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National Preparedness Month — September 2017

Every September, CDC, private and public health institutions, and approximately 3,000 government organizations support preparedness efforts and encourage Americans to take action before, during, and after an emergency. Every community in the United States should be ready to respond to an infectious disease outbreak, chemical or radiological release, or natural disaster (*1*). Public health systems should have the capacity to scale up and respond to the varying demands of public health emergencies (*2*).

Many emergencies happen without warning; it is important for all persons to take steps ahead of time to keep themselves and their loved ones safe and healthy. Research shows that only 46% of persons think a natural disaster is likely to occur in their community (*3*). It is vital to take immediate and appropriate actions in the event of an emergency.

This year, CDC's Office of Public Health Preparedness and Response focuses on empowering individuals to better prepare for public health emergencies. The 2017 theme "The Power of Preparedness" highlights the importance of building and updating an emergency kit, having and reviewing an emergency plan, inspiring others to prepare, and taking immediate action to save lives. This issue of *MMWR* includes a report describing a series of unannounced mystery patient drills that were conducted in New York City emergency departments to assess response to potential infectious disease threats. Individual and community preparedness resources are available at https://www.cdc.gov/phpr/preparedness_month.htm.

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Assessment of Hospital Emergency Department Response to Potentially Infectious Diseases Using Unannounced Mystery Patient Drills — New York City, 2016

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Recent outbreaks of infectious diseases have revealed significant health care system vulnerabilities and highlighted the importance of rapid recognition and isolation of patients with potentially severe infectious diseases. During December 2015–May 2016, a series of unannounced "mystery patient drills" was carried out to assess New York City Emergency Departments' (EDs) abilities to identify and respond to patients with communicable diseases of public health concern. Drill scenarios presented a patient reporting signs or symptoms and travel history consistent with possible measles or Middle East Respiratory Syndrome (MERS). Evaluators captured key infection control performance measures, including time to patient masking and isolation. Ninety-five drills (53 measles and 42 MERS) were conducted in 49 EDs with

INSIDE

Continuing Education examination available at https://www.cdc.gov/mmwr/cme/conted_info.html#weekly.

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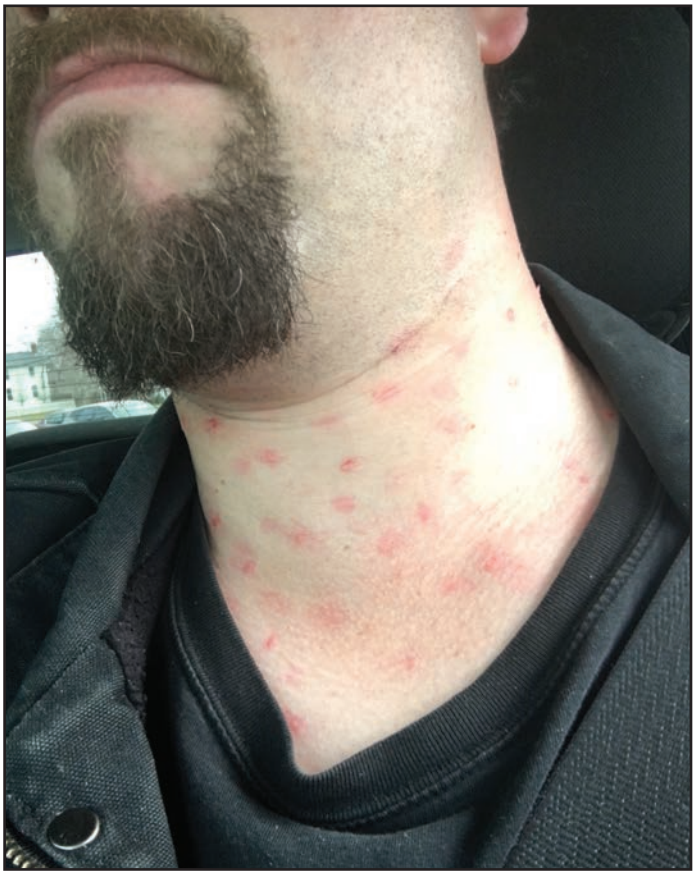
patients masked and isolated in 78% of drills. Median time from entry to masking was 1.5 minutes (range = 0–47 minutes) and from entry to isolation was 8.5 minutes (range = 1–57). Hospitals varied in their ability to identify potentially infectious patients and implement recommended infection control measures in a timely manner. Drill findings were used to inform hospital improvement planning to more rapidly and consistently identify and isolate patients with a potentially highly infectious disease.

