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HIV Testing Trends Among Persons with Commercial Insurance or Medicaid — United States, 2014–2019

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HIV testing is a critical component of effective HIV prevention and care. CDC recommends routine opt-out HIV testing in health care settings for all sexually active persons aged 13–64 years at least once in their lifetime and risk-based testing regardless of age for those who report behaviors associated with HIV acquisition (*1*). However, recent studies show low HIV testing rates in clinical settings; HIV testing rates at visits to physician offices did not increase during 2009–2016 (*2*). The objective of the current study is to estimate temporal trends in HIV testing among persons with commercial insurance or Medicaid from 2014 through 2019 and describe their demographic characteristics in 2019. Weighted data from the IBM MarketScan Commercial Claims and Encounters database* (commercial insurance) and from the Centers for Medicare & Medicaid Services (CMS) claims database† (Medicaid) were analyzed to estimate the proportions of persons with commercial insurance or Medicaid who received testing for HIV. Testing rates increased among male and nonpregnant female persons aged ≥13 years with either type of coverage. In 2019, only 4.0% of those with commercial insurance and 5.5% of those with Medicaid received testing for HIV. Testing rates were higher among non-Hispanic Black or African American (Black) persons and Hispanic or Latino (Hispanic) persons. Based on mathematical modeling studies, these annual testing rates would need to increase at least threefold and be sustained over several years (*3*,*4*) to achieve the Ending the HIV Epidemic (EHE) in the U.S. initiative goal of ≥95% of persons with HIV being aware of their infection by 2025.§ Interventions need to be implemented to increase routine and risk-based HIV testing in clinical settings to higher levels that can help reduce disparities in HIV diagnoses between Black and Hispanic persons compared with non-Hispanic White (White) persons (*5*). Increased HIV testing is essential to achieve the goals of the EHE initiative and reduce disparities in HIV diagnoses; public health should partner with health care systems to implement interventions that support increased testing.

Many factors might be associated with low HIV testing rates for persons across socioeconomic strata, even among those with health care insurance (*6*). In 2019, the U.S. Department of Health and Human Services launched the EHE initiative that includes four strategic pillars (diagnose, treat, prevent, and respond) to end the HIV epidemic by 2030. The "diagnose" pillar is intended to achieve diagnosis for all persons with HIV as early as possible, with a goal to detect ≥95% of all infections by 2025. As part of the initiative, CDC funded

* https://www.ibm.com/products/marketscan-research-databases/databases
† https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo. Access to this database is by license only.
§ https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview

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health departments to conduct several activities, including the expansion of routine and risk-based testing in clinical settings.[¶] HIV testing can serve as an entry point for HIV prevention and care services and can normalize HIV testing as a routine part of preventive care.

CDC analyzed data from the 2014–2019 MarketScan and Medicaid databases to identify temporal trends in HIV testing in clinical settings among persons with commercial insurance or Medicaid and their demographic characteristics. The MarketScan database is a convenience sample of commercial health plans that include health service information for approximately 40 million persons per year and is weighted using validated methods to be nationally representative of the 200 million U.S. persons with commercial insurance. The CMS database includes information on persons with Medicaid in all 50 states and the District of Columbia. Both databases contained deidentified patient information and diagnostic, procedural, and drug codes for clinical services provided; Medicaid reports data on race/ethnicity, and MarketScan does not. Separate analyses were conducted using the MarketScan and Medicaid databases. Eligibility criteria included persons who 1) were aged ≥13 years, 2) were continuously enrolled for at least 6 months in a given year, and 3) had no previous HIV diagnosis. Pregnant adolescents and women were excluded because CDC recommends that they receive prenatal testing for HIV during each pregnancy, rather than routine or risk-based testing (*1*). Persons aged ≥65 years were included because HIV prevalence has increased in the oldest age group for which surveillance data are reported (*7*). HIV diagnoses were identified using codes from the ninth and tenth revisions of the *International Classification of Diseases.*[**] HIV tests were identified using Current Procedural Terminology[††] and Healthcare Common Procedure Coding System[§§] codes. SAS software (version 9.4; SAS Institute) was used to conduct analyses. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.[¶¶]

The proportions of male and nonpregnant female persons aged ≥13 years with commercial insurance or Medicaid who received HIV testing each year were estimated. Race/ethnicity data were available only for persons with Medicaid, therefore the trend in testing over time was estimated by race/ethnicity

[¶] https://www.cdc.gov/hiv/funding/announcements/ps20-2010/index.html

[**] *International Classifications of Diseases, Ninth Revision* (ICD-9) diagnosis codes of 042, 079.53, 795.71 were used to identify persons with an HIV diagnosis. https://www.cdc.gov/nchs/icd/icd9.htm. *International Classifications of Diseases, Tenth Revision* (ICD-10 diagnosis codes of B20, B97.35, O98.7XX, R75, V08, Z21 were used to identify persons with an HIV diagnosis. https://www.cdc.gov/nchs/icd/icd10.htm

[††] Current Procedural Terminology codes 86689, 86701–86703, and 87389–87391 were used to identify HIV testing procedures. https://www.ama-assn.org/practice-management/cpt

[§§] Healthcare Common Procedure Coding System codes G0432-G0435 were also included to identify HIV testing. https://www.cms.gov/Medicare/Coding/MedHCPCSGenInfo

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

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only for those with Medicaid. The estimated annual percentage change and 95% confidence intervals were calculated for each trend. The estimated number and proportion of persons with commercial insurance and with Medicaid who had testing in 2019 were stratified by sex, age group, race/ethnicity (Medicaid only), urban versus rural residence, and U.S. Census region.

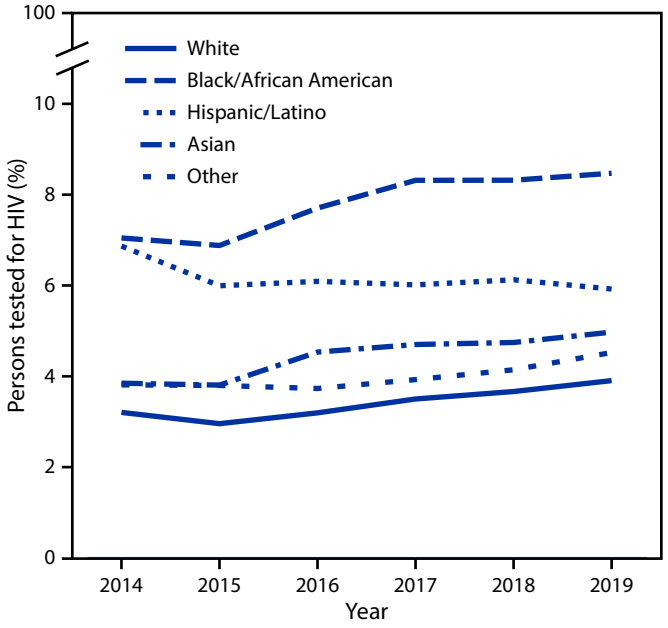
During 2014–2019, the proportion of male and nonpregnant female persons aged ≥13 years with HIV testing increased an estimated 6.0% per year among those with commercial insurance, and an estimated 3.2% among those with Medicaid (Table 1). Among persons with Medicaid, this trend was observed for all racial and ethnic groups except Hispanic persons (Figure). Despite the increase in HIV testing, only 4.0% of persons with commercial insurance and 5.5% of persons with Medicaid received testing for HIV in 2019 (Table 1). The proportion of persons with HIV testing was higher among those with Medicaid than among those with commercial insurance across all regions and all demographic groups except persons aged ≥65 years (Table 2). In 2019, among persons with Medicaid, the percentages of Black persons (8.5%) and Hispanic persons (5.9%) with HIV testing were higher than the percentages of White persons (3.9%) and non-Hispanic Asian (Asian) persons (5.0%) with HIV testing.

Discussion

HIV testing rates increased from 2014 through 2019 among persons with commercial insurance and persons with Medicaid. The proportion of persons who received HIV testing was higher among those with Medicaid than among those with commercial insurance; trends were generally similar across demographic characteristics.

Higher rates of HIV testing were expected among persons with Medicaid because Medicaid includes large proportions of persons in populations with the highest rates of HIV diagnoses. A recent study found that from 2009 to 2014 HIV testing increased in community health centers, and this trend likely continued during the period of this study (*2*). Guidelines for routine opt-out and risk-based HIV testing have been widely disseminated, and testing campaigns have been conducted by public health organizations and health care systems to increase provider awareness of these recommendations. Testing also might have increased as HIV preexposure prophylaxis (PrEP)

FIGURE. Percentage of male and nonpregnant female persons aged ≥13 years with Medicaid who received testing for HIV, by race and ethnicity* — Centers for Medicare & Medicaid Services, United States, 2014–2019



* Persons reported as White, Black, Asian, and Other were non-Hispanic; persons reported as Hispanic/Latino could be of any race.

TABLE 1. Number and percentage of male and nonpregnant female persons aged ≥13 years who received testing for HIV and the estimated annual percentage change in HIV testing among persons with commercial insurance or Medicaid — United States, 2014–2019

Insurance type/ Insured persons	Year						EAPC* (95% CI)
	2014	2015	2016	2017	2018	2019	
Commercial†							
Unweighted no.	32,965,590	19,983,855	19,897,709	18,747,383	19,122,236	17,471,826	N/A
Weighted no.§	110,689,206	117,747,637	112,914,294	115,710,035	114,177,141	114,726,222	N/A
Weighted no. with HIV test§	3,486,360	3,540,501	3,408,869	3,781,412	4,247,939	4,637,964	6.4 (6.3–6.4)
Weighted % with HIV test	3.1	3.0	3.0	3.3	3.7	4.0	6.0 (6.0–6.1)
Medicaid†							
Total no.	**45,964,636**	**51,684,583**	**52,911,975**	**53,444,150**	**53,126,192**	**52,472,143**	**N/A**
No. with HIV test	2,284,238	2,371,188	2,606,385	2,794,386	2,844,232	2,898,425	5.2 (5.2–5.2)
% with HIV test	5.0	4.6	4.9	5.2	5.4	5.5	3.2 (3.1–3.2)

Abbreviations: CI = confidence interval; EAPC = estimated annual percentage change; N/A = not applicable.
* EAPCs were calculated using a generalized Poisson model.
† Persons who were continuously insured for at least 6 months in a given year.
§ Weighted to generate nationally representative estimates of persons with commercial insurance (https://www.ibm.com/products/marketscan-research-databases/databases).

use increased during the same period because PrEP users should receive HIV testing at PrEP initiation and every 3 months thereafter (*7*,*8*). HIV testing is a strategic priority of EHE and was included among Medicaid noncore health care quality measures for adults in 2021 (*9*), which could contribute to future increases in HIV testing rates.

The findings in this report are subject to at least four limitations. First, only persons with 6 months of continuous commercial insurance or Medicaid enrollment were included, which might have resulted in an underestimate or overestimate of testing rates. Length of enrollment might vary by a person's demographic characteristics and result in under- or overestimation of HIV testing rates by these characteristics. Second, because there was no link between persons included in the MarketScan and Medicaid databases, accounting for persons enrolled in both Medicaid and commercial insurance in the same year was not possible. This circumstance might have resulted in counting a person as having been tested in both the commercial insurance and Medicaid analyses in the same year. However, by limiting the analyses to persons enrolled in their health plan for at least 6 months, it is unlikely that many such persons were included in analyses for both systems. Third, Medicare recipients who were not dually enrolled in Medicaid or commercial insurance were not included, so this study included only limited HIV testing information for persons aged ≥65 years. Finally, persons receiving testing at an HIV outreach event or in a venue that did not bill a person's health insurance for the HIV test would not have been included in this study.

TABLE 2. Number and percentage of male and nonpregnant female persons aged ≥13 years with commercial insurance or Medicaid who received testing for HIV, by demographic characteristics — United States, 2019

	Insured persons*				
	Commercial insurance			Medicaid	
Characteristic	Unweighted no.	Weighted no.†	Weighted no. with HIV test† (%)	No.	No. with HIV test (%)
Total	**17,471,826**	**114,726,222**	**4,637,964 (4.0)**	**52,472,143**	**2,898,425 (5.5)**
Sex at birth					
Male	8,545,670	57,671,191	2,129,687 (3.7)	22,869,597	1,084,432 (4.7)
Female	8,926,156	57,055,031	2,508,276 (4.4)	29,602,546	1,813,993 (6.1)
Age group, yrs					
13–14	614,706	4,137,555	17,427 (0.4)	3,550,836	34,672 (1.0)
15–18	1,144,235	7,924,306	173,427 (2.2)	6,272,678	279,257 (4.5)
19–29	3,600,398	22,265,021	1,515,024 (6.8)	10,011,887	855,013 (8.5)
30–49	6,650,691	45,192,213	2,103,739 (4.7)	14,950,792	1,140,752 (7.6)
50–64	5,448,381	35,119,257	827,531 (2.4)	9,816,896	529,234 (5.4)
≥65	13,415	87,870	816 (0.9)	7,869,054	59,497 (0.8)
Race/Ethnicity					
White	—§	—	—	19,713,421	769,135 (3.9)
Black/African American	—	—	—	9,283,337	785,673 (8.5)
Hispanic/Latino¶	—	—	—	11,379,127	673,073 (5.9)
Asian	—	—	—	2,636,311	130,950 (5.0)
Other**	—	—	—	1,012,462	45,751 (4.5)
Unknown	—	—	—	8,447,485	493,843 (5.8)
Urban/Rural residence††					
Urban	13,853,880	94,995,029	4,195,184 (4.4)	41,294,013	2,503,400 (6.1)
Rural	1,867,957	11,658,371	204,827 (1.8)	9,747,177	292,824 (3.0)
Unknown	1,749,989	8,072,823	237,952 (2.9)	1,430,953	102,201 (7.1)
U.S. Census region§§					
Northeast	3,199,361	20,951,646	1,204,664 (5.7)	10,228,160	732,846 (7.2)
Midwest	3,492,100	25,925,386	707,469 (2.7)	9,274,664	468,835 (5.1)
South	7,916,680	41,356,545	1,646,199 (4.0)	15,431,589	710,537 (4.6)
West	2,801,976	26,430,883	1,076,942 (4.1)	16,444,186	923,992 (5.6)
Unknown	61,709	61,762	2,690 (4.4)	1,094,450	62,222 (5.7)

* Persons who were continuously enrolled in their health insurance plan for ≥6 months in 2019.
† Weighted to generate nationally representative estimates of persons with commercial insurance (https://www.ibm.com/products/marketscan-research-databases/databases).
§ Dashes indicate race/ethnicity data not available in commercial insurance data set.
¶ Race/ethnicity groups are mutually exclusive. Hispanic/Latino persons can be of any race.
** "Other" includes American Indian or Alaska Native and Native Hawaiian or Other Pacific Islander.
†† Location of patient residence. For persons with commercial insurance, their urban or rural residence was defined using Metropolitan Statistical Areas codes. For persons with Medicaid, their urban or rural location was defined using their zip code and the Centers for Medicare & Medicaid Services carriers' Medicare Administrative Contractors and localities files (https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/FeeScheduleGenInfo).
§§ *Northeast:* Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. *Midwest:* Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. *South:* Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. *West:* Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Summary

What is already known about this topic?

HIV testing in clinical settings provides an entry point for other HIV care and prevention services.

What is added by this report?

The percentage of males and nonpregnant females aged ≥13 years with either commercial insurance or Medicaid who received testing for HIV increased from 2014 to 2019 but was less than 6%. Testing rates were higher among persons with Medicaid than those with commercial insurance; among those with Medicaid, rates for Black/African Americans and Hispanic/Latino persons were higher than for White persons.

What are implications for public health practice?

Increasing HIV testing in clinical settings by at least threefold is essential to achieve the goal of ≥95% of persons with HIV being aware of their infection by 2025 and to reduce disparities in HIV diagnoses.

HIV testing rates were highest among Black persons and Hispanic persons, which is encouraging. To accomplish goals of the EHE initiative and to reduce disparities in HIV diagnoses, higher HIV testing rates are needed for all groups, but especially for some racial and ethnic minority groups (*4*). A recent study found that a two- to threefold increase in HIV testing rates at ambulatory care visits would result in almost all Black men and Hispanic men receiving testing by age 39 years (*3*). In another recent study, a standing order for a routine opt-out HIV test added to all blood draws in a large health care system in 2016 resulted in 35.4% of the patient population receiving an HIV test (*10*). These percentages were much higher than the national percentages found in the current study (4.0% among persons with commercial insurance and 5.5% among those with Medicaid). A recent review conducted by the Community Preventive Services Task Force (CPSTF) found that testing can be efficiently increased at clinical visits by incorporating clinical decision support tools in electronic health records that generate an automated order for routine opt-out testing or risk-based testing (*5*). Increased HIV testing in clinical settings is essential to achieve the goals of the EHE initiative and reduce disparities in HIV diagnoses. Public health should partner with health care systems to implement interventions, such as those reviewed by the CPSTF, that support increased testing.

