27.3 (27.0–27.7)	44.2 (31.9–57.3)	46.6 (34.6–59.0)	46.7 (33.0–61.0)	35.7 (31.3–40.5)
Health–related behavior¶¶						
No current cigarette smoking	169,349 (83.7)	83.7 (83.4–84.0)	79.1 (68.5–86.8)	72.9 (59.1–83.3)	85.1 (75.2–91.6)	89.6 (86.6–92.0)
Moderate or no drinking	131,494 (63.8)	63.6 (63.2–64.0)	74.2 (62.7–83.1)	70.3 (57.9–80.4)	61.4 (47.7–73.4)	80.8 (76.0–84.8)
Having a normal weight	58,606 (31.2)	31.2 (30.7–31.6)	23.9 (15.7–34.5)	36.3 (23.6–51.4)	—¶	34.4 (29.0–40.2)
Any leisure-time physical activity	150,369 (75.3)	75.5 (75.1–75.9)	56.7 (42.9–69.6)	69.0 (57.7–78.4)	72.2 (57.1–83.5)	66.1 (61.4–70.5)
Sleeping ≥7 hours/24-hour period**	134,343 (65.0)	65.0 (64.6–65.5)	77.4 (68.3–84.5)	58.9 (46.2–70.5)	52.9 (39.7–65.7)	62.8 (57.7–67.6)
No. of health–related behaviors						
0 and 1	9,156 (5.8)	5.8 (5.6–6.0)	—¶	—¶	—¶	3.9 (2.3–6.3)
2	31,350 (18.6)	18.6 (18.3–19.0)	12.3 (7.9–18.6)	—¶	—¶	17.1 (12.3–23.2)
3	64,569 (35.2)	35.3 (34.8–35.7)	47.2 (33.5–61.4)	28.2 (19.0–39.7)	31.4 (20.4–44.9)	32.9 (27.7–38.5)
4 and 5	78,331 (40.3)	40.3 (39.9–40.8)	32.1 (21.8–44.5)	43.3 (30.1–57.5)	34.7 (23.2–48.4)	46.2 (40.2–52.4)

Abbreviations: CI = confidence interval; GED = general educational development high school equivalency diploma; HS = high school.

* Transgender status is based on responses of "Yes, transgender, male-to-female," "Yes, transgender, female-to-male," "Yes, transgender, gender nonconforming," "No," "Don't know/not sure," and "Refused" to a question, "Do you consider yourself to be transgender?"

† Cisgender is related to a person whose gender identity corresponds with sex at birth.

§ Significant associations ($p<0.05$) between transgender status and characteristics based on Cochran-Mantel-Haenszel chi-squared for trends. Don't know/Refused was not included in the test.

¶ Data are suppressed if relative standard error >0.3 or sample size <50. Relative standard error was calculated as a ratio of standard error and mean of the estimate.

** Significant associations ($p<0.05$) between transgender status and characteristics based on Cochran-Mantel-Haenszel chi-squared for general association. Don't know/Refused was not included in the test.

†† Single includes those who were never married or a member of an unmarried couple.

§§ Employment status is defined as retired, and employed if responses are "currently employed for wages" or "currently self-employed," "Not employed" included adults who were currently out of work, a homemaker, a student, or unable to work.

¶¶ Not a current cigarette smoker were respondents who reported not having smoked 100 cigarettes or more in their lifetime or having smoked at least 100 cigarettes in their lifetime but not smoking at the time of the survey. Moderate or no drinking in the past 30 days was defined as respondents' self-reported no alcohol drinking or drinking ≤2 alcoholic drinks per day for men and ≤1 alcoholic drink per day for women, and not binge drinking or heavy drinking. Binge drinking was defined as drinking ≥5 drinks on one occasion for men and ≥4 drinks on one occasion for women. Heavy drinking was defined as drinking ≥15 drinks per week for men and ≥8 drinks per week for women in the past 30 days. Having a normal body weight was defined as body mass index ≥18.5 kg/m^2 and <25 kg/m^2. Any leisure-time physical activity was defined as an affirmative response to a question, "During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?" Sufficient sleep was defined as ≥7 hours in response to a question, "On average, how many hours of sleep do you get in a 24-hour period?"

Conflict of Interest

No conflicts of interest were reported.

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Emergence of Localized Serogroup W Meningococcal Disease in the United States — Georgia, 2006–2016

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Several countries in Europe and Australia are reporting an increasing incidence of *Neisseria meningitidis* serogroup W (NmW) as a consequence of the rapid expansion of a single NmW clone belonging to clonal complex 11 (*1*–*5*). Because this clone is reported to be associated with more severe disease, unusual clinical presentations, and a high case fatality ratio (CFR), it is considered a hypervirulent strain (*1*,*6*). In the United States, NmW accounts for approximately 5% of meningococcal disease reported each year, and this proportion has remained stable for several years (*7*). However, localized increases in NmW have been reported, most notably in Florida during 2008–2009 (*8*). In Georgia, NmW accounted for only 3% of meningococcal disease cases reported during 2006–2013; however, between January 2014 and December 2016, 42% of all reported cases were NmW. Surveillance data from Georgia were analyzed to describe the epidemiology and clinical characteristics of NmW cases, and whole-genome sequencing of NmW isolates was performed for comparison with NmW strains circulating in the United States and worldwide. These data indicate that the U.S. NmW strains might have evolved from the same ancestor as the hypervirulent strain that is circulating globally. Genetic analysis demonstrates that these strains are closely related, which would suggest that genetic variation led to the rise of different strains from the same ancestor. Given the recent global expansion of this potentially hypervirulent NmW lineage, clinicians and public health officials need to remain vigilant in obtaining isolates to monitor changes in circulating strains.

A case of meningococcal disease was defined as laboratory-confirmed *N. meningitidis* isolated from a normally sterile body site, reported to the Georgia Department of Public Health (DPH) during 2006–2016. A comprehensive case report form, developed for the Emerging Infections Program's Active Bacterial Core surveillance (*9*), was used to abstract case medical record data, including demographic and clinical information. Clinical syndromes (e.g., bacteremia, meningitis, pneumonia) were not mutually exclusive; a patient could have multiple syndromes simultaneously. For statistical comparisons, Fisher's Exact and Student's t-Test statistics were calculated; p-values <0.05 were considered statistically significant.

All *N. meningitidis* isolates were requested for serogroup typing at the Georgia Public Health Laboratory as part of Active Bacterial Core surveillance. The isolates were then forwarded to CDC for serogroup confirmation and further molecular characterization using whole genome sequence analysis. The phylogenetic analysis included 18 NmW isolates collected in Georgia during 2012–2016, isolates from other states collected through routine surveillance, and the genome sequences of the global strains, obtained from the Bacterial Isolate Genome Sequence Database of PubMLST,* public databases for molecular typing and microbial genome diversity.