Exercises were designed in accordance with the U.S. Department of Homeland Security Exercise and Evaluation Program (*1*). Scenarios were developed in collaboration with a stakeholder advisory group and consisted of a person simulating a patient entering the ED and reporting recent fever and either 1) respiratory symptoms and recent travel to the Middle East (i.e., possible MERS) or 2) a rash after traveling to Europe (i.e., possible measles). A red maculopapular measles-like rash was simulated on the neck or upper extremities of the person in the role of the measles patient using a commercially available moulage kit (Figure 1). Based on previously provided ED guidance (*2*), the expectation was that once the patient was identified as being at high risk for having a communicable disease with a potential for respiratory transmission, he or she would be asked to don a mask and would be placed into an airborne infection isolation room.

All 50 New York City hospitals with emergency departments that participate in the 911 system and receive Hospital Preparedness Program funding through the U.S. Department of Health and Human Services Office of Assistant Secretary

FIGURE 1. Patient actor displaying moulage-simulated measles rash during mystery patient drills — New York City, December 2015–May 2016



Photo/New York City Department of Health and Mental Hygiene

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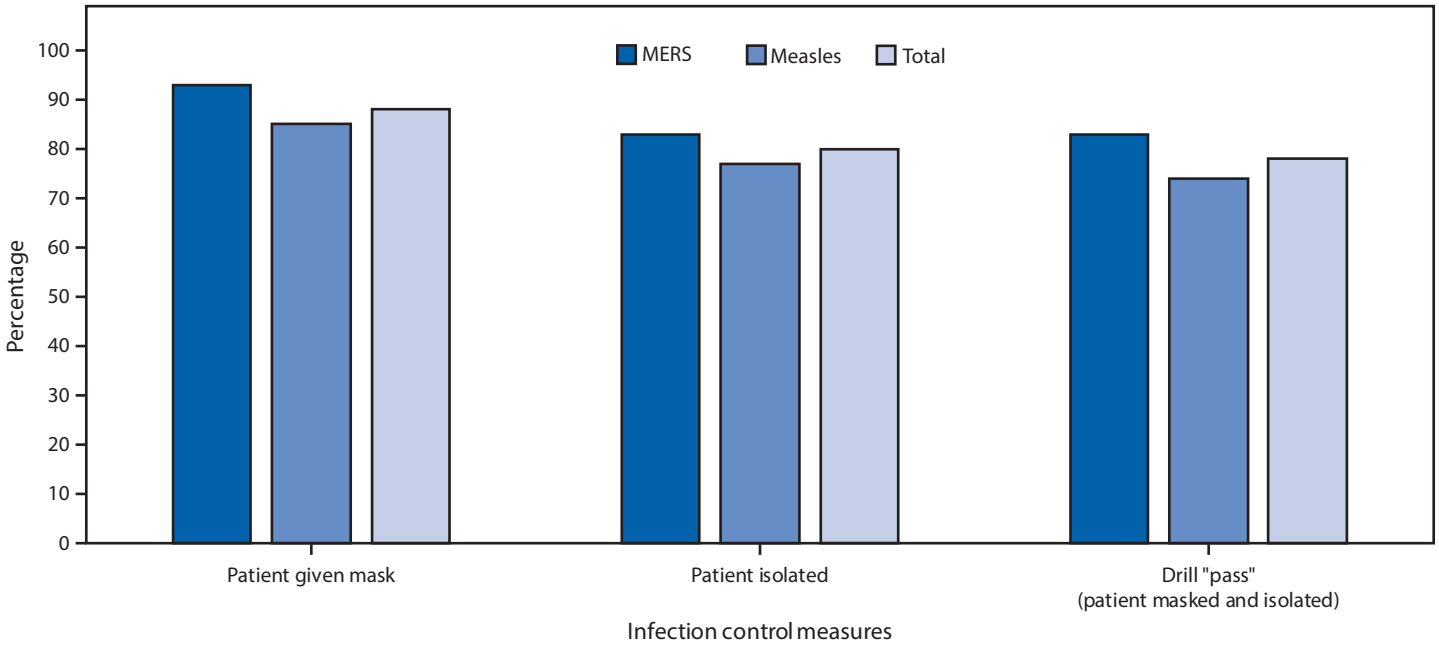
of Preparedness and Response were offered the opportunity to participate in the program; 49 agreed to take part. Exercises were conducted with a simulated patient (who served as the exercise controller), an evaluator, and up to two hospital employees (serving as trusted agents) who helped coordinate the visit. No other hospital staff members were informed of the drill. The controller entered the ED unannounced, and, when prompted by ED staff members, reported signs or symptoms consistent with the exercise scenario. The evaluator entered the ED separately with one of the trusted agents and remained in the ED during the exercise to collect data using a standardized exercise evaluation guide. The controller ended the exercise after the initial evaluation by a health care provider. Exercises were terminated and considered failed if ED wait time exceeded 30 minutes without triage. The following outcomes were evaluated: 1) compliance with key infection control measures, including staff member hand hygiene, appropriate use of personal protective equipment (PPE), and infection prevention signage; 2) association between screening interventions (e.g., travel screening) and implementation of infection control measures; and 3) key quantitative measures including time from entry of the patient until triage, until donning a mask, and until isolation. The exercise was considered successful (i.e., "passed") if the patient was given a mask and isolated from other patients and staff members. At the conclusion of the drill, exercise staff members facilitated a debriefing with all the drill participants including the facility trusted agents. Descriptive analyses and chi-square tests for association were performed using statistical software with p-values <0.05 considered to be statistically significant. Variable specific analyses of times excluded drills with missing time stamp data.