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References

1. Branson BM, Handsfield HH, Lampe MA, et al.; CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep 2006;55(No. RR-14). PMID:16988643
2. Hoover KW, Huang YA, Tanner ML, et al. HIV Testing trends at visits to physician offices, community health centers, and emergency departments—United States, 2009–2017. MMWR Morb Mortal Wkly Rep 2020;69:776–80. PMID:32584800 https://doi.org/10.15585/mmwr.mm6925a2
3. Hoover KW, Khalil GM, Cadwell BL, Rose CE, Peters PJ. Benchmarks for HIV testing: what is needed to achieve universal testing coverage at U.S. ambulatory healthcare facilities. J Acquir Immune Defic Syndr 2021;86:e48–53. PMID:33136820 https://doi.org/10.1097/QAI.0000000000002553
4. Jenness SM, Johnson JA, Hoover KW, Smith DK, Delaney KP. Modeling an integrated HIV prevention and care continuum to achieve the Ending the HIV Epidemic goals. AIDS 2020;34:2103–13. PMID:32910062 https://doi.org/10.1097/QAD.0000000000002681
5. Community Preventative Services Task Force. HIV prevention: clinical decision support system to increase HIV screening. Atlanta, GA: US Department of Health and Human Services, CDC, The Community Guide. Accessed June 21, 2021. https://www.thecommunityguide.org/findings/hiv-prevention-and-control-clinical-decision-support-system-increase-hiv-screening
6. Wise JM, Ott C, Azuero A, et al. Barriers to HIV testing: patient and provider perspectives in the deep South. AIDS Behav 2019;23:1062–72. PMID:30607759 https://doi.org/10.1007/s10461-018-02385-5
7. US Department of Health and Human Services. AHEAD America's HIV epidemic analysis dashboard. Washington, DC: US Department of Health and Human Services; 2021. Accessed June 21, 2021. https://ahead.hiv.gov
8. Huang YA, Zhu W, Smith DK, Harris N, Hoover KW. HIV preexposure prophylaxis, by race and ethnicity—United States, 2014–2016. MMWR Morb Mortal Wkly Rep 2018;67:1147–50. PMID:30335734 https://doi.org/10.15585/mmwr.mm6741a3
9. Centers for Medicare & Medicaid Services. Quality of care performance measurement. Baltimore, MD: Centers for Medicare & Medicaid Services; 2021. Accessed April 28, 2021. https://www.medicaid.gov/medicaid/quality-of-care/quality-of-care-performance-measurement/index.html
10. Arya M, Marren RE, Marek HG, Pasalar S, Hemmige V, Giordano TP. Success of supplementing national HIV testing recommendations with a local initiative in a large health care system in the U.S. South. J Acquir Immune Defic Syndr 2020;83:e6–9. PMID:31929408 https://doi.org/10.1097/QAI.0000000000002222

Need for Contraceptive Services Among Women of Reproductive Age — 45 Jurisdictions, United States, 2017–2019

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Ensuring access to contraceptive services is an important strategy for preventing unintended pregnancies, which account for nearly one half of all U.S. pregnancies (*1*) and are associated with adverse maternal and infant health outcomes (*2*). Equitable, person-centered contraceptive access is also important to ensure reproductive autonomy (*3*). Behavioral Risk Factor Surveillance System (BRFSS) data collected during 2017–2019 were used to estimate the proportion of women aged 18–49 years who were at risk for unintended pregnancy* and had ongoing or potential need for contraceptive services.† During 2017–2019, in the 45 jurisdictions§ from which data were collected, 76.2% of women aged 18–49 years were considered to be at risk for unintended pregnancy, ranging from 67.0% (Alaska) to 84.6% (Georgia); 60.7% of women had ongoing or potential need for contraceptive services, ranging from 45.3% (Puerto Rico) to 73.7% (New York). For all jurisdictions combined, the proportion of women who were at risk for unintended pregnancy and had ongoing or potential need for contraceptive services varied significantly by age group, race/ethnicity, and urban-rural status. Among women with ongoing or potential need for contraceptive services, 15.2% used a long-acting reversible method (intrauterine device or contraceptive implant), 25.0% used a short-acting reversible method (injectable, pill, transdermal patch, or vaginal ring), and 29.5% used a barrier or other reversible method (diaphragm, condom, withdrawal, cervical cap, sponge, spermicide, fertility-awareness–based method, or emergency contraception). In addition, 30.3% of women with ongoing or potential need were not using any method of contraception. Data in this report can be used to help guide jurisdictional planning to deliver contraceptive services, reduce unintended pregnancies, ensure that the contraceptive needs of women and their partners are met, and evaluate efforts to increase access to contraception.

BRFSS is a state-based, random-digit-dialed telephone survey that collects self-reported health information from U.S. adults.¶ This report uses the most recent available data for the optional Family Planning Module** (2017 data for seven jurisdictions and 2019 data for 38 jurisdictions). The proportion of women aged 18–49 years at risk for unintended pregnancy was estimated.†† Women were considered to be at risk for unintended pregnancy unless they reported 1) not being sexually active with a male partner, 2) being currently pregnant or seeking pregnancy, 3) not minding being pregnant, or 4) having had a hysterectomy. This approach is consistent with prior evaluation of BRFSS contraceptive use data (*4*). The proportion and total number of women aged 18–49 years with ongoing or potential need for contraceptive services, defined as women considered to be at risk for unintended pregnancy who were not using permanent contraception (female sterilization or male partner vasectomy), were also estimated.§§ Estimates were calculated overall, by jurisdiction, and by selected sociodemographic characteristics.¶¶

* Women were considered to be at risk for unintended pregnancy unless they reported 1) not being sexually active with a male partner, 2) being currently pregnant or seeking pregnancy, 3) not minding being pregnant, or 4) having had a hysterectomy.

† Women with ongoing or potential need for contraceptive services were defined as women considered to be at risk for unintended pregnancy who were not using permanent contraception (female sterilization or male partner vasectomy). The number of women with ongoing or potential need for contraceptive services can be used to estimate how many women might seek services.

§ 2017: Alaska, California, District of Columbia, Maine, Nevada, New Jersey, and Texas. 2019: Alabama, Arizona, Arkansas, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Virginia, West Virginia, Wisconsin, Wyoming, and Puerto Rico.

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

** 2017 questions are listed in Module 17: Preconception Health/Family Health (https://www.cdc.gov/brfss/questionnaires/pdf-ques/2017_BRFSS_Pub_Ques_508_tagged.pdf). 2019 questions are listed in Module 23: Family Planning (https://www.cdc.gov/brfss/questionnaires/pdf-ques/2019-BRFSS-Questionnaire-508.pdf).

†† Twenty-one percent of women aged 18–49 years had missing data on being at risk for unintended pregnancy status, primarily caused by incomplete BRFSS interviews administered via mobile telephone rather than missing data specifically on the family planning module questions.

§§ Women at risk for unintended pregnancy who did not specify the type of contraception that they used or reported "other method" (4.8%) were excluded from estimates of women with ongoing or potential need for contraceptive services and from estimates of contraceptive use by method category. Write-in responses were not available for women who responded "other method"; previous evaluation of BRFSS contraceptive use data indicates that these methods are a mix of permanent and reversible methods. https://www.cdc.gov/mmwr/volumes/65/wr/mm6530e2.htm

¶¶ Age was ascertained by the answer to the question, "What is your age?" Race/ethnicity was ascertained by the answer to the question, "Which one or more of the following would you say is your race?" Health insurance coverage was ascertained by the answer to the question, "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?" Routine checkup within the past year was ascertained by the answer to the question, "About how long has it been since you last visited a doctor for a routine checkup?" Urban-rural status was determined using the 2013 National Center for Health Statistics urban-rural classification scheme for counties.

TABLE 1. Estimated numbers and percentages of women aged 18–49 years who were at risk for unintended pregnancy* and had ongoing or potential need for contraceptive services,† by jurisdiction — Behavioral Risk Factor Surveillance System, 45 jurisdictions, 2017–2019§

	Women aged 18–49 yrs			
			No. and % who had ongoing or potential need for contraceptive services	
Jurisdiction	Total no.¶	% at risk for unintended pregnancy (95% CI)	No. (95% CI)¶	% (95% CI)
Alabama	**1,005,000**	76.8 (73.5–79.8)	571,800 (533,700–610,000)	56.9 (53.1–60.7)
Alaska	**146,300**	67.0 (60.6–72.9)	75,600 (65,400–85,700)	51.7 (44.7–58.6)
Arizona	**1,444,100**	80.9 (76.6–84.5)	875,100 (804,400–943,000)	60.6 (55.7–65.3)
Arkansas	**596,100**	75.3 (70.5–79.5)	347,500 (316,500–377,900)	58.3 (53.1–63.4)
California	**8,514,600**	70.6 (67.6–73.5)	5,091,700 (4,810,700–5,355,700)	59.8 (56.5–62.9)
Connecticut	**694,700**	82.7 (79.6–85.3)	481,400 (455,700–505,000)	69.3 (65.6–72.7)
Delaware	**189,900**	79.6 (74.0–84.3)	125,300 (114,100–135,800)	66.0 (60.1–71.5)
District of Columbia	**192,700**	73.9 (69.5–78.0)	131,600 (122,700–139,900)	68.3 (63.7–72.6)
Florida	**4,130,200**	80.4 (76.4–83.9)	2,589,600 (2,403,800–2,767,200)	62.7 (58.2–67.0)
Georgia	**2,226,700**	84.6 (81.0–87.6)	1,572,100 (1,474,100–1,661,100)	70.6 (66.2–74.6)
Hawaii	**275,300**	70.8 (67.5–73.8)	164,400 (154,400–174,000)	59.7 (56.1–63.2)
Idaho	**350,100**	77.9 (73.7–81.7)	188,000 (170,100–205,500)	53.7 (48.6–58.7)
Illinois	**2,604,400**	78.6 (75.1–81.7)	1,669,400 (1,567,800–1,763,200)	64.1 (60.2–67.7)
Indiana	**1,349,100**	75.7 (72.6–78.6)	785,200 (739,300–831,000)	58.2 (54.8–61.6)
Iowa	**613,400**	79.4 (77.0–81.6)	348,400 (330,600–365,600)	56.8 (53.9–59.6)
Kansas	**573,400**	77.6 (74.9–80.0)	342,900 (325,700–358,900)	59.8 (56.8–62.6)
Louisiana	**968,400**	79.8 (76.3–82.9)	625,600 (586,900–662,400)	64.6 (60.6–68.4)
Maine	**244,500**	71.5 (66.8–75.8)	131,300 (118,800–143,800)	53.7 (48.6–58.8)
Maryland	**1,214,500**	77.0 (74.2–79.5)	763,900 (727,500–800,400)	62.9 (59.9–65.9)
Massachusetts	**1,420,600**	80.1 (76.9–83.0)	964,600 (913,400–1,012,900)	67.9 (64.3–71.3)
Minnesota	**1,119,500**	78.9 (76.9–80.8)	690,700 (665,000–715,400)	61.7 (59.4–63.9)
Mississippi	**610,100**	75.4 (71.7–78.8)	338,600 (313,600–362,400)	55.5 (51.4–59.4)
Missouri	**1,222,900**	78.9 (75.4–82.0)	694,600 (644,500–743,500)	56.8 (52.7–60.8)
Montana	**203,400**	80.6 (77.4–83.4)	115,900 (108,200–123,500)	57.0 (53.2–60.7)
Nebraska	**380,800**	80.1 (76.9–83.0)	243,300 (229,200–256,700)	63.9 (60.2–67.4)
Nevada	**619,000**	73.7 (68.2–78.6)	359,000 (322,500–394,300)	58.0 (52.1–63.7)
New Jersey	**1,792,400**	74.9 (71.4–78.1)	1,100,500 (1,032,400–1,166,900)	61.4 (57.6–65.1)
New Mexico	**409,000**	81.0 (77.2–84.3)	246,600 (228,200–264,200)	60.3 (55.8–64.6)
New York	**4,069,700**	81.6 (77.1–85.4)	2,999,400 (2,800,000–3,178,400)	73.7 (68.8–78.1)
North Carolina	**2,155,000**	71.3 (67.1–75.2)	1,204,600 (1,109,800–1,299,500)	55.9 (51.5–60.3)
Ohio	**2,281,900**	78.1 (74.0–81.8)	1,360,000 (1,255,000–1,460,400)	59.6 (55.0–64.0)
Oklahoma	**788,500**	75.6 (70.5–80.0)	414,000 (371,400–455,000)	52.5 (47.1–57.7)
Oregon	**861,400**	82.0 (78.8–84.8)	528,900 (495,300–560,800)	61.4 (57.5–65.1)
Pennsylvania	**2,446,600**	77.7 (73.9–81.1)	1,460,600 (1,357,900–1,560,900)	59.7 (55.5–63.8)
Rhode Island	**215,300**	80.3 (75.4–84.5)	144,700 (133,500–155,200)	67.2 (62.0–72.1)
South Carolina	**1,010,300**	79.3 (75.8–82.4)	640,500 (599,100–678,900)	63.4 (59.3–67.2)
South Dakota	**170,200**	81.4 (76.4–85.5)	103,100 (92,900–112,700)	60.6 (54.6–66.2)
Tennessee	**1,362,800**	78.4 (74.2–82.0)	800,000 (735,900–861,300)	58.7 (54.0–63.2)
Texas	**6,093,500**	67.4 (63.1–71.5)	3,199,100 (2,918,800–3,479,400)	52.5 (47.9–57.1)
Utah	**707,100**	75.4 (73.2–77.6)	403,000 (386,100–420,700)	57.0 (54.6–59.5)
Virginia	**1,759,700**	78.9 (75.7–81.7)	1,113,900 (1,050,500–1,173,700)	63.3 (59.7–66.7)
West Virginia	**333,400**	76.7 (72.6–80.3)	170,400 (154,700–185,700)	51.1 (46.4–55.7)
Wisconsin	**1,125,000**	79.5 (74.8–83.4)	717,800 (661,500–770,600)	63.8 (58.8–68.5)
Wyoming	**111,500**	78.5 (74.0–82.4)	63,300 (57,300–69,100)	56.8 (51.4–62.0)
Puerto Rico	**734,000**	75.6 (72.7–78.2)	332,500 (309,700–356,000)	45.3 (42.2–48.5)
Overall	**61,337,100**	**76.2 (75.4–77.0)**	**37,231,600 (36,618,200–37,783,700)**	**60.7 (59.7–61.6)**

Abbreviation: CI = confidence interval.

* Women were considered to be at risk for unintended pregnancy unless they reported 1) not being sexually active with a male partner, 2) being currently pregnant or seeking pregnancy, 3) not minding being pregnant, or 4) having had a hysterectomy.

† Women with ongoing or potential need for contraceptive services were defined as women considered to be at risk for unintended pregnancy not using permanent contraception (female sterilization or male partner vasectomy). The number of women with ongoing or potential need for contraceptive services can be used to estimate how many women might seek services.

§ Data shown are from 2019, except 2017 data are shown for seven jurisdictions: Alaska, California, District of Columbia, Maine, Nevada, New Jersey, and Texas.

¶ Weighted numbers are rounded to the nearest 100.

TABLE 2. Estimated numbers and percentages of women aged 18–49 years who were at risk for unintended pregnancy* and had ongoing or potential need for contraceptive services,† by selected sociodemographic characteristics — Behavioral Risk Factor Surveillance System, 45 jurisdictions, 2017–2019§

Sociodemographic characteristic	Women aged 18–49 yrs			
	Total no.¶	% at risk for unintended pregnancy (95% CI)	No. and % who had ongoing or potential need for contraceptive services	
			No. (95% CI)¶	% (95% CI)
Age group, yrs				
18–24	13,992,200	71.5 (69.5–73.5)**	9,696,600 (9,402,800–9,990,400)	69.3 (67.2–71.4)**
25–34	20,042,800	74.5 (73.0–75.9)	12,867,500 (12,546,800–13,188,200)	64.2 (62.6–65.8)
35–44	18,901,000	79.5 (78.1–80.8)	10,263,200 (9,960,800–10,546,800)	54.3 (52.7–55.8)
45–49	8,401,100	80.4 (78.6–82.1)	4,435,800 (4,251,000–4,620,600	52.8 (50.6–55.0)
Race/Ethnicity				
White, non-Hispanic	30,888,700	78.0 (77.0–78.9)**	18,131,700 (17,791,900–18,471,400)	58.7 (57.6–59.8)**
Black, non-Hispanic	8,764,100	75.3 (73.1–77.5)	5,723,000 (5,503,900–5,933,300)	65.3 (62.8–67.7)
Hispanic	14,526,100	75.5 (73.6–77.2)	8,948,100 (8,643,000–9,238,600)	61.6 (59.5–63.6)
Other	6,305,400	70.8 (67.1–74.2)	3,903,000 (3,657,100–4,136,300)	61.9 (58.0–65.6)
Insurance coverage				
Yes	51,112,100	76.2 (75.3–77.1)	30,871,700 (30,360,600–31,382,800)	60.4 (59.4–61.4)
No	9,915,300	76.8 (74.7–78.8)	6,167,300 (5,929,300–6,395,400)	62.2 (59.8–64.5)
Routine checkup within past yr				
Yes	43,835,000	76.7 (75.7–77.6)	26,651,700 (26,213,300–27,133,900)	60.8 (59.8–61.9)
No	16,704,300	75.3 (73.6–76.9)	10,056,000 (9,755,300–10,356,700)	60.2 (58.4–62.0)
Urban-rural status††				
Urban	57,369,500	76.5 (75.6–77.3)**	35,282,200 (34,708,500–35,798,600)	61.5 (60.5–62.4)**
Rural	3,227,300	72.6 (69.6–75.4)	1,639,500 (1,552,300–1,729,800)	50.8 (48.1–53.6)

Abbreviation: CI = confidence interval.

* Women were considered to be at risk for unintended pregnancy unless they reported 1) not being sexually active with a male partner, 2) being currently pregnant or seeking pregnancy, 3) not minding being pregnant, or 4) having had had a hysterectomy.

† Women with ongoing or potential need for contraceptive services were defined as women considered to be at risk for unintended pregnancy not using permanent contraception (female sterilization or male partner vasectomy). The number of women with ongoing or potential need for contraceptive services can be used to estimate how many women might seek services.

§ 2017: Alaska, California, District of Columbia, Maine, Nevada, New Jersey, and Texas. 2019: Alabama, Arizona, Arkansas, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Virginia, West Virginia, Wisconsin, Wyoming, and Puerto Rico.

¶ Weighted numbers are rounded to the nearest 100.

** p<0.05 for chi-square test comparing the distribution of the outcome by the sociodemographic characteristic.

†† Determined using the 2013 National Center for Health Statistics urban-rural classification scheme for counties. https://www.cdc.gov/nchs/data_access/urban_rural.htm

Chi-square tests were conducted to examine differences in distributions by sociodemographic characteristics.

