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Sexual Orientation Disparities in Risk Factors for Adverse COVID-19–Related Outcomes, by Race/Ethnicity — Behavioral Risk Factor Surveillance System, United States, 2017–2019

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Sexual minority persons experience health disparities associated with sexual stigma and discrimination and have a high prevalence of several health conditions that have been associated with severe coronavirus disease 2019 (COVID-19) (*1*,*2*). Current COVID-19 surveillance systems do not capture information about sexual orientation. To begin bridging the gap in knowledge about COVID-19 risk among sexual minority adults, CDC examined disparities between sexual minority and heterosexual adults in the prevalence of underlying conditions with strong or mixed evidence of associations with severe COVID-19–related illness (*3*), by using data from the 2017–2019 Behavioral Risk Factor Surveillance System (BRFSS).* When age, sex, and survey year are adjusted, sexual minority persons have higher prevalences than do heterosexual persons of self-reported cancer, kidney disease, chronic obstructive pulmonary disease (COPD), heart disease (including myocardial infarction, angina, or coronary heart disease), obesity, smoking, diabetes, asthma, hypertension, and stroke. Sexual minority adults who are members of racial/ethnic minority groups disproportionately affected by the pandemic also have higher prevalences of several of these health conditions than do racial/ethnic minority adults who are heterosexual. Collecting data on sexual orientation in COVID-19 surveillance and other studies would improve knowledge about disparities in infection and adverse outcomes by sexual orientation, thereby informing more equitable responses to the pandemic.

Conducted by the 50 states, the District of Columbia, three U.S. territories, and two freely associated states, BRFSS is a collection of population health surveys that gather demographic and health-related information from noninstitutionalized U.S. residents aged ≥18 years. BRFSS includes standard core

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* BRFSS collects information on demographics and health, including underlying conditions, use of preventive services, health care access, and health-related behavioral risk factors for the 50 states, District of Columbia, three U.S. territories (American Samoa, Guam, and U.S. Virgin Islands), and two freely associated states (Federated States of Micronesia and Palau). https://www.cdc.gov/brfss/index.html

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questions and optional modules. All participants are asked "Has a doctor, nurse, or other health practitioner ever told you that you have…" followed by a list of health conditions.[†] The number of jurisdictions opting to include questions on sexual orientation in BRFSS has increased in recent years. Gender identity is addressed in a BRFSS survey question separately from sexual orientation questions. This analysis combined the 3 most recent years of BRFSS data for states that include a sexual orientation question: a total of 28 states in 2017, a total of 29 states in 2018, and a total of 31 states in 2019.[§] The percentage of BRFSS respondents who refused to answer the sexual orientation question was 1.8% (both male and female) in 2017, 1.5% (male) and 1.9% (female) in 2018, and 1.6% (male) and 2.0% (female) in 2019. Among states with a sexual orientation question, the median overall survey response rate was 42.3% in 2017, 48.5% in 2018, and 46.4% in 2019.

For this analysis, respondents were classified as sexual minority persons (versus heterosexual persons) if they selected any of the following responses from the 2017–2019 questions on sexual orientation: "gay," "lesbian or gay," or "bisexual[¶]" (sexual minority: 24,582 [unweighted], 4.7% [weighted];

[†] Health conditions were elicited by the question "Has a doctor, nurse, or other health practitioner ever told you that you have…" followed by a set of conditions, including those used in this analysis: a heart attack, also called a myocardial infarction; angina or coronary heart disease; stroke; asthma (with positive responses followed by "Do you still have asthma?"); any other type of cancer (other than skin cancer); chronic obstructive pulmonary disease, emphysema, or chronic bronchitis; kidney disease (not including kidney stones, bladder infection, or incontinence); or diabetes (followed by questions allowing separation of gestational diabetes, prediabetes, and borderline diabetes). Hypertension was assessed separately but with the same question format. Possible responses to these questions were "yes," "no," "don't know/not sure," or refused. Because coronary heart disease is the most common cause of heart attack/myocardial infarction, respondents answering affirmatively to questions about a heart attack/myocardial infarction, angina, or coronary heart disease were counted as having heart disease.

[§] Jurisdictions with a sexual orientation question in 2017 were California, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Louisiana, Massachusetts, Minnesota, Mississippi, Montana, Nevada, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Texas, Vermont, Virginia, Washington, Wisconsin, and Guam. Jurisdictions with a sexual orientation question in 2018 were Connecticut, Delaware, Florida, Hawaii, Idaho, Illinois, Kansas, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nevada, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Guam. Jurisdictions with a sexual orientation question in 2019 were Alaska, Arizona, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Indiana, Kansas, Louisiana, Maryland, Minnesota, Mississippi, Montana, New York, North Carolina, Ohio, Oklahoma, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Guam.

[¶] In 2017, the BRFSS question on sexual orientation was "Do you consider yourself to be: straight, lesbian or gay, or bisexual?" The interviewer recorded responses of "other," "don't know/not sure," and refusals. In 2018 and 2019, the BRFSS question on sexual orientation was "Which of the following best represents how you think of yourself?" Response options for men were "gay"; "straight, that is, not gay"; "bisexual"; and "something else." Response options for women were "lesbian or gay"; "straight, that is, not gay"; "bisexual"; and "something else." The interviewer recorded "don't know" responses and refusals. The analysis excludes 3.4% of respondents who responded "something else," "other," or "don't know" to the sexual orientation question or who refused to respond.

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heterosexual: 619,374 [unweighted], 95.3% [weighted]). Race and ethnicity were categorized as Hispanic (any race), non-Hispanic Black, non-Hispanic White, and non-Hispanic other; the non-Hispanic other category includes non-Hispanic Asian, non-Hispanic American Indian/Alaskan Native, and non-Hispanic persons of other races/ethnicities. Adults with the following conditions are at increased risk for severe illness from COVID-19: cancer, chronic kidney disease, COPD, heart conditions, obesity, pregnancy, sickle cell disease, smoking, and type 2 diabetes mellitus (*3*). In addition, adults with the following conditions might be at increased risk for severe illness from COVID-19: asthma, cerebrovascular disease, cystic fibrosis, hypertension, immunocompromised state, neurologic conditions (e.g., dementia), liver disease, overweight, pulmonary fibrosis, thalassemia, and type 1 diabetes mellitus. Among these conditions with strong or mixed evidence of associations with adverse COVID-19–related outcomes (*3*,*4*), the following variables from the BRFSS core module were included: asthma (current and ever), cancer (except nonmelanoma skin cancer), COPD, heart disease (myocardial infarction, angina, or coronary heart disease) (*4*), diabetes, hypertension, kidney disease, obesity (current), smoking (current), and stroke. Hypertension questions were asked only in 2017 and 2019.**

Adjusted percentages and adjusted prevalence ratios (aPRs) comparing sexual minority persons and heterosexual persons with each condition were calculated overall and stratified by race/ethnicity. Using Stata (version 16.0; StataCorp) software to account for the BRFSS survey design, all estimates were adjusted for age, sex (male or female), and survey year, using multivariate logistic regression with the margins and nonlinear combination of estimators (nlcom) postestimation commands. The nlcom procedure takes nonlinear transformations of a parameter estimate from a fitted model and applies the delta method to calculate the variance. All aPRs with 95% confidence intervals that exclude 1 are considered statistically significant.

Among all racial/ethnic groups combined, sexual minority persons had higher adjusted prevalences of asthma (current and ever), cancer, heart disease, COPD, hypertension, kidney disease, obesity (current), smoking (current), and stroke than did heterosexual persons (Table). Among non-Hispanic Black persons, sexual minority persons had higher adjusted prevalences of asthma (current and ever), COPD, and smoking (current) than did heterosexual persons. Among non-Hispanic White persons, sexual minority persons had higher adjusted prevalences of asthma (current and ever), cancer, COPD, diabetes, hypertension, kidney disease, obesity (current), smoking (current), and stroke than did heterosexual persons. Among Hispanic persons, sexual minority persons had higher adjusted prevalences of asthma (current and ever), cancer, COPD, smoking (current), and stroke than did heterosexual persons. Among non-Hispanic other persons, sexual minority persons had higher adjusted prevalences of asthma (current and ever), cancer, heart disease, COPD, obesity (current), and smoking (current) than did heterosexual persons. Among the 11 conditions studied, the highest significant aPRs were observed among sexual minority persons overall, and for eight of these 11 conditions, the highest significant aPRs were among sexual minority persons within a racial/ethnic minority group. None of the 11 conditions studied was more prevalent among heterosexual persons than among members of sexual minority groups.

Discussion

This analysis found that several underlying health conditions that increase or might increase the risk for more severe COVID-19–related illness were more prevalent among sexual minority persons than heterosexual persons, both within the overall population and within specific racial/ethnic groups. Non-Hispanic Black and Hispanic populations have been disproportionately affected by the COVID-19 pandemic in the United States, and the increased prevalence of certain risk factors among sexual minority members of these racial/ethnic minority populations is of particular concern. Because of their sexual orientation, sexual minority persons experience stigmatization and discrimination (*1*) that can increase vulnerabilities to illness and limit the means to achieving optimal health and well-being through meaningful work and economic security, routine and critical health care, and relationships in which sexual orientation and gender identity can be openly expressed (*5*). Persons who are members of both sexual minority and racial/ethnic minority groups might therefore experience a convergence of distinct social, economic, and environmental disadvantages that increase chronic disease disparities and the risk for adverse COVID-19–related outcomes.

In November 2020, CDC conducted a series of group listening sessions with representatives of advocacy and health care organizations serving sexual and gender minority communities across the United States to gather information on the effect of the pandemic on their constituents and patient

** The differences between the CDC list of conditions that place adults at increased risk for severe illness from COVID-19 and the BRFSS variables are the following, respectively: current cancer versus lifetime history of (ever) cancer; current chronic kidney disease versus ever kidney disease; current chronic obstructive pulmonary disease versus ever chronic obstructive pulmonary disease; current heart condition versus ever coronary heart disease, angina, or heart attack/myocardial infarction; obesity and severe obesity versus obesity; and current type 2 diabetes mellitus versus ever diabetes. BRFSS does not include a variable on sickle cell disease, which is one of the conditions on the CDC "at increased risk" list. The differences between the CDC list and BRFSS variables are the following, respectively: moderate to severe asthma versus asthma; current cerebrovascular disease versus ever stroke; current hypertension versus ever hypertension; and current type 1 diabetes mellitus versus ever diabetes.

TABLE. Adjusted prevalence and adjusted prevalence ratios (aPRs)* of underlying health conditions† among sexual minority§ and heterosexual adults, by race and Hispanic origin — Behavioral Risk Factor Surveillance System, United States, 2017–2019

Characteristic	% (95% CI)				
	All	Black, non-Hispanic	White, non-Hispanic	Other, non-Hispanic	Hispanic
Respondents, no.	**643,956**	54,486	495,278	51,781	42,411
Sexual minority persons,¶ no. (%)	**24,582 (4.7)**	2,004 (4.7)	17,656 (4.4)	2,616 (5.5)	2,306 (5.3)
Underlying condition					
Asthma, current					
Sexual minority	**13.8 (13.0–14.6)**	14.5 (12.2–16.8)	13.3 (12.4–14.3)	13.5 (11.1–16.0)	14.2 (11.5–16.9)
Heterosexual	**8.9 (8.8–9.1)**	10.7 (10.2–11.2)	9.2 (9.0–9.3)	8.1 (7.5–8.7)	6.8 (6.3–7.3)
aPR	**1.55 (1.45–1.64)**	1.35 (1.13–1.58)	1.46 (1.35–1.56)	1.67 (1.35–2.00)	2.09 (1.67–2.51)
Asthma, ever					
Sexual minority	**19.8 (18.8–20.8)**	21.0 (18.2–23.8)	19.1 (18.0–20.1)	19.7 (16.7–22.8)	20.9 (17.7–24.0)
Heterosexual	**14.1 (13.9–14.2)**	15.9 (15.3–16.5)	14.3 (14.1–14.6)	13.3 (12.5–14.0)	11.8 (11.2–12.4)
aPR	**1.41 (1.34–1.48)**	1.32 (1.14–1.50)	1.33 (1.25–1.41)	1.49 (1.24–1.73)	1.78 (1.49–2.06)
Cancer**					
Sexual minority	**9.2 (8.4–10.0)**	7.9 (5.6–10.2)	9.2 (8.4–9.9)	9.1 (6.5–11.6)	9.7 (6.2–13.3)
Heterosexual	**7.3 (7.2–7.4)**	6.1 (5.8–6.5)	7.8 (7.6–7.9)	5.8 (5.3–6.4)	5.9 (5.4–6.5)
aPR	**1.26 (1.15–1.37)**	1.29 (0.90–1.67)	1.18 (1.08–1.28)	1.56 (1.10–2.02)	1.64 (1.02–2.26)
Heart disease††					
Sexual minority	**8.0 (7.3–8.9)**	8.8 (6.2–11.4)	7.3 (6.6–8.0)	10.9 (7.8–14.1)	9.8 (6.6–13.0)
Heterosexual	**6.8 (6.6–6.9)**	7.0 (6.6–7.4)	6.7 (6.6–6.8)	7.0 (6.5–7.5)	6.7 (6.1–7.3)
aPR	**1.19 (1.08–1.30)**	1.26 (0.88–1.64)	1.09 (0.98–1.19)	1.56 (1.10–2.03)	1.46 (0.97–1.95)
COPD					
Sexual minority	**10.3 (9.5–11.1)**	10.2 (7.8–12.7)	10.1 (9.4–11.1)	9.2 (7.1–11.3)	10.3 (7.3–13.3)
Heterosexual	**6.9 (6.8–7.0)**	7.1 (6.7–7.6)	7.3 (7.2–7.5)	5.9 (5.4–6.3)	4.8 (4.3–5.3)
aPR	**1.49 (1.37–1.61)**	1.44 (1.09–1.78)	1.40 (1.28–1.52)	1.45 (1.14–1.76)	2.15 (1.49–2.81)
Diabetes					
Sexual minority	**12.5 (11.6–13.4)**	18.5 (15.3–21.7)	11.0 (10.1–11.9)	17.4 (13.1–21.6)	14.6 (11.4–17.7)
Heterosexual	**11.6 (11.4–11.7)**	17.1 (16.6–17.7)	9.8 (9.6–9.9)	13.7 (12.9–14.4)	16.1 (15.3–16.8)
aPR	**1.08 (1.00–1.16)**	1.08 (0.89–1.27)	1.12 (1.03–1.22)	1.27 (0.95–1.59)	0.91 (0.71–1.11)
Hypertension§§					
Sexual minority	**35.7 (34.2–37.1)**	45.4 (41.5–49.4)	34.9 (33.2–36.5)	35.9 (30.1–41.1)	32.3 (27.4–37.2)
Heterosexual	**33.6 (33.3–33.9)**	45.2 (44.3–46.1)	32.1 (31.8–32.4)	31.0 (29.7–32.2)	32.1 (31.1–33.1)
aPR	**1.06 (1.02–1.11)**	1.01 (0.92–1.09)	1.09 (1.05–1.14)	1.16 (0.98–1.33)	1.01 (0.85–1.16)
Kidney disease					
Sexual minority	**4.7 (4.0–5.4)**	7.2 (4.2–10.2)	4.2 (3.6–4.8)	4.5 (3.0–5.9)	5.8 (2.7–8.8)
Heterosexual	**3.2 (3.1–3.3)**	4.2 (3.8–4.5)	2.9 (2.8–3.0)	3.6 (3.0–4.1)	3.7 (3.3–4.1)
aPR	**1.47 (1.25–1.69)**	1.73 (0.99–2.46)	1.42 (1.22–1.63)	1.25 (0.80–1.70)	1.55 (0.71–2.39)
Obesity (BMI≥30 kg/m^2)					
Sexual minority	**34.1 (32.9–35.3)**	41.4 (37.6–45.1)	33.6 (32.3–35.0)	26.2 (22.8–29.7)	35.4 (31.5–39.3)
Heterosexual	**31.9 (31.6–32.1)**	41.0 (40.2–41.8)	30.5 (30.2–30.7)	22.1 (21.1–23.0)	35.4 (34.4–36.5)
aPR	**1.07 (1.03–1.11)**	1.01 (0.92–1.10)	1.10 (1.06–1.15)	1.19 (1.03–1.35)	1.00 (0.89–1.11)
Smoking, current					
Sexual minority	**22.1 (21.1–23.1)**	22.4 (19.4–25.4)	22.9 (21.7–24.0)	19.1 (16.2–22.0)	19.1 (16.0–22.2)
Heterosexual	**15.5 (15.3–15.7)**	16.9 (16.3–17.5)	16.5 (16.3–16.7)	12.8 (12.2–13.5)	11.5 (10.8–12.1)
aPR	**1.43 (1.36–1.50)**	1.32 (1.14–1.51)	1.39 (1.31–1.46)	1.49 (1.25–1.73)	1.67 (1.38–1.95)
Stroke					
Sexual minority	**4.7 (4.1–5.4)**	7.5 (5.1–9.9)	4.0 (3.4–4.5)	5.7 (3.2–8.2)	6.2 (3.5–8.9)
Heterosexual	**3.4 (3.4–3.5)**	5.5 (5.2–5.9)	3.2 (3.1–3.3)	3.6 (3.2–4.0)	3.0 (2.6–3.4)
aPR	**1.37 (1.19–1.56)**	1.36 (0.91–1.81)	1.24 (1.05–1.43)	1.59 (0.88–2.30)	2.08 (1.13–3.00)

Abbreviations: BMI = body mass index; CI = confidence interval; COPD = chronic obstructive pulmonary disease.