Forty-nine New York City hospitals participated in 95 (53 measles, 42 MERS) drills during December 2015–May 2016. Overall, 76 (80%) patients were asked about recent fevers, and 81 (85%) were asked about recent travel. Questions about a rash or unusual skin lesions or respiratory symptoms were asked of 47 (50%) and 69 (68%) patients, respectively. Overall, 84 (88%) patients were given a mask, including 45 (85%) patients in the measles scenarios and 39 (93%) patients in the MERS scenarios.

Among all 95 drills, 74 (78%) passed, including 35 (83%) of 42 MERS scenarios and 39 (74%) of 53 measles scenarios (p = 0.3). Similarly, there were no significant differences in the percentage of simulated MERS and measles patients who received a mask (93% versus 85%) or were isolated (83% versus 77%) (Figure 2). Nineteen (39%) of 49 hospitals failed at least one drill. Masking and isolation occurred in 88% (71 of 81) drills when travel history was obtained, compared with only 21% (3 of 14) drills when such history was not obtained (p<0.001). The median time from patient entry to triage was 1 minute for both scenarios (Table). The median time from patient entry to masking was 1 minute in the measles scenario and 2 minutes

FIGURE 2. Adherence to mask use and isolation protocols and drill pass rate* in 95 mystery patient drills, by scenario† — 49 New York City emergency departments, December 2015–May 2016



Abbreviation: MERS = Middle East Respiratory Syndrome.
* "Patient" asked to don a mask and isolated from other patients and staff members.
† Simulation drill, with "patient" describing signs and symptoms and providing travel history consistent with either possible MERS or measles.