Among women with ongoing or potential need for contraceptive services, the proportions who were using a specific contraceptive method at last sexual encounter were estimated*** by category of method or no method, overall, and by jurisdiction. Categories of contraceptive methods reflect different levels of effort for method initiation and continuation. Long-acting reversible contraception methods include intrauterine devices and contraceptive implants; these methods require the most clinical effort for initiation but require minimal follow-up until time for removal or reinsertion and minimal action by the woman. Short-acting reversible contraception methods include injectables, pills, transdermal patches, and vaginal rings; these methods require less clinical effort for initiation than long-acting reversible methods but require ongoing clinical services and supplies and action by the woman to maintain use. Barrier or other reversible methods included diaphragms, condoms (male or female), withdrawal, cervical caps, sponges, spermicides, fertility-awareness–based methods, and emergency contraception; these methods have little or no need for clinical services for initiation but require action by the woman or her partner to maintain use. Analyses were conducted using SAS (version 9.4; SAS Institute) with SUDAAN to account for the complex sampling methods used in BRFSS; data were weighted for nonresponse.†††

Among women aged 18–49 years in the 45 jurisdictions, 76.2% were considered to be at risk for unintended pregnancy,

*** Contraceptive method use at last sexual encounter was ascertained by the answers to the questions, "The last time you had sex with a man, did you or your partner do anything to keep you from getting pregnant?" (2019) or "What did you or your partner do the last time you had sex to keep you from getting pregnant?" (2017).

††† Response rates for the included jurisdictions in 2019 ranged from 37.3% (New York) to 73.1% (South Dakota) (https://www.cdc.gov/brfss/annual_data/2019/pdf/2019-response-rates-table-508.pdf). Response rates for the included jurisdictions in 2017 ranged from 31.4% (California) to 49.3% (Maine). https://www.cdc.gov/brfss/annual_data/2017/pdf/2017-response-rates-table-508.pdf

TABLE 3. Percentages of women aged 18–49 years who had ongoing or potential need for contraceptive services* using specific contraceptive methods, by category of method† or no method and jurisdiction — Behavioral Risk Factor Surveillance System, 45 jurisdictions, 2017–2019§

Jurisdiction	% of women aged 18–49 yrs (95% CI)			
	Long-acting reversible method	Short-acting reversible method	Barrier or other reversible method	No method
Alabama	9.6 (7.1–12.9)	25.1 (20.7–30.1)	37.0 (31.9–42.3)	28.3 (23.7–33.3)
Alaska	28.5 (19.6–39.5)	18.6 (11.9–27.8)	31.6 (21.9–43.1)	21.3 (13.9–31.4)
Arizona	13.0 (9.5–17.5)	24.5 (19.3–30.6)	28.3 (22.8–34.4)	34.3 (28.5–40.5)
Arkansas	9.8 (6.2–15.2)	25.2 (19.4–32.0)	30.1 (23.6–37.5)	35.0 (28.6–41.9)
California	15.1 (12.5–18.2)	26.9 (23.1–31.0)	30.4 (26.6–34.4)	27.6 (23.9–31.6)
Connecticut	16.1 (12.5–20.4)	23.8 (19.9–28.2)	31.1 (26.7–35.9)	29.0 (24.8–33.6)
Delaware	12.5 (8.8–17.6)	28.1 (21.8–35.4)	30.1 (23.6–37.6)	29.2 (22.9–36.5)
District of Columbia	11.5 (8.1–15.9)	16.0 (12.3–20.7)	42.6 (37.1–48.3)	29.9 (25.2–35.0)
Florida	12.9 (9.8–16.8)	25.8 (21.2–31.0)	28.9 (23.9–34.4)	32.5 (27.4–38.0)
Georgia	11.2 (8.2–15.0)	25.3 (20.3–31.1)	26.2 (21.3–31.9)	37.3 (31.6–43.3)
Hawaii	16.9 (13.6–20.7)	21.4 (18.0–25.3)	22.3 (18.9–26.1)	39.4 (34.8–44.2)
Idaho	29.4 (23.5–36.1)	22.4 (17.0–28.9)	24.0 (18.4–30.6)	24.2 (19.1–30.2)
Illinois	10.4 (8.1–13.2)	23.8 (20.0–28.1)	35.4 (30.9–40.2)	30.4 (26.0–35.2)
Indiana	14.0 (11.2–17.4)	24.7 (20.8–29.2)	29.7 (25.6–34.2)	31.5 (27.4–35.9)
Iowa	22.3 (19.3–25.7)	28.9 (25.5–32.7)	25.2 (22.0–28.8)	23.5 (20.5–26.8)
Kansas	19.2 (16.3–22.4)	27.7 (24.3–31.4)	23.7 (20.3–27.6)	29.4 (26.0–33.1)
Louisiana	11.1 (8.1–14.9)	25.2 (20.9–30.0)	34.3 (29.4–39.6)	29.4 (25.2–34.0)
Maine	33.6 (26.8–41.2)	26.7 (20.6–33.8)	19.3 (14.3–25.5)	20.4 (15.7–26.2)
Maryland	16.1 (13.5–19.1)	24.4 (21.1–28.1)	33.4 (29.8–37.2)	26.1 (22.9–29.6)
Massachusetts	19.5 (16.3–23.2)	28.6 (24.5–33.0)	31.8 (27.6–36.2)	20.1 (16.6–24.1)
Minnesota	21.9 (19.6–24.4)	28.5 (25.8–31.3)	23.5 (21.0–26.1)	26.2 (23.6–28.9)
Mississippi	10.3 (7.4–14.1)	24.7 (20.1–29.9)	34.1 (29.0–39.7)	30.9 (26.2–36.1)
Missouri	16.5 (12.8–21.1)	27.7 (22.8–33.1)	31.8 (26.6–37.4)	24.1 (19.5–29.3)
Montana	29.2 (24.8–34.1)	23.2 (19.3–27.6)	24.0 (19.9–28.6)	23.6 (19.8–27.9)
Nebraska	17.1 (13.5–21.5)	27.0 (22.7–31.7)	28.7 (24.5–33.4)	27.1 (23.2–31.5)
Nevada	21.2 (15.5–28.3)	22.7 (16.9–29.8)	23.6 (17.3–31.3)	32.5 (25.6–40.1)
New Jersey	12.6 (9.8–16.0)	22.7 (18.6–27.4)	31.1 (26.7–35.8)	33.6 (29.0–38.6)
New Mexico	22.5 (18.0–27.7)	18.0 (13.8–23.1)	27.7 (22.7–33.4)	31.8 (26.5- 37.6)
New York	14.1 (10.2–19.2)	18.1 (14.1–22.9)	33.7 (28.0–39.9)	34.1 (28.4–40.2)
North Carolina	20.0 (15.6–25.1)	24.4 (19.8–29.6)	23.7 (19.2–28.9)	32.0 (26.8–37.6)
Ohio	15.9 (11.7–21.3)	30.8 (25.4–36.9)	23.5 (18.8–29.0)	29.8 (24.5–35.6)
Oklahoma	16.5 (11.9–22.6)	29.7 (23.1–37.1)	26.7 (20.6–33.8)	27.1 (21.4–33.7)
Oregon	30.7 (26.5–35.3)	24.2 (20.5–28.4)	24.8 (21.1–29.0)	20.2 (16.5–24.5)
Pennsylvania	13.9 (11.0–17.3)	30.6 (25.9–35.8)	29.4 (24.5–34.9)	26.1 (21.6–31.1)
Rhode Island	16.6 (12.3–22.1)	31.0 (25.3–37.4)	26.6 (21.0–33.0)	25.8 (20.7–31.7)
South Carolina	11.9 (9.1–15.4)	28.4 (24.0–33.3)	30.8 (26.2–35.8)	28.9 (24.2–34.1)
South Dakota	17.6 (12.7–23.9)	27.7 (21.2–35.2)	26.7 (20.0–34.7)	27.9 (21.4–35.7)
Tennessee	10.5 (7.4–14.7)	32.9 (27.3- 38.9)	28.2 (22.6–34.6)	28.4 (23.2–34.2)
Texas	12.0 (8.6–6.5)	18.3 (14.3–23.3)	30.3 (24.7–36.7)	39.3 (33.2–45.8)
Utah	36.1 (33.0–39.3)	21.9 (19.2–24.8)	21.2 (18.7–24.0)	20.8 (18.3–23.6)
Virginia	17.4 (14.3–21.0)	27.3 (23.1–31.9)	25.1 (21.5–29.0)	30.3 (26.0–34.9)
West Virginia	16.6 (12.2–22.3)	25.9 (20.4–32.2)	27.1 (20.9–34.3)	30.4 (24.7–36.8)
Wisconsin	18.4 (13.8–24.0)	32.4 (26.8–38.4)	25.7 (20.5–31.6)	23.6 (18.8–29.1)
Wyoming	18.7 (13.6–25.1)	23.3 (17.5–30.3)	27.9 (21.6–35.3)	30.1 (23.4–37.8)
Puerto Rico	6.9 (4.7–10.0)	13.7 (10.8–17.4)	33.5 (29.1–38.2)	45.8 (41.1–50.7)
Overall	**15.2 (14.4–16.0)**	**25.0 (24.0–26.0)**	**29.5 (28.4–30.6)**	**30.3 (29.2–31.5)**

Abbreviation: CI = confidence interval.

* Women with ongoing or potential need for contraceptive services were defined as women considered to be at risk for unintended pregnancy not using permanent contraception (female sterilization or male partner vasectomy). The number of women with ongoing or potential need for contraceptive services can be used to estimate how many women might seek services.

† Categories of contraceptive methods reflect different levels of effort for method initiation and continuation. Long-acting reversible contraception methods include intrauterine devices and contraceptive implants; these methods require the most clinical effort for initiation but require minimal follow-up until time for removal or reinsertion and minimal action by the woman. Short-acting reversible contraception methods include injectables, pills, transdermal patches, and vaginal rings; these methods require less clinical effort for initiation than long-acting reversible methods but require ongoing clinical services and supplies and action by the woman to maintain use. Barrier or other reversible contraception methods included diaphragms, condoms (male or female), withdrawal, cervical caps, sponges, spermicides, fertility-awareness–based methods, and emergency contraception; these methods have little or no need for clinical services for initiation, but require action by the woman or her partner to maintain use.

§ Data shown are from 2019, except 2017 data are shown for seven jurisdictions: Alaska, California, District of Columbia, Maine, Nevada, New Jersey, and Texas.

Summary

What is already known about this topic?

Ensuring access to contraception is important for promoting reproductive autonomy, preventing unintended pregnancies, and promoting optimal and equitable reproductive health.

What is added by this report?

Analysis of 2017–2019 Behavioral Risk Factor Surveillance System data from 45 jurisdictions found that 60.7% of women aged 18–49 years had ongoing or potential need for contraceptive services; estimates varied by jurisdiction, age group, race/ethnicity, and urban-rural status. Nearly one third (30.3%) of women with ongoing or potential need were not using any method of contraception at last sexual encounter.

What are the implications for public health practice?

Jurisdictions can use the data provided in this report to plan delivery of contraceptive services and evaluate efforts to increase access to contraception.

ranging from 67.0% (Alaska) to 84.6% (Georgia); 60.7% had ongoing or potential need for contraceptive services, ranging from 45.3% (Puerto Rico) to 73.7% (New York) (Table 1). For all jurisdictions combined, the proportion of women who were at risk for unintended pregnancy and had need for contraceptive services varied significantly by age group, race/ethnicity, and urban-rural status (Table 2). Although these proportions did not vary by insurance coverage or routine checkup within the past year, among women with ongoing or potential need for contraceptive services, 16.7% did not have insurance, and 27.4% did not have a routine checkup within the past year.

Among women with ongoing or potential need for contraceptive services, 15.2% used a long-acting reversible method, 25.0% used a short-acting reversible method, 29.5% used a barrier or other reversible method, and 30.3% used no method (Table 3). By jurisdiction, among women with ongoing or potential need for contraceptive services, use of a long-acting reversible method ranged from 6.9% (Puerto Rico) to 36.1% (Utah), use of a short-acting reversible method ranged from 13.7% (Puerto Rico) to 32.9% (Tennessee), use of a barrier or other reversible method ranged from 19.3% (Maine) to 42.6% (District of Columbia), and use of no method ranged from 20.1% (Massachusetts) to 45.8% (Puerto Rico).

Discussion

During 2017–2019, six out of 10 (60.7%, approximately 37.2 million women) women aged 18–49 years in the 45 jurisdictions had ongoing or potential need for contraceptive services, with variation observed by jurisdiction, age group, race/ethnicity, and urban-rural status. An estimated 6.2 million women without insurance had ongoing or potential need for contraceptive services and might require publicly funded care. Among women with ongoing or potential need for contraceptive services, nearly one in three (30.3%) was not using contraception at last sexual encounter. Improving contraception access and uptake among these women might have a large effect on meeting reproductive health care needs and reducing unintended pregnancies (*5*). In addition, nearly one in three women (29.5%) used a barrier or other reversible method (i.e., diaphragm, condom, withdrawal, cervical cap, sponge, spermicide, fertility-awareness–based method, or emergency contraception); given lower effectiveness of these methods for preventing unintended pregnancy during typical use compared with long-acting and short-acting reversible methods (*6*), jurisdictions might consider efforts to ensure women's access to the full range of available contraceptive methods. These efforts might include removing logistic and administrative barriers for contraceptive services and supplies, training providers, increasing provider reimbursement, and increasing consumer awareness of available contraceptive services and method options (*7*).

Jurisdiction-level information on unintended pregnancy risk and need for contraceptive services is important because unintended pregnancy rates vary by jurisdiction (*8*). Variation might be caused by differences in population characteristics (*9*) or differences in the implementation of public health programs and policies to increase contraceptive use. Examples of programs and policies that vary by jurisdiction include participation in a learning community to increase contraception access through a broad range of strategies[§§§] and leveraging Medicaid coverage to expand eligibility for family planning services.[¶¶¶]

Jurisdiction-level information is also important for planning, enhancing, and evaluating efforts to improve contraception access and services. Contraceptive care clinical performance measures use administrative data to assess health system quality of care (*10*), but these data lack information on unintended pregnancy risk. Data in this report can be used by jurisdictions to calculate the measures[****] to better reflect their populations in need. The data provided in this report also have implications for ensuring access to contraceptive services during public health emergencies that have a disproportionate impact on

[§§§] The learning community was convened by the Association of State and Territorial Health Officials in collaboration with CDC, Centers for Medicare & Medicaid Services, and the U.S. Department of Health and Human Services Office of Population Affairs. Examples of strategies to improve contraceptive use included improving provider awareness and training; addressing logistical, stocking, and administrative barriers; improving reimbursement and financial sustainability; and ensuring adequate service locations. https://www.astho.org/Programs/Maternal-and-Child-Health/Increasing-Access-to-Contraception/

[¶¶¶] https://www.guttmacher.org/state-policy/explore/medicaid-family-planning-eligibility-expansions

[****] https://opa.hhs.gov/research-evaluation/title-x-services-research/contraceptive-care-measures/most-or-moderately

reproductive-aged women or on the delivery of routine clinical services. BRFSS data were previously used to estimate the number of women needing contraceptive services during the 2016 Zika virus outbreak because of concerns about Zika virus–related adverse pregnancy and birth outcomes (*4*). In emergencies that disrupt routine care, jurisdictions can use data on the number of women needing contraceptive services and current contraceptive use to help plan for potential alternative models for service provision (e.g., telehealth/telemedicine) and for ensuring continued access to method supply (e.g., providing or prescribing a 1-year supply of methods that need resupply).††††

The findings provided in this report are subject to at least four limitations. First, information on contraceptive use was self-reported and might be subject to recall error or social desirability bias. Second, for 21% of women aged 18–49 years, data on the family planning module were missing, mostly a result of incomplete BRFSS interviews. Although the proportion of women for whom these data were missing was generally similar by jurisdiction, a higher proportion of younger women and women who self-identified as non-Hispanic Black or other had missing data. Third, findings apply only to the jurisdictions that implemented the optional family planning module and therefore might not be generalizable to the entire U.S. population of women aged 18-49 years. Finally, nonresponse bias remains a possibility, although the BRFSS weighting methodology adjusts for nonresponse.

Ensuring access to contraceptive services is important to promote reproductive autonomy, prevent unintended pregnancies, and promote optimal and equitable reproductive health. Understanding the need for contraceptive services, including the number of uninsured women who might need publicly supported care, can help jurisdictions plan health care delivery to support women and their partners in choosing whether and when to become pregnant. The data in this report can be used by jurisdictions to estimate the number of women who might seek contraceptive services and to plan and evaluate contraception access policies and programs.