During 2006–2016, a total of 178 meningococcal disease cases were reported to DPH, including 158 (89%) with isolates available for serogroup typing. The 20 patients without an isolate available for serogroup typing were excluded from the analysis; these patients did not differ significantly by race, age, or sex from those with a known serogroup.

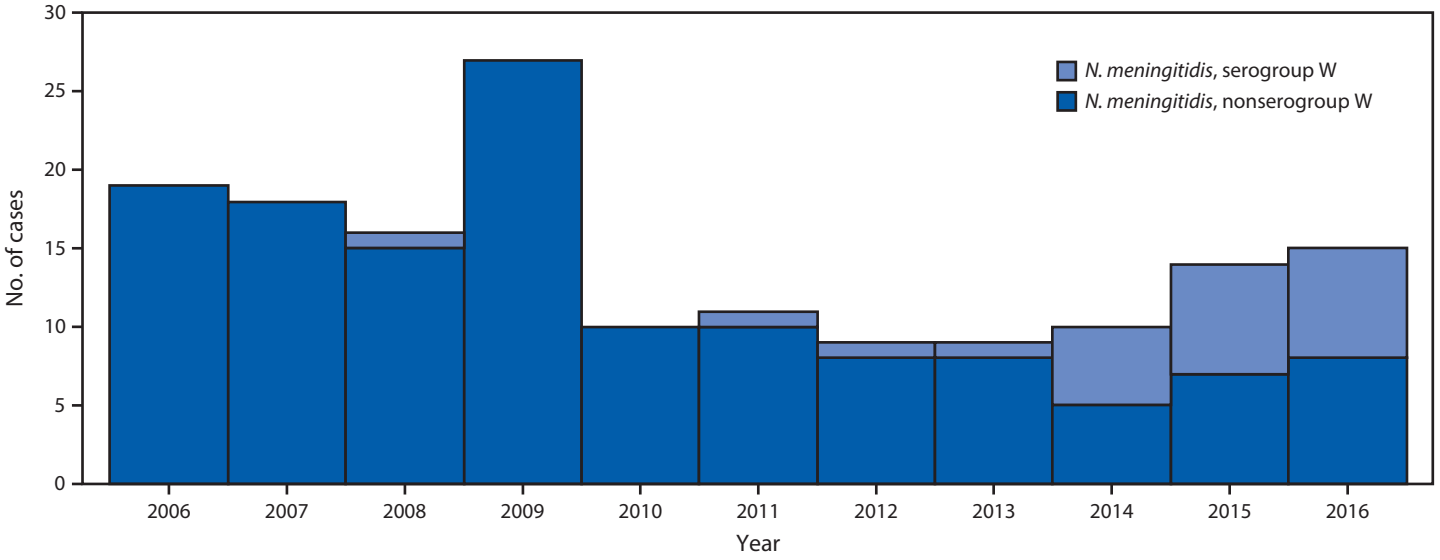
Overall, 21 (13%) NmW cases and 137 (87%) *N. meningitidis* non-serogroup W (non-NmW) cases were identified; the proportion of NmW cases increased from 0% in 2013 to 47% in 2016 (Figure 1). No epidemiologic links were identified among the patients with NmW disease, although 70% of NmW cases reported since 2006 were concentrated geographically in northern Georgia.

Among 21 patients with NmW disease, 14 (68%) were male compared with 74 (54%) patients with non-NmW disease; however, this difference was not statistically significant (Table). The median age of patients with NmW disease (34 years) was significantly higher than that of patients with non-NmW disease (26 years) (p = 0.005); 90% of patients with NmW were aged ≥18 years compared with 61% of patients with non-NmW disease. Data on admission to an intensive care unit (ICU) has been collected for all meningococcal disease cases since 2010; from 2010–2016, a similar percentage of patients with NmW disease and non-NmW disease were admitted to an ICU (56% and 54%, respectively). The CFR was higher for patients with NmW (24%) than for patients with non-NmW disease (15%); however, the numbers are small and were not statistically significantly different.

Bacteremia was reported in 50% of NmW and 35% of non-NmW cases, and meningitis accounted for less than 40% of infections in both groups. Although not collected systematically for all meningococcal disease cases in Georgia, it was noted in medical records that nine (41%) NmW patients

* https://pubmlst.org/software/database/bigsdb.

FIGURE 1. Meningococcal disease cases, by serogroup type — Georgia, 2006–2016



Abbreviation: *N. meningitidis* = *Neisseria meningitidis*.

during 2014–2016 reported gastrointestinal (GI) symptoms, such as diarrhea and vomiting, to their providers.

Eighteen (86%) NmW isolates belonged to clonal complex 11 (CC11); 17 of these were sequence type 11 (ST-11), and one, ST-10826, was a new sequence type. Pairwise comparison, a process of comparing any two sequences for genetic differences, indicated the difference between each pair of the 18 Georgia isolates ranged from 0–63 single nucleotide polymorphisms. The 17 ST-11 isolates from Georgia were more similar to each other than to isolates tested from other states (California, Florida, Ohio, and Texas) (Figure 2). Overall, the U.S. NmW CC11 isolates were more similar to strains from South America and Europe (six from the United Kingdom) than to those from Africa (Figure 2).

Discussion

Georgia experienced an increase in NmW disease during 2014–2016, compared with 2006–2013, which was associated with the emergence of a CC11 NmW strain that is different from the CC11 NmW strains from other U.S. states. Phylogenetic comparison of the Georgia and other U.S. CC11 NmW strains with global isolates indicates that these U.S. strains might have evolved from a clone previously observed in South America, which is also an ancestor of the hypervirulent United Kingdom strain that has emerged in Europe and Australia (*5*).