TABLE. Median intervals from patient entry to implementation of specific infection control measures* in simulated measles (N = 53) and MERS (N = 42) scenarios — 49 New York City hospital emergency departments, December 2015–May 2016

	Measles scenarios		MERS scenarios		All scenarios	
Infection control measure	No. scenarios	Minutes, median (range) to implement	No. scenarios	Minutes, median (range) to implement	No. scenarios	Minutes, median (range) to implement
Entry to triage	52	1 (0–26)	41	1 (0–30)	93	1 (0–30)
Entry to masking	45	1 (0–26)	39	2 (0–47)	84	1.5 (0–47)
Entry to isolation	41	8 (1–41)	35	11 (1–57)	76	8.5 (1–57)

Abbreviation: MERS = Middle East Respiratory Syndrome.
* Drills with missing time stamps were excluded.

in the MERS scenario, and from patient entry to isolation was 8 minutes in the measles scenario and 11 minutes in the MERS scenario.

Assessment of other infection control practices found that 36% of staff members performed personal hand hygiene and 16% of staff members instructed patients to perform hand hygiene. In the 76 (80%) drills that resulted in the patient being isolated, precaution signage was posted outside the patient's airborne isolation room of 53 (70%), and staff members used recommended PPE when entering these rooms in 56 (74%) drills.

Discussion

EDs and their associated waiting areas have been shown to facilitate the transmission of infections, such as measles and severe acute respiratory syndrome, to patients and health care workers, leading to spread within hospitals and surrounding communities (*3*,*4*). This mystery patient drill program provided an opportunity to examine real-world implementation of infectious disease-related screening and isolation of potentially high-risk patients in EDs across New York City. It also provided a reasonable baseline for expectations of ED staff member practices regarding control of highly infectious diseases at this entry point to the hospital system. Based on these findings, performance goals of 1 minute from entry to masking and 10 minutes from entry to isolation will be adopted for evaluating similar drills in the future. In addition, the overall median time from entry to isolation achieved in this study (8.5 minutes) is comparable to times achieved in an earlier Ebola drill analysis (9 minutes) (*5*).

Although the majority of drills were completed successfully by masking and isolating the patient, approximately 40% of hospitals failed at least one drill, and there was considerable variation in the length of time each hospital took to perform these steps. It is possible that measles cases were recognized to be an infectious risk more quickly, as the rash was a clearer objective finding. However, the higher percentage of mask provision and patient isolation in MERS scenarios suggests that a history of travel to the Middle East might be more recognizable as a high-risk exposure than history of travel to Germany in the measles scenario; it was noted on multiple drill reports that staff members were unsure if travel to Europe constituted a risk. The finding that masking and isolation occurred significantly more frequently in situations where a travel history had been elicited suggests that routinely inquiring about recent travel could prevent exposures to infectious patients at critical entry points to the health care system.

Another important finding was suboptimal adherence to key infection control practices, including hand hygiene (36%), PPE use (74%), and posting of isolation signage (70%), highlighting the need for routine competency-based infection-control training programs.

Simulated patient exercises have been demonstrated to be effective tools to evaluate hospital emergency plans (*6*), and studies have validated their use for testing health care system preparedness for communicable diseases of public health concern, including Ebola, avian influenza, inhalation anthrax, and smallpox (*6*–*10*). This is the first report describing the use of unannounced mystery patient drills to test ED preparedness for MERS and measles. Whereas other studies have described specific infection-control interventions, such as patient masking (*7*), isolation (*9*), and risk-factor screening (*8*), this study is unique in its use of drills to capture both key temporal measures and staff member compliance with multiple infection control practices.

The findings in this report are subject to at least two limitations. First, exercise evaluation was limited to items that were under direct control of the staff members who participated in the drill, the controller, and the evaluator. Factors such as ED patient volume and staffing levels could potentially influence performance on a given day, but these were not evaluated. Second, controllers were not able to objectively present all signs of illness (e.g., fever, chills), and the moulage used to simulate a measles rash might have been misleading or unconvincing, although this information was not captured in the drill reports.

Unannounced mystery patient drills were successfully used to evaluate communicable disease response capabilities in the acute care setting in 49 New York City hospital EDs. As part of this program, a toolkit was developed to help hospitals carry out similar infectious disease drills to test protocols and identify areas for improvement. Use of standardized scenarios,

Summary

What is already known about this topic?