†††† https://rhntc.org/resources/what-family-planning-providers-can-do-meet-client-needs-during-covid-19?utm_source=eNews&utm_campaign=March

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References

1. Finer LB, Zolna MR. Declines in unintended pregnancy in the United States, 2008–2011. N Engl J Med 2016;374:843–52. PMID:26962904 https://doi.org/10.1056/NEJMsa1506575
2. Gipson JD, Koenig MA, Hindin MJ. The effects of unintended pregnancy on infant, child, and parental health: a review of the literature. Stud Fam Plann 2008;39:18–38. PMID:18540521 https://doi.org/10.1111/j.1728-4465.2008.00148.x
3. Holt K, Reed R, Crear-Perry J, Scott C, Wulf S, Dehlendorf C. Beyond same-day long-acting reversible contraceptive access: a person-centered framework for advancing high-quality, equitable contraceptive care. Am J Obstet Gynecol 2020;222(4S):S878.e1–6. PMID:31809706 https://doi.org/10.1016/j.ajog.2019.11.1279
4. Pazol K, Ellington SR, Fulton AC, et al.; Behavioral Risk Factor Surveillance System Family Planning Module Working Group. Contraceptive use among women at risk for unintended pregnancy in the context of public health emergencies—United States, 2016. MMWR Morb Mortal Wkly Rep 2018;67:898–902. PMID:30114001 https://doi.org/10.15585/mmwr.mm6732a6
5. Thomas A, Karpilow Q. The intensive and extensive margins of contraceptive use: comparing the effects of method choice and method initiation. Contraception 2016;94:160–7. PMID:27036300 https://doi.org/10.1016/j.contraception.2016.03.014
6. Trussell J, Aiken ARA, Micks E, Guthrie KA. Efficacy, safety, and personal considerations. In: Hatcher RA, Nelson AL, Trussell J, et al, eds. Contraceptive technology. 21st ed. New York, NY: Ayer Company Publishers, Inc.; 2018.
7. Kroelinger CD, Romero L, Lathrop E, et al. Meeting summary: state and local implementation strategies for increasing access to contraception during Zika preparedness and response—United States, September 2016. MMWR Morb Mortal Wkly Rep 2017;66:1230–5. PMID:29121000 https://doi.org/10.15585/mmwr.mm6644a6
8. Finer LB, Kost K. Unintended pregnancy rates at the state level. Perspect Sex Reprod Health 2011;43:78–87. PMID:21651706 https://doi.org/10.1363/4307811
9. Janis JA, Ahrens KA, Kozhimannil KB, Ziller EC. Contraceptive method use by rural-urban residence among women and men in the United States, 2006 to 2017. Women's Health Issues 2021;31:277–85. PMID:33531190 https://doi.org/10.1016/j.whi.2020.12.009
10. Gavin L, Frederiksen B, Robbins C, Pazol K, Moskosky S. New clinical performance measures for contraceptive care: their importance to healthcare quality. Contraception 2017;96:149–57. PMID:28596123 https://doi.org/10.1016/j.contraception.2017.05.013

COVID-19 Surveillance and Investigations in Workplaces — Seattle & King County, Washington, June 15–November 15, 2020

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Workplace activities involving close contact with coworkers and customers can lead to transmission of SARS-CoV-2, the virus that causes COVID-19 (*1*,*2*). Information on the approach to and effectiveness of COVID-19 workplace investigations is limited. In May 2020, Public Health — Seattle & King County (PHSKC), King County, Washington established a COVID-19 workplace surveillance and response system to enhance COVID-19 contact tracing and identify outbreaks in workplaces. During June 15–November 15, 2020, a total of 2,881 workplaces in King County reported at least one case of COVID-19. Among 1,305 (45.3%) investigated workplaces,* 524 (40.3%) met the definition of a workplace outbreak.† Among 306 (58.4%) workplaces with complete data,§ an average of 4.4 employee COVID-19 cases¶ (median = three; range = 1–65) were identified per outbreak, with an average attack rate among employees of 17.5%. PHSKC and the Washington State Department of Health optimized resources by establishing a classification scheme to prioritize workplace investigations as high, medium, or low priority based on workplace features observed to be associated with increased COVID-19 spread and workforce features associated with severe disease outcomes. High-priority investigations were significantly more likely than medium- and low-priority investigations to have two or more cases among employees ($p<0.001$), two or more cases not previously linked to the workplace ($p<0.001$), or two or more exposed workplace contacts not previously identified during case interviews ($p = 0.002$). Prioritization of workplace investigations allowed for the allocation of limited resources to effectively conduct workplace investigations to limit the potential workplace spread of COVID-19. Workplace investigations can also serve as an opportunity to provide guidance on preventing workplace exposures to SARS-CoV-2, facilitate access to vaccines, and strengthen collaborations between public health and businesses.

Workplaces that met the investigation threshold during June 15–November 15, 2020 were assessed. Workplaces met the investigation threshold if one or more COVID-19 patients attended work while contagious** or two or more COVID-19 patients from the same workplace reported symptom onset within 14 days (or received a positive SARS-CoV-2 reverse transcription–polymerase chain reaction [RT-PCR] or antigen test result if asymptomatic). Information to determine whether workplaces met the investigation threshold was collected during routine patient interviews and through daily review of a list of workplaces where one or more COVID-19 patients attended work while contagious.

Workplaces were prioritized as high, medium, or low priority for investigation based on information collected during routine patient interviews. Workplaces meeting at least one of the following criteria were classified as high priority: 1) workplaces with two or more laboratory-confirmed (RT-PCR or antigen test) COVID-19 cases in which symptom onset occurred within 14 days (or asymptomatic workers who received a positive laboratory test result); 2) workplaces with an infected person who mentioned coworkers had received positive test results or had COVID-like symptoms; 3) workplaces with an infected person without phone numbers for exposed coworkers or customers; or 4) workplaces in which at least one person with laboratory-confirmed COVID-19 infection reported going to work while contagious, and one of the following: a) at least five potential close contacts†† with other coworkers or customers, b) was an industry with a high number of customers

* Workplaces related to health care, education, child care, correctional facilities, and congregate living settings are managed separately by PHSKC and are not included in this report.

† A workplace outbreak (cluster) was defined by the Washington State Department of Health as the occurrence of two or more cases of reverse transcription–polymerase chain reaction (RT-PCR) or antigen-confirmed cases of SARS-CoV-2 infection among patients from the same workplace with symptom onset within 14 days (or positive laboratory test result if asymptomatic), a plausible epidemiologic link in the workplace, and no known epidemiologic link outside the workplace.

§ Fifteen workplaces reported only one case among employees but were classified as workplace outbreaks because multiple cases among customers were identified. Among 261 workplace outbreaks with complete information, 32 customers were linked to workplace outbreaks, but were not included in this report.

¶ A COVID-19 case was defined as a positive SARS-CoV-2 RT-PCR or antigen test result.

** Period of contagiousness was defined as 2 days before onset of any symptoms (or 2 days before the date of specimen collection for a confirmed laboratory test in asymptomatic persons) through the beginning of isolation.

†† A close contact was defined as a person who has been within 6 feet of a contagious person (laboratory-confirmed or a clinically compatible illness) for a cumulative total of ≥15 minutes over a 24-hour period.

or a high-density workplace,[§§] c) had a disproportionate number of workers at higher risk for infection or disproportionally affected or restricted populations, or d) had workers with concerns about an absence of infection control measures in the workplace because they worked in close contact with coworkers or customers. Medium-priority workplaces were those in which at least one person with laboratory-confirmed infection reported going to work while contagious and one of the following: a) workers reported working in close contact with coworkers or customers, b) workers had concerns about an absence of infection control measures in the workplace, c) was an industry with a likely high number of customers, or d) was a workplace with a prior documented COVID-19 outbreak or other concerns that were flagged during the case investigation (e.g., patient was not allowed to take COVID-19 leave or was allowed to go to work while contagious). Low-priority workplaces were those with at least one laboratory-confirmed case in which the patient reported going to work while contagious, and other criteria not included for high- and medium-priority workplaces.

Medium- and low-priority workplaces were only investigated once all high-priority workplaces had been assigned to investigators. A workplace investigation entailed working with occupational health services, human resources, or managers to identify all cases and contacts, assessing workplace adherence to COVID-19 prevention and control guidelines, and responding to outbreaks.[¶¶] An investigation was closed 14 days after the last identified patient was known to be in the workplace during their contagious period (later revised to 28 days); investigations that could not be initiated within 14 days of notification were not pursued.

During the analysis period, workplace outbreak characteristics were calculated by notification method, industry type,[***] and number of on-site employees (<10, 10–49, 50–249, or ≥250). Assessment of outbreak characteristics included number of cases and attack rate among employees (cases among employees divided by total on-site workforce). The effectiveness of workplace investigations was evaluated by assessing 1) the number of exposed workplace contacts identified that had not been elicited during case interviews; 2) the number of identified cases not previously linked to the workplace; and 3) the number of cases among employees. Timeliness was evaluated by examining the interval between notification date and investigation date, and time spent on an investigation. The ratio of notification, investigations, and outbreaks to all community cases occurring in King County during the same period was calculated. Data were collected using the Research Electronic Data Capture (REDCap; version 11.0.3; Vanderbilt University) data management platform (*3*). Descriptive analyses were performed in R (version 3.5.1; R Foundation). Statistically significant differences ($p<0.05$) by priority level and outbreak status were assessed using Wilcoxon Rank Sum test (medians) and Pearson's chi-square test or Fisher's exact test (proportions). This activity was reviewed by CDC and conducted consistent with applicable federal law and CDC policy.[†††]

During June 15–November 15, 2020, a total of 2,881 King County workplaces met the investigation threshold (108 notifications per 1,000 community cases). Among 2,850 workplaces with known priority level, 1,770 (62.1%) were classified as high-, 702 (24.6%) as medium-, and 378 (13.3%) as low-priority investigations. A total of 1,404 (48.7%) workplaces were contacted, 99 (3.4%) of which did not require a full investigation because the employee was determined not to have been at work while infectious. Overall, 1,305 (45.3%) of 2,881 workplaces were investigated (49 investigations per 1,000 community cases) (Table 1). Of 1,300 investigated workplaces with complete information, 524 (40.3%) met the definition of an outbreak (19.6 outbreaks per 1,000 community cases). Among 1,085 completed high-priority investigations, 489 (45.1%) met the definition of an outbreak, compared with 35 of 217 (16.1%) completed medium- and low-priority investigations. Among the 1,477 (51.3%) workplaces not investigated, 1,232 (84%) investigations could not be initiated within 14 days.[§§§]

Among 838 workplaces with complete relevant data, the median interval between symptom onset (or positive laboratory test result for asymptomatic cases) of the first reported case associated with the workplace and notification to PHSKC was 6 days (interquartile range [IQR] = 4–9 days). In these workplaces, 295 (56%) outbreaks were identified during routine case investigations, 124 (24%) outbreaks were self-reported by workplaces (voluntary or mandated), and 106 (20%) outbreaks were identified through other means. Among 306 workplaces with complete data on number of cases, the average outbreak involved 4.4 employees (median = 3; range = 1–65), with an

[§§] A high-density workplace was defined as workplace in which workers were in the workplace for long time periods (e.g., for 8–12 hours per shift), and had prolonged close contact with coworkers. These workplaces included agriculture or produce-packing, construction, fishing vessels, manufacturing (food and food-related), and manufacturing (non-food).

[¶¶] Cases were identified by defining the employee population at risk and comparing cases within the population with the list of reported cases, and by contact tracing for known cases. Adherence to COVID-19 prevention and control guidelines was ascertained by assessing workplace policies related to personal protective equipment, engineering controls, and administrative controls.

[***] Industry types described in this report included 1) government agency or facility (e.g., military and public safety); 2) service provision (e.g., food service and restaurants, recreation and hospitality, and retail); and 3) goods production (e.g., agriculture, produce packing, construction, and food and non-food manufacturing).

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

[§§§] Other reasons for noninvestigation included unavailable contact information (54 [3.6%]), refusal to cooperate (82 [5.5%]), out of jurisdiction (10 [0.7%]), or unknown reason (99 [6.7%]).

average attack rate of 17.5% (median = 8.9%; range = 0.1%–100%), among 287 workplaces with complete attack rate data (Table 2). A total of 1,347 cases were associated with these workplace outbreaks, representing 5.0% of the 26,703 total COVID-19 cases reported in King County during the same period.

The median interval between notification and investigation (among 1,142 workplaces with complete data on this metric) was 2 days (IQR = 1–5 days) and was significantly

TABLE 1. COVID-19 workplace notifications,* investigations, and outbreaks,† by priority classification§ — Seattle & King County, Washington, June 15–November 15, 2020

Workplace status	Priority				
	Total	High	Medium	Low	Unknown
Notifications, no.	**2,881**	1,770	702	378	31
Investigated, no. (%)	**1,305 (45.3)**	1,085 (61.3)	191 (27.2)	26 (6.9)	3 (9.7)
Outbreak identified, no. (%)	**524¶ (18.2)**	489 (27.6)	28 (4.0)	7 (1.9)	0 (—)

Abbreviation: RT-PCR = reverse transcription–polymerase chain reaction.

* Workplaces met the investigation threshold if at least one COVID-19 patient attended work while contagious or two or more COVID-19 patients from the same workplace reported symptom onset within 14 days (or received a positive SARS-CoV-2 RT-PCR or antigen test result if asymptomatic). Period of contagiousness was defined as 2 days before onset of any symptoms (or 2 days before the date of specimen collection for a confirmed laboratory test in asymptomatic persons) through the beginning of isolation.

† A workplace outbreak (cluster) was defined by the Washington State Department of Health as the occurrence of two or more cases of RT-PCR- or antigen-confirmed cases of SARS-CoV-2 infection from the same workplace in which symptom onset occurred within 14 days (or positive laboratory test result if asymptomatic), a plausible epidemiologic link in the workplace, and no known epidemiologic link outside the workplace.

§ Priority levels were assigned based on workplace features assumed to be associated with increased COVID-19 spread, and workforce features associated with severe disease outcomes.

¶ An outbreak determination was not available for two workplaces.

TABLE 2. COVID-19 workplace notifications,* investigations, outbreaks,† and outbreak characteristics, by industry type§ and workplace size — Seattle & King County, Washington, June 15–November 15, 2020

Characteristic	Workplace status, no. (column %)			Median (IQR)		
	Notifications	Investigations	Outbreaks	Employee cases¶	Outbreak-associated employee cases**	Outbreak-associated employee attack rate††,§§
Industry type						
Govt. or public administration	39 (1.4)	28 (2.1)	8 (1.5)	1 (1–2)	2 (2–3)	10.4 (6.5–21.9)
Service provision	1,005 (34.9)	707 (54.2)	209 (39.9)	1 (1–2)	3 (2–4)	8.8 (3.1–20)
Goods production	300 (10.4)	203 (15.6)	110 (21.0)	2 (1–4)	4 (2–3)	8.9 (3.3–22.7)
Other	29 (1.0)	27 (2.1)	7 (1.3)	1 (1–2)	3 (2.5–5.5)	10.0 (4.1–20.5)
Unknown	1,508 (52.3)	340 (26.1)	190 (36.3)	1 (1–1.5)	2 (2–2)	9.5 (9.5–9.5)
Total	**2,881**	**1,305**	**524**	**1 (1–2)**	**3 (2–5)**	**8.9 (3.3–22.1)**
Workplace size, no. of on-site employees						
≥250	46 (1.6)	37 (2.8)	21 (4.0)	2.5 (1–6)	3.5 (2.8–6)	1.1 (0.5–2)
50–249	225 (7.8)	327 (25.1)	105 (20.0)	2 (1–4)	3 (2–5)	3.3 (1.9–5.7)
10–49	346 (12.0)	212 (16.2)	110 (21.0)	1 (1–2)	3(2–4)	12.8 (8.7–18.2)
<10	196 (6.8)	178 (13.6)	52 (9.9)	1 (1–2)	2 (2–4)	40.0 (28.6–66.7)
Unknown	2,068 (71.8)	551 (42.2)	236 (45.0)	1 (1–2)	2 (2–5.5)	—¶¶
Total	**2,881**	**1,305**	**524**	**1 (1–2)**	**3 (2–5)**	**8.9 (3.3–22.1)**

Abbreviation: IQR = interquartile range.

* Workplaces met the investigation threshold if one or more COVID-19 patients attended work while contagious or two or more COVID-19 patients from the same workplace reported symptom onset (or a positive SARS-CoV-2 RT-PCR or antigen test result if asymptomatic) within 14 days. Period of contagiousness was defined as 2 days before onset of any symptoms (or 2 days before the date of specimen collection for a confirmed laboratory test in asymptomatic persons) through the beginning of isolation.

† A workplace outbreak (cluster) was defined by the Washington State Department of Health as the occurrence of two or more cases of reverse transcription–polymerase chain reaction (RT-PCR)- or antigen-confirmed cases of SARS-CoV-2 infection from the same workplace with symptom onset within 14 days (or positive laboratory test result if asymptomatic), a plausible epidemiologic link in the workplace, and no known epidemiologic link outside the workplace.

§ Industry types described in this report included the following: 1) government agency or facility (e.g., military and public safety); 2) service provision (e.g., food service and restaurants, recreation and hospitality, personal care, retail, and transportation); and 3) goods production (e.g., agriculture, produce packing, construction, food and food-related manufacturing, non-food manufacturing).

¶ Total of 813 workplaces with completed investigation.

** Total of 306 workplaces with completed investigation and confirmed outbreak.

†† Total of 287 workplaces with completed investigation and confirmed outbreak.

§§ Number of cases among employees divided by total on-site workforce.

¶¶ Attack rate could not be calculated as denominator was unknown.

lower in high-priority investigations (2 days; IQR = 1–5 days) than in medium- and low-priority investigations (3 days; IQR = 1–8 days) (Table 3). The median time (minutes) spent per investigation was significantly higher in high-priority investigations (60 minutes; IQR = 45–100 minutes) than in medium- and low-priority investigations (50 minutes; IQR = 30–60 minutes). Among 191 workplaces with complete information on contacts, workplace investigation uncovered an average of 2.7 contacts not previously elicited (median = one; range = 1–35). Among 507 workplaces with complete information on cases, an average of 0.5 cases not previously linked to the workplace (median = 0; range = 0–11) were identified. High-priority investigations were more likely than were medium- and low-priority investigations to identify two or more exposed workplace contacts not previously elicited, two or more cases not previously linked to the workplace, or two or more employee cases. These metrics were also significantly higher (p≤0.001) in outbreaks than in investigations that did not meet the definition of a workplace outbreak.¶¶¶

¶¶¶ The median number of exposed contacts identified in the workplace who were not previously elicited during patient interviews (in 191 workplaces with complete information) was significantly higher in workplaces with outbreaks (median = 2; IQR = 1–4) than in those without outbreaks (median = 1; IQR = 1–3) (p = 0.001). The median number of employee cases identified who had not previously been linked to the workplace (in 507 workplaces with complete information) was significantly higher in workplaces with outbreaks (median = 1; IQR = 0–2) compared with workplaces without outbreaks (median = 0; IQR = 0–0) (p<0.001). The median number of employee cases identified (in 813 workplaces with complete information) was significantly higher in workplaces with outbreaks (median = 3; IQR = 2–5) compared with workplaces without outbreaks (median = 1; IQR = 1–1) (p<0.001).