In contrast to other published reports, this analysis did not identify significant differences in CFR or clinical presentation of patients with NmW disease compared with those with non-NmW disease. However, there was a slightly higher frequency of ICU admission and higher CFR in patients with NmW

TABLE. Selected characteristics of patients with meningococcal disease (N = 158), by serogroup type — Georgia, 2006–2016

Characteristic*	*Neisseria meningitidis* serogroup type No. (%)	
	NmW (n = 21)	Non-NmW (n = 137)
Sex		
Male	14 (68)	74 (54)
Female	7 (32)	63 (46)
Age group		
Median, yrs (range)	34 (9 mos–84 yrs)	26 (13 days–91 yrs)
≥18	19 (90)	83 (61)
<18	2 (10)	53 (39)
Race		
Black	7 (35)	51 (38)
White	13 (65)	80 (59)
Other	0	4 (4)
Ethnicity		
Hispanic	2 (10)	8 (6)
Non-Hispanic	19 (90)	118 (94)
Type of infection		
Bacteremia only	11 (48)	47 (35)
Meningitis	5 (22)	52 (38)
Other†	7 (30)	45 (33)
Admitted to ICU§		
Yes	10 (56)	20 (54)
No	8 (44)	17 (46)
Outcome		
Survived	16 (76)	116 (85)
Died	5 (24)	21 (15)

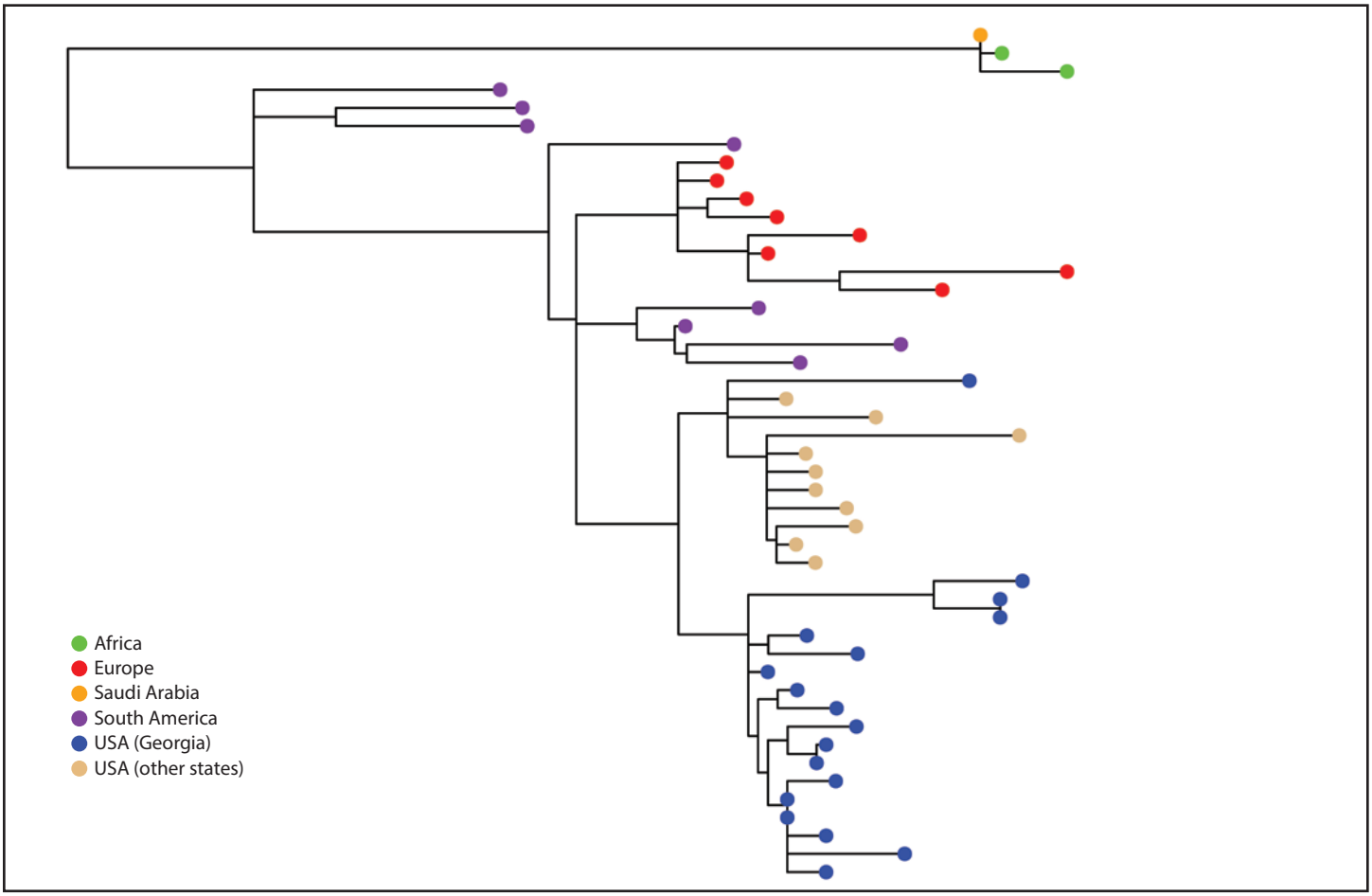
Abbreviations: ICU = intensive care unit; NmW = *N. meningitidis* serogroup W; Non-NmW = *N. meningitidis* nonserogroup W.

* Unknowns excluded from the table and the denominator calculations.

† Other infections not listed include pneumonia, septic arthritis, puerperal sepsis, cellulitis, epiglottitis, and supraglottitis. With the exception of bacteremia only, a patient might have multiple types of infections simultaneously.

§ This variable was not collected before 2010.

FIGURE 2. Whole genome maximum likelihood phylogeny * of *N. meningitidis* serogroup W clonal complex 11 isolates from Georgia, other U.S. states, Europe, Africa, and South America, 2006–2016*



* Branch length is related to the number of nucleotide substitutions. The more substitutions an isolate has, the longer its branch will be. More evolved strains will be further from their ancestor.

disease, which are consistent with a report from the United Kingdom that found that older children and adults with NmW disease were more likely to be admitted to the ICU (*1*). In addition, many NmW patients in the United Kingdom had predominantly GI symptoms, diarrhea in particular, which reportedly led to initial misdiagnoses and delays in provision of appropriate care (*6*). Although 41% of the Georgia NmW patients did report GI symptoms, information on these symptoms was not systematically collected on all meningococcal cases for comparison.

In the United Kingdom, the emergence of cases caused by the hypervirulent ST-11 strain initially began in adults but quickly extended to other age groups; during 2013–2014, this ST-11 strain accounted for nearly all NmW cases in persons aged 5–64 years and a high proportion of NmW cases in other age groups (*1*). This is of interest because in this analysis 90% of NmW cases occurred in persons aged ≥18 years; therefore, surveillance data will need to be monitored closely for future shifts in the age distribution of NmW cases.

The findings in this report are subject to at least three limitations. First, cases of *N. meningitidis* are rare, and thus performing sufficiently powered statistical tests of significance on the data are difficult. Second, serogroup W cases only make up 5% of reported meningococcal cases each year in the United States, and as a result, the comparison group for isolates within the United States is limited. Finally, clinical presentation and symptoms were not collected systematically for all *N. meningitidis* cases, which precluded direct analysis of Georgia data and comparison with data from other countries.