Recent infectious disease epidemics highlight the importance of rapid recognition and isolation of patients with severe infectious diseases. Unannounced mystery patient drills have been used in the health care setting to evaluate protocols and staff members' ability to identify and manage potentially infectious patients.

What is added by this report?

Ninety-five mystery patient drills were conducted in 49 New York City hospital emergency departments to assess responsiveness to patients with potentially severe infections. The times required to perform patient masking and isolation were evaluated; overall, patients were masked and isolated in 78% of drills. Masking and isolation occurred significantly more frequently when travel history was obtained (88%) than when it was not (21%). Overall, the median time from patient entry to masking was 1.5 minutes (range = 0–47 minutes) and from entry to isolation was 8.5 minutes (range = 1–57).

What are the implications for public health practice?

A toolkit was developed to support health care facilities and health departments conduct similar drills to identify areas for improvement and enhance readiness at a critical point of entry into the health care system. This toolkit could be useful for other jurisdictions.

evaluation guides, and reporting templates can assist public health officials in assessing system-wide capabilities and gaps to guide interventions, and inform development of training resources to improve health care facility readiness at a critical point of entry into the health care system. The toolkit is available at http://on.nyc.gov/IDPrep.

Acknowledgment

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Conflict of Interest

No conflicts of interest were reported.

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Rates and Trends of Pediatric Acute Lymphoblastic Leukemia — United States, 2001–2014

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Acute lymphoblastic leukemia (ALL) is the most prevalent cancer among children and adolescents in the United States, representing 20% of all cancers diagnosed in persons aged <20 years, or >3,000 new cases each year (*1*). Past studies reported increasing trends of ALL overall and among Hispanics, but these represented ≤28% of the U.S. population and did not provide state-based estimates (*1–3*). To describe U.S. ALL incidence rates and trends among persons aged <20 years during 2001–2014, CDC analyzed rigorous data (based on established publication criteria) from the United States Cancer Statistics data set, which includes incidence data on approximately 15,000 new cases per year of all types of invasive cancer among children and adolescents aged <20 years (*4*). The data set represented 98% of the U.S. population during the study period. Overall incidence of pediatric ALL during 2001–2014 was 34.0 cases per 1 million persons and among all racial/ethnic groups was highest among Hispanics (42.9 per 1 million). Both overall and among Hispanics, pediatric ALL incidence increased during 2001–2008 and remained stable during 2008–2014. ALL incidence was higher in the West than in any other U.S. Census region. State-specific data indicated that the highest rates of pediatric ALL incidence were in California, New Mexico, and Vermont. These demographic and geographic ALL incidence data might better inform public health interventions targeting the following areas: exposures to recognized risk factors for leukemia; ALL treatment, including clinical trial enrollment; survivorship care planning; and studies designed to understand the factors affecting changes in pediatric cancer incidence.

The United States Cancer Statistics data set includes cancer incidence data from CDC's National Program of Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results program (*4*). Data on new cases of cancer diagnosed during 2001–2014 were obtained from population-based cancer registries affiliated with the National Program of Cancer Registries or Surveillance, Epidemiology, and End Results programs. Incidence data for all registries except the District of Colombia, Mississippi, and Nevada met United States Cancer Statistics publication criteria during 2001–2014, and represented 98% of the U.S population.* This report includes cases diagnosed among children and adolescents aged <20 years and includes *International Classification of Diseases for Oncology, Third Edition*† codes 9728–9729, 9811–9818, and 9835–9837 as grouped by the *International Classification of Childhood Cancer*.§ Cases were included if ALL was the first or only cancer diagnosed and was confirmed microscopically or by positive laboratory test or marker study. Recurrent cases of ALL were not included in this report.

Age-adjusted rates were calculated using statistical software. All rates were expressed per 1 million persons and were age-adjusted to the 2000 U.S. standard population.¶ Age-adjusted incidence trends were quantified using annual percent change (APC) calculated using joinpoint regression. Statistically significant APCs were different from zero ($p<0.05$). A maximum of two joinpoints were used to determine a change of direction in trends during the study period. Rates and trends were estimated by sex, age group, race/ethnicity, state, U.S. Census region,** county-level economic status, and rural/urban status.