* Adjusted for age, sex (female or male), and Behavioral Risk Factor Surveillance System survey year. Adjusted prevalence ratios with 95% CIs that exclude 1 are statistically significant.

† Includes conditions with strong or mixed evidence of associations with COVID-19–associated adverse outcomes.

§ Includes persons who identified as gay, lesbian or gay, or bisexual. The analysis excludes those who responded to the sexual orientation question with "something else," "other," or "don't know" or who refused (3.4% of respondents).

¶ Unweighted number of respondents.

** Lifetime history of cancer, except nonmelanoma skin cancer.

†† Includes heart attack/myocardial infarction, coronary heart disease, or angina.

§§ 2017 and 2019 Behavioral Risk Factor Surveillance Systems only.

populations. A major concern expressed in these sessions was that information about sexual orientation and gender identity is not standard in COVID-19 data collection systems. Privacy issues around sexual orientation and concerns about nonresponse or refusals to answer such questions have often been used as justification for not including these elements in public health surveillance and patient record systems (*6*); however, regarding public health surveillance systems, CDC surveys such as BRFSS, the National Health Interview Survey, and the National Survey on Family Growth have demonstrated the feasibility of collecting sexual orientation data from the civilian, noninstitutionalized population on an ongoing basis (*2*). Several months into the COVID-19 pandemic, several states and local jurisdictions responded to demands from advocacy organizations to begin collecting these data. For example, in July 2020, California Health and Human Services announced emergency regulations that required local health departments and service providers to collect and report voluntary data on sexual orientation and gender identity to better understand the effect of COVID-19 in these population subgroups. Illinois has included a COVID-19 module in its 2020 BRFSS that also includes questions on sexual orientation and gender identity (*7*). Pennsylvania, the District of Columbia, and several other jurisdictions are taking steps toward including sexual orientation and gender identity information in COVID-19–related data collection; however, these data are not yet available (*6*).

The findings in this report are subject to at least six limitations. First, all conditions are self-reported, and all but three (asthma, obesity, and smoking) refer to lifetime instead of current prevalence. Second, although the 3-year data set included as many as 31 states in 2019, the data are not nationally representative. Third, although BRFSS variables used in this analysis are general measures of the list of underlying health conditions identified by CDC as COVID-19 risk factors (*3*), they do not always reflect the clinical specificity of the condition list; for example, the diabetes question does not distinguish between type 1 and type 2 diabetes, and the heart disease variable includes conditions that might not affect COVID-19 outcomes (*4*). Fourth, several important underlying health conditions, such as sickle cell disease, have no corresponding variable in BRFSS. Fifth, although BRFSS includes a question on gender identity, the number of respondents identifying as transgender or nonbinary was too small for reliable estimates compared with the majority cisgender population. Finally, the large number of respondents in the aggregated non-Hispanic other race/ethnicity category could potentially obscure disparities between sexual minority and heterosexual populations within these smaller communities.

Summary

What is already known about this topic?

Risks for COVID-19 acquisition and severe associated illness vary by characteristics, including race/ethnicity, age, and urban/rural residence. U.S. COVID-19 surveillance systems lack information on sexual orientation, hampering examination of COVID-19–associated disparities among sexual minority adults.

What is added by this report?

Sexual minority persons in the United States have higher self-reported prevalences of several underlying health conditions associated with severe outcomes from COVID-19 than do heterosexual persons, both in the overall population and among racial/ethnic minority groups.

What are the implications for public health practice?

Inclusion of sexual orientation and gender identity data in COVID-19 surveillance and other data collections could improve knowledge about disparities in infections and adverse outcomes among sexual and gender minority populations, overall and by race/ethnicity.

Despite the numerous studies among racial/ethnic minority groups and the increasing number of studies among sexual minority groups, examinations of health outcomes by combinations of sexual orientation and race/ethnicity remain relatively rare. Attention to potentially larger disparities at the intersections of sexual orientation and race/ethnicity is critical to ensuring health equity for all, including subpopulations whose circumstances often remain uncaptured despite acknowledgments of their distinct importance and needs. Because of longstanding social inequities and higher prevalences of several underlying health conditions, sexual minority populations might be vulnerable to COVID-19 acquisition and associated severe outcomes, and this vulnerability might be magnified when coupled with other demographic characteristics such as race/ethnicity (*8*). However, because data on sexual orientation are not collected in existing COVID-19 data systems, the effect of COVID-19 on sexual minority populations is unknown. This data gap underscores the need to extend COVID-19 surveillance and other studies to include measures of sexual orientation and gender identity. This recommendation is consistent with the emphasis on "key equity indicators" in the January 2021 Executive Order on Ensuring a Data-Driven Response to COVID-19 and Future High-Consequence Public Health Threats (*9*). Expanding sexual orientation and gender identity data collection to surveillance systems with shorter lags in data reporting could support more equitable representation of sexual and gender minority populations in public health data systems to facilitate improved decision-making during and after the pandemic.

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Decreases in Young Children Who Received Blood Lead Level Testing During COVID-19 — 34 Jurisdictions, January–May 2020

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Exposure to lead, a toxic metal, can result in severe effects in children, including decreased ability to learn, permanent neurologic damage, organ failure, and death. CDC and other health care organizations recommend routine blood lead level (BLL) testing among children as part of well-child examinations to facilitate prompt identification of elevated BLL, eliminate source exposure, and provide medical and other services (*1*). To describe BLL testing trends among young children during the coronavirus disease 2019 (COVID-19) pandemic, CDC analyzed data reported from 34 state and local health departments about BLL testing among children aged <6 years conducted during January–May 2019 and January–May 2020. Compared with testing in 2019, testing during January–May 2020 decreased by 34%, with 480,172 fewer children tested. An estimated 9,603 children with elevated BLL were missed because of decreased BLL testing. Despite geographic variability, all health departments reported fewer children tested for BLL after the national COVID-19 emergency declaration (March–May 2020). In addition, health departments reported difficulty conducting medical follow-up and environmental investigations for children with elevated BLLs because of staffing shortages and constraints on home visits associated with the pandemic. Providers and public health agencies need to take action to ensure that children who missed their scheduled blood lead screening test, or who required follow-up on an earlier high BLL, be tested as soon as possible and receive appropriate care.

CDC identifies no safe BLL in children and considers a blood lead reference value (BLRV) of 5.0 μg/dL* sufficient to prompt clinical and public health intervention (*1,2*). Among children aged <6 years, very high BLL (>70 μg/dL) can cause neurologic problems (e.g., seizures or coma), organ failure, and death. Lower, but still elevated, BLL can affect the nervous system, causing permanent neurologic damage, behavioral disorders, and cognitive impairment (*1*). In the United States, the most common childhood lead exposures are from lead-based paint that was used in pre-1978 housing,† lead-contaminated soil or lead-containing pollutants from industrial sources, and water from old lead pipes and fixtures (*3*). Very young children might ingest lead dust or paint because of their tendency to put fingers or objects (toys or paint chips) in their mouths, and they more readily absorb lead because their bodies are rapidly developing. Primary prevention focuses on reducing lead exposures in homes, schools, and communities. Secondary prevention consists of BLL screening as part of routine well-child examinations. Early identification of children with lead exposure can help identify and eliminate lead sources (and future exposures for other children); reduce their BLL over time; and link children with high BLLs to medical, nutritional, and educational services. Medicaid-enrolled children are required to be screened at ages 12 and 24 months; many states have additional screening requirements (*4*).

In 1995, elevated BLLs became a nationally reportable condition (*5*). CDC funds 53 state and local childhood lead poisoning prevention programs to conduct ongoing surveillance of BLL testing among children.§ During May and June 2020, CDC received anecdotal reports of declines in BLL testing. To understand BLL testing trends during the COVID-19 pandemic, including after a national emergency was declared in March 2020, CDC requested that state and local health departments report the total number of children aged <6 years with BLL tests by month during January–May 2019 and January–May 2020. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.¶ Health departments could also submit qualitative information. Based on the 2007–2010 National Health and Nutrition Examination Survey (NHANES) data and subsequent trends** (*1*), an estimated 2.0% of children who did not have a BLL test were conservatively assumed to have levels exceeding the BLRV.

* CDC uses a BLRV of 5.0 μg/dL to identify children with blood lead levels that are higher than those of most children. The BLRV is based on the 97.5th percentile of the NHANES blood lead distribution in children aged 1–5 years. The current BLRV is based on NHANES data from 2007–2008 and 2009–2010.

† The U.S. Consumer Products Safety Commission banned lead-based paints for residential use in 1978.

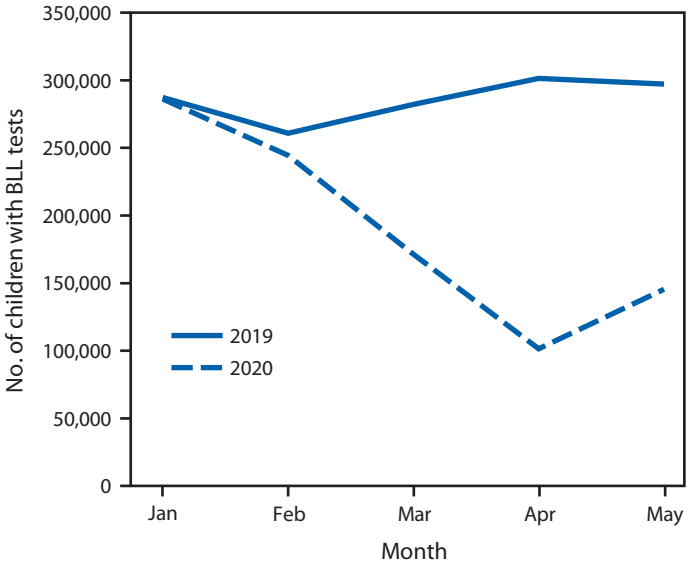
§ https://www.cdc.gov/nceh/lead/programs/default.htm

¶ 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.

** Trends in NHANES blood lead levels are in the National Report on Human Exposure to Environmental Chemicals Updated Tables, January 2019. https://www.cdc.gov/exposurereport/pdf/FourthReport_UpdatedTables_Volume1_Jan2019-508.pdf

Data for the period of interest for children aged <6 years were received from 34 state and local health departments, including the District of Columbia and New York City.[††] Overall, the number of children aged <6 years who had BLL tests during January–May 2020 (948,844) was lower by 33.6% (480,172) than the number who had BLL tests during January–May 2019 (1,429,016) (Figure), resulting in an estimated 9,603 children with elevated BLLs being missed. During the analysis period, the number of children with BLL testing was lower during every month during January–May 2020 compared with the number with testing during the same period in 2019; the largest proportional decrease (66.4%) occurred in April 2020. During the early pandemic period (March–May 2020), the number of children with BLL tests (481,199) decreased by 52.5% compared with the same period in 2019 (880,812). Despite geographic variation, all 34 responding state and local health departments reported decreased BLL testing during March–May 2020 compared with testing during 2019 (Table). Several health departments reported difficulties in conducting home nursing visits and environmental investigations following identification of children with BLL above the reference value because of staffing shortages and difficulties conducting home visits. In addition, some families whose children had elevated BLLs were no longer in the listed residence.

FIGURE. Number of children aged <6 years who received blood lead level (BLL) tests,* by month — 34 U.S. jurisdictions,† 2019–2020



* CDC requested that state and local health departments report the total number of children with BLL tests by month during January–May 2019 and January–May 2020. Data for children aged <6 years were received from 34 state and local health departments, including the District of Columbia and New York City.

† Alabama, Alaska, Arizona, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Hampshire, New Mexico, New York (excluding New York City), New York City, Ohio, Oregon, Rhode Island, Tennessee, Texas, Washington, West Virginia, and Wisconsin.

Discussion

Approximately 500,000 fewer children in the reporting jurisdictions were tested for lead exposure during the first 5 months of 2020 than during the same period in 2019. Estimating from this finding, approximately 10,000 children with elevated BLL were missed because of decreased testing. Reported challenges to conducting follow-up medical visits and environmental investigations indicate delays in exposure elimination and linkage to critical services for these children. Although socioeconomic data were not collected, a disproportionate impact is anticipated among children at risk for increased lead exposure, including children from racial or ethnic minority groups, from families who have been economically or socially marginalized, and those living in older housing with lead-based paint (*1*,*3*). These groups have also been disproportionately affected by the COVID-19 pandemic (*6*,*7*). Lead testing trends among young children mirror declines in other pediatric medical services during the pandemic, including emergency department visits (*8*), well-child visits and screenings,[§§] and orders for childhood vaccines (*9*) and vaccination coverage (*10*). As a result of COVID-19 shelter-in-place orders and school closures, there is also concern that children spending more time in contaminated environments could have ongoing or increased exposure.

Although telemedicine and other remote service delivery strategies provide an alternative to office and clinic visits during the pandemic, in-person visits are still necessary for many essential health examinations, including BLL testing among children. During the pandemic, the American Academy of Pediatrics recommends that well-child examinations occur in person whenever possible and within the child's medical home where continuity of care can be established.[¶¶] CDC guidance recommends that health care providers identify children who have missed well-child visits or recommended vaccinations and contact them to schedule in-person appointments, with prioritization of infants, children aged <24 months, and

[††] Alabama, Alaska, Arizona, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Hampshire, New Mexico, New York State (excludes New York City), New York City, Ohio, Oregon, Rhode Island, Tennessee, Texas, Washington, West Virginia, and Wisconsin.

[§§] https://www.medicaid.gov/resources-for-states/downloads/medicaid-chip-beneficiaries-18-under-COVID-19-snapshot-data.pdf

[¶¶] https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/

school-aged children.*** It is important that health care providers ensure that all children receive lead testing, including those who missed routine BLL screening, those with prior elevated BLLs who need follow-up testing, and those with possible lead exposure. Collaborations among health departments; Special Supplementation Nutrition Program for Women, Infants, and Children programs; immunization programs; Medicaid; refugee health organizations; and other health service providers for children at risk, including outreach to parents and providers and reminders to test children at risk for lead exposure, can help ensure that these children receive needed health assessments. States and local childhood lead poisoning prevention programs can examine data from blood lead surveillance and Medicaid to identify children in need of lead testing.

The findings in this report are subject to at least two limitations. First, this report is based on preliminary surveillance data. Observed declines could be partially caused by delays in laboratory reporting and data entry backlogs. Second, use of laboratory and health department resources for COVID-19 activities could have also affected these preliminary data. However, given broader national trends for pediatric medical services, it is likely that these BLL testing data reflect actual declines.

CDC has developed guidance for conducting environmental inspections and public health home visits during the COVID-19 pandemic,††† and the Health Resources and Services Administration's Maternal and Child Health Bureau has developed guidance for conducting home health visits for young children.§§§ Childhood lead poisoning prevention programs can collaborate with federal and local housing and environmental health agencies to address priority housing hazards. CDC will continue to work with health departments and other partners to develop and disseminate strategies for BLL testing during the pandemic. As surveillance data become available, CDC will conduct analyses to guide decision-making and interventions toward ensuring all children receive blood lead screening and appropriate care management during the pandemic.

Summary

What is already known about this topic?

Lead can affect a young child's ability to learn and cause other adverse health effects; no safe blood lead level (BLL) is known. Routine testing can detect elevated BLLs.

What is added by this report?

During January–May 2020, 34% fewer U.S. children had BLL testing compared with those during January–May 2019, with an estimated 9,603 children with elevated BLLs missed. All 34 reporting jurisdictions reported that fewer children were tested following the COVID-19 national emergency declaration in March.

What are the implications for public health practice?

COVID-19 has adversely affected identification of children with elevated BLLs, exposure elimination, and linkage to services. It remains important that providers ensure that young children receive appropriate lead testing and care management.

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State and local lead poisoning prevention programs.