Although the numbers in this study are small, this report provides description of the NmW clone that has emerged in Georgia and its associated cases. The DPH will continue to monitor and follow up on all patients with meningococcal disease to collect clinical information and isolates to determine whether the trend of an increasing proportion of NmW cases continues. Clinicians and public health officials need to remain vigilant in obtaining isolates from all cases of meningococcal

Summary

What is already known about this topic?

The incidence of meningococcal disease has been declining in the United States for decades, but *Neisseria meningitidis* serogroup W incidence has been increasing in countries around the world.

What is added by this report?

The incidence of *Neisseria meningitidis* serogroup W is increasing in Georgia. Although not associated with an outbreak, molecular testing indicated that the Georgia serogroup W isolates are all from the same clonal complex, CC11. This strain is associated with an increased morbidity and mortality which could have severe implications.

What are the implications for public health practice?

The collection and testing of meningococcal isolates for serogroup and strain information is important to monitor changes and emergence of previously underrepresented serogroups.

disease to monitor changes in circulating strains over time, and also remain aware of the potential for atypical clinical presentations that might not be indicative of meningococcal disease to prevent delays in treatment that could result in unnecessary morbidity and mortality.

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Conflict of Interest

No conflicts of interest were reported.

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Contraceptive Use Among Women at Risk for Unintended Pregnancy in the Context of Public Health Emergencies — United States, 2016

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Ensuring access to and promoting use of effective contraception have been identified as important strategies for preventing unintended pregnancy (*1*). The importance of ensuring resources to prevent unintended pregnancy in the context of public health emergencies was highlighted during the 2016 Zika virus outbreak when Zika virus infection during pregnancy was identified as a cause of serious birth defects (*2*). Accordingly, CDC outlined strategies for state, local, and territorial jurisdictions to consider implementing to ensure access to contraception (*3*). To update previously published contraceptive use estimates* among women at risk for unintended pregnancy† and to estimate the number of women with ongoing or potential need for contraceptive services,§,¶ data on contraceptive use were collected during September–December 2016 through the Behavioral Risk Factor Surveillance System (BRFSS). Results from 21 jurisdictions indicated that most women aged 18–49 years were at risk for unintended pregnancy (range across jurisdictions = 57.4%–76.8%). Estimates of the number of women with ongoing or potential need for contraceptive services ranged from 368 to 617 per 1,000 women aged 18–49 years. The percentage of women at risk for unintended pregnancy using a most or moderately effective contraceptive method** ranged from 26.1% to 65.7%. Jurisdictions can use this information to estimate the number of women who might seek contraceptive services and to plan and evaluate efforts to increase contraceptive use. This information is particularly important in the context of public health emergencies, such as the recent Zika virus outbreak, which have been associated with increased risk for adverse maternal-infant outcomes (*2*,*4*–*6*) and have highlighted the importance of providing women and their partners with resources to prevent unintended pregnancy.

BRFSS is a cross-sectional jurisdiction-specific, random-digit–dialed, telephone survey that collects data on risk behaviors and preventive health practices among adult respondents living in the 50 states, the District of Columbia, Puerto Rico, Guam, and U.S. Virgin Islands.†† This report includes data from 21 jurisdictions§§ that implemented the optional family planning module on self-reported contraceptive use during September–December 2016.¶¶ Individual contraceptive methods from this module were classified according to first-year typical use failure rates as most effective (≤1% failure), moderately effective (>1%–10% failure), or less effective (>10% failure).*** Women reporting more than one contraceptive method were classified according to the most effective method they reported using.

Weighted estimates and 95% confidence intervals were calculated to determine the proportion of women aged 18–49 years at risk for unintended pregnancy (defined as those who reported they were sexually active with a male partner, but did not report that they were currently pregnant or seeking

* State-based estimates of contraceptive use during the Zika response were from 2011–2013. https://www.cdc.gov/mmwr/volumes/65/wr/mm6530e2.htm.

† Women were considered at risk for unintended pregnancy unless they reported that they were not sexually active with a male partner, that they were currently pregnant or seeking pregnancy, that they would not mind being pregnant, or that they had a hysterectomy.

§ Women with ongoing or potential need for contraceptive services were defined as those women considered at risk for unintended pregnancy who were not using permanent contraceptive methods (female sterilization or report of male partner vasectomy).

¶ The number of women with ongoing or potential need for contraceptive services can be used to predict the number of women who might seek services, but does not represent unmet need for contraception because many of these women might already be using some method of contraception. https://www.guttmacher.org/sites/default/files/report_pdf/contraceptive-needs-and-services-2014_1.pdf.

** Most effective contraceptive methods are associated with a ≤1% failure rate during the first year of typical use; moderately effective contraceptive methods are associated with a >1%–10% failure rate during the first year of typical use. These contrast with less effective methods, which are associated with a >10% failure rate during the first year of typical use, and the use of no method, which is associated with an 85% pregnancy rate for the overall population of women of reproductive age. https://www.cdc.gov/reproductivehealth/contraception/index.htm.

†† https://www.cdc.gov/brfss/data_documentation/index.htm.

§§ Includes Alabama, Arizona, California, Connecticut, Florida, Georgia, Illinois, Kansas, Kentucky, Louisiana, Maryland, Minnesota, New Jersey, Ohio, Oklahoma, South Carolina, Texas, Virginia, West Virginia, Guam, and Puerto Rico. Data collected for Mississippi are not included in this report because they did not meet BRFSS reliability standards (denominators ≥50 respondents and a relative standard error ≤30%) with respect to reporting the number of women with ongoing or potential need for contraceptive services, or the proportion of women at risk for unintended pregnancy by method type.

¶¶ Questions implemented followed those implemented in 2017 with Module 17: Preconception Health/Family Planning. https://www.cdc.gov/brfss/questionnaires/pdf-ques/2017_BRFSS_Pub_Ques_508_tagged.pdf.