During 2001–2014, a total of 38,136 new pediatric ALL cases were diagnosed in the United States (Table). Overall incidence of ALL was 34.0 cases per 1 million. Rates were highest in children aged 1–4 years (75.2 per 1 million) and were higher in males (38.0) than in females (29.7). Among all racial/ethnic groups, the highest incidence rate (42.9 per 1 million) was among Hispanics, followed by non-Hispanic whites (34.2 per 1 million). The lowest incidence (18.7) occurred among non-Hispanic blacks. Pediatric ALL incidence rates in the 25% of U.S. counties with the highest economic status were higher than rates in the 25% of counties with the lowest economic status and were higher in metropolitan areas with ≥1 million persons than in nonmetropolitan areas. Rates were highest in the West (38.5) followed by the Northeast (34.8), Midwest (32.4), and South (31.6) Census regions, and, among states, were highest in Vermont (41.9), California (40.8), and New

* Cancer registries' incidence data met the following five United States Cancer Statistics criteria: 1) ≤5% of cases ascertained solely on the basis of death certificate; 2) ≤3% of cases missing information on sex; 3) ≤3% of cases missing information on age; 4) ≤5% of cases missing information on race; and 5) ≥97% of registry's records passed a set of single-field and inter-field computerized edits that test the validity and logic of data components. https://nccd.cdc.gov/uscs/.

† http://codes.iarc.fr/.

§ https://seer.cancer.gov/iccc/iccc-who2008.html. "ALL" in this study includes precursor cell leukemia and lymphoma *International Classification of Diseases for Oncology, Third Edition* codes, excluding code 9727 because of its use to code for blastic plasmacytoid dendritic cell neoplasm. Additional information is available at http://onlinelibrary.wiley.com/doi/10.1002/cncr.20910/full and http://www.bloodjournal.org/content/114/5/937?sso-checked=true.

¶ Population estimates incorporate bridged single-race estimates derived from the original multiple race categories in the 2010 U.S. Census. https://seer.cancer.gov/popdata.

** https://www.census.gov/geo/reference/gtc/gtc_census_divreg.html.

TABLE. Age-adjusted incidence* of acute lymphoblastic leukemia† in persons aged <20 years and annual percentage change (APC) in rates, by selected characteristics — United States,§ 2001–2014