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*** Developmental surveillance and early childhood screenings, including developmental and autism screening, should continue along with referrals for early intervention services and further evaluation if concerns are identified. https://www.cdc.gov/coronavirus/2019-ncov/hcp/pediatric-hcp.html

††† https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/ph-inspectors-employees.html

§§§ https://mchb.hrsa.gov/Home-Visiting-Information-During-COVID-19

TABLE. Number of children aged <6 years with blood lead level (BLL) tests,* absolute change, and percentage change, by jurisdiction — 34 U.S. jurisdictions, 2019–2020

Jurisdiction	Month	No. of children tested		Absolute change, no.	% Change
		2019	2020		
U.S. totals (for programs reporting data)	**Jan**	**287,343**	**286,261**	**−1,082**	**−0.4**
	Feb	**260,861**	**244,384**	**−16,477**	**−6.3**
	Mar	**282,150**	**171,298**	**−110,852**	**−39.3**
	Apr	**301,380**	**101,388**	**−199,992**	**−66.4**
	May	**297,282**	**145,513**	**−151,769**	**−51.1**
5-month totals	**Jan–May**	**1,429,016**	**948,844**	**−480,172**	**−33.6**
Alabama	Jan	3,376	3,060	−316	−9.4
	Feb	2,914	2,219	−695	−23.9
	Mar	2,972	1,928	−1,044	−35.1
	Apr	3,563	1,328	−2,235	−62.7
	May	2,732	1,097	−1,635	−59.8
Alaska	Jan	701	561	−140	−20.0
	Feb	544	526	−18	−3.3
	Mar	659	325	−334	−50.7
	Apr	627	334	−293	−46.7
	May	581	417	−164	−28.2
Arizona	Jan	5,571	5,278	−293	−5.3
	Feb	4,701	4,501	−200	−4.3
	Mar	5,278	3,060	−2,218	−42.0
	Apr	5,470	1,819	−3,651	−66.7
	May	5,233	2,300	−2,933	−56.0
California	Jan	41,972	39,719	−2,253	−5.4
	Feb	36,939	35,170	−1,769	−4.8
	Mar	41,215	24,210	−17,005	−41.3
	Apr	43,778	12,746	−31,032	−70.9
	May	43,734	21,006	−22,728	−52.0
Colorado	Jan	1,994	1,406	−588	−29.5
	Feb	1,882	1,113	−769	−40.9
	Mar	1,826	803	−1,023	−56.0
	Apr	1,963	716	−1,247	−63.5
	May	2,060	609	−1,451	−70.4
Delaware	Jan	1,177	885	−292	−24.8
	Feb	1,068	759	−309	−28.9
	Mar	1,166	517	−649	−55.7
	Apr	1,358	126	−1,232	−90.7
	May	1,319	270	−1,049	−79.5
District of Columbia	Jan	1,411	1,109	−302	−21.4
	Feb	1,126	1,186	60	5.3
	Mar	1,357	828	−529	−39.0
	Apr	1,465	264	−1,201	−82.0
	May	1,408	567	−841	−59.7
Florida	Jan	17,839	16,928	−911	−5.1
	Feb	16,001	14,444	−1,557	−9.7
	Mar	15,165	11,667	−3,498	−23.1
	Apr	17,473	8,061	−9,412	−53.9
	May	16,993	11,385	−5,608	−33.0
Georgia	Jan	9,079	9,401	322	3.5
	Feb	8,104	7,302	−802	−9.9
	Mar	8,059	4,905	−3,154	−39.1
	Apr	8,154	3,818	−4,336	−53.2
	May	8,222	4,490	−3,732	−45.4
Hawaii	Jan	1,593	1,456	−137	−8.6
	Feb	1,378	1,315	−63	−4.6
	Mar	1,437	976	−461	−32.1
	Apr	1,627	578	−1,049	−64.5
	May	1,688	980	−708	−41.9

See table footnotes on page 161.

TABLE. (*Continued*) Number of children aged <6 years with blood lead level (BLL) tests,* absolute change, and percentage change, by jurisdiction — 34 U.S. jurisdictions, 2019–2020

Jurisdiction	Month	No. of children tested		Absolute change, no.	% Change
		2019	2020		
Illinois	Jan	17,426	18,219	793	4.6
	Feb	18,094	16,693	−1,401	−7.7
	Mar	19,265	11,326	−7,939	−41.2
	Apr	21,269	5,760	−15,509	−72.9
	May	21,014	8,700	−12,314	−58.6
Indiana	Jan	6,349	7,801	1,452	22.9
	Feb	5,920	6,586	666	11.3
	Mar	6,503	4,592	−1,911	−29.4
	Apr	6,622	2,285	−4,337	−65.5
	May	6,487	3,911	−2,576	−39.7
Iowa	Jan	5,396	5,241	−155	−2.9
	Feb	5,066	4,361	−705	−13.9
	Mar	5,616	3,567	−2,049	−36.5
	Apr	5,937	2,472	−3,465	−58.4
	May	5,969	3,277	−2,692	−45.1
Kansas	Jan	2,462	2,485	23	0.9
	Feb	2,104	2,083	−21	−1.0
	Mar	2,317	1,603	−714	−30.8
	Apr	2,670	1,163	−1,507	−56.4
	May	2,580	1,523	−1,057	−41.0
Louisiana	Jan	2,837	2,808	−29	−1.0
	Feb	2,576	2,307	−269	−10.4
	Mar	2,675	1,639	−1,036	−38.7
	Apr	2,718	1,145	−1,573	−57.9
	May	3,086	1,931	−1,155	−37.4
Maine	Jan	1,231	1,862	631	51.3
	Feb	1,013	1,420	407	40.2
	Mar	1,207	988	−219	−18.1
	Apr	1,271	766	−505	−39.7
	May	1,361	1,137	−224	−16.5
Maryland	Jan	6,300	6,153	−147	−2.3
	Feb	5,662	5,004	−658	−11.6
	Mar	6,498	3,535	−2,963	−45.6
	Apr	6,876	1,626	−5,250	−76.4
	May	7,271	2,726	−4,545	−62.5
Massachusetts	Jan	18,682	18,470	−212	−1.1
	Feb	15,917	14,996	−921	−5.8
	Mar	18,170	10,012	−8,158	−44.9
	Apr	18,868	5,594	−13,274	−70.4
	May	19,852	8,007	−11,845	−59.7
Michigan	Jan	12,006	13,224	1,218	10.1
	Feb	12,242	11,201	−1,041	−8.5
	Mar	13,421	7,181	−6,240	−46.5
	Apr	13,093	3,008	−10,085	−77.0
	May	13,400	2,266	−11,134	−83.1
Minnesota	Jan	7,551	8,040	489	6.5
	Feb	6,877	6,717	−160	−2.3
	Mar	7,180	4,803	−2,377	−33.1
	Apr	8,272	3,323	−4,949	−59.8
	May	8,096	4,198	−3,898	−48.1
Missouri	Jan	6,860	6,252	−608	−8.9
	Feb	5,881	4,851	−1,030	−17.5
	Mar	6,415	3,154	−3,261	−50.8
	Apr	6,886	1,350	−5,536	−80.4
	May	6,666	2,012	−4,654	−69.8

See table footnotes on page 161.

TABLE. (*Continued*) Number of children aged <6 years with blood lead level (BLL) tests,* absolute change, and percentage change, by jurisdiction — 34 U.S. jurisdictions, 2019–2020

Jurisdiction	Month	No. of children tested		Absolute change, no.	% Change
		2019	2020		
Nevada	Jan	663	691	28	4.2
	Feb	617	701	84	13.6
	Mar	699	409	−290	−41.5
	Apr	761	206	−555	−72.9
	May	726	279	−447	−61.6
New Hampshire	Jan	1,900	1,974	74	3.9
	Feb	1,627	1,551	−76	−4.7
	Mar	1,887	1,175	−712	−37.7
	Apr	1,932	853	−1,079	−55.8
	May	1,979	1,278	−701	−35.4
New Mexico	Jan	1,276	1,162	−114	−8.9
	Feb	1,117	881	−236	−21.1
	Mar	1,152	781	−371	−32.2
	Apr	1,365	357	−1,008	−73.8
	May	1,255	398	−857	−68.3
New York (excluding New York City)	Jan	19,553	20,385	832	4.3
	Feb	18,130	17,293	−837	−4.6
	Mar	20,463	12,771	−7,692	−37.6
	Apr	20,351	8,806	−11,545	−56.7
	May	21,633	13,088	−8,545	−39.5
New York City	Jan	26,415	27,190	775	2.9
	Feb	23,736	23,026	−710	−3.0
	Mar	26,556	13,618	−12,938	−48.7
	Apr	26,970	3,703	−23,267	−86.3
	May	27,779	10,286	−17,493	−63.0
Ohio	Jan	14,382	15,154	772	5.4
	Feb	13,440	12,865	−575	−4.3
	Mar	13,533	9,555	−3,978	−29.4
	Apr	14,878	6,377	−8,501	−57.1
	May	14,243	6,938	−7,305	−51.3
Oregon	Jan	1,817	1,843	26	1.4
	Feb	1,644	1,710	66	4.0
	Mar	1,566	1,153	−413	−26.4
	Apr	1,880	968	−912	−48.5
	May	1,707	1,330	−377	−22.1
Rhode Island	Jan	N/A	N/A	N/A	N/A
	Feb	N/A	N/A	N/A	N/A
	Mar	1,360	711	−649	−47.7
	Apr	1,425	227	−1,198	−84.1
	May	1,547	512	−1,035	−66.9
Tennessee	Jan	7,350	8,379	1,029	14.0
	Feb	6,616	7,338	722	10.9
	Mar	7,179	5,968	−1,211	−16.9
	Apr	8,256	4,629	−3,627	−43.9
	May	7,634	4,451	−3,183	−41.7
Texas	Jan	30,459	27,570	−2,889	−9.5
	Feb	26,647	24,147	−2,500	−9.4
	Mar	27,352	16,441	−10,911	−39.9
	Apr	30,569	13,107	−17,462	−57.1
	May	26,280	18,833	−7,447	−28.3
Washington	Jan	2,521	1,876	−645	−25.6
	Feb	1,802	1,701	−101	−5.6
	Mar	2,343	1,328	−1,015	−43.3
	Apr	2,200	1,010	−1,190	−54.1
	May	2,649	943	−1,706	−64.4

See table footnotes on page 161.

TABLE. (*Continued*) Number of children aged <6 years with blood lead level (BLL) tests,* absolute change, and percentage change, by jurisdiction — 34 U.S. jurisdictions, 2019–2020

Jurisdiction	Month	No. of children tested		Absolute change, no.	% Change
		2019	2020		
West Virginia	Jan	1,604	1,484	−120	−7.5
	Feb	1,569	1,328	−241	−15.4
	Mar	1,782	1,049	−733	−41.1
	Apr	1,876	624	−1,252	−66.7
	May	1,861	930	−931	−50.0
Wisconsin	Jan	7,590	8,195	605	8.0
	Feb	7,907	7,089	−818	−10.3
	Mar	7,877	4,720	−3,157	−40.1
	Apr	8,957	2,239	−6,718	−75.0
	May	8,237	3,438	−4,799	−58.3

Abbreviation: N/A = not available.

* CDC requested that state and local health departments report the total number of children with BLL tests by month during January–May 2019 and January–May 2020. Data for children aged <6 years were received from 34 state and local health departments, including the District of Columbia and New York City.

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Racial and Ethnic Disparities in the Prevalence of Stress and Worry, Mental Health Conditions, and Increased Substance Use Among Adults During the COVID-19 Pandemic — United States, April and May 2020

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In 2019, approximately 51 million U.S. adults aged ≥18 years reported any mental illness,* and 7.7% reported a past-year substance use disorder† (*1*). Although reported prevalence estimates of certain mental disorders, substance use, or substance use disorders are not generally higher among racial and ethnic minority groups, persons in these groups are often less likely to receive treatment services (*1*). Persistent systemic social inequities and discrimination related to living conditions and work environments, which contribute to disparities in underlying medical conditions, can further compound health problems faced by members of racial and ethnic minority groups during the coronavirus disease 2019 (COVID-19) pandemic and worsen stress and associated mental health concerns (*2,3*). In April and May 2020, opt-in Internet panel surveys of English-speaking U.S. adults aged ≥18 years were conducted to assess the prevalence of self-reported mental health conditions and initiation of or increases in substance use to cope with stress, psychosocial stressors, and social determinants of health. Combined prevalence estimates of current depression, initiating or increasing substance use, and suicidal thoughts/ideation were 28.6%, 18.2%, and 8.4%, respectively. Hispanic/Latino (Hispanic) adults reported a higher prevalence of psychosocial stress related to not having enough food or stable housing than did adults in other racial and ethnic groups. These estimates highlight the importance of population-level and tailored interventions for mental health promotion and mental illness prevention, substance use prevention, screening and treatment services, and increased provision of resources to address social determinants of health. How Right Now (Qué Hacer Ahora) is an evidence-based and culturally appropriate communications campaign designed to promote and strengthen the emotional well-being and resiliency of populations adversely affected by COVID-19–related stress, grief, and loss (*4*).

CDC licensed results from Porter Novelli's PN View 360, a nationwide, weekly opt-in Internet panel survey of U.S. adults. The survey was administered by ENGINE Insights in English to U.S. adults aged ≥18 years using the Lucid platform (*5*); respondents who had not taken a survey in the previous 20 waves of survey administration were eligible to participate. Quota sampling was conducted by ENGINE Insights to identify respondents, and statistical weighting was used during the analysis to match proportions in the 2019 Current Population Survey; therefore, the sample was representative of the overall U.S. population by sex, age, region, race/ethnicity, and education. CDC licensed the results of the PN View 360 survey after data collection from Porter Novelli. This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.§ In both April and May, 502 respondents participated, for a combined total of 1,004 respondents; the survey included questions about increases in or initiation of substance use during the COVID-19 pandemic,¶ symptoms of current depression,** and suicidal thoughts/ideation,†† as well as questions about psychosocial stress (e.g., feeling isolated and alone), stigma or discrimination (from being blamed for spreading COVID-19), and social determinants of health (e.g., food instability). Combined and weighted response percentages and 95% confidence intervals (CIs) were calculated by using PROC SURVEYFREQ in SAS statistical software (version 9.4; SAS Institute). Because respondents were recruited from an

* Adults with any mental illness were defined as those having any mental, behavioral, or emotional disorder in the past year that met specified criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition,* (DSM-IV) (excluding developmental disorders and substance use disorders).

† Persons who met the criteria for dependence or abuse for alcohol or illicit drugs in the past 12 months based on criteria specified in the DSM-IV were defined as having a substance use disorder.

§ 45 C.F.R. part 4601[b][2].

¶ Substance use initiation or increase was defined as an affirmative response to the question "Have you started or increased using substances to help you cope with stress or emotions during the COVID-19 pandemic? Substance use includes alcohol, legal or illegal drugs, or prescriptions drugs that are taken in a way not recommended by your doctor."

** Current depression was defined as a score of ≥10 on the eight-item Patient Health Questionnaire (PHQ-8). The PHQ-8 is adapted from the nine-item PHQ (PHQ-9), which is based on the nine criteria for diagnosis of depressive disorders in the DSM-IV.

†† Having suicidal thoughts/ideation was defined as an affirmative response to the question "At any time in the past 30 days, did you seriously think about trying to kill yourself?"

opt-in panel rather than by probability sampling, other than using CIs, no inferential statistical tests were performed.[§§]

The overall prevalence estimates of current depression, suicidal thoughts/ideation, and initiation of or increase in substance use were 28.6%, 8.4%, and 18.2%, respectively (Table). Symptoms of current depression were reported 59% more frequently by Hispanic adults (40.3%) than by non-Hispanic White (White) persons (25.3%). Estimates of self-reported suicidal thoughts/ideation among Hispanic persons (22.9%) were four times those among non-Hispanic Black (Black) persons (5.2%) and White persons (5.3%) and approximately twice those of multiracial and non-Hispanic persons of other races/ethnicities (8.9%).[¶¶] Increased or newly initiated substance use was reported among 36.9% of Hispanic respondents, compared with 14.3%–15.6% among all other respondents.

Among U.S. adults overall, sources of psychosocial stress included family health (36.3%), feelings of isolation or loneliness (28.6%), worry about getting ill from COVID-19 or infecting others (25.7%), worry about the death of a loved one or persons dying (15.2%), workplace COVID-19 exposure (13.5%), and stigma or discrimination from being blamed for spreading COVID-19 (4.1%) (Figure 1). White adults were more likely to report stress and worry about the health of family members and loved ones (39.3%) than were Black adults (24.5%). A larger percentage of multiracial and non-Hispanic adults of other races/ethnicities reported stress and worry about stigma or discrimination associated with being blamed for spreading COVID-19 (12.9%) than did White (2.4%) or Hispanic (3.7%) adults.

Estimates of stress and worry about social determinants of health included possible job loss (27.1%), ability to obtain needed health care (18.4%), not having enough food (14.4%), and housing instability (11.8%) (Figure 2). A higher percentage of Hispanic adults reported stress about not having enough food (22.7%) or stable housing (20.7%) than did White adults (11.9% and 9.2%, respectively).