*** Most effective contraceptive methods included permanent contraceptive methods (female sterilization or report of male partner vasectomy) and long-acting reversible contraception (LARC, including intrauterine devices [IUDs] and contraceptive implants). Moderately effective contraceptive methods included contraceptive injectables, contraceptive pills, contraceptive patches, and vaginal rings. Less effective contraceptive methods included diaphragms, condoms (male or female), withdrawal, cervical caps, sponges, spermicides, fertility-awareness based methods, and emergency contraception.

pregnancy, that they would not mind being pregnant, or that they had a hysterectomy). In addition, numbers and rates (total number and number per 1,000 women aged 18–49 years) and corresponding 95% confidence intervals were calculated for women with ongoing or potential need for contraceptive services (defined as those at risk for unintended pregnancy who were not using permanent contraceptive methods [female sterilization or report of male partner vasectomy]). Estimates also were calculated to describe the proportion of women at risk for unintended pregnancy using contraception by effectiveness category (most effective, including permanent methods and long-acting reversible contraception [LARC]; moderately effective; less effective; and no method). Estimates for using either a less effective method or no method were further stratified by age group (18–24, 25–34, 35–44, and 45–49 years). Women at risk for unintended pregnancy who did not specify the type of contraception they used or reported "other" methods (4.8%)[†††] were excluded from estimates of contraceptive use by method effectiveness and from estimates of the number of women with ongoing or potential need for contraceptive services. Estimates that did not meet reliability standards established for BRFSS were suppressed.[§§§]

Among the 21 jurisdictions, the proportion of women aged 18–49 years at risk for unintended pregnancy ranged from 57.4% (Texas) to 76.8% (Minnesota) (Table 1). Jurisdictions with the fewest numbers of women with ongoing or potential need for contraceptive services included Guam, Kansas, Puerto Rico, and West Virginia; jurisdictions with the highest numbers included California, Florida, Illinois, and Texas. Estimates of the number of women with ongoing or potential need for contraceptive services per 1,000 women aged 18–49 years ranged from 368 in Puerto Rico to 617 in Maryland. Among women at risk for unintended pregnancy, the proportion using either a most or moderately effective contraceptive method ranged from 26.1% (Guam) to 65.7% (West Virginia) (Table 2); among 11 jurisdictions with reliable estimates for LARC, use ranged from 5.5% (Kansas) to 17.0% (Maryland). Among 18 jurisdictions with reliable estimates, the percentage of

[†††] Write-in responses were not available for women responding "other," and previous evaluation of BRFSS contraceptive use data indicates these methods are a mix of permanent and reversible methods of all effectiveness levels. https://www.cdc.gov/mmwr/volumes/65/wr/mm6530e2.htm.

[§§§] Reliability standards for BRFSS require suppression of estimates with an unweighted denominator of <50 respondents or a relative standard error >30%.

TABLE 1. Percentage of women aged 18–49 years at risk for unintended pregnancy* and numbers of women with ongoing or potential need for contraceptive services,[†,§] by jurisdiction — Behavioral Risk Factor Surveillance System, 21 jurisdictions, September–December, 2016

Jurisdiction	Total no. of women aged 18–49 years[¶]	% of women aged 18–49 years at risk for unintended pregnancy (95% CI)	Women with ongoing or potential need for contraceptive services	
			No. (95% CI)[¶]	No. per 1,000 aged 18–49 years (95% CI)
Alabama	1,022,400	64.6 (56.9–71.6)	418,200 (342,500–498,400)	409 (335–487)
Arizona	1,400,300	57.9 (42.9–71.5)	683,400 (487,400–882,200)	488 (348–630)
California	8,585,800	67.6 (60.3–74.1)	4,464,500 (3,817,200–5,104,000)	520 (445–594)
Connecticut	737,700	67.2 (51.5–79.9)	378,800 (283,900–472,400)	514 (385–640)
Florida	4,027,500	59.9 (53.4–66.1)	1,803,900 (1,566,300–2,047,500)	448 (389–508)
Georgia	2,252,800	62.5 (50.3–73.2)	1,089,400 (828,400–1,354,400)	484 (368–601)
Illinois	2,745,600	74.1 (63.9–82.1)	1,675,800 (1,380,200–1,944,600)	610 (503–708)
Kansas	588,900	71.9 (66.8–76.5)	297,100 (262,900–331,300)	505 (446–563)
Kentucky	913,400	71.8 (66.8–76.3)	447,900 (397,400–498,600)	490 (435–546)
Louisiana	997,700	62.1 (44.0–77.3)	387,800 (227,600–576,400)	389 (228–578)
Maryland	1,299,200	75.8 (69.3–81.3)	801,200 (707,500–888,600)	617 (545–684)
Minnesota	1,126,900	76.8 (70.3–82.3)	596,800 (502,200–689,700)	530 (446–612)
New Jersey	1,862,500	76.6 (65.4–85.0)	1,142,400 (922,100–1,340,300)	613 (495–720)
Ohio	2,359,500	61.5 (52.9–69.4)	1,105,200 (907,800–1,306,900)	468 (385–554)
Oklahoma	805,100	65.8 (58.5–72.5)	376,800 (318,000–436,600)	468 (395–542)
South Carolina	1,021,100	70.3 (62.7–76.9)	548,300 (461,100–633,400)	537 (452–620)
Texas	6,011,100	57.4 (47.4–66.9)	2,435,800 (1,888,700–3,025,200)	405 (314–503)
Virginia	1,813,800	71.6 (64.1–78.1)	938,500 (799,900–1,075,600)	517 (441–593)
West Virginia	360,400	67.6 (61.4–73.3)	158,200 (136,700–180,300)	439 (379–500)
Guam	35,200	70.3 (59.2–79.4)	20,800 (16,500–24,700)	591 (469–702)
Puerto Rico	795,700	63.7 (58.8–68.4)	292,900 (255,600–332,200)	368 (321–417)

Abbreviation: CI = confidence interval.

* Women were considered at risk for unintended pregnancy unless they reported that they were not sexually active with a male partner, that they were currently pregnant or seeking pregnancy, that they would not mind being pregnant, or that they had a hysterectomy.

† Women with ongoing or potential need for contraceptive services were defined as those women considered at risk for unintended pregnancy who were not using permanent contraceptive methods (female sterilization or report of male partner vasectomy).

§ The number of women with ongoing or potential need for contraceptive services can be used to predict how many women might seek services; this measure does not represent unmet need for contraception because many of these women might already be using some method of contraception: https://www.guttmacher.org/sites/default/files/report_pdf/contraceptive-needs-and-services-2014_1.pdf.

¶ Numbers are rounded to the nearest 100.