Characteristic	No.	Incidence (95% CI)	APC¶					
			Years	APC_1 (95% CI)	Years	APC_2 (95% CI)	Years	APC_3 (95% CI)
Overall	**38,136**	**34.0 (33.6–34.3)**	**2001–2008**	**1.9 (0.5–3.3)****	**2008–2014**	**-1.1 (-2.8–0.6)**	—††	—
Sex								
Male	21,871	38.0 (37.5–38.5)	2001–2008	2.1 (0.5–3.7)**	2008–2014	-1.5 (-3.3–0.4)	—	—
Female	16,265	29.7 (29.2–30.1)	2001–2003	-4.0 (-14.7–8.1)	2003–2008	3.2 (-0.5–7.0)	2008–2014	-1.0 (-2.9–0.9)
Age group (yrs)								
<1	1,009	18.4 (17.3–19.6)	2001–2014	-1.5 (-3.3–0.3)	—††	—	—	—
1–4	16,388	75.2 (74.0–76.4)	2001–2009	1.3 (-0.1–2.8)	2009–2014	-2.4 (-5.2–0.5)	—	—
5–9	9,535	34.8 (34.1–35.5)	2001–2010	2.2 (1.3–3.2)**	2010–2014	-1.7 (-4.6–1.3)	—	—
10–14	6,201	21.6 (21.1–22.1)	2001–2014	1.3 (0.5–2.1)**	—	—	—	—
15–19	5,003	17.0 (16.5–17.5)	2001–2014	0.4 (-0.5–1.3)	—	—	—	—
Race/Ethnicity§§								
White	21,843	34.2 (33.8–34.7)	2001–2014	0.3 (-0.3–0.9)	—	—	—	—
Black	3,129	18.7 (18.0–19.3)	2001–2014	1.2 (-0.1–2.7)	—	—	—	—
Hispanic	10,595	42.9 (42.1–43.7)	2001–2008	2.5 (0.3–4.7)**	2008–2014	-1.8 (-4.2–0.6)	—	—
American Indian/ Alaska Native	350	30.2 (27.1–33.6)	2001–2014	-1.9 (-4.2–0.5)	—	—	—	—
Asian/Pacific Islander	1,765	31.6 (30.1–33.1)	2001–2014	0.3 (-0.9–1.6)	—	—	—	—
U.S. Census region¶¶								
Northeast	—***	34.8 (34.0–35.6)	2001–2007	3.0 (0.2–6.0)**	2007–2014	-1.6 (-3.7–0.7)	—	—
Midwest	—	32.4 (31.7–33.2)	2001–2011	1.6 (0.6–2.6)**	2011–2014	-5.4 (-11.4–1.0)	—	—
South	—	31.6 (31.0–32.1)	2001–2003	-4.6 (-15.3–7.6)	2003–2008	3.9 (0.2–7.7)**	2008–2014	-1.3 (-3.2–0.5)
West	—	38.5 (37.8–39.3)	2001–2014	0.4 (-0.3–1.1)	—	—	—	—
County-level economic status by percentile (%)								
Bottom 25	4,182	32.2 (31.2–33.2)	2001–2014	1.4 (0.6–2.2)**	—	—	—	—
25–75	22,141	33.9 (33.4–34.3)	2001–2010	1.1 (0.2–2.1)**	2010–2014	-2.4 (-5.5–0.9)	—	—
Top 25	10,646	34.9 (34.2–35.6)	2001–2008	2.9 (0.7–5.1)**	2008–2014	-1.5 (-4.0–1.1)	—	—
Urban/Rural status								
Metropolitan area ≥1 million population	21,690	35.7 (35.3–36.2)	2001–2008	2.7 (1.2–4.2)**	2008–2014	-1.6 (-3.4–0.2)	—	—
Metropolitan area 250,000 to <1 million population	8,134	34.4 (33.7–35.2)	2001–2011	0.8 (-0.4–2.1)	2011–2014	-4.4 (-11.8–3.7)	—	—
Metropolitan area <250,000 population	3,302	33.8 (32.7–35.0)	2001–2014	0.6 (-0.3–1.5)	—	—	—	—
Nonmetropolitan counties	4,962	32.9 (32.0–33.9)	2001–2014	0.9 (0.0–1.8)	—	—	—	—

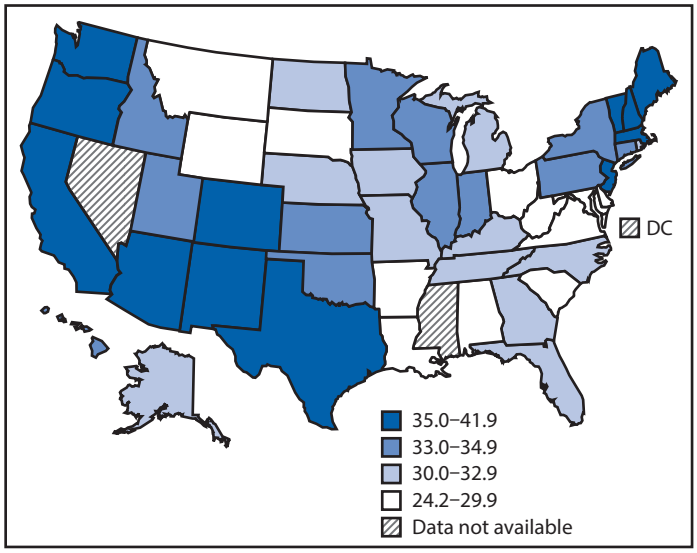
Source: CDC's National Program of Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results program.
Abbreviation: CI = confidence interval.