Discussion

Selected mental health conditions and initiation of or increase in substance use to cope with stress or emotions during the COVID-19 pandemic were commonly reported by U.S. adults responding to an opt-in survey in April and May 2020. The prevalence of current depression, suicidal thoughts/ideation, and increased or newly initiated substance use was also higher for some racial and ethnic minority groups, especially Hispanic respondents. Hispanic adults reported higher levels of stress and worry about not having enough food or stable housing than did White adults.

A review of baseline mental health data from other national surveys, which used different study designs and methodologies, suggests potential increases in the mental health outcomes included in this report. Current depression among adults aged ≥18 years was estimated to be 7.0% by the 2019 National Health Interview Survey (*6*) and 23.5% by the 2020 Household Pulse Survey during April 23–May 5, 2020,[***] compared with an estimated 28.6% of adults aged ≥18 years in this report. In the 2019 National Survey on Drug Use and Health, 4.8% of U.S. adults aged ≥18 years reported serious suicidal thoughts (*1*), whereas 8.4% of adults in this report

[§§] The standard errors assume that the weighted estimates used in the Taylor series linearization are approximately unbiased or at the very least are consistent. This assumption of approximate unbiasedness is based on the assertion that any differences between the survey sample and the target population on key survey outcomes are corrected by the weighting. No analysis was conducted to validate that assertion. https://www.aapor.org/AAPOR_Main/media/MainSiteFiles/NPS_TF_Report_Final_7_revised_FNL_6_22_13.pdf

[¶¶] Other non-Hispanic minority groups included participants who identified as Native American/Alaska Native, Asian, multiracial, or another race/ethnicity.

[***] https://www.cdc.gov/nchs/covid19/pulse/mental-health.htm

TABLE. Weighted prevalence estimates of current depression,* suicidal thoughts/ideation,† and substance use increase or initiation§ among adults aged ≥18 years, by race/ethnicity — Porter Novelli View 360 survey, United States, April and May 2020

Race/Ethnicity	Unweighted no. of persons	Weighted % (95% CI)		
		Current depression	Suicidal thoughts/Ideation	Substance use increase or initiation
Total	**1,004**	**28.6 (25.6–31.5)**	**8.4 (6.6–10.2)**	**18.2 (15.7–20.7)**
White, NH	657	25.3 (21.9–28.7)	5.3 (3.6–6.9)	14.3 (11.6–17.0)
Black, NH	100	27.7 (18.7–36.7)	5.2 (0.7–9.7)	15.6 (8.4–22.7)
Hispanic/Latino	118	40.3 (31.3–49.3)	22.9 (15.2–30.6)	36.9 (28.1–45.7)
Other, NH[¶]	129	31.4 (22.8–40.0)	8.9 (3.6–14.1)	15.1 (8.4–21.7)

Abbreviations: CI = confidence interval; DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; NH = non-Hispanic/Latino.

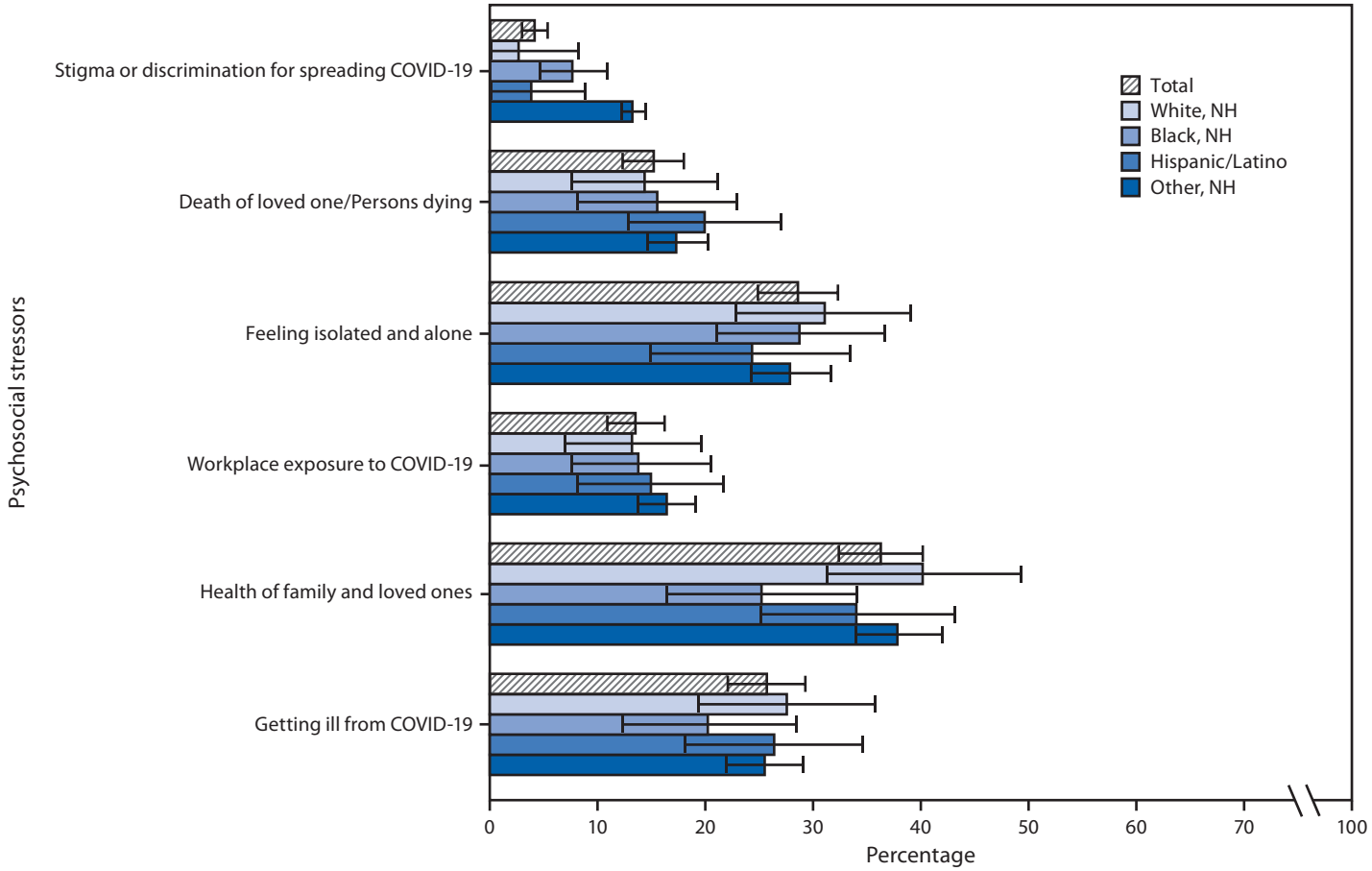
* Defined as a score of ≥10 on the eight-item Patient Health Questionnaire (PHQ-8). The PHQ-8 is adapted from the nine-item PHQ (PHQ-9), which is based on the nine criteria for diagnosis of depressive disorders in the DSM-IV.

† Defined as an affirmative response to the question "At any time in the past 30 days, did you seriously think about trying to kill yourself?"

§ Defined as an affirmative response to the question "Have you started or increased using substances to help you cope with stress or emotions during the COVID-19 pandemic? Substance use includes alcohol, legal or illegal drugs, or prescriptions drugs that are taken in a way not recommended by your doctor."

¶ Includes participants who identified as Native American/Alaska Native, Asian, multiracial, or another race/ethnicity.

FIGURE 1. Weighted prevalence estimates* of self-reported stress and worry about psychosocial stressors among adults aged ≥18 years (N = 1,004), overall and by race/ethnicity† — Porter Novelli View 360 survey, United States, April and May 2020



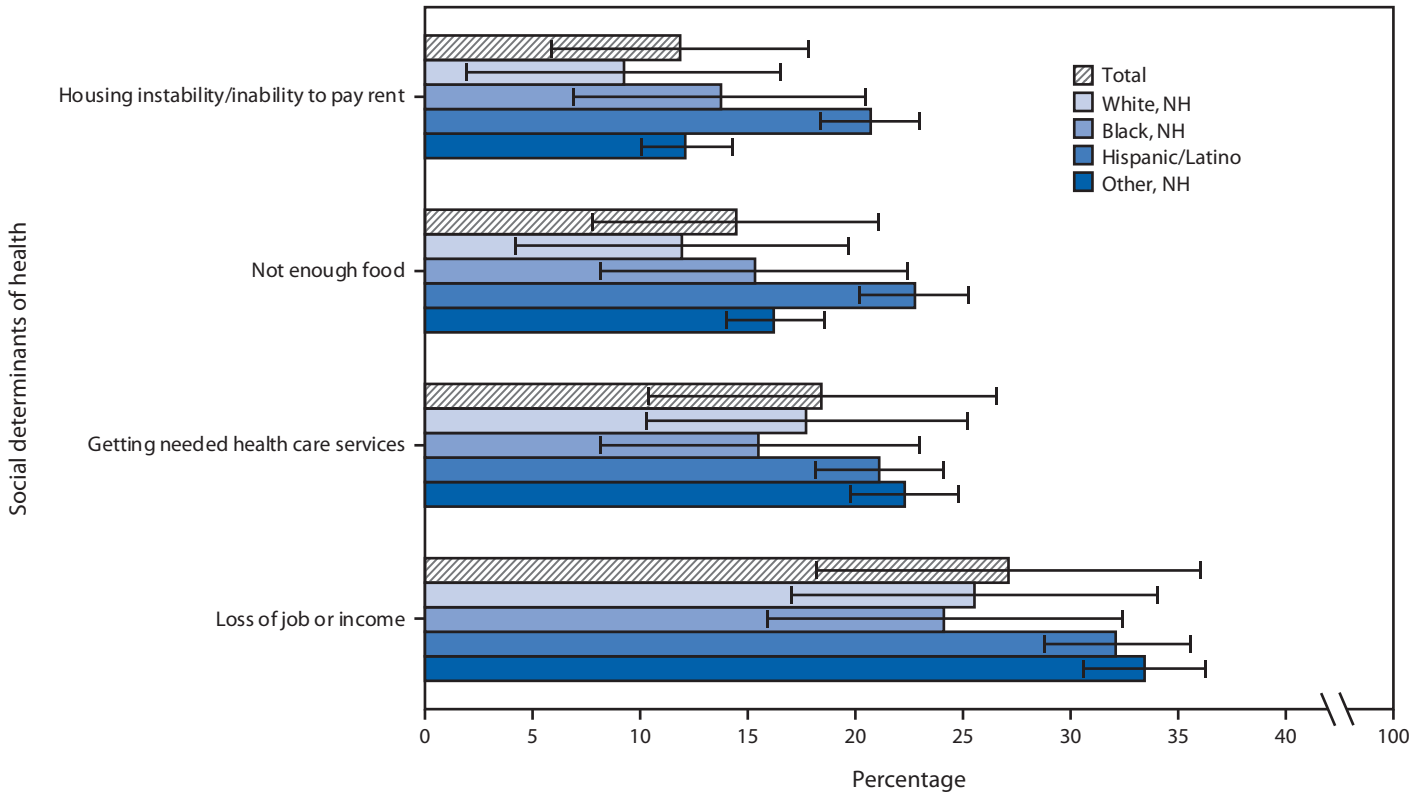
Abbreviations: COVID-19 = coronavirus disease 2019; NH = non-Hispanic/Latino.
* With 95% confidence intervals shown by error bars.
† Other non-Hispanic minority groups include participants who identified as Native American/Alaska Native, Asian, multiracial, or another race/ethnicity.

indicated having suicidal thoughts/ideation. Recent data from another U.S. panel survey indicated that 40.9% of respondents aged ≥18 years reported mental or behavioral health concerns during the COVID-19 pandemic, with 13.3% of respondents reporting that they increased or initiated substance use (*7*), compared with nearly 20% of respondents in this report.

In 2019, not having enough food was reported three times more frequently by Black persons and two times more frequently by Hispanic persons than by White persons (*8*). Stigma, including harassment and discrimination, combined with social or structural determinants of health, such as inadequate access to safe housing, healthy food, transportation, and health care, can increase the risk for chronic stress among persons in racial and ethnic minority groups and potentially affect their mental and physical health, including contributing to poor outcomes from COVID-19 (*3*,*4*,*7*). Additional evidence-based measures to promote population-level mental health in adults are important,[†††] including screening for mental illness (e.g., depression) (*9*) and substance misuse (e.g., alcohol misuse) (*10*). Persons identified by screening as having a higher risk for mental illness are best served when treated or referred to a health care provider for intervention, including counseling, referral to services, or treatment (*9*,*10*). Because a substantial proportion of mental health care occurs in primary care settings,[§§§] health care access is important for addressing mental health and substance use conditions, including opioid use. Although racial and ethnic minority group members did not report more psychosocial stress related to health care access than did White persons, disparities in access to health care,

[†††] https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/managing-stress-anxiety.html
[§§§] https://www.cdc.gov/nchs/products/databriefs/db311.htm#ref3

FIGURE 2. Weighted prevalence estimates* of self-reported stress and worry about social determinants of health among adults aged ≥18 years (N = 1,004), overall and by race/ethnicity† — Porter Novelli View 360 survey, United States, April and May 2020



Abbreviations: COVID-19 = coronavirus disease 2019; NH = non-Hispanic/Latino.
* With 95% confidence intervals shown by error bars.
† Other non-Hispanic minority groups include participants who identified as Native American/Alaska Native, Asian, multiracial, or another race/ethnicity.

including having a usual source of care, are preexisting factors that affect physical and mental health.¶¶¶

Additional public health measures are critical to address the mental and behavioral health consequences of the COVID-19 pandemic. How Right Now (Qué Hacer Ahora) is a communications campaign designed to promote and strengthen the emotional well-being and resiliency of populations adversely affected by COVID-19–related stress, grief, and loss. The campaign offers evidence-based and culturally appropriate information and resources to address the emotional health needs of adults in both English and Spanish (*4*). CDC is working with national, tribal, state, and community partners; academic institutions; and other federal agencies to define, measure, and improve the emotional well-being and quality of life of the U.S. population across the lifespan. Additional resources are available from CDC.**** Behavioral health and addiction services resources are available through a free Substance Abuse and Mental Health Services Administration's Disaster Distress Helpline (1-800-985-5990)†††† and addiction treatment locators.§§§§

The findings in this report are subject to at least five limitations. First, all responses were self-reported and might be subject to recall, response, or social desirability biases. Second, although survey responses were weighted to be representative of U.S. population demographics, whether responses in this opt-in panel sample are representative of the broader U.S. population and which biases might have affected the findings are not known. Third, the generalizability of estimates for Hispanic populations was limited because the survey was administered in English on the Internet; therefore, Spanish-only speakers might not have been included. This report suggests that additional studies are needed, and consideration of surveys that focus on sampling Hispanic/Latino populations who speak Spanish might be helpful. Fourth, the data are cross-sectional, which

¶¶¶ https://www.ahrq.gov/research/findings/nhqrdr/nhqdr18/index.html
**** https://www.cdc.gov/populationhealth/well-being

†††† https://www.samhsa.gov/find-help/disaster-distress-helpline
§§§§ https://www.samhsa.gov/medication-assisted-treatment/practitioner-program-data/treatment-practitioner-locator

precludes the ability to make causal inferences. Finally, the sample size was small (1,004), which limited certain types of analysis and resulted in small cell sizes for some comparisons.

Addressing barriers or disruptions to access to and delivery of mental health and substance use services during the COVID-19 pandemic, including considerations for health care systems, practices, and providers using telehealth coverage[¶¶¶¶]; consideration of parity in insurance coverage for mental health and substance use services; and use of virtual mental health treatment and substance use recovery groups, is important. Policies and structural programs can be adapted or developed to reduce preexisting racial and ethnic group disparities in social determinants of health (e.g., housing,[*****] food, access to health care, and income security) while also addressing psychosocial stressors unique to communities with large racial and ethnic minority populations. The mental health and psychosocial needs of U.S. adults, including persons in racial and ethnic minority groups, are an important consideration when promoting community resilience and preserving access to and provision of services during the COVID-19 pandemic.

Summary

What is already known about this topic?

Racial and ethnic minority groups have experienced disparities in mental health and substance misuse related to access to care, psychosocial stress, and social determinants of health.

What is added by this report?

Combined prevalence estimates of current depression, initiating or increasing substance use, and suicidal thoughts/ideation among U.S. adults aged ≥18 years were 28.6%, 18.2%, and 8.4%, respectively. Hispanic adults reported a higher prevalence of psychosocial stress related to not having enough food or stable housing than did adults in other racial and ethnic groups.

What are the implications for public health practice?

Addressing psychosocial stressors, mental health conditions, and substance misuse among U.S. adults during the COVID-19 pandemic is important, as are interventions tailored for racial and ethnic minority groups.