Discussion

These King County COVID-19 workplace investigations identified contacts not previously elicited and cases not previously linked to the workplace. The difficulty in eliciting contacts has been documented (*4*) and might be particularly challenging in workplaces where employees might be unable or reluctant to name close contact coworkers. Conversely, workplace outbreaks were primarily identified during case interviews rather than through self-report by employees or businesses, demonstrating the importance of conducting workplace investigations in addition to case interviews and the utility of eliciting detailed workplace information during case interviews.

Given the substantial volume and time-intensive nature of workplace investigations, a prioritization scheme could maximize investigation effectiveness in identifying close contacts, cases, and outbreaks (*5*); CDC has issued similar guidance on prioritization of case investigation and contact tracing (*6*). Improved understanding of occupational risk factors for SARS-CoV-2 infection in workplaces could be used to further refine prioritization (*7*), thereby reducing community transmission through rapid isolation and quarantine of workplace-associated cases and contacts.

Effectiveness metrics were higher in workplace outbreaks than in investigations not meeting the definition of an outbreak. Although this is expected given that workplace outbreaks will generate more cases and contacts, it suggests that prioritizing only workplaces with two or more cases (i.e., those most likely to be outbreaks) could be more efficient. However, this approach could risk missing outbreaks; in this analysis, not all

TABLE 3. Timeliness and effectiveness of workplace investigations, by workplace prioritization* — Seattle & King County, Washington, June 15–November 15, 2020

Features	Priority, no. (row %)			p-value†
	Total	High	Medium and low	
Timeliness				
Interval between notification and investigation, days, median (IQR)§	2 (1–5)	2 (1–5)	3 (1–8)	0.002
Duration spent on an investigation, minutes, median (IQR)¶	60 (40–90)	60 (45–100)	50 (30–60)	<0.001
Effectiveness				
Exposed contacts not previously elicited during patient interviews				
0–1	96	60 (62.5)	36 (37.5)	0.002
≥2	95	79 (83.2)	16 (16.8)	
Identified employee cases not previously linked to the workplace				
0–1	452	335 (74.1)	117 (25.9)	0. 001
≥2	55	52 (94.5)	3 (5.5)	
No. employee cases identified				
0–1	450	350 (77.8)	100 (22.2)	<0.001
≥2	363	337 (92.8)	26 (7.2)	

Abbreviation: IQR = interquartile range.

* Priority levels were assigned based on workplace features observed to be associated with increased COVID-19 spread, and workforce features associated with severe disease outcomes.

† P-value comparisons using Wilcoxon Rank-Sum test to compare medians and Pearson's chi-square test or Fisher's exact test to compare categorical data. Number of workplaces varies by metric because of incomplete data.

§ Total of 1,142 workplaces.

¶ Total of 671 workplaces.

Summary

What is already known about this topic?

Workplace activities that involve close contact with coworkers and customers can lead to COVID-19 spread.

What is added by this report?

Workplace investigations were prioritized using workplace features associated with increased COVID-19 spread and with severe disease outcomes. High-priority investigations were more likely than were medium- and low-priority investigations to have two or more cases among employees, two or more cases not previously linked to the workplace, or two or more exposed workplace contacts not previously elicited during case interviews.

What are the implications for public health practice?

Workplace investigations uncovered contacts not previously elicited and cases not previously linked to the workplace, demonstrating the importance of conducting workplace investigations in addition to routine case interviews to limit the potential workplace spread of COVID-19.

cases were linked to a workplace during the initial interview, and less than one quarter of businesses with outbreaks self-reported to PHSKC.

The findings in this report are subject to at least four limitations. First, only one half of workplaces were investigated, only a small proportion of which were categorized as low-priority for immediate investigation, which could have biased the results toward increased effectiveness of investigating high-priority workplaces. Second, for a high proportion of workplaces, effectiveness data were missing, which could have resulted in bias if the lack of effectiveness data was related to both effectiveness and priority classification. Third, misclassification of workplace exposures and outbreaks might have occurred because of the challenge in ascertaining epidemiologic links when cases have multiple high-risk exposures (e.g., workplace and community exposures). Finally, whereas the number of cases associated with workplace outbreaks as a proportion of the total number of cases in King County (5.0%) was similar to that reported in Wisconsin (5.2%) (*8*), it was less than that reported in Utah (12%) (*9*), suggesting potential underreporting of workplaces-associated cases.

Workplace investigations can enhance the effectiveness of contact tracing and identification of workplace outbreaks, which can inform the implementation of strategies to prevent the spread of COVID-19. Prioritizing workplace investigations based on workplace and workforce characteristics gathered during patient interviews can optimize investigation timeliness and effectiveness in resource-constrained settings (*5*,*10*). Workplace investigations can also serve as an opportunity to provide guidance on preventing workplace exposures to SARS-CoV-2 (*1*), facilitate access to vaccines, and strengthen collaborations between public health and businesses.

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References

1. CDC. Guidance for businesses and employers responding to coronavirus disease 2019 (COVID-19). Atlanta Georgia: US Department of Health and Human Services, CDC; 2021. Accessed April 23, 2021. https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html
2. CDC. Ways COVID-19 spreads. Atlanta, Georgia: US Department of Health and Human Services, CDC; 2021. Accessed April 23, 2021. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html
3. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. J Biomed Inform 2019;95:103208. Epub May 9, 2019. PMID:31078660 https://doi.org/10.1016/j.jbi.2019.103208
4. Lash RR, Donovan CV, Fleischauer AT, et al. COVID-19 contact tracing in two counties—North Carolina, June–July 2020. MMWR Morb Mortal Wkly Rep 2020;69:1360–3. PMID:32970654 https://doi.org/10.15585/mmwr.mm6938e3
5. CDC. Prioritizing non-healthcare worksite assessments for coronavirus disease 2019 (COVID-19). Atlanta, Georgia: US Department of Health and Human Services, CDC; 2020. Accessed April 23, 2021. https://www.cdc.gov/coronavirus/2019-ncov/php/community-mitigation/prioritizing-non-healthcare-assessments.html

6. CDC. Prioritizing case investigations and contact tracing for COVID-19 in high burden jurisdictions. Atlanta, Georgia: US Department of Health and Human Services, CDC; 2021. Accessed April 23, 2021. https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/prioritization.html
7. Zhang M. Estimation of differential occupational risk of COVID-19 by comparing risk factors with case data by occupational group. Am J Ind Med 2021;64:39–47. Epub November 18, 2020. PMID:33210336 https://doi.org/10.1002/ajim.23199
8. Pray IW, Kocharian A, Mason J, Westergaard R, Meiman J. Trends in outbreak-associated cases of COVID-19—Wisconsin, March–November 2020. MMWR Morb Mortal Wkly Rep 2021;70:114–7. PMID:33507887 https://doi.org/10.15585/mmwr.mm7004a2
9. Bui DP, McCaffrey K, Friedrichs M, et al. Racial and ethnic disparities among COVID-19 cases in workplace outbreaks by industry sector—Utah, March 6–June 5, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1133–8. PMID:32817604 https://doi.org/10.15585/mmwr.mm6933e3
10. CDC. Investigating and responding to COVID-19 cases in non-healthcare work settings. Atlanta, Georgia: US Department of Health and Human Services, CDC; 2020. Accessed April 23, 2021. https://www.cdc.gov/coronavirus/2019-ncov/php/community-mitigation/non-healthcare-work-settings.html

COVID-19 Vaccination Coverage Among Adults — United States, December 14, 2020–May 22, 2021

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The U.S. COVID-19 vaccination program launched on December 14, 2020. The Advisory Committee on Immunization Practices recommended prioritizing COVID-19 vaccination for specific groups of the U.S. population who were at highest risk for COVID-19 hospitalization and death, including adults aged ≥75 years*; implementation varied by state, and eligibility was gradually expanded to persons aged ≥65 years beginning in January 2021. By April 19, 2021, eligibility was expanded to all adults aged ≥18 years nationwide.† To assess patterns of COVID-19 vaccination coverage among U.S. adults, CDC analyzed data submitted on vaccinations administered during December 14, 2020–May 22, 2021, by age, sex, and community-level characteristics. By May 22, 2021, 57.0% of persons aged ≥18 years had received ≥1 COVID-19 vaccine dose; coverage was highest among persons aged ≥65 years (80.0%) and lowest among persons aged 18–29 years (38.3%). During the week beginning February 7, 2021, vaccination initiation among adults aged ≥65 years peaked at 8.2%, whereas weekly initiation among other age groups peaked later and at lower levels. During April 19–May 22, 2021, the period following expanded eligibility to all adults, weekly initiation remained <4.0% and decreased for all age groups, including persons aged 18–29 years (3.6% to 1.9%) and 30–49 years (3.5% to 1.7%); based on the current rate of weekly initiation (as of May 22), younger persons will not reach the same levels of coverage as older persons by the end of August. Across all age groups, coverage (≥1 dose) was lower among men compared with women, except among adults aged ≥65 years, and lower among persons living in counties that were less urban, had higher social vulnerabilities, or had higher percentages of social determinants of poor health. Continued efforts to improve vaccination confidence and alleviate barriers to vaccination initiation, especially among adults aged 18–49 years, could improve vaccination coverage.

Vaccination data were reported to CDC via state immunization information systems,§ the Vaccine Administration Management System,¶ or direct data submission to the CDC Data Clearinghouse.** Data for vaccinations administered among adults aged ≥18 during December 14, 2020–May 22, 2021, were included in the analysis.†† Two measures of vaccination coverage were assessed: 1) persons who received ≥1 dose of any COVID-19 vaccine (≥1-dose coverage) authorized by the Food and Drug Administration (FDA) and 2) persons who received 2 doses of an FDA authorized 2-dose vaccine (Pfizer-BioNTech or Moderna) or 1 dose of the Janssen (Johnson & Johnson) vaccine (fully vaccinated); each measure of coverage was calculated using total population counts from the U.S. Census Bureau's 2019 Population Estimates Program.§§ Weekly vaccine initiation was defined as the percentage of persons who received the first dose within the epidemiologic week¶¶ among those in the total population. Coverage (≥1 dose) was projected through the week of August 29, 2021, by applying the rate of weekly initiation in the most recent week (May 22) for each age group to subsequent weeks beyond the study period. Second dose completion was defined as the percentage of persons who received the second dose of a 2-dose vaccine at any point, among those who had received at least 1 dose of a 2-dose vaccine.*** Absolute differences in coverage by age were

* https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e2.htm

† Dates of vaccine eligibility opened to persons aged ≥16 years based on data from the Kaiser Family Foundation State COVID-19 Data and Policy Actions (https://www.kff.org/report-section/state-covid-19-data-and-policy-actions-policy-actions/).

§ Immunization information systems are confidential, computerized, population-based systems that collect and consolidate vaccination data from providers in 64 jurisdictions nationwide and can be used to track administered vaccines and measure vaccination coverage. The 64 jurisdictions comprise the 50 U.S. states, five U.S. territories (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and U.S. Virgin Islands), three freely associated states (Federated States of Micronesia, Marshall Islands, and Palau), and six local jurisdictions (Chicago, Illinois; Houston, Texas; New York, New York; Philadelphia, Pennsylvania; San Antonio, Texas; and Washington, DC).

¶ https://www.cdc.gov/vaccines/covid-19/reporting/vams/program-information.html

** https://www.cdc.gov/vaccines/covid-19/reporting/overview/IT-systems.html

†† Vaccination providers are required to report administration records to the state immunization information system within 72 hours; 5 additional days of observation were included to account for delays in reporting and transmission of records to CDC.

§§ https://www.census.gov/programs-surveys/popest.html

¶¶ An epidemiologic week is based on the National Notifiable Diseases Surveillance System guidance and is assigned by the reporting local or state health department for the purposes of *MMWR* disease incidence reporting and publishing. The first day of any *MMWR* week is Sunday. https://wwwn.cdc.gov/nndss/document/MMWR_Week_overview.pdf

*** Analysis for second dose completion was restricted to persons who had received their first dose of a 2-dose vaccine (Pfizer-BioNTech or Moderna) during December 14, 2020–March 31, 2021. All persons included in the analysis for second dose completion were ≥42 days past their first dose.

calculated during three periods selected to represent general shifts in targeted subpopulations, supply, and policy over the course of the COVID-19 vaccination program[†††] (*1*): December 14, 2020–January 23, 2021; January 24, 2021–March 20, 2021; and March 21, 2021–May 22, 2021.

Coverage was evaluated by selected community-level characteristics matched to vaccine recipients' county of residence.[§§§] County-level rankings of social vulnerability from the 2018 CDC Social Vulnerability Index (SVI), which is used to identify community needs during emergencies, were categorized into quartiles based on distribution among all U.S. counties.[¶¶¶] County-level data on Social Determinants of Health[****] obtained from the American Community Survey[††††] were dichotomized based on the median of all U.S. counties.[§§§§] County-level urbanicity was based on the 2013 National Center for Health Statistics urban-rural classification scheme.[¶¶¶¶] Generalized estimating equation models with binomial regression and an identity link were used to estimate absolute differences in coverage and associated 95% confidence intervals. SAS (version 9.4; SAS Institute) was used to conduct all analyses. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.[*****]

During December 14, 2020–May 22, 2021, 57.0% of U.S. adults had received ≥1 vaccine dose; coverage was highest among adults aged ≥65 years (80.0%) and lowest among adults aged 18–29 years (38.3%) (Figure 1). Vaccination coverage was lower among younger age groups in all states, regardless of timing of expanded vaccine eligibility to all adults (Supplementary Table, https://stacks.cdc.gov/view/cdc/107123). During January 24, 2021–March 20, 2021, coverage among persons aged ≥65 years increased from 14.3% to 67.0% (absolute difference: 52.7%). During March 21, 2021–May 22, 2021, absolute increases in coverage were largest among adults aged 50–64 years (31.5% to 63.5%; absolute difference: 32.0%).

Over the entire period, weekly initiation was highest among adults aged ≥65 years and peaked during the week of February 7, during which 8.2% of adults aged ≥65 years initiated vaccination (Figure 1). Weekly initiation peaked at 7.5% among adults aged 50–64 years during the week of March 21, at 5.8% among adults aged 30–49 years during the week of April 4, and at 5.3% among adults aged 18–29 years during the week of April 4. Since the week of April 18, during which eligibility was expanded to all adults, weekly COVID-19 vaccine initiation was <4.0% and decreased over time for all age groups, including younger adults aged 18–29 years (3.6% to 1.9%) and 30–49 years (3.5% to 1.7%). If weekly initiation remains at the rate as of the week of May 22 for each age group, coverage by the week of August 29, 2021 is projected to reach 57.5% for adults aged 18–29 years, 71.4% for adults aged 30–49 years, 85.9% for adults aged 50–64 years, 94.9% for adults aged ≥65 years, and 78.4% for persons aged ≥18 years.

By May 22, among adults who initiated a 2-dose vaccine series (Pfizer-BioNTech or Moderna), 89.3% had received their second dose at any point. The second dose completion was similar across age groups (Figure 2) and over time.

Men had lower coverage than women in all age groups, except those aged ≥65 years (Table). Persons living in counties that were less urban were less likely to be vaccinated, and differences were smaller for adults aged ≥65 years. Across all age groups, people living in counties with higher social vulnerabilities or higher percentages of the population who are uninsured, living in poverty, lacking access to a computer, and lacking access to a computer with Internet were less likely to be vaccinated.

[†††] Periods are based on eligibility and other process factors (e.g., phase of vaccine rollout, eligible population, supply, and programs and policy enacted) important in framing the specific needs and constraints at that time. Period 1 represented when most states opened eligibility to health care workers, residents in long-term care facilities, and older adults while there was a highly constrained supply, which overlapped phase 1a, and a portion of phase 1b (https://www.cdc.gov/mmwr/volumes/69/wr/mm695152e2.htm). Period 2 represented when states were expanding eligibility inconsistently, and supply was becoming more available, which overlapped with phases 1b and 1c. Period 3 represented when all states expanded eligibility to all adults while supply was steady and increased, which overlapped with phases 1c and 2.

[§§§] The following jurisdictions were excluded from all county-level analyses (National Center for Health Statistics urban-rural, SVI, and Social Determinants of Health) due to lack of county-level vaccination data: all counties in Hawaii and eight counties in California for which total population was <20,000. Among all first doses analyzed during December 14, 2020–May 22, 2021, 5.9% were missing county data and were therefore excluded from models.

[¶¶¶] Fifteen elements categorized into four themes (socioeconomic status, household composition and disability, racial/ethnic minority status and language, and housing type and transportation) are included in SVI (https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/pdf/SVI2018Documentation-H.pdf). Overall SVI includes all 15 indicators as a composite measure (https://www.atsdr.cdc.gov/placeandhealth/svi/fact_sheet/fact_sheet.html). One county in New Mexico was excluded because SVI ranking could not be calculated (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

[****] Measures of Social Determinants of Health from the American Community Survey: percentage of the total population 1) unemployed, 2) uninsured, 3) that earned an income below the federal poverty level, 4) without a computer (e.g., desktop or laptop computer [excludes mobile phones]), 5) with a computer but without Internet access, and 6) identifying as a racial/ethnic group other than non-Hispanic White (https://health.gov/healthypeople/objectives-and-data/social-determinants-health).