TABLE 2. Percentage of women aged 18–49 years at risk for unintended pregnancy* using most† or moderately effective§ contraceptive methods, by jurisdiction — Behavioral Risk Factor Surveillance System, 21 jurisdictions, September–December, 2016

	Total	Most effective		
	Most or moderately effective	Sterilization	Long-acting reversible (LARC)	Moderately effective
Jurisdiction	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Alabama	63.8 (54.0–72.5)	35.7 (26.6–46.0)	—¶	19.1 (12.5–28.2)
Arizona	39.1 (25.1–55.1)	—	—	—
California	51.5 (42.0–60.9)	22.5 (16.5–29.9)	11.7 (7.5–17.8)	17.2 (12.4–23.4)
Connecticut	55.4 (44.5–65.9)	21.9 (15.0–31.0)	9.4 (5.5–15.7)	24.1 (14.6–37.0)
Florida	48.6 (42.0–55.2)	22.9 (17.3–29.6)	9.7 (6.5–14.4)	16.0 (12.0–21.0)
Georgia	51.5 (36.9–65.8)	22.3 (12.0–37.7)	—	—
Illinois	62.4 (50.5–73.0)	16.8 (10.0–26.7)	—	33.3 (21.0–48.3)
Kansas	60.9 (53.7–67.7)	28.9 (23.0–35.8)	5.5 (3.3–9.1)	26.4 (20.6–33.2)
Kentucky	60.1 (53.4–66.5)	31.3 (25.1–38.2)	6.6 (4.1–10.6)	22.2 (17.0–28.4)
Louisiana	56.9 (32.1–78.7)	35.0 (18.7–55.8)	—	—
Maryland	62.3 (53.8–70.1)	17.6 (12.7–23.9)	17.0 (11.0–25.4)	27.7 (19.5–37.6)
Minnesota	60.2 (50.2–69.4)	29.9 (21.3–40.2)	11.8 (6.6–20.2)	18.5 (11.1–29.2)
New Jersey	50.8 (37.2–64.2)	16.3 (10.5–24.5)	—	—
Ohio	45.4 (35.7–55.3)	22.9 (16.6–30.6)	7.6 (4.4–13.0)	14.8 (10.0–21.5)
Oklahoma	62.5 (53.0–71.1)	28.2 (21.3–36.3)	—	27.0 (19.5–36.0)
South Carolina	61.5 (50.3–71.7)	22.8 (15.5–32.3)	10.5 (5.8–18.3)	28.2 (19.4–39.2)
Texas	53.0 (40.7–65.1)	27.3 (17.7–39.5)	—	20.5 (12.8–31.1)
Virginia	60.8 (51.9–68.9)	26.8 (20.0–35.0)	13.3 (7.8–21.7)	20.7 (14.8–28.0)
West Virginia	65.7 (58.9–72.0)	34.4 (27.8–41.6)	11.0 (6.5–17.9)	20.4 (15.0–27.0)
Guam	26.1 (15.2–41.0)	—	—	—
Puerto Rico	49.8 (43.6–55.9)	41.6 (35.7–47.8)	—	6.8 (4.1–11.1)

Abbreviation: CI = confidence interval

* Women were considered at risk for unintended pregnancy unless they reported that they were not sexually active with a male partner, that they were currently pregnant or seeking pregnancy, that they would not mind being pregnant, or that they had a hysterectomy.

† Most effective contraceptive methods included permanent methods (female sterilization or report of male partner vasectomy) and long-acting reversible contraception (LARC, including intrauterine devices [IUDs] and contraceptive implants); most effective methods have a ≤1% failure rate during the first year of typical use. Sources: Trussell J. Contraceptive failure in the United States. Contraception 2011;83:397–404. Sundaram A, Vaughan B, Kost K, et al. Contraceptive failure in the United States: estimates from the 2006–2010 National Survey of Family Growth. Perspect Sex Reprod Health 2017;49:7–16.

§ Moderately effective contraceptive methods included contraceptive injectables, contraceptive pills, transdermal contraceptive patches, and vaginal rings; moderately effective methods have a >1%–10% failure rate with typical use. Sources: Trussell J. Contraceptive failure in the United States. Contraception 2011;83:397–404. Sundaram A, Vaughan B, Kost K, et al. Contraceptive failure in the United States: estimates from the 2006–2010 National Survey of Family Growth. Perspect Sex Reprod Health 2017;49:7–16.

¶ Estimate is unreliable (relative standard error >30% or denominator <50).

women at risk for unintended pregnancy using a less effective method of contraception ranged from 11.1% (Illinois) to 47.7% (Arizona), and among 19 jurisdictions, the percentage not using any method of contraception ranged from 16.5% (Virginia) to 63.0% (Guam) (Table 3). Across age-stratified estimates, the percentage using either a less effective method or no method ranged from 25.9% (women aged 35–44 years in South Carolina) to 79.9% (women aged 18–24 years in California) (Supplementary Table, https://stacks.cdc.gov/view/cdc/57915).

Discussion

Across the 21 jurisdictions, the number of women with ongoing or potential need for contraceptive services per 1,000 women aged 18–49 years ranged from 368 to 617 and exceeded 4 million in total in the jurisdiction with the highest number of women with ongoing or potential need for contraceptive services. The proportion of women at risk for unintended pregnancy using a most or moderately effective method of contraception ranged from 26.1% to 65.7%. The proportion using no contraception ranged from 16.5% to 63.0%. These data can be used for jurisdictional planning and are particularly important in the context of public health emergencies associated with increased risk for adverse maternal-infant outcomes that heighten the need to provide women and their partners with resources to prevent unintended pregnancy.

The data for this report were collected because of concerns about Zika virus–related adverse pregnancy and birth outcomes; however, the findings have broader implications. Several types of public health emergencies, such as natural disasters, including hurricanes, have been associated with adverse maternal-infant outcomes, along with disruptions in women's abilities to access contraception and interruptions in method use (*4*,*5*). Similarly, given the ongoing opioid crisis and high proportion of unintended pregnancies among women who misuse opioids (*6*), ensuring access to contraception and preconception care among these women is an important strategy for reducing the incidence of neonatal abstinence syndrome (*6*). Moreover, ensuring access to effective contraception is important in general for supporting women and their

TABLE 3. Percentage of women aged 18–49 years at risk for unintended pregnancy* using less effective† contraceptive methods or no method, by jurisdiction — Behavioral Risk Factor Surveillance System, 21 jurisdictions, September–December, 2016