[¶¶¶¶] https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html
[*****] https://www.jchs.harvard.edu/sites/default/files/sonhr14-color-full_0.pdf

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Vital Signs: Prevalence of Multiple Forms of Violence and Increased Health Risk Behaviors and Conditions Among Youths — United States, 2019

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Abstract

Introduction: Experiencing violence, especially multiple types of violence, can have a negative impact on youths' development. These experiences increase the risk for future violence and other health problems associated with the leading causes of morbidity and mortality among adolescents and adults.

Methods: Data from the 2019 national Youth Risk Behavior Survey were used to determine the prevalence of high school students' self-reported experiences with physical fighting, being threatened with a weapon, physical dating violence, sexual violence, and bullying. Logistic regression models adjusting for sex, grade, and race/ethnicity were used to test the strength of associations between experiencing multiple forms of violence and 16 self-reported health risk behaviors and conditions.

Results: Approximately one half of students (44.3%) experienced at least one type of violence; more than one in seven (15.6%) experienced two or more types during the preceding 12 months. Experiencing multiple types of violence was significantly more prevalent among females than among males and among students identifying as gay, lesbian, or bisexual or not sure of their sexual identity than among heterosexual students. Experiencing violence was significantly associated with higher prevalence of all examined health risks and conditions. Relative to youths with no violence experiences, adjusted health risk and condition prevalence estimates were up to seven times higher among those experiencing two types of violence and up to 21 times higher among those experiencing three or more types of violence.

Conclusions and implications for public health practice: Many youths experience multiple types of violence, with potentially lifelong health impacts. Violence is preventable using proven approaches that address individual, family, and environmental risks. Prioritizing violence prevention is strategic to promoting adolescent and adult health.

Introduction

Violence experienced by high school-aged youths is a significant public health problem. Homicide is the third leading cause of death among persons aged 14–18 years in the United States (*1*). Every day, approximately 360 youths are treated in emergency departments for nonfatal assault-related injuries (*1*). Youths also report experiencing a high prevalence of different types of violence (e.g., fights, dating violence, and bullying) (*2*). Because many types of violence share the same risk factors and experiencing one type of violence increases the risk for experiencing another type of violence, some youths have multiple violence experiences during childhood and adolescence (*3*,*4*).

Adverse childhood experiences, including experiences of violence, are traumatic and can have a negative impact on the brain's chemistry and physical development related to attention, decision-making, learning, and emotional regulation (*5*,*6*). Adolescence is a critical period for the development of cognitive, emotional, and interpersonal skills, and exposure to violence in the home and community during this period can disrupt healthy brain and associated skill growth (*7*,*8*). These impacts could impair problem-solving, ability to cope with stress, and academic performance. Exposure to violence, especially multiple types of violence, could exacerbate these disruptions in development, which could have a negative impact on health across the life course. Surveys of adults demonstrate that adverse experiences before age 18 years, including violence experiences (e.g., child abuse and neglect and witnessing intimate partner violence), significantly increase the risk for adult chronic health conditions and risk behaviors (e.g., overweight or obesity, smoking, and heavy drinking), depression, and negative socioeconomic outcomes, especially as these adverse experiences accumulate (*9*).

Preventing violence during childhood and adolescence might reduce morbidity and mortality in adolescence and adulthood and improve economic and social outcomes (*10*). Previous research has focused primarily on the health consequences of adverse childhood experiences within the home and violence

perpetrated by adults; however, less is known about the potential health effects of adolescents experiencing multiple types of violence in school and community settings (*10*). Addressing this gap could inform the collaborative work of youth-serving partners (e.g., health, education, and justice) to prevent adolescent health risk behaviors and conditions linked to morbidity and premature mortality.

Methods

This report includes results from CDC's 2019 Youth Risk Behavior Survey (YRBS). YRBS is a nationally representative, biennial, cross-sectional, complex school-based survey that measures prevalence of health-related behaviors among students in grades 9–12 who attend public and private schools in the United States. The school response rate for the 2019 national YRBS was 75.1%, and the student response rate was 80.3% (*2*). The overall sample size was 13,677 students. Participants answered eight questions related to four types of violence (physical fighting or threatened with a weapon, physical dating violence, sexual violence, and bullying) experienced during the 12 months before the survey (Supplementary Table, https://stacks.cdc.gov/view/cdc/101069). In some schools, students were not asked all the physical fighting and sexual violence questions. The analytic sample was restricted to 9,080 students for whom data were available to assess the presence of all four types of violence experiences. Students were classified into one of four categories based on the number of violence types experienced: zero, one, two, or three or more. The prevalence of students experiencing one, two, and three or more types of violence was examined by sex, race/ethnicity (non-Hispanic white, non-Hispanic black, and Hispanic), grade in school (9–12), and sexual identity (heterosexual, gay/lesbian/bisexual, and not sure) using a test for trend.

Participants also answered questions about 16 health risk behaviors and conditions during the 30 days, 3 months, or 12 months before the survey (Supplementary Table, https://stacks.cdc.gov/view/cdc/101069). Prevalence for each of these health risks was estimated by number of types of violence experiences. Pairwise comparisons were conducted using t-tests and considered significant if $p<0.05$. Logistic regression models with predicted marginals were used to quantify the associations between violence experiences (the exposure of interest) and each health risk (outcomes of interest), adjusting for sex, race/ethnicity, grade, and sexual identity. Associations are presented as adjusted prevalence ratios (aPRs). Analyses were conducted using SAS callable SUDAAN (version 11.0.3; RTI International).

Results

Among high school students, 28.7% experienced one type of violence during the 12 months before the survey, 10.8% experienced two types, and 4.8% experienced three or more types (Table 1). This equates to 44.3% students experiencing at least one type and 15.6% two or more types. Sex and sexual identity were significantly associated with experiencing violence. Female students (6.1%) were significantly more likely than were male students (3.4%) to experience three or more types of violence. Students identifying as gay, lesbian, or bisexual (9.6%) or not sure of their sexual identity (7.4%) were significantly more likely than were heterosexual students (3.8%) to report three or more types of violence experiences.

Experiencing violence was significantly associated with all examined health risk behaviors and conditions (Table 2). Students experiencing three or more types of violence reported high prevalences of health risks: 34.1% missed school because of safety concerns, 33.8% had low academic grades, 13.4% carried a weapon on school property, 18.9% carried a gun, 30.1%–65.4% used substances, 21%–63.4% engaged in risky sexual behavior, 39.1% were overweight or had obesity, 71.4% reported suicidal thoughts or behaviors, and 78.4% felt sad or hopeless.

Except for overweight or obesity, the aPR for each examined health risk was significantly higher among youths who experienced one type of violence (range = 1.2–3.9) than those experiencing no types (Table 3). Among students who experienced two types of violence, aPRs for 15 of the outcomes were significantly higher (range = 1.2–6.7) than among those experiencing no types. All 16 outcomes were significantly more prevalent among youths who experienced three or more types (range = 1.3–20.6) than among those who experienced no types. The prevalence of the following health risk behaviors increased in a stepwise manner as the number of violence types increased: missing school because of safety concerns, using electronic vapor products, drinking alcohol, misusing prescription pain medicine, feeling sad or hopeless, and having suicidal thoughts or behavior. Prevalence of the following risk behaviors was higher among students who experienced three or more types of violence than it was among those who experienced two types of violence: carrying a weapon on school property, carrying a gun, using tobacco, engaging in binge drinking, using marijuana, and engaging in all three measures of risky sexual behavior.

Discussion

Experiencing violence was common among U.S. high school students. Approximately one half of high school students experienced at least one type of violence, and approximately one in seven experienced two or more types. Results are consistent

TABLE 1. Number of types of violence experiences among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2019

Characteristic	No. of types of violence experiences* % (95% CI) 0 n = 4,994	1 n = 2,649	2 n = 999	≥3 n = 438	P-value†
Total	**55.7 (53.9–57.4)**	**28.7 (27.4–30.2)**	**10.8 (9.9–11.8)**	**4.8 (4.2–5.5)**	—
Sex					0.001
Male	57.4 (54.5–60.2)	29.6 (27.4–31.9)	9.5 (8.3–10.9)§	3.4 (2.8–4.3)§	—
Female	53.8 (51.3–56.4)	28.0 (25.9–30.1)	12.1 (10.6–13.8)	6.1 (5.2–7.2)	—
Race/Ethnicity¶					0.100
White**	55.0 (52.4–57.5)	28.5 (26.6–30.4)§§	11.9 (10.6–13.3)††	4.7 (3.9–5.6)	—
Black**	52.2 (48.3–56.1)††	32.8 (29.3–36.4)	10.5 (8.3–13.2)	4.5 (3.0–6.9)	—
Hispanic	57.1 (55.4–58.9)	29.0 (26.7–31.5)	9.4 (7.9–11.2)	4.4 (3.3–5.8)	—
Grade					0.005
9	53.1 (50.2–56.0)	30.7 (28.1–33.4)	12.4 (10.5–14.6)	3.9 (2.9–5.1)	—
10	53.4 (50.3–56.5)	29.9 (27.6–32.3)	11.4 (9.8–13.3)	5.3 (4.1–6.9)	—
11	57.3 (54.4–60.2)¶¶,***	27.7 (25.2,30.3)	10.5 (8.9,12.5)	4.5 (3.5,5.9)	—
12	59.4 (56.1,62.7)¶¶,***	26.6 (23.8–29.7)	8.6 (6.7–10.9)¶¶,***	5.4 (4.2–6.8)	—
Sexual identity					<0.001
Heterosexual	57.8 (56.2–59.4)	28.8 (27.4–30.1)	9.6 (8.7–10.5)	3.8 (3.2–4.6)	—
Gay, lesbian, or bisexual	41.3 (36.5–46.3)†††	31.3 (26.8–36.3)	17.8 (14.3–21.9)†††	9.6 (7.3–12.4)†††	—
Not sure	54.8 (46.2–63.1)§§§	21.6 (15.9–28.6)†††,§§§	16.2 (12.2–21.2)†††	7.4 (4.9–11.0)†††	—

Abbreviation: CI = confidence interval.

* Types of violence experiences during the 12 months before the survey: physical fighting or threatened with a weapon (in a physical fight, in a physical fight on school property, threatened or injured with a weapon on school property), physical dating violence, sexual violence (sexual violence by anyone, sexual dating violence), and bullying (bullied at school or bullied electronically).

† Test for trend.

§ Significantly different from females based on pairwise t-test p<0.05.

¶ Race/ethnicity "other" not presented because of limited interpretability.

** Non-Hispanic.

†† Significantly different from Hispanic based on pairwise t-test p<0.05.

§§ Significantly different from Black based on pairwise t-test p<0.05.

¶¶ Significantly different from grade 9 based on pairwise t-test p<0.05.

*** Significantly different from grade 10 based on pairwise t-test p<0.05.

††† Significantly different from heterosexual based on pairwise t-test p<0.05.

§§§ Significantly different from gay, lesbian, or bisexual based on pairwise t-test p<0.05.

with previous research indicating that adverse experiences in childhood are common (*3*,*10*). During the critical developmental period of adolescence, violence that occurs between peers in school and the community was associated with all the health risk behaviors and conditions examined, which could have a negative impact on immediate and long-term health and social outcomes. As adolescents' experiences with multiple types of violence increased, their likelihood of engaging in risk behaviors increased significantly, often in a stepwise manner. Relative to youths with no reported violence type experiences, adjusted models demonstrated prevalence estimates up to seven times higher among those with two types of violence experiences and up to 21 times higher among those experiencing three or more types of violence.

Some adolescent health behaviors (e.g., carrying a weapon and suicidal behavior) pose an immediate risk for mortality in adolescence when homicide and suicide are among the top three leading causes of death (*1*). Others, such as missing school, low academic grades, and poor mental health, could have long-term implications for high school graduation, well-being, and life opportunities (e.g., employment and income) (*11*). Substance use and sexual risk-taking behaviors in adolescence could have immediate and long-term health implications (e.g., overdose and development of substance use disorder, impaired driving, sexually transmitted infections including human immunodeficiency virus infection, and chronic diseases).

The impact of violence experiences on adolescent brain and interpersonal skill development could result in the adoption of negative coping behaviors (e.g., substance use and unhealthy eating) to handle stress that could harm short- and long-term health (*4*,*6*). These youths might have less developed abilities to problem-solve and manage social interactions in ways that minimize risk (e.g., negotiating safer sex practices and resolving conflicts without violence). Youths who experience violence might have heightened fear and perceived vulnerability, which might contribute to carrying a weapon and missing school. Prior research demonstrates that youth weapon carrying is positively associated with victimization, and many youths who carry weapons report doing so for self-protection (*12*). Violence

TABLE 2. Prevalence of health risk behaviors and conditions among high school students, by number of types of violence experiences — Youth Risk Behavior Survey, United States, 2019

Characteristic	No. of types of violence experiences* % (95% CI)				P-value†
	0 n = 4,994	1 n = 2,649	2 n = 999	≥3 n = 438	
Missed school and low academic grades					
Missed school because of safety concerns§	3.8 (2.8–5.3)	8.3 (6.5–10.6)	18.3 (15.5–21.6)	34.1 (29.2–39.4)	<0.001
Earned mostly Cs/Ds/Fs¶	16.2 (13.8–19.0)	24.5 (21.1–28.3)	29.2 (24.3–34.7)	33.8 (27.4–40.9)	<0.001
Health risk behaviors					
Weapon carrying					
Carried a weapon on school property§	0.9 (0.5–1.5)	3.0 (2.1–4.2)	4.5 (2.9–6.8)	13.4 (9.8–18.1)	<0.001
Carried a gun**	1.5 (0.9–2.4)	5.5 (4.4–7.0)	6.8 (5.0–9.1)	18.9 (14.7–23.9)	<0.001
Substance use					
Smoked cigarettes or cigars or used smokeless tobacco§	5.2 (4.2–6.6)	12.5 (10.1–15.4)	15.4 (12.3–19.0)	37.0 (30.1–44.4)	<0.001
Used electronic vapor products§	23.8 (21.4–26.3)	38.7 (35.7–41.7)	52.2 (48.5–55.8)	65.4 (58.8–71.4)	<0.001
Drank alcohol§	21.4 (19.3–23.7)	34.8 (31.8–37.9)	47.7 (42.8–52.5)	59.3 (52.6–65.7)	<0.001
Binge drinking††	9.5 (7.9–11.2)	16.4 (14.1–19.0)	20.4 (16.5–24.9)	36.5 (29.0–44.7)	<0.001
Used marijuana§§	14.6 (12.8–16.5)	28.1 (25.5–30.8)	31.2 (27.7–35.0)	46.7 (39.6–53.9)	<0.001
Prescription pain medicine misuse§§	3.4 (2.7–4.3)	7.1 (5.9–8.7)	12.2 (10.2–14.4)	30.1 (24.1–37.0)	<0.001
Risky sexual behavior					
Drank alcohol or used drugs before last sexual intercourse¶¶	15.0 (11.6–19.1)	20.2 (16.9–24.0)	27.0 (20.8–34.2)	43.1 (34.9–51.8)	<0.001
Currently sexually active with multiple persons***	2.7 (2.0–3.7)	8.0 (6.3–10.0)	9.3 (6.8–12.5)	21.0 (15.5–27.8)	<0.001
Did not use a condom during last sexual intercourse¶¶,†††	39.6 (35.7–43.7)	45.1 (41.7–48.5)	46.6 (38.5–54.9)	63.4 (54.9–71.1)	0.004
Weight					
Overweight or obesity§§§	29.5 (25.7–33.5)	32.5 (29.3–35.9)	35.5 (30.4–40.9)	39.1 (33.6–44.9)	0.001
Mental health and suicide risks					
Felt sad or hopeless¶¶¶	24.8 (22.8–27.0)	42.6 (39.6–45.7)	64.2 (59.7–68.4)	78.4 (73.2–82.8)	<0.001
Suicidal thoughts or behavior****	13.7 (12.1–15.5)	27.9 (25.3–30.7)	48.3 (44.9–51.7)	71.4 (64.9–77.2)	<0.001

Abbreviation: CI = confidence interval.

* Types of violence experiences during the 12 months before the survey: physical fighting or threatened with weapon (in a physical fight, in a physical fight on school property, threatened or injured with a weapon on school property), physical dating violence, sexual violence (sexual violence by anyone, sexual dating violence), and bullying (bullied at school or bullied electronically).

† Test for trend.

§ On at least 1 day during the 30 days before the survey.

¶ During the 12 months before the survey.

** On at least 1 day during the 12 months before the survey.

†† Had four or more drinks of alcohol in a row (if female) or five or more drinks of alcohol in a row (if male) within a couple of hours on at least 1 day during the 30 days before the survey.

§§ One or more times during the 30 days before the survey.

¶¶ Among students who were sexually active with one or more persons during the 3 months before the survey

*** Had sex with two or more persons during the 3 months before the survey.

††† Excludes female students who reported sexual contact with only females.

§§§ Were ≥85th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts.