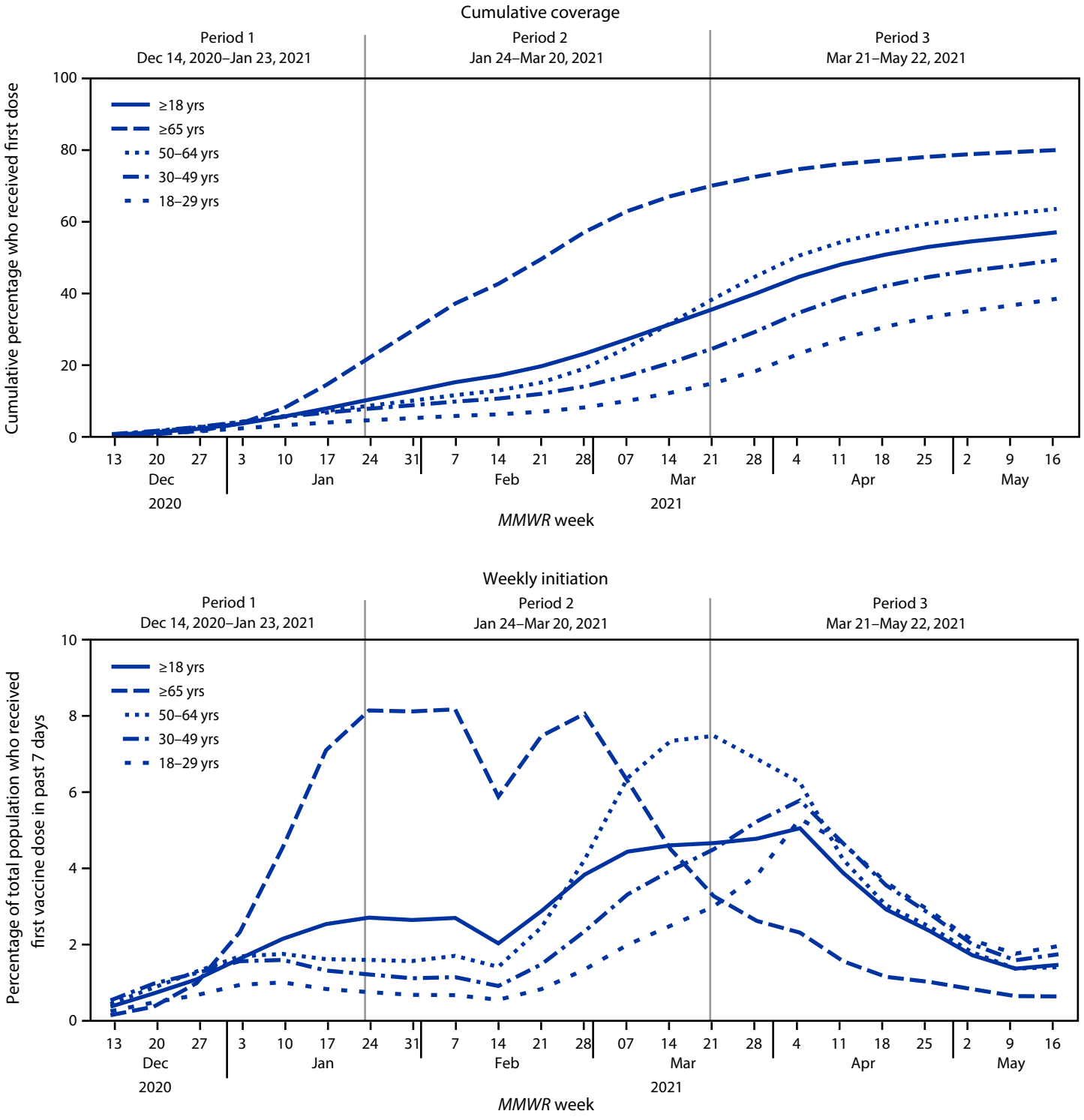
[††††] https://www.census.gov/programs-surveys/acs

[§§§§] In some instances, the total non-Hispanic White population exceeded the total population estimate and therefore the model did not permit vaccination initiation estimates to exceed 100%.

[¶¶¶¶] https://www.cdc.gov/nchs/data_access/urban_rural.htm#2013_Urban-Rural_Classification_Scheme_for_Counties

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

FIGURE 1. Trends in COVID-19 vaccination cumulative coverage* and weekly initiation among adults, by epidemiologic week† and age group — United States, December 14, 2020–May 22, 2021



* Coverage includes persons who received at least 1 dose of any Food and Drug Administration–authorized COVID-19 vaccine (≥1 dose; Pfizer-BioNTech, Moderna, or Janssen [Johnson & Johnson]).

† An epidemiologic week is based on the National Notifiable Diseases Surveillance System guidance and is assigned by the reporting local or state health department for the purposes of *MMWR* disease incidence reporting and publishing. The first day of any *MMWR* week is Sunday. https://wwwn.cdc.gov/nndss/document/MMWR_Week_overview.pdf

Summary

What is already known about this topic?

The U.S. COVID-19 vaccination program initially prioritized groups at highest risk for COVID-19 hospitalization and death; by April 19, 2021, eligibility expanded to all persons aged ≥16 years.

What is added by this report?

By May 22, 2021, 57.0% of U.S. adults aged ≥18 years had received ≥1 vaccine dose; coverage was lower and increased more slowly over time among younger adults. If the current rate of vaccination continues through August, coverage among young adults will remain substantially lower than among older adults.

What are the implications for public health practice?

Efforts to improve vaccination coverage are needed, especially among younger adults, to reduce COVID-19 cases, hospitalizations, and deaths.

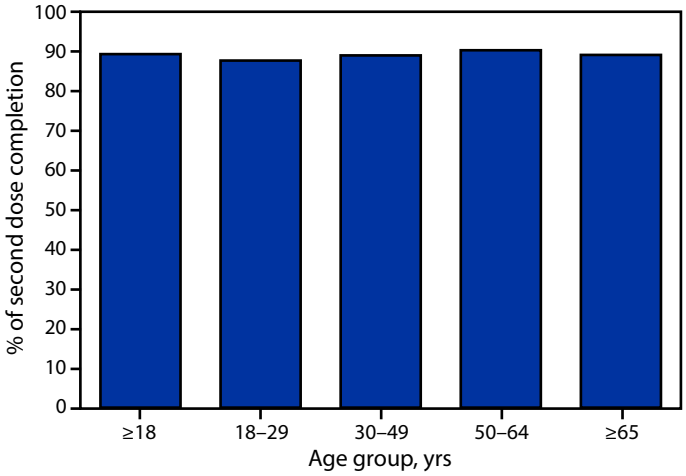
Discussion

As of May 22, 2021, COVID-19 vaccination coverage among U.S. adults was highest among adults aged ≥65 years and lowest among adults aged 18–29 years. Despite recently expanded eligibility for vaccination to all adults, increases in weekly initiation among younger age groups have not reached peak weekly initiation rates that occurred in January and February among adults aged ≥65 years. If the current rate of weekly vaccine initiation continues through August, coverage among young adults will not reach the coverage level of older adults. High vaccination coverage among all age groups is important for decreasing COVID-19 cases, hospitalizations, and deaths (*2*,*3*), especially among groups with lower vaccination uptake, such as young adults (*4*,*5*).

Equitable access to vaccination is critical to improve coverage for persons of all ages who live in communities that are less urban (*6*), have higher social vulnerabilities (*1*,*7*), and have higher percentages of social determinants of poor health (*8*). In a report that pooled findings from two representative surveys of U.S. adults aged 18–39 years, only one half (51.8%) reported that they had been or were planning to be vaccinated, whereas 24.9% reported that they probably or definitely would not be vaccinated, and 23.2% reported that they would probably be vaccinated or were unsure if they would be vaccinated (*9*). Respondents who were reluctant or unsure about vaccination reported concerns about vaccine side effects, distrust of COVID-19 vaccines, a plan to wait and see whether the vaccine was safe and to possibly get vaccinated later, thinking that others needed a vaccine more than they did, and the belief that they did not need the vaccine. Low intention to receive COVID-19 vaccination among younger adults aligns with historic vaccination coverage for influenza†††††† and lower adherence to COVID-19 public health guidelines (*10*). For coverage among persons in this age group to be improved, community-specific messaging could engage younger adults using trusted sources to explain the community and individual value of vaccination and to address concerns about vaccine safety. In addition, younger adults might be reached by establishing strategically located mobile and walk-in clinics with flexible hours,§§§§§ providing vaccinations at the workplace, and encouraging employers to offer paid leave for employees to receive the vaccine and for treatment of any vaccine-related side effects.¶¶¶¶¶

The findings in this report are subject to at least four limitations. First, general periods were used that applied broadly to eligibility periods for most states; however, states varied in their expansion of vaccine eligibility over time, thus vaccine initiation by age might differ if evaluated using precise eligibility periods. Second, the ecologic findings for vaccination coverage by community-level factors do not reflect the status of individual persons. Third, county-level characteristics might vary at a smaller geographic level; future analyses could consider using a more granular assessment of community factors that are associated with poor health. Finally, coverage might be

FIGURE 2. COVID-19 vaccination second dose completion among adults who received ≥1 COVID-19 dose and had sufficient time to receive the second dose,* by age group — United States,† December 14, 2020–May 22, 2021



* Analysis for second dose completion was restricted to persons who had received their first dose of a 2-dose vaccine (Pfizer-BioNTech or Moderna) during December 14, 2020–March 31, 2021. All persons included in the analysis for second dose completion were ≥42 days past their first dose.

† Excludes residents of Texas because Texas does not report information for age-specific dose number to CDC.

†††††† Estimates from the Behavioral Risk Factor Surveillance System and the National 2009 H1N1 Flu Survey (https://www.cdc.gov/flu/fluvaxview/trends/age-groups.htm).

§§§§§ Mobile Vaccination Resources (https://www.cdc.gov/vaccines/covid-19/planning/mobile.html); Key Operational Considerations for Jurisdictions Planning to Operate COVID-19 Vaccination Clinics (https://www.cdc.gov/vaccines/covid-19/downloads/Key-Op-Considerations-COVID-Mass-Vax.pdf).

¶¶¶¶¶ https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/21/fact-sheet-president-biden-to-call-on-all-employers-to-provide-paid-time-off-for-employees-to-get-vaccinated-after-meeting-goal-of-200-million-shots-in-the-first-100-days/

TABLE. Coverage with ≥1 dose COVID-19 vaccine* among adults, by age group, sex†, and county-level characteristics§ — United States, December 14, 2020—May 22, 2021

Characteristic	Vaccine coverage									
	Overall ≥18 yrs (N = 255,200,373)		18–29 yrs (n = 53,728,222)		30–49 yrs (n = 84,488,200)		50–64 yrs (n = 62,925,688)		≥65 yrs (n = 54,058,263)	
	Estimate (%)	% Difference (95% CI)	Estimate (%)	% Difference (95% CI)	Estimate (%)	% Difference (95% CI)	Estimate (%)	% Difference (95% CI)	Estimate (%)	% Difference (95% CI)
Overall	**56.3**	—	37.6	—	48.5	—	62.9	—	79.1	—
Sex†										
Female	**58.0**	**Ref**	40.4	Ref	50.2	Ref	63.8	Ref	77.5	Ref
Male	**53.4**	**−4.6 (−5.5 to −3.7)**	34.0	−6.4 (−7.8 to −5.1)	45.5	−4.7 (−5.7 to −3.6)	60.3	−3.5 (−4.4 to −2.7)	79.9	2.4 (2.1 to 2.8)
Urban/Rural status¶										
Large central metro	**56.2**	**Ref**	41.0	Ref	50.9	Ref	63.2	Ref	74.8	Ref
Large fringe metro	**58.0**	**1.7 (−7.7 to 11.2)**	40.3	−0.7 (−9.0 to 7.5)	49.8	−1.2 (−10.6 to 8.2)	64.1	0.9 (−9.3 to 11.1)	79.7	4.9 (−3.4 to 13.2)
Medium metro	**53.7**	**−2.6 (−12.3 to 7.2)**	33.3	−7.7 (−15.9 to 0.5)	44.9	−6.1 (−16.0 to 3.9)	60.4	−2.8 (−13.5 to 8.0)	79.0	4.2 (−4.4 to 12.9)
Small metro	**48.6**	**−7.6 (−18.6 to 3.3)**	28.5	−12.5 (−21.9 to −3.1)	39.6	−11.4 (−22.6 to −0.2)	54.3	−8.9 (−20.9 to 3.0)	73.8	−1.0 (−11.0 to 9.0)
Micropolitan	**45.3**	**−10.9 (−22.2 to 0.3)**	23.6	−17.4 (−27.4 to −7.3)	34.5	−16.4 (−28.3 to −4.5)	50.8	−12.4 (−24.9 to 0)	71.2	−3.6 (−13.3 to 6.1)
Noncore	**42.0**	**−14.2 (−25.1 to −3.3)**	20.1	−20.9 (−31.2 to −10.6)	29.7	−21.3 (−33.2 to −9.3)	45.8	−17.4 (−29.4 to −5.4)	65.4	−9.4 (−18.2 to −0.7)
SVI quartile**										
Low vulnerability										
<25th percentile	**59.8**	**Ref**	42.1	Ref	51.6	Ref	64.5	Ref	80.9	Ref
25th to <50th percentile	**58.0**	**−1.7 (−6.8 to 3.3)**	40.0	−2.1 (−8.2 to 4.0)	51.0	−0.6 (−7.3 to 6.2)	63.4	−1.2 (−6.4 to 4.1)	80.4	−0.4 (−3.4 to 2.5)
50th to <75th percentile	**52.2**	**−7.5 (−13.6 to −1.5)**	33.9	−8.1 (−13.7 to −2.6)	44.2	−7.4 (−13.3 to −1.5)	58.3	−6.2 (−12.9 to 0.4)	74.5	−6.4 (−13.4 to 0.6)
High vulnerability										
≥75th percentile	**46.0**	**−13.8 (−23.8 to −3.7)**	28.5	−13.5 (−22.6 to −4.5)	39.2	−12.4 (−22.2 to −2.6)	53.9	−10.6 (−22.3 to 1.0)	67.4	−13.5 (−25.9 to −1.0)
Percent of total population unemployed††										
Below median (<50th percentile)	**52.6**	**Ref**	34.7	Ref	44.1	Ref	57.4	Ref	75.2	Ref
At or above median (≥50th percentile)	**54.2**	**1.6 (−2.4 to 5.7)**	35.9	1.2 (−3.3 to 5.6)	47.0	2.9 (−1.7 to 7.5)	61.0	3.6 (−0.7 to 7.9)	76.0	0.8 (−2.7 to 4.4)
Percent of total population uninsured††										
Below median (<50th percentile)	**61.7**	**Ref**	42.7	Ref	54.7	Ref	67.8	Ref	83.0	Ref
At or above median (≥50th percentile)	**44.1**	**−17.6 (−33.8 to −1.5)**	27.2	−15.5 (−26.4 to −4.6)	36.3	−18.4 (−32.9 to −4.0)	50.2	−17.6 (−35.2 to 0.0)	66.9	−16.1 (−36.6 to 4.3)
Percent of total population below the federal poverty level††										
Below median (<50th percentile)	**58.0**	**Ref**	40.0	Ref	50.0	Ref	63.5	Ref	79.7	Ref
At or above median (≥50th percentile)	**48.0**	**−10.0 (−14.3 to −5.8)**	30.4	−9.6 (−13.4 to −5.9)	41.0	−9.0 (−13.4 to −4.5)	54.8	−8.7 (−13.6 to −3.8)	70.3	−9.3 (−14.8 to −3.8)
Percent of total population with no computer††										
Below median (<50th percentile)	**55.6**	**Ref**	37.7	Ref	48.4	Ref	62.1	Ref	77.6	Ref
At or above median (≥50th percentile)	**44.0**	**−11.7 (−17.1 to −6.2)**	24.0	−13.7 (−19.3 to −8.1)	34.2	−14.2 (−20.8 to −7.6)	49.5	−12.6 (−18.4 to −6.8)	67.7	−9.9 (−13.9 to −5.9)
Percent of total population with a computer but no Internet††										
Below median (<50th percentile)	**57.4**	**Ref**	39.5	Ref	50.0	Ref	63.5	Ref	79.0	Ref
At or above median (≥50th percentile)	**42.3**	**−15.1 (−21.4 to −8.9)**	23.6	−15.9 (−20.5 to −11.3)	33.7	−16.3 (−21.9 to −10.7)	48.7	−14.7 (−21.4 to −8.0)	65.9	−13.1 (−21.6 to −4.6)
Percent of total population of a racial/ethnic group other than non-Hispanic White††										
Below median (<50th percentile)	**51.0**	**Ref**	29.1	Ref	39.9	Ref	55.4	Ref	75.9	Ref
At or above median (≥50th percentile)	**54.3**	**3.4 (−8.0 to 14.7)**	36.8	7.7 (−1.1 to 16.6)	47.4	7.4 (−3.7 to 18.6)	61.0	5.6 (−6.5 to 17.7)	75.7	−0.1 (−12.9 to 12.6)

Abbreviations: CI = confidence interval; NCHS = National Center for Health Statistics; Ref = referent group; SVI = Social Vulnerability Index.

* All models exclude persons with missing state of residence (modeled overall coverage is slightly lower than shown in descriptive results).

† Persons with sex reported as "unknown" (N = 1,627,296) were excluded from the table (≥18 years, n = 1,627,296; 18–29 years, n = 242,601; 30–49 years, n = 578,940; 50–64 years, n = 504,173; ≥65 years, n = 301,582).

§ The following jurisdictions were excluded from all county-level analyses (NCHS urban-rural, SVI, and Social Determinants of Health) due to lack of county-level vaccination data: all counties in Hawaii and eight counties in California for which total population was <20,000. Among all first doses analyzed during December 14, 2020–May 22, 2021, 5.9% were missing county data and were therefore excluded from models.

¶ Categories of county-level urbanicity based on the 2013 NCHS urban-rural classification scheme. https://www.cdc.gov/nchs/data_access/urban_rural.htm#2013_Urban-Rural_Classification_Scheme_for_Counties

** Fifteen elements categorized into four themes (socioeconomic status, household composition and disability, racial/ethnic minority status and language, and housing type and transportation) are included in SVI (https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/pdf/SVI2018Documentation-H.pdf). Overall SVI includes all 15 indicators as a composite measure (https://www.atsdr.cdc.gov/placeandhealth/svi/fact_sheet/fact_sheet.html). One county in New Mexico was excluded because SVI ranking could not be calculated (https://www.atsdr.cdc.gov/placeandhealth/svi/index.html).

†† Measures of Social Determinants of Health from the American Community Survey: percentage of the total population 1) unemployed, 2) uninsured, 3) that earned an income below the federal poverty level, 4) without a computer (e.g., desktop or laptop computer [excludes mobile phones]), 5) with a computer but without Internet access, and 6) identifying as a racial/ethnic group other than non-Hispanic White (https://health.gov/healthypeople/objectives-and-data/social-determinants-health).

underestimated because persons for whom county of residence were incomplete were excluded from models.