	Total		
	Less effective or no method	Less effective method	No method
Jurisdiction	% (95% CI)	% (95% CI)	% (95% CI)
Alabama	36.2 (27.5–46.0)	13.6 (8.3–21.6)	22.6 (15.6–31.6)
Arizona	60.9 (44.9–74.9)	47.7 (31.0–65.0)	—§
California	48.5 (39.1–58.0)	31.6 (21.9–43.2)	16.9 (12.3–22.9)
Connecticut	44.6 (34.1–55.5)	20.4 (13.0–30.6)	24.1 (16.4–34.1)
Florida	51.4 (44.8–58.0)	14.1 (10.2–19.3)	37.3 (31.2–43.9)
Georgia	48.5 (34.2–63.1)	—	34.1 (21.9–48.8)
Illinois	37.6 (27.0–49.5)	11.1 (6.2–19.1)	26.4 (18.0–37.0)
Kansas	39.1 (32.3–46.3)	14.5 (10.4–19.8)	24.6 (18.7–31.7)
Kentucky	39.9 (33.5–46.6)	20.0 (15.0–26.1)	19.9 (15.5–25.2)
Louisiana	43.1 (21.3–67.9)	—	—
Maryland	37.7 (29.9–46.2)	18.8 (13.3–26.0)	18.9 (13.4–25.8)
Minnesota	39.8 (30.6–49.8)	13.1 (8.1–20.6)	26.7 (19.0–36.1)
New Jersey	49.2 (35.8–62.8)	18.3 (10.7–29.6)	30.9 (21.3–42.5)
Ohio	54.6 (44.7–64.3)	22.2 (13.0–35.2)	32.5 (23.5–43.0)
Oklahoma	37.5 (28.9–47.0)	11.8 (7.9–17.3)	25.7 (17.8–35.6)
South Carolina	38.5 (28.3–49.7)	11.3 (7.7–16.3)	27.2 (17.6–39.5)
Texas	47.0 (34.9–59.3)	16.0 (9.8–24.9)	31.0 (19.7–45.0)
Virginia	39.2 (31.1–48.1)	22.7 (15.6–31.8)	16.5 (11.9–22.4)
West Virginia	34.3 (28.0–41.1)	11.9 (8.4–16.7)	22.3 (17.2–28.5)
Guam	74.0 (59.0–84.8)	—	63.0 (47.7–76.0)
Puerto Rico	50.2 (44.1–56.4)	20.1 (15.5–25.6)	30.2 (24.8–36.1)

Abbreviation: CI = confidence interval.

* Women were considered at risk for unintended pregnancy unless they reported that they were not sexually active with a male partner, that they were currently pregnant or seeking pregnancy, that they would not mind being pregnant, or that they had a hysterectomy.

† Less effective contraceptive methods included diaphragms, condoms (male or female), withdrawal, cervical caps, sponges, spermicides, fertility-awareness based methods, and emergency contraception; less effective methods have a >10% failure rate during the first year of typical use. Sources: Trussell J. Contraceptive failure in the United States. Contraception 2011;83:397–404. Sundaram A, Vaughan B, Kost K, et al. Contraceptive failure in the United States: estimates from the 2006–2010 National Survey of Family Growth. Perspect Sex Reprod Health 2017;49:7–16.

§ Estimate is unreliable (relative standard error >30% or denominator <50).

partners in planning their pregnancies and is also cost-saving (*7*), particularly during public health emergencies such as the Zika virus outbreak where costs associated with long-term care of children with adverse birth outcomes are high (*8*).

Jurisdiction-level data are important because of the substantial variation among jurisdictions in unintended pregnancy rates (*9*). Although a number of sociodemographic factors contribute to this variation, implementation of programs and policies that increase access to contraception, including the most effective methods, also varies considerably among jurisdictions.¶¶¶ During the Zika virus outbreak response, CDC worked with jurisdictional partners to implement strategies to promote increased access to contraception (*3*). Frequently adopted strategies included maintaining sustainable partnerships among insurers, manufacturers, and state agencies; reimbursing for the full range of contraceptive services; maintaining continuous stocking and supply of devices in a wide range of service facilities; and training providers on current insertion and removal techniques for the most effective methods. Although developed during the Zika virus response, these strategies apply broadly to all situations in which women and their partners need access to resources to prevent unintended pregnancy.

This report provides data both for estimating the number of women who might seek services and for evaluating the impact of policies and programs. Understanding how many women need contraceptive services and where the need is greatest can aid in planning health care delivery.**** In addition, the proportion of women at risk for unintended pregnancy using a most or moderately effective contraceptive method is an established indicator of quality family planning service provision†††† and a *Healthy People 2020* objective.§§§§ This indicator is critical for evaluating the success of implementation strategies and population-level impact (*1*). Conversely, variation in prevalence of use of less effective contraceptive methods or no method, as documented in this report by age group, can be used to identify the need for targeted implementation of strategies, such as provision of youth-friendly services (*3*).

The findings in this report are subject to at least five limitations. First, information on contraceptive use was self-reported and might be subject to recall or social desirability bias. Second, because data for this report were collected over a 4-month period versus an entire year, small sample sizes limited the precision of estimates. Third, it was not possible to determine whether those reporting unspecified methods were using permanent or reversible methods. Estimates of the number of women with ongoing or potential need for contraceptive services therefore excluded these women and might have underestimated the number who might seek services; conversely, these estimates included women using LARC, who might only need services every 3–10 years depending on the type of LARC (*10*). Fourth, this report includes data from only 21 jurisdictions and is not representative of other jurisdictions; however, it highlights the need for ongoing collection of jurisdiction-level data for all U.S. jurisdictions. Finally, nonresponse bias remains a possibility, although the weighting methodology used by BRFSS adjusts for nonresponse bias.

¶¶¶ Examples of programs and policies that vary by state include participation in the Association of State and Territorial Health Officials' state learning community for improving access http://www.astho.org/Programs/Maternal-and-Child-Health/Increasing-Access-to-Contraception/ and Medicaid family planning eligibility expansions https://www.guttmacher.org/state-policy/explore/medicaid-family-planning-eligibility-expansions.

**** https://www.guttmacher.org/sites/default/files/report_pdf/contraceptive-needs-and-services-2014_1.pdf and https://thenationalcampaign.org/deserts.

†††† https://www.hhs.gov/opa/performance-measures/most-or-moderately-effective-contraceptive-methods/index.html.

§§§§ https://www.healthypeople.gov/2020/topics-objectives/topic/family-planning/objectives; FP-16.

Summary

What is already known about this topic?

Ensuring access to contraception is an effective strategy for preventing unintended pregnancy and associated negative maternal-infant outcomes.

What is added by this report?

Data from 21 jurisdictions collected during a 4-month period indicated the number of women with ongoing or potential need for contraceptive services per 1,000 women aged 18–49 years. ranged from 368 to 617. The proportion at risk for unintended pregnancy using a most or moderately effective contraceptive method ranged from 57.4% to 76.8%. The proportion using no contraception ranged from 16.5% to 63.0%.

What are the implications for public health practice?