¶¶¶ Almost every day for ≥2 weeks in a row so that the student stopped doing some usual activities, during the 12 months before the survey.

**** Created by combining affirmative responses to any of following suicide related experiences in the 12 months before the survey: seriously considered attempting suicide, made a plan to attempt suicide, or attempted suicide.

victimization is also related to suicidal thoughts or behavior and risk-taking behavior (*13*,*14*). Primary prevention approaches (e.g., social-emotional learning, mentoring and after-school programs, and parent and family relationship programs) can build youths' emotional regulation and communication skills to resolve conflicts without violence and reduce risk behaviors, such as smoking, substance use, weapon carrying, sexual risk taking, and academic challenges (*15*).

This study extends research on health impacts from experiences of violence outside the home but does not include all types of violence that can negatively affect youth development and health. Other forms of community and school violence (e.g., gang-related violence, homophobic name calling, and witnessing violence) are associated with poor health outcomes and well-being (*5*,*16*,*17*). Some youths (e.g., females, racial/ethnic minorities, and sexual minorities) are more likely to experience multiple forms of violence (*4*,*15*). Community factors (e.g., poverty, limited access to high-quality education, unstable housing, bias, and stigma) can contribute to increased risk for violence and other health problems (e.g., coronavirus disease 2019 [COVID-19]) and the differences observed across population subgroups (*18*).* Emerging data

* https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html

TABLE 3. Adjusted prevalence ratios for health risk behaviors and conditions among high school students, by number of violence experiences — Youth Risk Behavior Survey, United States, 2019

Characteristic	No. of types of violence experiences*,† aPR (95% CI)		
	1	2	≥3
Missed school and low academic grades			
Missed school because of safety concerns§	2.1 (1.7–2.6)¶	4.6 (3.3–6.4)¶,**	8.5 (5.8–12.5)¶,**,††
Earned mostly Cs/Ds/Fs§§	1.5 (1.3–1.7)¶	1.8 (1.5–2.2)¶,**	2.2 (1.7–2.7)¶,**
Health risk behaviors			
Weapon carrying			
Carried a weapon on school property§	3.9 (2.4–6.2)¶	6.7 (3.7–12.0)¶	20.6 (11.6–36.6)¶,**,††
Carried a gun¶¶	3.9 (2.4–6.3)¶	5.6 (3.2–9.8)¶	16.2 (9.7–27.3)¶,**,††
Substance use			
Smoked cigarettes cigars or used smokeless tobacco§	2.4 (1.9–3.1)¶	2.9 (2.2–3.8)¶	7.1 (5.3–9.4)¶,**,††
Used electronic vapor products§	1.7 (1.6–1.8)¶	2.3 (2.0–2.6)¶,**	2.8 (2.4–3.3)¶,**,††
Drank alcohol§	1.7 (1.5–1.8)¶	2.3 (2.0–2.6)¶,**	2.7 (2.3–3.2)¶,**,††
Binge drinking***	1.8 (1.5–2.1)¶	2.3 (1.7–3.0)¶	3.8 (2.9–4.9)¶,**,††
Used marijuana†††	2.0 (1.7–2.2)¶	2.2 (1.9–2.5)¶	3.2 (2.7–3.7)¶,**,††
Prescription pain medicine misuse†††	2.1 (1.7–2.5)¶	3.3 (2.5–4.5)¶,**	8.5 (6.1–11.7)¶,**,††
Risky sexual behavior			
Drank alcohol or used drugs before last sexual intercourse§§§	1.4 (1.1–1.9)¶	1.9 (1.3–2.7)¶	3.1 (2.3–4.2)¶,**,††
Currently sexually active with multiple persons¶¶¶	3.0 (2.1–4.4)¶	3.9 (2.5–6.1)¶	8.4 (5.7–12.4)¶,**,††
Did not use a condom during last sexual intercourse§§§,****	1.2 (1.0–1.3)¶	1.2 (1.0–1.4)	1.6 (1.3–1.8)¶,**,††
Weight			
Overweight or obesity††††	1.1 (1.0–1.2)	1.2 (1.1–1.4)¶	1.3 (1.1–1.6)¶
Mental health and suicide risk			
Felt sad or hopeless§§§§	1.7 (1.5–1.9)¶	2.4 (2.2–2.6)¶,**	3.0 (2.7–3.3)¶,**,††
Suicidal thoughts or behavior¶¶¶¶	1.9 (1.7–2.2)¶	3.0 (2.6–3.5)¶,**	4.7 (4.0–5.6)¶,**,††

Abbreviations: aPR = adjusted prevalence ratio; CI = confidence interval.

* Types of violence experiences during the 12 months before the survey: physical fighting or threatened with weapon (in a physical fight, in a physical fight on school property, threatened or injured with a weapon on school property), physical dating violence, sexual violence (sexual violence by anyone, sexual dating violence), and bullying (bullied at school, bullied electronically).

† Reference for all models is zero types of violence.

§ On at least 1 day during the 30 days before the survey.

¶ Significantly different from zero types, based on linear contrast analysis ($p<0.05$).

** Significantly different from one type, based on linear contrast analysis ($p<0.05$).

†† Significantly different from two types, based on linear contrast analysis ($p<0.05$).

§§ During the 12 months before the survey.

¶¶ On at least 1 day during the 12 months before the survey.

*** Had four or more drinks of alcohol in a row (if female) or five or more drinks of alcohol in a row (if male) within a couple of hours on at least 1 day during the 30 days before the survey.

††† One or more times during the 30 days before the survey.

§§§ Among students who were sexually active with one or more persons during the 3 months before the survey.

¶¶¶ Had sex with two or more persons during the 3 months before the survey.

**** Excludes female students who reported sexual contact with only females.

†††† Were ≥85th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts.

§§§§ Almost every day for ≥2 weeks in a row so that the student stopped doing some usual activities, during the 12 months before the survey.

¶¶¶¶ Created by combining affirmative responses to any of following suicide-related experiences in the 12 months before the survey: seriously considered attempting suicide, made a plan to attempt suicide, or attempted suicide.

suggest that certain forms of violence, including relationship and community violence, might be increasing and that youths might be more vulnerable to online violence (e.g., threats and harassment through social media) during the COVID-19 pandemic (*19*). The influence of community and contextual factors underscores the importance of prevention approaches that build youths' skills, support families, promote social norms that protect against violence and adversity (e.g., positive norms about gender and parenting), and create protective environments (e.g., positive school climate) (*10*,*15*,*20*).

The findings in this report are subject to at least six limitations. First, recall and social desirability biases might reduce self-reporting of violence experiences and health risk behaviors, thereby underestimating the actual prevalence of these experiences and behaviors. Second, causality and directionality cannot be inferred from these cross-sectional data. Third, some students were not asked all violence questions, and the analytic sample was restricted to students for whom data were available to determine the presence of the four violence types examined. This might reduce generalizability of the results. Fourth, data are student reports, and results might not be

Summary

What is already known about this topic?

Violence during adolescence is a leading cause of death. Violence can harm development and affects health across the lifespan.

What is added by this report?

Adolescents experience multiple forms of violence at school and in the community. Experiencing violence was significantly associated with higher prevalence of all examined health risks and conditions, including missing school, low academic grades, health risk behaviors, and mental health and suicide risks.

What are the implications for public health practice?

Violence is preventable. Primary prevention puts adolescents on a healthy developmental trajectory by reducing the leading causes of morbidity and mortality among youths and young adults.

generalized to out-of-school youth. Fifth, data were not available to control for other factors (e.g., socioeconomic status of students) that could affect violence experiences and examined health outcomes. Finally, assessed violence experiences focused on those in the 12 months before the survey. Some early and unmeasured experiences of violence (e.g., childhood physical and sexual abuse) that have significant negative impacts on development were not examined, resulting in underestimates of youths' experiences of violence.

Violence that has negative impacts on healthy development of youths can be prevented (*4,15,20*). Early intervention is strategic because it is cost-effective and can potentially reduce injury and illness throughout life (*6*,*15*). Strategies for the primary prevention of violence, such as those identified by CDC's violence prevention technical packages, can put youths on a healthy trajectory by reducing the leading causes of morbidity and mortality among adolescents and adults (*15*). Many strategies can simultaneously reduce more than one type of violence, health disparities, and associated health risk behaviors and conditions (*15*,*20*). These strategies promote adolescents' short- and long-term health and opportunity by addressing individual behaviors as well as providing quality education, access to supportive services, connections with caring adults, and safe and supportive home, school, and community environments. Building school and community capacity to implement effective violence prevention strategies that reach all youths can promote health across the lifespan. Collaboration of multiple sectors (e.g., public health, public safety, and education) can ensure the effective implementation of strategies to help youths and communities be safe and thrive.

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Demographic Characteristics of Persons Vaccinated During the First Month of the COVID-19 Vaccination Program — United States, December 14, 2020–January 14, 2021

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In December 2020, two COVID-19 vaccines (Pfizer-BioNTech and Moderna) were authorized for emergency use in the United States for the prevention of coronavirus disease 2019 (COVID-19).* Because of limited initial vaccine supply, the Advisory Committee on Immunization Practices (ACIP) prioritized vaccination of health care personnel† and residents and staff members of long-term care facilities (LTCF) during the first phase of the U.S. COVID-19 vaccination program (*1*). Both vaccines require 2 doses to complete the series. Data on vaccines administered during December 14, 2020–January 14, 2021, and reported to CDC by January 26, 2021, were analyzed to describe demographic characteristics, including sex, age, and race/ethnicity, of persons who received ≥1 dose of COVID-19 vaccine (i.e., initiated vaccination). During this period, 12,928,749 persons in the United States in 64 jurisdictions and five federal entities§ initiated COVID-19 vaccination. Data on sex were reported for 97.0%, age for 99.9%, and race/ethnicity for 51.9% of vaccine recipients. Among persons who received the first vaccine dose and had reported demographic data, 63.0% were women, 55.0% were aged ≥50 years, and 60.4% were non-Hispanic White (White). More complete reporting of race and ethnicity data at the provider and jurisdictional levels is critical to ensure rapid detection of and response to potential disparities in COVID-19 vaccination. As the U.S. COVID-19 vaccination program expands, public health officials should ensure that vaccine is administered efficiently and equitably within each successive vaccination priority category, especially among those at highest risk for infection and severe adverse health outcomes, many of whom are non-Hispanic Black (Black), non-Hispanic American Indian/Alaska Native (AI/AN), and Hispanic persons (*2*,*3*).

Data on COVID-19 vaccine doses administered in the United States are collected by vaccination providers and reported to CDC through multiple sources, including jurisdictions, pharmacies, and federal entities, who use various reporting methods including immunization information systems,¶ Vaccine Administration Management System,** and direct data submission. Data on first vaccine doses administered during December 14, 2020–January 14, 2021, and reported to CDC by January 26, 2021, were analyzed to describe demographic characteristics, including sex, age, and race/ethnicity among persons who received ≥1 dose of COVID-19 vaccine. Age was calculated based on date or year of birth and date of vaccine administration and was categorized as <18, 18–29, 30–39, 40–49, 50–64, 65–74, or ≥75 years. Race and ethnicity were combined and categorized as Hispanic/Latino, White, Black, non-Hispanic Asian (Asian), AI/AN, non-Hispanic Native Hawaiian or other Pacific Islander (NH/PI), non-Hispanic multiple/other,†† or unknown (if either race or ethnicity was reported as unknown§§ or not reported because of jurisdictional policy or law).¶¶ Analyses were conducted using SAS (version 9.4; SAS Institute).

During the first month of the U.S. COVID-19 vaccination program, 12,928,749 persons received at least 1 dose of COVID-19 vaccine (Figure). Vaccination was initiated by persons in all 64 jurisdictions and five federal entities reporting data to CDC. Among 12,537,841 (97.0%) vaccine recipients with reported sex, 63.0% were women and 37.0% were men (Table). Among

* https://www.cdc.gov/vaccines/covid-19/eua/index.html

† Health care personnel include persons working in settings such as hospitals, long-term care facilities, outpatient clinics, public health clinics, emergency medical services, and pharmacies.

§ Sixty-four jurisdictions include 50 states, the District of Columbia, five cities (Chicago, Philadelphia, San Antonio, Houston, and New York City), and eight territories or freely associated states; five federal entities also received a direct allocation of vaccine (Federal Bureau of Prisons, U.S. Department of Defense, U.S. Department of State, Indian Health Services, and Veterans Health Administration) and report administration data to CDC.

¶ https://www.cdc.gov/vaccines/programs/iis/index.html

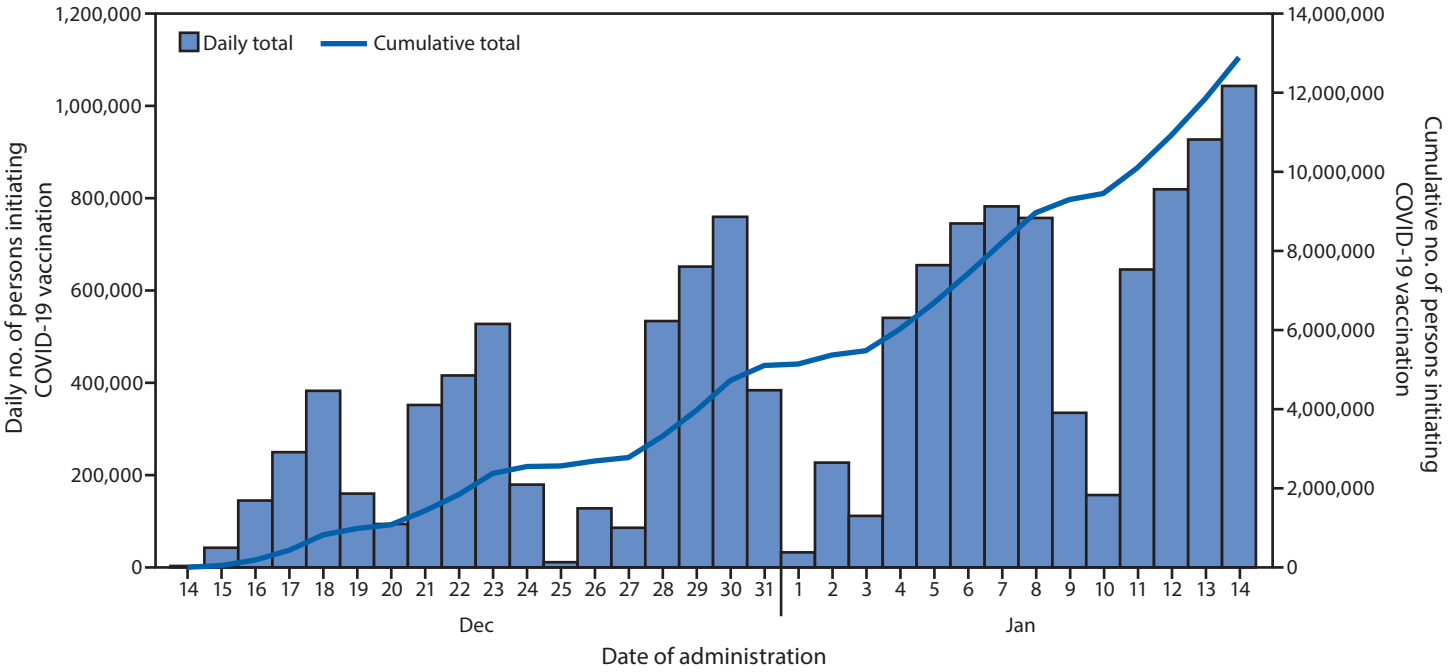
** https://www.cdc.gov/vaccines/covid-19/reporting/vams/program-information.html

†† Represents persons identified as being non-Hispanic and having multiple race categories selected or non-Hispanic and "other race" selected.

§§ If ethnicity was identified as Hispanic and race was unknown, the person was classified as Hispanic.

¶¶ Race/ethnicity was not reported because of jurisdictional policy or law or was unknown for all persons initiating vaccination in six jurisdictions.

FIGURE. Number of persons initiating COVID-19 vaccination, by date of vaccine administration (N = 12,928,749) — United States, December 14, 2020–January 14, 2021*



Abbreviation: COVID-19 = coronavirus disease 2019.
* Vaccines administered December 14, 2020–January 14, 2021, and reported to CDC by January 26, 2021.

12,924,116 (99.9%) persons whose age was known, 55.0% were aged ≥50 years, 16.8% were aged 40–49 years, and 28.2% were aged 18–39 years. Among 6,706,697 (51.9%) persons whose race/ethnicity was known, 60.4% were White and 39.6% represented racial and ethnic minorities, including 14.4% categorized as multiple or other race/ethnicity, 11.5% Hispanic/Latino, 6.0% Asian, 5.4% Black, 2.0% AI/AN, and 0.3% NH/PI. Race/ethnicity was unknown or not reported for 6,222,052 (48.1%) persons initiating vaccination. Across jurisdictions and federal entities, the percentage of persons initiating vaccination with race/ethnicity that was unknown or not reported ranged from 0.2% to 100% (median = 39.6%; interquartile range = 25.3%–66.1%).