Despite expanded eligibility to all adults in the United States by April 19, 2021, vaccine initiation among persons aged <65 years has not increased at the same rate observed in earlier periods among persons aged ≥65 years. Continued targeted efforts are needed to accelerate vaccination rates, especially among younger adults. Community-based outreach efforts to increase vaccine confidence and reduce potential barriers to access could improve COVID-19 vaccination initiation, particularly among persons aged 18–29 years, and reduce the spread and impact of COVID-19 among the general U.S. population.

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References

1. Barry V, Dasgupta S, Weller D, et al. Patterns in COVID-19 vaccination coverage by social vulnerability and urbanicity—United States, December 14, 2020–April 20, 2021. MMWR Morb Mortal Wkly Rep 2021;70:818–24. PMID:34081685 https://doi.org/10.15585/mmwr.mm7022e1
2. Borchering RK, Viboud C, Howerton E, et al. Modeling of future COVID-19 cases, hospitalizations, and deaths, by vaccination rates and nonpharmaceutical intervention scenarios—United States, April–September 2021. MMWR Morb Mortal Wkly Rep 2021;70:719–24. PMID:33988185 https://doi.org/10.15585/mmwr.mm7019e3
3. Haas EJ, Angulo FJ, McLaughlin JM, et al. Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalisations, and deaths following a nationwide vaccination campaign in Israel: an observational study using national surveillance data. Lancet 2021;397:1819–29. PMID:33964222 https://doi.org/10.1016/S0140-6736(21)00947-8
4. COVID-19 Stats: COVID-19 incidence, by age group—United States, March 1–November 14, 2020. MMWR Morb Mortal Wkly Rep 2021;69:1664. PMID:33382674
5. Leidman E, Duca LM, Omura JD, Proia K, Stephens JW, Sauber-Schatz EK. COVID-19 trends among persons aged 0–24 years—United States, March 1–December 12, 2020. MMWR Morb Mortal Wkly Rep 2021;70:88–94. PMID:33476314 https://doi.org/10.15585/mmwr.mm7003e1
6. Murthy BP, Sterrett N, Weller D, et al. Disparities in COVID-19 vaccination coverage between urban and rural counties—United States, December 14, 2020–April 10, 2021. MMWR Morb Mortal Wkly Rep 2021;70:759–64. PMID:34014911 https://doi.org/10.15585/mmwr.mm7020e3
7. Hughes MM, Wang A, Grossman MK, et al. County-level COVID-19 vaccination coverage and social vulnerability—United States, December 14, 2020–March 1, 2021. MMWR Morb Mortal Wkly Rep 2021;70:431–6. PMID:33764963 https://doi.org/10.15585/mmwr.mm7012e1
8. Whiteman A, Wang A, McCain K, et al. Demographic and social factors associated with COVID-19 vaccination initiation among adults aged ≥65 years—United States, December 14, 2020–April 10, 2021. MMWR Morb Mortal Wkly Rep 2021;70:725–30. PMID:33983911 https://doi.org/10.15585/mmwr.mm7019e4
9. Baack BN, Abad N, Yankey D, et al. COVID-19 vaccination coverage and intent among adults aged 18–39 years—United States, March–May 2021. MMWR Morb Mortal Wkly Rep 2021. Epub June 21, 2021. http://dx.doi.org/10.15585/mmwr.mm7025e2
10. Moran C, Campbell DJT, Campbell TS, et al. Predictors of attitudes and adherence to COVID-19 public health guidelines in Western countries: a rapid review of the emerging literature. J Public Health (Oxf) 2021;fdab070:fdab070. PMID:33704456 https://doi.org/10.1093/pubmed/fdab070

COVID-19 Vaccination Coverage and Intent Among Adults Aged 18–39 Years — United States, March–May 2021

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Since April 19, 2021, all persons aged ≥16 years in the United States have been eligible to receive a COVID-19 vaccine. As of May 30, 2021, approximately one half of U.S. adults were fully vaccinated, with the lowest coverage and lowest reported intent to get vaccinated among young adults aged 18–39 years (*1–4*). To examine attitudes toward COVID-19 vaccination and vaccination intent among adults in this age group, CDC conducted nationally representative household panel surveys during March–May 2021. Among respondents aged 18–39 years, 34.0% reported having received a COVID-19 vaccine. A total of 51.8% were already vaccinated or definitely planned to get vaccinated, 23.2% reported that they probably were going to get vaccinated or were unsure about getting vaccinated, and 24.9% reported that they probably or definitely would not get vaccinated. Adults aged 18–24 years were least likely to report having received a COVID-19 vaccine and were most likely to report being unsure about getting vaccinated or that they were probably going to get vaccinated. Adults aged 18–39 years with lower incomes, with lower educational attainment, without health insurance, who were non-Hispanic Black, and who lived outside of metropolitan areas had the lowest reported vaccination coverage and intent to get vaccinated. Concerns about vaccine safety and effectiveness were the primary reported reasons for not getting vaccinated. Vaccination intent and acceptance among adults aged 18–39 years might be increased by improving confidence in vaccine safety and efficacy while emphasizing that vaccines are critical to prevent the spread of COVID-19 to friends and family and for resuming social activities (*5*).

During March–May 2021, CDC sponsored questions in two nationally representative, probability-based panel surveys (Ipsos Knowledge Panel and NORC AmeriSpeak)* that were administered to U.S. adults aged ≥18 years to assess COVID-19 vaccination status, intent, attitudes, and perceptions (*6–8*). Eight surveys were administered to 8,410 panelists (approximately 1,000 per panel) during March 5–May 2, 2021, with panel completion† ranging from 20.3% to 60.1%. Because of similar sampling methods and characteristics of respondents, results were pooled across surveys.

For each survey, respondents were asked questions about receipt of COVID-19 vaccine and intent to get vaccinated if not already vaccinated, as well as questions about their perceptions of the COVID-19 vaccine. Respondents were asked, "Have you received a COVID-19 vaccine?" and those who answered "no" were asked, "Once a vaccine to prevent COVID-19 is available to you, would you: definitely get a vaccine, probably get a vaccine, be unsure about getting a vaccine, probably not get a vaccine, or definitely not get a vaccine?" Respondents were grouped by vaccination and intent status as follows§: 1) persons who had already received a COVID-19 vaccine or who were definitely intending to get vaccinated; 2) persons who were probably getting vaccinated or who were unsure about getting vaccinated; and 3) persons who probably or definitely did not intend to get vaccinated.

Analyses were conducted among the subset of adults aged 18–39 years (N = 2,726) to estimate vaccination coverage and intent by sociodemographic characteristics¶ and to assess COVID-19 vaccine perceptions among intent groups. All survey data were weighted to U.S. Census geodemographic benchmarks to ensure representativeness and analyzed using SAS-callable SUDAAN (version 11.0.1; RTI International). T-tests were used to determine differences by age and sociodemographic characteristics. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.**

* Both the Ipsos and NORC panel surveys use an address-based sampling methodology that covers nearly all households in the United States, regardless of their telephone or Internet status. Surveys were conducted in English and Spanish, and non-Hispanic Black persons and non-Hispanic "other race" panel members were oversampled to ensure adequate sample size for subgroup analyses by race/ethnicity.

† Panel completion = proportion of all respondents interviewed among all eligible persons ever contacted. https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf

§ A preliminary analysis of data from an in-depth CDC survey that was conducted during this time period and examined behavioral factors associated with vaccination intent status found that attitudes, perceptions, and behaviors were similar for each of the categories within a group. Because all respondents might not have been eligible to get a vaccine during previous surveys, persons who had been vaccinated and those who definitely intended to get vaccinated were combined for analysis.

¶ Metropolitan statistical area (MSA) status was determined by U.S. Census block group using the panelist's address. For a small number of panelists for whom an address was not available, zip codes were used to determine MSA status. https://www.census.gov/programs-surveys/metro-micro.html

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

Among 2,726 adults aged 18–39 years, 51.8% reported that they had been vaccinated or were definitely intending to get vaccinated, including 34.0% who had already received a COVID-19 vaccine; 23.2% were probably going to get vaccinated or were unsure about getting vaccinated; and 24.9% reported that they probably or definitely would not get vaccinated (Table 1). Compared with adults aged 35–39 years, a smaller proportion of adults aged 18–24 years reported having been vaccinated (28.4% versus 35.5%), and a larger proportion was unsure about getting vaccinated or was probably going to get vaccinated (28.3% versus 19.2%).

COVID-19 vaccination and intent differed by demographic characteristics (Table 1). Education and income were both associated with likelihood of vaccination and all levels of intent. Those with a bachelor's degree or higher were most likely to report being vaccinated or definitely intending to get vaccinated (72.6%), including 51.8% who reported already having been vaccinated; these proportions decreased with decreasing educational level. Similarly, adults with the highest household incomes were most likely to report being vaccinated or definitely intending to get vaccinated (64.2%), including 42.9% who were already vaccinated; these proportions also decreased with income. Reported COVID-19 vaccination coverage or definite intent to get vaccinated was lower among non-Hispanic Black adults (40.1%, with 25.4% vaccinated) than among non-Hispanic White adults (51.8%, with 35.0% vaccinated). A higher percentage of adults living outside metropolitan areas reported that they probably or definitely would not get vaccinated (40.1%), compared with those within metropolitan areas (22.1%).

Among adults aged 18–39 years, reasons for not intending to get a COVID-19 vaccine varied by vaccine intent (Table 2). Persons who were unsure about getting vaccinated or probably going to get vaccinated, as well as those who were not planning to get vaccinated, had similar levels of concern about experiencing vaccine side effects (56.2% and 56.3%, respectively). Among those who were unsure about getting vaccinated or probably going to get vaccinated, wanting to wait and see if the vaccine was safe (52.9%) and thinking that others needed a vaccine more than they did (39.5%) were the next most frequently cited reasons for not getting vaccinated, whereas lack of trust in COVID-19 vaccines (56.5%) and not believing that a vaccine was necessary (36.4%) were frequently cited reasons among adults aged 18–39 years who were probably or definitely not planning to get vaccinated. Persons who were unsure or probably going to get vaccinated reported a higher level of concern about getting COVID-19 (42.7%) than those who were not planning to get vaccinated (26.1%). Persons who were unsure or probably going to get vaccinated reported that they would be motivated to get vaccinated if they had more information indicating that the vaccines were safe (39.0%), were effective (28.8%), would prevent them from spreading COVID-19 to family and friends (27.6%), and would allow them to resume social activities (20.9%) (Figure). Among those who were unsure or probably going to get vaccinated and those who were not planning to get vaccinated, approximately 60%–70% reported that they were unsure about or did not have enough information about vaccine safety or about vaccine effectiveness (Table 2).

Among persons who were unsure about getting vaccinated or probably going to get vaccinated and those who were probably or definitely not going to get vaccinated, the most frequently reported trusted information sources were CDC (44.5% and 22.7%, respectively) and primary health care providers (39.0% and 23.1%, respectively), whereas employers (4.3% and 3.0%, respectively), social media (4.2% and 3.4%, respectively), and religious organizations (2.5% and 5.2%, respectively) were the least frequently reported sources (Table 2). Percentages of persons who reported barriers to vaccine access were generally low (<10%); difficulty making appointments (8.9%) and being too busy to get vaccinated (7.6%) were reported by respondents who were unsure or probably going to get vaccinated. Although 46.4% of these persons reported a lack of adequate information about where to get vaccinated, a much smaller percentage (9.5%) cited this as a barrier to vaccination.

Discussion

During March–May 2021, nearly one fourth of adults aged 18–39 years were unsure about whether to receive a COVID-19 vaccine or were probably going to get vaccinated, and nearly one fourth reported that they would probably not or definitely not get vaccinated. Among adults aged 18–39 years, those who were younger, were non-Hispanic Black, had lower incomes and educational attainment, had no health insurance, and lived outside of metropolitan areas had the lowest reported vaccination rates and intent to get vaccinated.

The findings in this report indicate that trust in COVID-19 vaccines, particularly in their safety and effectiveness, was an important factor in the decision to get vaccinated among adults aged 18–39 years, especially for those who were unsure about or probably planning on getting vaccinated. Compared with those who were probably or definitely not planning to get vaccinated, this group was more concerned about getting COVID-19, indicating that information about vaccine safety and effectiveness might have influenced their decision to get vaccinated. This information might be a motivating factor if it were to come from trusted sources, such as health authorities, primary health care providers, and family and friends. In contrast, vaccine messages from employers, religious leaders, or social media might not be as effective. Adults aged 18–39 years

TABLE 1. COVID-19 vaccination and intent status among adults aged 18–39 years, by sociodemographic characteristics — United States, March–May 2021

Characteristic	Total no.*	% (95% CI)	Weighted % (95% CI†)			
			Vaccination status	Vaccination and intent status		
			Vaccinated (N = 1,022)	Vaccinated or definitely planning to get vaccinated (N = 1,521)	Unsure or probably will get vaccinated (N = 562)	Probably or definitely will not get vaccinated (N = 643)
Total	**2,726**	**100 (99.9–100.0)**	**34.0 (31.9–36.2)**	**51.8 (49.3–54.4)**	**23.2 (21.1–25.4)**	**24.9 (22.9–27.1)**
Age group, yrs						
18–24	**532**	**29.1 (26.8–31.4)**	28.4 (23.9–33.3)§	49.9 (44.7–55.1)	28.3 (23.5–33.4)§	21.8 (17.9–26.2)
25–29	**675**	**25.2 (23.2–27.3)**	36.1 (31.7–40.7)	50.6 (45.8–55.5)	24.6 (20.6–28.8)	24.8 (20.6–29.4)
30–34	**834**	**22.9 (21.1–24.7)**	37.4 (33.5–41.5)	54.6 (50.3–58.9)	19.4 (16.1–22.9)	26.0 (22.4–29.9)
35–39 (Ref)	**685**	**22.9 (21.0–24.7)**	35.5 (31.5–39.6)	52.8 (48.3–57.4)	19.2 (15.7–23.2)	27.9 (24.0–32.2)
Sex						
Female (Ref)	**1,395**	**51.2 (48.7–53.7)**	34.3 (31.2–37.4)	50.7 (47.1–54.3)	21.9 (19.2–24.9)	27.4 (24.2–30.8)
Male	**1,331**	**48.8 (46.3–51.3)**	33.8 (30.7–37.0)	53.1 (49.6–56.4)	24.6 (21.3–28.1)	22.3 (19.6–25.3)§
Race/Ethnicity						
White, non-Hispanic (Ref)	**1,684**	**54.9 (52.3–57.4)**	35.0 (32.4–37.8)	51.8 (48.8–54.8)	21.4 (18.8–24.2)	26.8 (24.2–29.5)
Black, non-Hispanic	**270**	**12.3 (10.6–14.1)**	25.4 (19.6–32.0)§	40.1 (33.2–47.2)§	27.6 (21.0–35.1)	32.3 (25.7–39.5)
Hispanic	**467**	**21.5 (19.5–23.7)**	33.7 (28.4–39.2)	52.2 (46.4–58.0)	25.8 (20.7–31.3)	22.0 (17.0–27.6)
All other races, non-Hispanic¶	**305**	**11.4 (9.8–13.1)**	39.0 (31.9–46.5)	63.9 (56.9–70.4)§	22.5 (16.9–28.9)	13.6 (8.9–19.6)§
Education						
Less than high school	**200**	**13.1 (11.2–15.2)**	16.2 (11.1–22.5)§	32.4 (25.0–40.5)§	31.8 (24.4–39.8)§	35.8 (27.3–45.1)§
High school diploma or equivalent	**533**	**28.0 (25.6–30.4)**	23.6 (19.3–28.3)§	40.7 (35.6–45.9)§	28.5 (24.0–33.3)§	30.8 (26.4–35.6)§
Some college	**932**	**28.9 (26.9–30.9)**	33.6 (30.0–37.4)§	49.9 (46.0–53.8)§	24.6 (21.2–28.4)§	25.5 (22.2–29.0)§
Bachelor's degree or higher (Ref)	**1,061**	**30.0 (28.0–32.1)**	51.8 (48.5–55.2)	72.6 (69.4–75.7)	13.3 (11.1–15.7)	14.1 (11.7–16.8)
Household income, $						
<24,999	**420**	**19.1 (16.9–21.4)**	21.0 (16.2–26.3)§	36.2 (30.0–42.7)§	27.0 (21.8–32.7)§	36.8 (30.9–42.9)§
25,000–49,999	**604**	**22.2 (20.2–24.2)**	28.0 (24.0–32.3)§	43.8 (39.1–48.7)§	26.3 (21.4–31.7)§	29.9 (25.4–34.6)§
50,000–74,999	**537**	**18.4 (16.7–20.1)**	35.3 (30.4–40.5)§	50.5 (45.3–55.7)§	24.7 (20.3–29.6)	24.7 (20.3–29.6)§
≥75,000 (Ref)	**1,165**	**40.3 (38.0–42.7)**	42.9 (39.5–46.4)	64.2 (60.9–67.5)	19.1 (16.3–22.1)	16.7 (14.5–19.1)
Health insurance coverage						
Insured (Ref)	**2,272**	**84.8 (82.7–86.7)**	36.2 (33.9–38.6)	55.4 (52.7–58.1)	21.9 (19.7–24.3)	22.6 (20.5–24.9)
Not insured	**358**	**15.2 (13.3–17.3)**	24.5 (19.7–29.8)§	35.8§ (29.6–42.3)	28.3 (22.5–34.6)	36.0 (29.3–43.1)§
Metropolitan residence						
Metropolitan (Ref)	**2,338**	**84.2 (82.2–85.9)**	35.4 (33.1–37.7)	55.0 (52.3–57.7)	22.9 (20.8–25.2)	22.1 (19.9–24.4)
Nonmetropolitan	**388**	**15.8 (14.1–17.8)**	26.9§ (21.9–32.4)	35.0 (29.3–41.1)§	24.9 (18.9–31.7)	40.1 (34.0–46.4)§

Abbreviations: CI = confidence interval; Ref = referent group.
* No. = unweighted sample size/denominator.
† Korn-Graubard 95% CI.
§ Statistically significant difference compared with referent group.
¶ Includes non-Hispanic Asian, American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, and multiple races.

who were unsure about getting vaccinated or probably going to get vaccinated reported that a desire to protect others and resume social activities were motivators to get vaccinated, suggesting that messages emphasizing that vaccination would allow them to resume social activities and encouraging vaccination for the greater good might be effective. Ensuring that vaccines are easily accessible, convenient, and available in places where young adults live and work could also improve vaccine acceptance and coverage (*9*).