The recent Zika virus outbreak highlighted the need for contraception data in the context of public health responses associated with adverse maternal-infant outcomes. These data can inform delivery of contraceptive services and evaluation of implementation strategies to increase access to contraception.

Ensuring access to effective contraception is an important strategy for preventing unintended pregnancy and can be particularly important in the context of certain public health responses. During the Zika virus outbreak, contraception served as a medical countermeasure to prevent Zika virus-affected pregnancies and is similarly important in other contexts where risk for adverse maternal-infant outcomes is increased. The data in this report can be applied in nonemergency settings to help jurisdictions estimate the number of women who might seek contraceptive services and to plan and evaluate implementation strategies.

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Conflict of Interest

No conflicts of interest were reported.

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Erratum

Vol. 67, No. 30

In the report "Progress Toward Poliomyelitis Eradication — Afghanistan, January 2017–May 2018," multiple incorrect spellings occurred because of a spell-check error. The errors are corrected online.

The listing of authors originally read "Maureen Martinez, MPH[1]; Hemant Shukla, MD[2]; Meiland Ahmadi, MD[3]; Joanna Inulin, MD[2]; Mufti Sabari Widodo, MBBS[2]; Jamal Ahmed, MD[2]; Chukwuma Mbaeyi, DDS[1]; Jaime Jabra, PhD[4]; Derek Gerhardt, MPH[1]"

The listing of authors should have read "Maureen Martinez, MPH[1]; Hemant Shukla, MD[2]; **Maiwand Ahmadzai**, MD[3]; **Joanna Nikulin**, MD[2]; **Mufti Zubair Wadood**, MBBS[2]; Jamal Ahmed, MD[2]; Chukwuma Mbaeyi, DDS[1]; **Jaume Jorba**, PhD[4]; **Derek Ehrhardt**, MPH[1]"

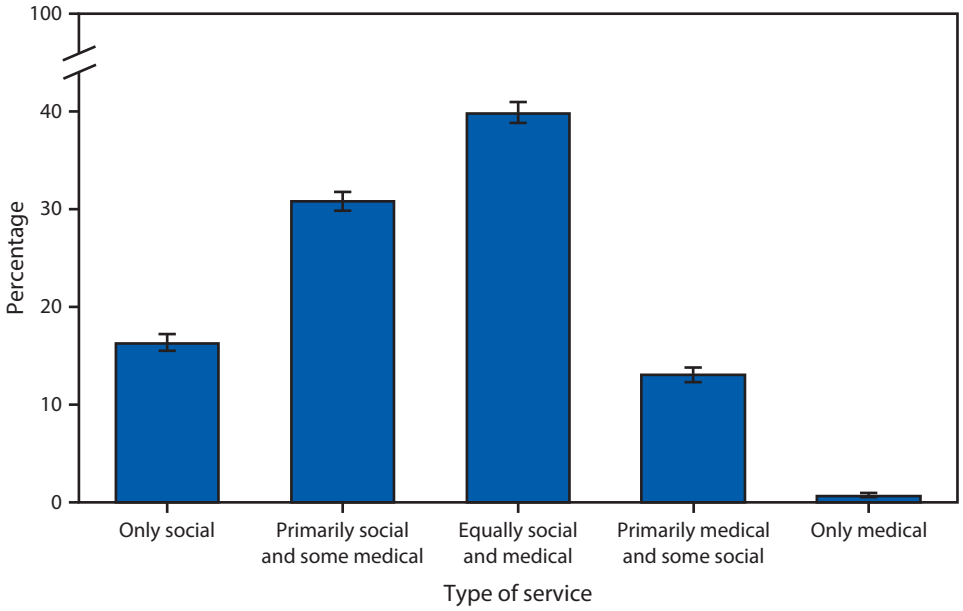
The first paragraph of text under Immunization Activities on page 833 beginning with the third sentence originally read "Administrative OPV3 coverage (calculated by dividing the number of doses administered by the estimated target population) in 2017 ranged from 100% in the central provinces of Kapitsa and Panjsher to 24% and 9% in the southern provinces of Helmand and Kabul, respectively. The proportion of children aged 6–23 months nationally with NPAFP who never received OPV through routine immunization services or SIAs (i.e., "zero-dose" children) was approximately 1% during 2016–2017. High proportions of zero-dose children were reported in 2017 in Kabul (9%) and Kandahar (4%) provinces in the southern region, Kunar (8%) province in the eastern region, and Paktika (7%) province in the southeastern region."

The sentences should have read "Administrative OPV3 coverage (calculated by dividing the number of doses administered by the estimated target population) in 2017 ranged from 100% in the central provinces of **Kapisa** and Panjsher to 24% and 9% in the southern provinces of Helmand and **Zabul**, respectively. The proportion of children aged 6–23 months nationally with NPAFP who never received OPV through routine immunization services or SIAs (i.e., "zero-dose" children) was approximately 1% during 2016–2017. High proportions of zero-dose children were reported in 2017 in **Zabul** (9%) and Kandahar (4%) provinces in the southern region, Kunar (8%) province in the eastern region, and Paktika (7%) province in the southeastern region."

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage Distribution* of Adult Day Services Centers,† by Type of Service§ — National Study of Long-Term Care Providers, 2016¶



* With 95% confidence intervals indicated with error bars.
† Adult day services centers 1) are licensed or certified by the state specifically to provide adult day services, or accredited by the Commission on Accreditation of Rehabilitation Facilities, or authorized or otherwise set up to participate in Medicaid (Medicaid state plan, Medicaid waiver, Medicaid managed care), or part of a Program of All-Inclusive Care for the Elderly; 2) have an average daily attendance of one or more participants based on a typical week; and 3) have one or more participants enrolled at the center at the designated location at the time of the survey.
§ Respondents, who were typically center directors, were asked, "Which one of the following best describes the participant needs that the services of this center are designed to meet? a. ONLY social/recreation needs—NO health/medical needs; b. PRIMARILY social/recreational needs and SOME health/medical needs; c. EQUALLY social/recreational and health/medical needs; d. PRIMARILY health/medical needs and SOME social/recreational needs; e. ONLY health/medical needs—NO social/recreational needs."
¶ Adult day services centers with missing data were excluded.

In 2016, four in 10 adult day services centers had services that were designed to meet both the social and medical needs of their enrolled participants equally. Approximately 31% of adult day services centers had services to meet primarily social needs and some medical needs of participants, 16% had services to meet only social needs, 13% had services to meet primarily medical needs and some social needs, and 1% had services to meet only medical needs.

Source: National Study of Long-Term Care Providers, 2016. https://www.cdc.gov/nchs/nsltcp/index.htm.

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