Discussion

During the first month of the U.S. COVID-19 vaccination program, 12,928,749 persons received ≥1 dose of COVID-19 vaccine, representing approximately 4% of the total U.S. population and 5% of the U.S. population aged ≥16 years.*** If vaccination was only provided to persons in the Phase 1a priority groups (health care personnel and LTCF residents), coverage among the 24 million persons included in these groups might have been as high as 50% (*1*). However, this is likely an overestimate because persons outside of the 1a priority group were vaccinated because of variation in implementation of national guidance at the jurisdictional and local levels (e.g., Florida and Texas expanded vaccination to all persons aged ≥65 years).†††

Among persons who received the first vaccine dose and had available data for the respective demographic characteristic variable, 63.0% were women, 55.0% were aged ≥50 years, and 60.4% were White, which likely reflects the demographic characteristics of the persons (health care personnel and LTCF residents) recommended to be vaccinated in the Phase 1a priority group (*4*,*5*). Data from the 2019 American Community Survey show that 60% of health care workers were White, 16% were Black, 13% were Hispanic, and 7% were Asian; however, race and ethnicity varied widely by occupation and setting (*6*). Women also account for approximately three fourths of persons employed in the health care industry (*7*). In addition, the 2015–2016 National Study of Long-Term Care Providers found that 65% of nursing home residents were women, 75% were White, 14% were Black, and 5% were Hispanic (*8*).

*** Population denominator data from U.S. Census Bureau 2019 American Community Survey 1-year population estimates. 2018 population estimates are used for American Samoa, Federated States of Micronesia, Guam, Marshall Islands, Northern Mariana Islands, Palau, and U.S. Virgin Islands.

††† http://www.floridahealth.gov/newsroom/2020/12/122920-2046-covid-vac.pr.html; https://dshs.texas.gov/news/releases/2020/20201221.aspx

TABLE. Demographic characteristics of persons initiating COVID-19 vaccination — United States, December 14, 2020–January 14, 2021*

Characteristic (no. [%] with available information)	No. (%)†
Overall	**12,928,749 (100.0)**
Sex (12,537,841 [97.0])	
Male	4,639,073 (37.0)
Female	7,898,768 (63.0)
Age group,§ yrs (12,924,116 [99.9])	
<18	4,837 (<0.1)
18–29	1,433,086 (11.1)
30–39	2,207,222 (17.1)
40–49	2,175,305 (16.8)
50–64	3,350,610 (25.9)
65–74	1,732,522 (13.4)
≥75	2,020,534 (15.6)
Race/Ethnicity¶ (6,706,697 [51.9])	
White, non-Hispanic	4,047,795 (60.4)
Hispanic/Latino	773,858 (11.5)
Black, non-Hispanic	359,934 (5.4)
Asian, non-Hispanic	405,227 (6.0)
AI/AN, non-Hispanic	134,127 (2.0)
NH/PI, non-Hispanic	20,585 (0.3)
Multiple/Other, non-Hispanic**	965,171 (14.4)

Abbreviations: AI/AN = American Indian/Alaska Native; COVID-19 = coronavirus disease 2019; NH/PI = Native Hawaiian or Other Pacific Islander.

* Vaccines administered December 14, 2020–January 14, 2021, and reported to CDC by January 26, 2021.

† Percentages were calculated among persons with available demographic characteristics.

§ Pfizer-BioNTech COVID-19 vaccine is authorized for persons aged ≥16 years, and Moderna COVID-19 vaccine is authorized for persons aged ≥18 years under Food and Drug Administration Emergency Use Authorizations. Ages that were outside of the expected range (<16 years or >120 years) were treated as unknown, which represented <0.1% of persons initiating vaccination.

¶ Race/ethnicity was not reported or was unknown for all persons initiating vaccination in six jurisdictions. The six jurisdictions not reporting race/ethnicity have a total population of approximately 18.9 million, which represents nearly 6% of the overall U.S. population.

** Represents persons identified as being non-Hispanic and having multiple race categories selected or being non-Hispanic and having "other race" selected.

Interpretation of data from the analysis of COVID-19 vaccination initiation is limited by the high percentage of records with unknown or missing race/ethnicity information and the unknown proportions of priority groups (health care personnel versus LTCF residents) among early vaccine recipients. Differences in how race and ethnicity data are collected and categorized, for example 14.4% of persons initiating vaccination reported as multiple or other race/ethnicity, also make comparisons difficult. The percentage of persons initiating vaccination who were Black appears lower relative to the percentage of persons who are Black among health care personnel and LTCF residents. Overall, 39.6% of persons who were vaccinated represented racial and ethnic minorities. Because persons who are Black, AI/AN, or Hispanic have been found to have more severe outcomes from COVID-19 than persons who are White, careful monitoring of vaccination by race/ethnicity is critical (*2*,*9*).

Summary

What is already known about this topic?

In December 2020, two COVID-19 vaccines were authorized for emergency use in the United States. The first groups prioritized for vaccination included health care personnel and long-term care facility residents.

What is added by this report?

During the first month of the U.S. COVID-19 vaccination program, approximately 13,000,000 persons received ≥1 dose of vaccine. Among persons with demographic data, 63.0% were women, 55.0% were aged ≥50 years, and 60.4% were non-Hispanic White.

What are the implications for public health practice?

As the vaccination program expands, it is critical to ensure efficient and equitable administration to persons in each successive vaccine priority category, especially those at highest risk for infection and severe health outcomes.

The findings in this report are subject to at least three limitations. First, race/ethnicity was unknown for approximately one half of the population who initiated vaccination during the first month of the COVID-19 vaccination program in the United States. In addition, the proportion of persons with unknown race/ethnicity varied across jurisdictions, including six jurisdictions that reported no race/ethnicity data.§§§ In addition, a high proportion of persons receiving vaccination were categorized as non-Hispanic, multiple or other races, whereas the population estimates from the 2019 American Community Survey¶¶¶ 1-year population were 2.8% non-Hispanic, multiple or other races. Thus, the findings presented in this study might not be generalizable to all persons initiating COVID-19 vaccination in the United States. The large proportion of missing data also might result in biased estimates of race/ethnicity, particularly if some groups are more likely than others to have race/ethnicity reported as unknown. Second, vaccine administration data reported to CDC include limited data elements and did not allow for stratification by the prioritized populations (health care personnel and LTCF residents) in the initial phase of the vaccination campaign. Therefore, it was not possible to directly compare the observed demographic patterns among persons initiating vaccination to demographic characteristics of prioritized populations. Finally, implementation of the ACIP recommendations, including subprioritization, varied by jurisdiction, with some jurisdictions changing and expanding their priority populations during the first month of the vaccination program.

§§§ The six jurisdictions not reporting race/ethnicity have a total population of approximately 18.9 million, which represents nearly 6% of the overall U.S. population.

¶¶¶ https://data.census.gov/cedsci/table?q=hispanic&tid=ACSDP1Y2019.DP05&hidePreview=false

Although these data reflect characteristics of persons initiating vaccination during the initial phase of the U.S. COVID-19 vaccination program and have several limitations, the findings underscore the need for more complete reporting of race and ethnicity data at the provider and jurisdictional levels to ensure rapid detection of and response to potential disparities in COVID-19 vaccine administration. Jurisdictions should monitor the demographic characteristics of vaccinated persons to identify emerging disparities. In addition, as vaccination expands to include additional groups, monitoring coverage by the Social Vulnerability Index, which uses U.S. Census Bureau variables to identify communities that might need support, will be useful to ensure equity and to identify communities where focused immunization efforts might be required.[****] CDC is working with jurisdictions to use these types of analyses to help direct efforts to bring vaccines to their communities and ensure that no persons are left behind. These data from the first month of the COVID-19 vaccination program indicate substantial progress in administration of the COVID-19 vaccine. To increase coverage among persons in Phase 1a, as vaccination expands into additional populations, unvaccinated health care personnel and LTCF residents should continue to be offered COVID-19 vaccine. Equitable and sustainable COVID-19 vaccine administration in all populations requires focus on groups with lower vaccine receipt who might face challenges with access or vaccine hesitancy.

[****] The Social Vulnerability Index uses U.S. Census variables to help local officials identify communities that might need support as the result of a disaster. https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

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Early COVID-19 First-Dose Vaccination Coverage Among Residents and Staff Members of Skilled Nursing Facilities Participating in the Pharmacy Partnership for Long-Term Care Program — United States, December 2020–January 2021

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Residents and staff members of long-term care facilities (LTCFs), because they live and work in congregate settings, are at increased risk for infection with SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19) (*1*,*2*). In particular, skilled nursing facilities (SNFs), LTCFs that provide skilled nursing care and rehabilitation services for persons with complex medical needs, have been documented settings of COVID-19 outbreaks (*3*). In addition, residents of LTCFs might be at increased risk for severe outcomes because of their advanced age or the presence of underlying chronic medical conditions (*4*). As a result, the Advisory Committee on Immunization Practices has recommended that residents and staff members of LTCFs be offered vaccination in the initial COVID-19 vaccine allocation phase (Phase 1a) in the United States (*5*). In December 2020, CDC launched the Pharmacy Partnership for Long-Term Care Program* to facilitate on-site vaccination of residents and staff members at enrolled LTCFs. To evaluate early receipt of vaccine during the first month of the program, the number of eligible residents and staff members in enrolled SNFs was estimated using resident census data from the National Healthcare Safety Network (NHSN†) and staffing data from the Centers for Medicare & Medicaid Services (CMS) Payroll-Based Journal.§ Among 11,460 SNFs with at least one vaccination clinic during the first month of the program (December 18, 2020–January 17, 2021), an estimated median of 77.8% of residents (interquartile range [IQR] = 61.3%–93.1%) and a median of 37.5% (IQR = 23.2%–56.8%) of staff members per facility received ≥1 dose of COVID-19 vaccine through the Pharmacy Partnership for Long-Term Care Program. The program achieved moderately high coverage among residents; however, continued development and implementation of focused communication and outreach strategies are needed to improve vaccination coverage among staff members in SNFs and other long-term care settings.

The Pharmacy Partnership for Long-Term Care Program is a public-private partnership among CDC, CVS Pharmacy (https://www.cvs.com), Managed Health Care Associates, Inc. (https://www.mhainc.com/home), and Walgreens (https://www.walgreens.com) to provide on-site COVID-19 vaccination of residents and staff members at enrolled LTCFs in 54 jurisdictions (49 states, four cities, and one territory).¶ These organizations report facility-level aggregate vaccine administration data to CDC through a web-based data platform. For this analysis, COVID-19 vaccine administration data were restricted to those from enrolled SNFs with a unique, valid CMS Certification Number (CCN) that had a vaccination clinic conducted on site during the first month of the program (December 18, 2020–January 17, 2021). The number of residents eligible for vaccination was estimated using the mean of NHSN weekly resident census counts for each facility during the weeks of December 14, 2020–January 17, 2021. Resident census data were available for 11,376 facilities; 60 (0.5%) facilities with missing data were excluded from analyses of resident vaccination, as were 24 (0.2%) facilities where the CCN was linked to NHSN reporting from multiple sites. The number of staff members eligible for vaccination was estimated using CMS Payroll-Based Journal counts of unique staff members for each facility during July–September (Quarter 3) 2020. Payroll data were available for 11,134 facilities; 326 (2.8%) facilities with missing data were excluded from analyses of staff member vaccination.

To estimate vaccination coverage, vaccine administration data for residents and staff members were matched to denominators for these groups using the facility CCN. National vaccination estimates included all CMS-certified SNFs with available denominator data and at least one on-site clinic in the first month of the program across all participating jurisdictions. Jurisdiction-level estimates are shown only for jurisdictions where >50 CMS-certified SNFs had at least one on-site clinic in the first month

* https://www.cdc.gov/vaccines/covid-19/long-term-care/pharmacy-partnerships.html

† https://www.cdc.gov/nhsn/index.html

§ https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Staffing-Data-Submission-PBJ

¶ Participating jurisdictions do not include West Virginia. Participating cities and territories include Chicago, Illinois; New York City, New York; Philadelphia, Pennsylvania; Washington, DC; and Puerto Rico.

of the program and denominator data were available; data for participating cities were combined with those of their respective states for jurisdiction-level estimates. No individual-level data were included in the data files provided to CDC. All analyses were performed using SAS statistical software (version 9.4; SAS Institute). This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.**

During December 18, 2020–January 17, 2021, among 12,702 CMS-certified SNFs enrolled in the Pharmacy Partnership for Long-Term Care Program, 11,460 (90.2%) had at least one on-site vaccination clinic conducted through the program.†† A total of 713,909 residents and 582,104 staff members received ≥1 COVID-19 vaccine doses.§§ Among 11,376 (99.3%) of these facilities with available resident census data, a median estimated 77.8% (IQR = 61.3%–93.1%) of residents were vaccinated; and among 11,134 (97.2%) facilities with available staff member payroll data, a median of 37.5% (IQR = 23.2%–56.8%) of staff members were vaccinated (Figure 1). Among the 54 participating jurisdictions, 40 states had >50 CMS-certified SNFs that conducted at least one on-site clinic during the first month of the program and had available denominator data; the median percentage of residents vaccinated by state ranged from 65.7% to >100%¶¶ and of staff members, ranged from 19.4% to 67.4% (Figure 2).

Discussion

The Pharmacy Partnership for Long-Term Care Program partners with pharmacy providers to manage the COVID-19 vaccination process, reducing the workload for SNF administrators and jurisdictional health departments by coordinating scheduling, vaccine cold chain management, patient counseling, and vaccine administration. In the first month of the program, more than one million SNF residents and staff members in CMS-certified SNFs received on-site COVID-19 vaccination, with moderately high coverage among residents. Considering the high COVID-19–associated morbidity and mortality in SNFs (*1*,*2*) and, particularly, the risk for severe disease among SNF residents (*3*), vaccination of this population is a public health priority. However, the lower percentage of staff members vaccinated raises concern about low coverage among a population at high risk for occupational exposure to SARS-CoV-2.

Low vaccination coverage among staff members working in LTCFs has been previously described for influenza vaccination; during the 2017–18 influenza season, vaccination coverage among LTCF staff members was lower than that among other health care workers (*6*), and survey data suggest that hesitancy among this population could be associated with skepticism about influenza vaccine effectiveness and perceived low risk for virus transmission to themselves or others (*7*). Although efforts are ongoing to promote confidence in COVID-19 vaccination among health care workers, challenges persist. According to a survey conducted in October 2020, 37% of nurses stated that they were not confident that a COVID-19 vaccine would be safe and effective, and only 34% agreed that they would voluntarily receive a COVID-19 vaccine.*** Frequently cited reasons for vaccine hesitancy included the perceived rapidity of vaccine development; inadequate information received about vaccine safety, side effects, and administration; and skepticism regarding the clinical trials and vaccine approval processes. Similarly, survey data from December 2020 indicated that nearly one third (29%) of respondents who worked in a health care delivery setting expressed COVID-19 vaccine hesitancy, and updated estimates from January 2021 indicated that hesitancy persisted, with 28% of health care workers indicating a desire to delay receipt of vaccine until they had more information about safety and effectiveness.††† Specifically among LTCF staff members, a November 2020 survey found that only 45% of respondents were willing to receive a COVID-19 vaccine immediately once available, and an additional 24% would consider it in the future; the most frequently identified reason for vaccine hesitancy was concern about side effects (*8*). High staff member turnover, staff members working in multiple facilities (*9*), and limited resources for staff member outreach and education (*10*) are also potential barriers to vaccination in LTCFs. Use of focused communication messages to increase COVID-19 vaccine confidence in health care personnel§§§ and specifically among LTCF staff members¶¶¶, including messages regarding the documented safety and efficacy of authorized COVID-19 vaccines, might help improve vaccination acceptance and coverage. Staff members serve as a trusted source of information for patients and residents; therefore particularly in LTCF settings where residents and staff members might be vaccinated simultaneously, increasing vaccine confidence among

** 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.

†† Data reported to CDC as of January 24, 2021.

§§ Both Pfizer-BioNTech COVID-19 vaccine and Moderna COVID-19 vaccine were used in the Pharmacy Partnership for Long-Term Care Program; jurisdictional health departments designated one vaccine product for use in all enrolled facilities in their jurisdiction. Administration of second doses was not evaluated in this analysis.

¶¶ Estimated vaccination >100% might reflect resident and staff member turnover, other variation in denominator estimates, or errors in reported vaccine administration data.