The findings in this report are subject to at least eight limitations. First, although panel recruitment methodology and data weighting were designed to produce nationally representative results, respondents might not be fully representative of the general U.S. adult population. Second, although data were weighted to account for differential nonresponse, low overall response rates might also affect sample representativeness. Third, because of small sample sizes for the age group 18–39 years within individual surveys, data were combined across multiple survey waves for this analysis, which might have minimized recent changes in vaccination coverage and intent status. Fourth, vaccination intent categories were combined in this analysis, which might have minimized distinctions between categories. However, a preliminary analysis of data from a CDC survey found that attitudes, perceptions, and behaviors were similar for each of the categories within a group. Fifth, state-specific vaccine eligibility varied during the data collection period, and some adults might not have been eligible during previous surveys, which might have affected

TABLE 2. COVID-19 vaccination attitudes and perceptions among adults aged 18–39 years, by vaccination and intent status — United States, March–May 2021

Attitudes and perceptions	Weighted % (95% CI)		
	Vaccination and intent status		
	Vaccinated or definitely planning to get vaccinated (N = 1,521)	Unsure or probably will get vaccinated (N = 562)	Probably or definitely will not get vaccinated (N = 643)
Reason for not intending to get vaccinated			
Concerned about possible side effects	NA	56.2 (51.3–61.1)	56.3 (50.9–61.5)
Plan to wait and see if it is safe and might get it later	NA	52.9 (47.4–58.3)	31.2 (26.5–36.2)
Think other people need it more than I do right now	NA	39.5 (34.8–44.3)	14.1 (11.0–17.8)
Concerned about having an allergic reaction	NA	23.5 (18.9–28.6)	23.4 (19.6–27.5)
Do not know if it will work	NA	19.0 (15.1–23.4)	29.3 (24.1–35.0)
Do not trust COVID-19 vaccines	NA	18.0 (14.1–22.3)	56.5 (51.7–61.2)
Concerned about the cost	NA	8.9 (5.9–12.9)	2.6 (1.4–4.5)
Do not believe I need a vaccine	NA	7.2 (4.7–10.6)	36.4 (31.8–41.2)
Do not think COVID-19 is that big of a threat	NA	6.7 (4.2–10.0)	27.4 (23.4–31.7)
Concern about COVID-19			
Somewhat/Very concerned about getting COVID-19	53.4 (50.2–56.5)	42.7 (37.8–47.7)	26.1 (21.8–30.8)
Mask-wearing behavior			
Always or often wore a mask in public during the past week	95.4 (93.4–96.9)	89.5 (86.3–92.2)	66.5 (61.6–71.2)
Adequacy of COVID-19 vaccine information			
Unsure/Not enough information about safety of vaccines	22.2 (19.6–25.0)	71.0 (66.0–75.7)	68.5 (63.3–73.4)
Unsure/Not enough information about how well vaccines protect you	24.2 (21.5–27.1)	67.7 (63.0–72.1)	62.5 (57.1–67.5)
Unsure/Not enough information about where to get a vaccine	22.4 (19.6–25.3)	46.4 (41.4–51.4)	30.0 (25.4–34.8)
Trusted sources for accurate vaccine information			
CDC	72.9 (69.9–75.8)	44.5 (39.3–49.8)	22.7 (18.6–27.2)
Primary care providers	61.4 (58.1–64.6)	39.0 (33.9–44.3)	23.1 (18.8–27.8)
State health departments	49.6 (46.3–52.8)	28.2 (23.8–33.0)	10.6 (7.7–14.1)
Local health officials	41.9 (38.5–45.3)	24.1 (19.8–29.0)	8.0 (5.7–11.0)
Family and friends	15.7 (13.3–18.4)	21.0 (16.9–25.6)	16.4 (12.6–20.8)
Food and Drug Administration	45.5 (42.5–48.6)	20.1 (16.3–24.4)	9.8 (7.3–12.8)
News sources	19.7 (17.4–22.2)	13.4 (10.1–17.4)	6.2 (3.9–9.2)
Employer	10.3 (8.6–12.4)	4.3 (2.5–6.8)	3.0 (1.8–4.7)
Social media	2.5 (1.6–3.6)	4.2 (2.3–7.0)	3.4 (1.8–5.9)
Religious organizations	2.2 (1.4–3.3)	2.5 (1.3–4.3)	5.2 (3.4–7.6)
Barriers to vaccination			
None/It is not difficult	30.4 (24.9–36.3)	33.0 (28.0–38.3)	62.6 (57.3–67.6)
Do not know where to go to get vaccinated	6.8 (4.3–10.1)	9.5 (7.0–12.7)	2.1 (1.0–3.8)
It is difficult to find or make an appointment	16.4 (12.7–20.6)	8.9 (6.2–12.2)	2.1 (1.1–3.6)
Too busy to get vaccinated	1.5 (0.6–3.0)	7.6 (4.9–11.0)	4.9 (2.8–8.1)
Do not have time off work	5.5 (3.3–8.6)	6.7 (4.0–10.4)	2.3 (1.1–4.4)
The lines are too long	2.3 (1.2–4.1)	4.6 (2.9–7.0)	1.5 (0.7–2.9)
It is too far away or I do not have transportation	4.1 (2.2–7.1)	3.1 (1.4–5.8)	1.2 (0.4–2.5)

Abbreviations: CI = confidence interval; NA = not applicable.

vaccination coverage responses to questions related to attitudes, behaviors, and perceptions. Sixth, attitudes, behaviors, and perceptions might change quickly, and these results might not reflect current COVID-19 vaccine barriers and motivators. Seventh, results were designed to be national estimates, cannot be generalized at state or local levels, and did not include an examination of geographic differences. Finally, results might not be comparable to results from other national polls or surveys because of potential differences in survey methods, sample design, and framing of questions related to vaccination intent.

Achieving high vaccination coverage among adults aged 18–39 years is critical to protect this population from COVID-19 and to reduce community incidence. Increasing confidence in vaccine safety and effectiveness and emphasizing that vaccines are important for preventing the spread of COVID-19 to family and friends and resuming social activities might help increase coverage in this younger adult population, particularly among those who are unsure about whether to get vaccinated (5).

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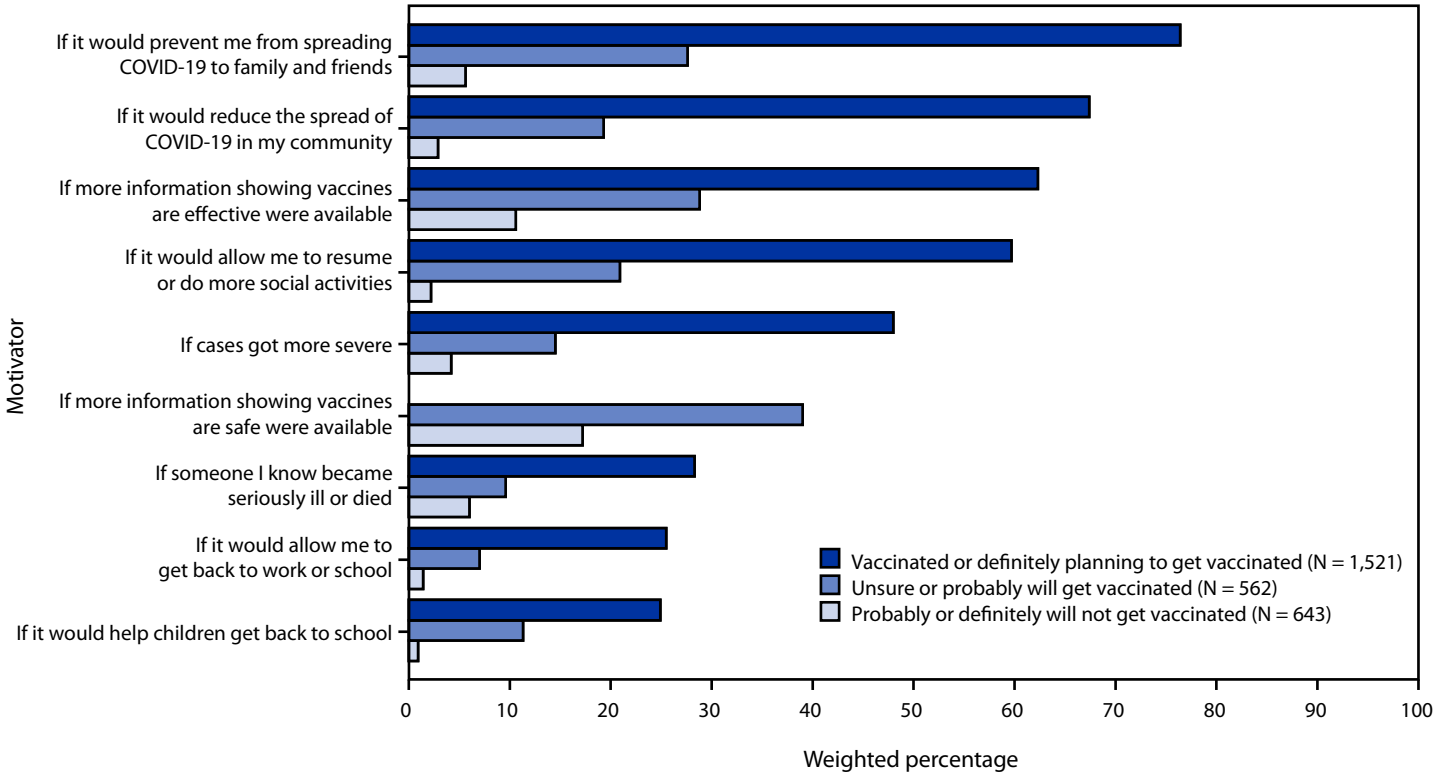
FIGURE. Motivators* for COVID-19 vaccination among adults aged 18–39 years, by intent status — United States, March–May 2021



* Respondents who reported that they had received a COVID-19 vaccine or definitely planned to get vaccinated were asked what made them definitely plan to get vaccinated; all other respondents were asked what would make them more likely to get a COVID-19 vaccine. Weighted percentages represent respondents who chose the motivator in answer to the question, "Which of the following made you definitely plan/would make you more likely to get a COVID-19 vaccine?" The response "more information showing vaccines are safe" was not provided as an option for respondents who reported being vaccinated or who definitely planned to get vaccinated.

Summary

What is already known about this topic?

Since April 19, 2021, all persons aged ≥16 years have been eligible for COVID-19 vaccination. Vaccination coverage and intent among adults are lowest among those aged 18–39 years.

What is added by this report?

Overall, 34% of adults aged 18–39 years reported having received a COVID-19 vaccine. Adults aged 18–24 years, as well as non-Hispanic Black adults and those with less education, no insurance, and lower household incomes, had the lowest reported vaccination coverage and intent to get vaccinated. Concerns about vaccine safety and effectiveness were commonly cited barriers to vaccination.

What are the implications for public health practice?

Addressing concerns about COVID-19 vaccine safety and efficacy and emphasizing the role of vaccination in protecting family and friends and resuming social activities might help increase coverage.

References

1. CDC. COVID data tracker: demographic trends of people receiving COVID-19 vaccinations in the United States. Atlanta, GA: US Department of Health and Human Services, CDC; 2021. https://covid.cdc.gov/covid-data-tracker/#vaccination-demographics-trends
2. Kaiser Family Foundation. COVID-19 vaccine monitor—April 2021. Washington, DC: Kaiser Family Foundation; 2021. https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-april-2021/
3. Morning Consult. COVID-19 vaccine dashboard. New York, NY: Morning Consult; 2021. Accessed May 16, 2021. https://morningconsult.com/covid19-vaccine-dashboard/#section-21
4. CDC. Sociodemographic factors associated with receipt of COVID-19 vaccination and intent to definitely get vaccinated, adults aged ≥18 years—Household Pulse Survey, United States, April 28–May 10, 2021. Atlanta, GA: US Department of Health and Human Services, CDC; 2021. https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/sociodemographic-factors-covid19-vaccination.html
5. CDC. Vaccinate with confidence: strategy to reinforce confidence in COVID-19 vaccines. Atlanta, GA: US Department of Health and Human Services, CDC; 2021. https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence.html

6. Ipsos. KnowledgePanel. New York, NY: Ipsos; 2021. Accessed May 16, 2021. https://www.ipsos.com/en-us/solutions/public-affairs/knowledgepanel
7. NORC. AmeriSpeak Omnibus. Chicago, IL: NORC at the University of Chicago; 2021. https://amerispeak.norc.org/our-capabilities/Pages/AmeriSpeak-Omnibus.aspx
8. Nguyen KH, Srivastav A, Razzaghi H, et al. COVID-19 vaccination intent, perceptions, and reasons for not vaccinating among groups prioritized for early vaccination—United States, September and December 2020. MMWR Morb Mortal Wkly Rep 2021;70:217–22. PMID:33571174 https://doi.org/10.15585/mmwr.mm7006e3
9. CDC. The guide to community preventive services (The Community Guide): vaccination. Atlanta, GA: US Department of Health and Human Services, CDC; 2020. https://www.thecommunityguide.org/topic/vaccination

Erratum

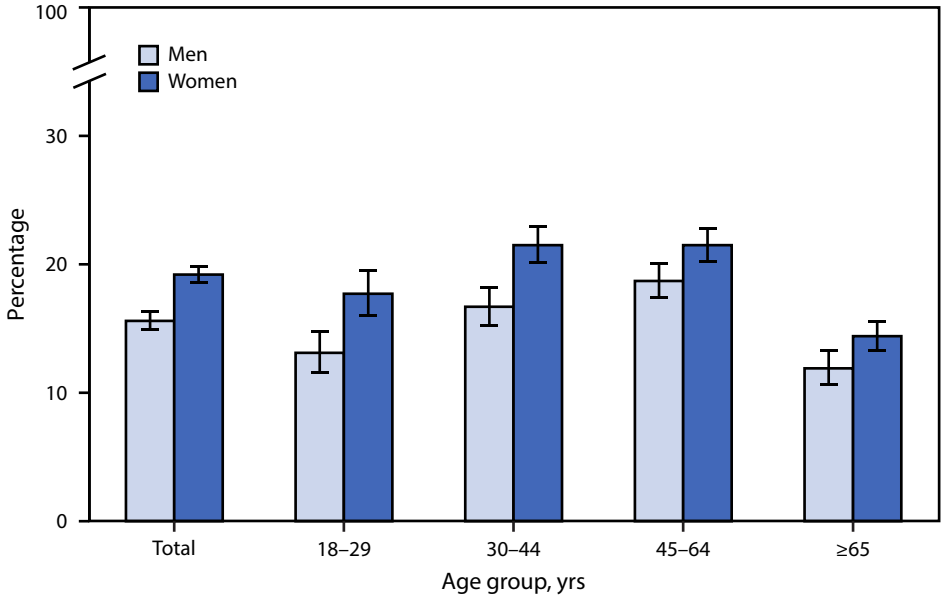
Vol. 70, No. 23

In the report "Progress Toward Rubella Elimination — World Health Organization European Region, 2005–2019," multiple errors occurred. On page 833, the second author's name should have read, "**Dragan Jankovic**." On page 833, in the fourth line of the second column, the sentence should have read, "During 2005–2019, estimated regional coverage with RCV1 was 93%–95%, and in 2019, **30 (57%)** countries achieved ≥95% coverage with the RCV1." On page 834, in the 11th line of first paragraph under "Immunization Activities," the sentence should have read, "During 2005–2019, estimated regional coverage with RCV1 was 93%–95%, and in 2019, **30 (57%)** countries achieved ≥95% coverage with the first dose of RCV." On page 835, in Table 1, in the "Total" line, for the % Coverage columns for 2005, the percentages for RCV1 and RCV2 should have read, "**93**" and "**76**," respectively; for the % Coverage columns for 2015, the percentages for RCV1 and RCV2 should have read, "**94**" and "**89**," respectively; and for the % Coverage columns for 2019, the percentages for RCV1 and RCV2 should have read, "**95**" and "**91**," respectively. On page 838, the second sentence in the "What is added by this report?" paragraph of the Summary box should have read, "In 2019, **30 (57%)** countries had achieved ≥95% RCV1 coverage."

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage* of Adults Who Did Not Get Needed Dental Care Because of Cost in the Past 12 Months,† by Age Group and Sex — National Health Interview Survey, United States, 2019§



* With 95% confidence intervals indicated with error bars.
† Based on a response of "yes" to a question asking, "During the past 12 months, was there any time when you needed dental care, but did not get it because of cost?"
§ Estimates are based on household interviews of a sample of the civilian, noninstitutionalized U.S. population.

In 2019, among adults aged ≥18 years, women (19.2%) were more likely than men (15.6%) not to get needed dental care because of cost in the past 12 months. The difference by sex was seen for all age groups: 17.7% versus 13.1% among adults aged 18–29 years, 21.5% versus 16.7% among those aged 30–44 years, 21.5% versus 18.7% among those aged 45–64 years, and 14.4% versus 11.9% among those aged ≥65 years. For both men and women, the percentages were highest among those aged 30–44 and 45–64 years. For men, the percentages were lowest among those aged 18–29 years and ≥65 years; for women, the percentage was lowest among those aged ≥65 years.

Source: National Center for Health Statistics; National Health Interview Survey, 2019. https://www.cdc.gov/nchs/nhis.htm

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