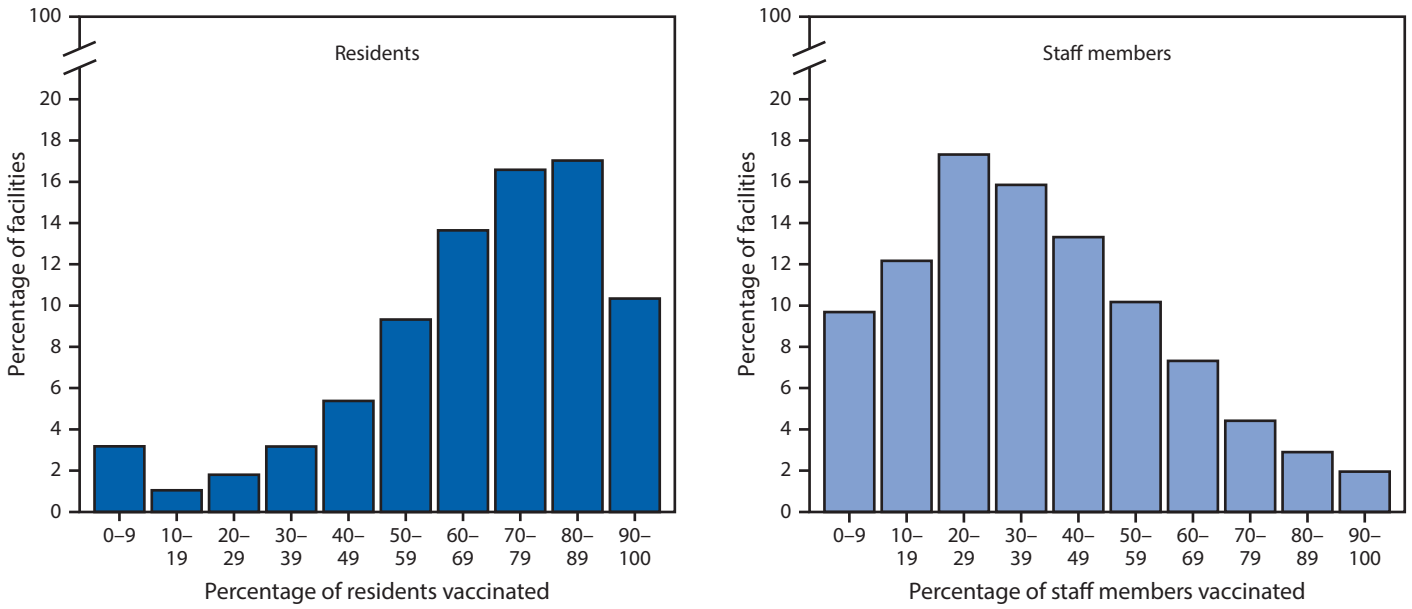
*** https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/what-you-need-to-know/covid-19-vaccine-survey

††† https://www.kff.org/coronavirus-covid-19/report/kff-covid-19-vaccine-monitor-december-2020/; https://www.kff.org/coronavirus-covid-19/report/kff-covid-19-vaccine-monitor-january-2021/

§§§ https://www.cdc.gov/vaccines/covid-19/health-systems-communication-toolkit.html

¶¶¶ https://www.cdc.gov/vaccines/covid-19/toolkits/long-term-care/index.html

FIGURE 1. Estimated percentage* of residents† and staff members§ at skilled nursing facilities¶ enrolled in the Pharmacy Partnership for Long-Term Care Program who received ≥1 dose of COVID-19 vaccine — United States, December 18, 2020–January 17, 2021



Abbreviations: CMS = Centers for Medicare & Medicaid Services; COVID-19 = coronavirus disease 2019.

* Vaccination coverage >100% (not shown) was estimated for residents in 2,118 (18.5%) facilities and for staff members in 559 (4.8%) facilities. Estimated vaccination coverage in excess of 100% might reflect resident and staff member turnover, other variation in denominator estimates, or errors in reported vaccine administration data.

† n = 11,376 facilities. The number of residents eligible for vaccination was estimated using the mean of National Healthcare Safety Network weekly resident census counts for each facility during December 14, 2020–January 17, 2021.

§ n = 11,134 facilities. The number of staff members eligible for vaccination was estimated using CMS Payroll-Based Journal counts of unique staff members for each facility during July–September (Quarter 3) 2020. Vaccination estimates reflect staff members vaccinated through the Pharmacy Partnership for Long-Term Care Program; additional staff members might have been vaccinated through other programs.

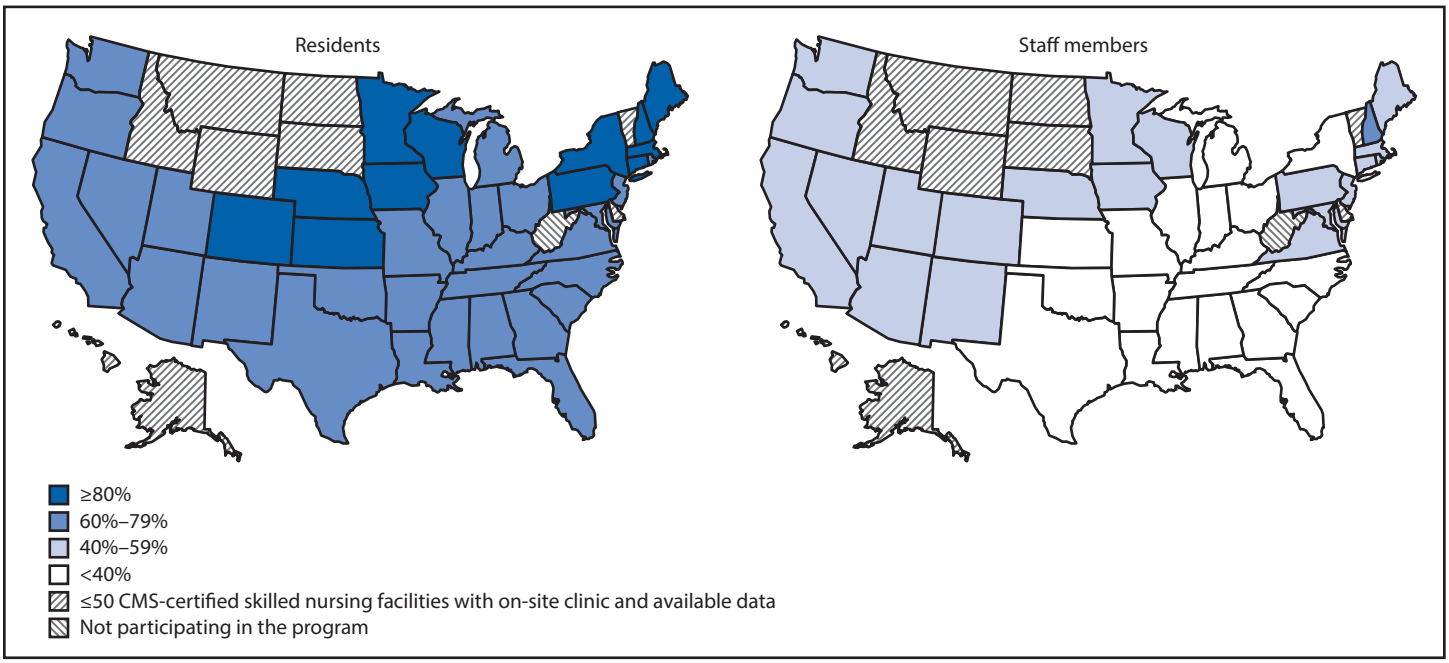
¶ Includes facilities with a unique, valid CMS Certification Number and with at least one on-site clinic conducted through the Pharmacy Partnership for Long-Term Care Program during December 18, 2020–January 17, 2021.

staff members might have additional benefits for promoting vaccination among residents. Because coverage varied among jurisdictions, lessons learned from jurisdictions or individual facilities with high coverage might provide insight into strategies that could be applied more broadly.

The findings in this report are subject to at least four limitations. First, vaccination procedures for health care workers might have underestimated the percentage of staff members vaccinated. Some jurisdictions encouraged LTCF staff members to be vaccinated through other programs for health care worker vaccination (e.g., clinics conducted by health departments or hospitals); only staff members vaccinated on site through the Pharmacy Partnership for Long-Term Care Program were included in these staff member vaccination estimates. Allocations to pharmacies included adequate vaccine to cover all expected residents and staff members in each facility; however, vaccination of staff members might have been intentionally staggered by SNFs in accordance with CDC's clinical considerations for health care providers, although staggering is emphasized for second doses in the 2-dose series.**** Similarly, scheduling of clinics could have posed challenges for staff members who worked on a shift schedule or worked at multiple facilities, or staff members might not have been available for vaccination around holidays falling within the time frame evaluated. Systematic data concerning these potential barriers were not recorded, and they require further study. Second, the number of residents and staff members eligible for vaccination at each facility was estimated using secondary data sources and was not determined in real time at each vaccination clinic. The most recent available CMS Payroll-Based Journal data were from July to September 2020 and might have differed from staffing during the time of vaccination clinics. Additional variation in facility occupancy and resident and staff member turnover during December 2020–January 2021 could affect the accuracy and precision of these denominator estimates. Third, these estimates only evaluated the first month of the program; vaccination coverage might have increased as subsequent clinics were conducted at each facility. Vaccination was only evaluated among CMS-certified SNFs because of the ability to match to secondary data sources using the facility CCN; these estimates might not be generalizable to all other LTCFs enrolled in the program (e.g., assisted living facilities and non-CMS certified facilities). Finally, no qualitative data were collected to determine

**** https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/covid-19/clinical-considerations.html

FIGURE 2. Estimated median percentage of residents* and staff members† at skilled nursing facilities§ enrolled in the Pharmacy Partnership for Long-Term Care Program who received ≥1 dose of COVID-19 vaccine, by jurisdiction¶ — United States, December 18, 2020–January 17, 2021



Abbreviations: CMS = Centers for Medicare & Medicaid Services; COVID-19 = coronavirus disease 2019.

* n = 11,376 facilities. The number of residents eligible for vaccination was estimated using the mean of National Healthcare Safety Network weekly resident census counts for each facility during December 14, 2020–January 17, 2021.

† n = 11,134 facilities. The number of staff members eligible for vaccination was estimated using CMS Payroll-Based Journal counts of unique staff members for each facility during July–September (Quarter 3) 2020. Vaccination estimates reflect staff members vaccinated through the Pharmacy Partnership for Long-Term Care Program; additional staff members might have been vaccinated through other programs.

§ Includes facilities with a unique, valid CMS Certification Number and with at least one on-site clinic conducted through the Pharmacy Partnership for Long-Term Care Program during December 18, 2020–January 17, 2021.

¶ Participating jurisdictions do not include West Virginia. Jurisdiction-level estimates are only presented for 40 states that had >50 CMS-certified skilled nursing facilities with a vaccination clinic conducted during December 18, 2020–January 17, 2021. Data for Chicago, New York City, and Philadelphia were combined with those of their respective states for jurisdiction-level estimates. Washington, DC, and Puerto Rico had ≤50 skilled nursing facilities with an on-site clinic and available data and are not shown.

Summary

What is already known about this topic?

Residents and staff members in long-term care facilities, particularly skilled nursing facilities (SNFs), are at increased risk for COVID-19–associated morbidity and mortality and have been prioritized for the first phase of vaccination in the United States.

What is added by this report?

Among 11,460 SNFs with at least one vaccination clinic conducted during the first month of the CDC Pharmacy Partnership for Long-Term Care Program, a median of 77.8% of residents and 37.5% of staff members received ≥1 vaccine dose through the program.

What are the implications for public health practice?

Barriers to SNF staff member vaccination need to be overcome with continued development and implementation of focused communication and outreach strategies to improve vaccination coverage.

motivators for vaccination or to document and characterize possible vaccine hesitancy suggested by the low percentage of staff members vaccinated.

Data on COVID-19 vaccine administration and coverage are essential to evaluating and supporting vaccination efforts over time. Additional data collected for the duration of the Pharmacy Partnership for Long-Term Care Program will characterize the percentage of residents and staff members vaccinated over time, as well as the percentage who complete the 2-dose series. Vaccine administration data can also be used to assess the effects of vaccination on COVID-19 case rates and transmission in high-risk settings; additional data will be collected through the NHSN LTCF Component.†††† Communications resources developed to increase vaccine confidence among LTCF staff members can be employed for public health outreach, and strategies to address structural barriers, such as scheduling around shift work or provision of paid medical leave for possible postvaccination side effects, should be encouraged. Further studies should explore

†††† https://www.cdc.gov/nhsn/ltc/index.html

differential vaccination coverage by characteristics, including geographic location, sociodemographic factors, and facility size, as well as characterize barriers to vaccination of persons working in LTCFs; qualitative assessment of attitudes and beliefs might inform additional communication strategies to improve vaccine confidence and increase vaccination among LTCF staff members.

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All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. David Gifford reports that his wife serves as the commissioner of public health in Connecticut, a jurisdiction involved in the Pharmacy Partnership for Long-Term Care Program partnership. Aaron Jaffe reports that his employer, Palantir Technologies, is in a paid engagement with the U.S. Department of Health and Human Services for providing software and configuration services. No other potential conflicts of interest were disclosed.

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Erratum

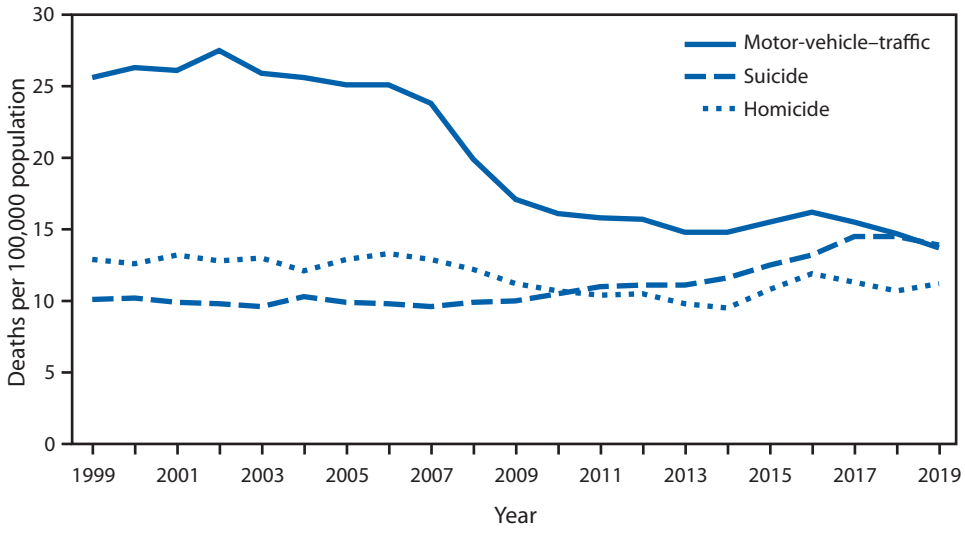
Vol. 70, No. 4

In the report "Trends in Outbreak-Associated Cases of COVID-19 — Wisconsin, March–November 2020," on page 114, the third sentence of the second paragraph should have read "Confirmed cases of COVID-19 that were linked[§] to these outbreaks were analyzed by symptom onset date (or sample collection date) **and** the reported setting[¶] of the associated outbreaks during three periods: before and during Wisconsin's Safer At Home order[**] (March 4–May 12), summer and return-to-school (May 13–September 2), and the exponential growth phase[††] (September 3–November 16)."

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Death Rates* for Motor-Vehicle–Traffic Injuries, Suicide, and Homicide Among Adolescents and Young Adults Aged 15–24 Years — United States, 1999–2019



* Rates are per 100,000 population aged 15–24 years. Deaths from motor-vehicle–traffic injuries are identified with *International Classification of Diseases, Tenth Edition* (ICD-10) codes V02–V04[.1–.9], V09.2, V12–V14[.3–.9], V19[.4–.6], V20–V28[.3–.9], V29–V79[.4–.9], V80[.3–.5], V81.1, V82.1, V83–V86[.0–.3], V87[.0–.8], V89.2. All motor-vehicle–traffic injuries are unintended. Suicides are identified with ICD-10 codes U03, X60–X84, and Y87.0, and homicides with codes U01–U02, X85–Y09, and Y87.1.

Mortality rates for adolescents and young adults aged 15–24 years for deaths from motor-vehicle–traffic injury, suicide, and homicide remained relatively stable during 1999–2006 and then exhibited different patterns through 2019. In 1999, the rate for motor-vehicle–traffic deaths was 25.6 per 100,000 population and declined to 13.7 in 2019. The suicide rate was 10.1 in 1999 and increased to 14.5 in 2018 before declining to 13.9 in 2019. The homicide rate was 12.9 in 1999 and declined to 9.5 in 2014 before increasing to 11.2 in 2019. In 2019, the death rates for motor-vehicle–traffic injury and suicide were similar; both rates were higher than the homicide rate.

Source: National Center for Health Statistics, National Vital Statistics System, Mortality Data, 2009–2019. http://www.cdc.gov/nchs/nvss/deaths.htm

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

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