* Per 1 million persons, age-adjusted to the 2000 U.S. standard population.
† Cases included *International Classification of Diseases for Oncology, Third Edition* codes (9728–9729, 9811–9818, 9835–9837) as grouped by the *International Classification of Childhood Cancer*.
§ Incidence data are compiled from cancer registries that meet the data quality criteria for all years during 2001–2014 (covering approximately 98% of the U.S. population). Registry-specific data quality information is available at https://www.cdc.gov/cancer/npcr/uscs/data/00_data_quality.htm. Characteristic values with unknown, other, missing, or blank results are not included in this table.
¶ Trends were measured with APC in rates and were considered to increase or decrease if $p<0.05$; otherwise trends were considered stable. Trends were calculated using joinpoint regression, which allowed for different slopes in as many as three different periods, represented by APC1, APC2, and APC3, as applicable. The duration in years of APC1, APC2, and APC3 varied by study characteristic depending on joinpoint regression calculation. APC was not calculated if case count was <16 cases in any 1 year.
** $p<0.05$.
†† Trend adequately described during 2001–2014 by previous APC columns.
§§ White, black, American Indian/Alaska Native, and Asian/Pacific Islander persons are non-Hispanic. Hispanic persons might be of any race.
¶¶ Midwest: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.
*** Number counts suppressed per United States Cancer Statistics complementary cell suppression rules: counts for national and regional data must be suppressed if a single state in a region or division is suppressed.

Mexico (39.1) (Figure 1) (Supplementary Table 1, https://stacks.cdc.gov/view/cdc/47662). State-specific ALL incidence by race/ethnicity ranged from 10.1–27.9 per 1 million among non-Hispanic blacks to 25.1–45.0 among non-Hispanic whites and 27.3–48.5 among Hispanics (Supplementary Table 2, https://stacks.cdc.gov/view/cdc/47663).

Overall pediatric ALL incidence increased 1.9% per year during 2001–2008, and then remained stable during 2008–2014

FIGURE 1. Annual age-adjusted rates* of acute lymphoblastic leukemia among persons aged <20 years, by state — National Program of Cancer Registries, and Surveillance, Epidemiology, and End Results program, United States, 2001–2014



* Rates are per 1 million persons and age-adjusted to the 2000 U.S. standard population.

(Figure 2). Incidence increased among males during 2001–2008 and among children aged 5–9 years and 10–14 years during 2001–2010 and 2001–2014, respectively, as well as in metropolitan areas with populations ≥1 million during 2001–2008 (Table). Among Hispanics, rates increased during 2001–2008 (APC 2.5, 95% confidence interval = 0.3–4.7) and were stable (nonsignificant decrease) during 2008–2014; pediatric ALL incidence rates were stable in all other racial/ethnic groups. State-specific analysis indicated that pediatric ALL incidence increased during all or part of 2001–2014 in four states: Alabama, Maryland, Massachusetts, and New York (Supplementary Table 1, https://stacks.cdc.gov/view/cdc/47662).

Discussion

Consistent with other published data, this analysis found that rates of ALL were highest in males, children aged 1–4 years, and Hispanics (*1*). Rates varied by state and region and were highest in the West U.S. Census Region. This report, using more recent data with broader population coverage than past studies (*1–3*), confirms an increase in pediatric ALL overall and among Hispanics (2001–2008) and also documents a subsequent period of stable trends overall and among Hispanics (2008–2014).

High rates of pediatric ALL in the Hispanic population might explain high ALL rates in the West U.S. Census Region and in other specific states, given the high proportion of Hispanics in many of these areas.†† Past studies documenting increasing incidence of pediatric ALL in Hispanics focused on earlier periods using the Surveillance, Epidemiology, and End Results database or the California Cancer Registry (*2*,*3*). Recent stable trends in ALL rates in Hispanic populations (2008–2014) might indicate a change after 2 decades of documented increasing trends. The cause for the higher rates of ALL in Hispanic populations and the increase during 2001–2008 is unknown; however, past studies have evaluated such factors as genetic susceptibility, disproportionate environmental exposure to household chemicals, or racial and ethnic disparities in parents' exposures to chemicals at work (*2*,*3*). Other studies have hypothesized that the increasing trends in obesity among Hispanics might explain the increasing trends of ALL incidence among this population (*2*).

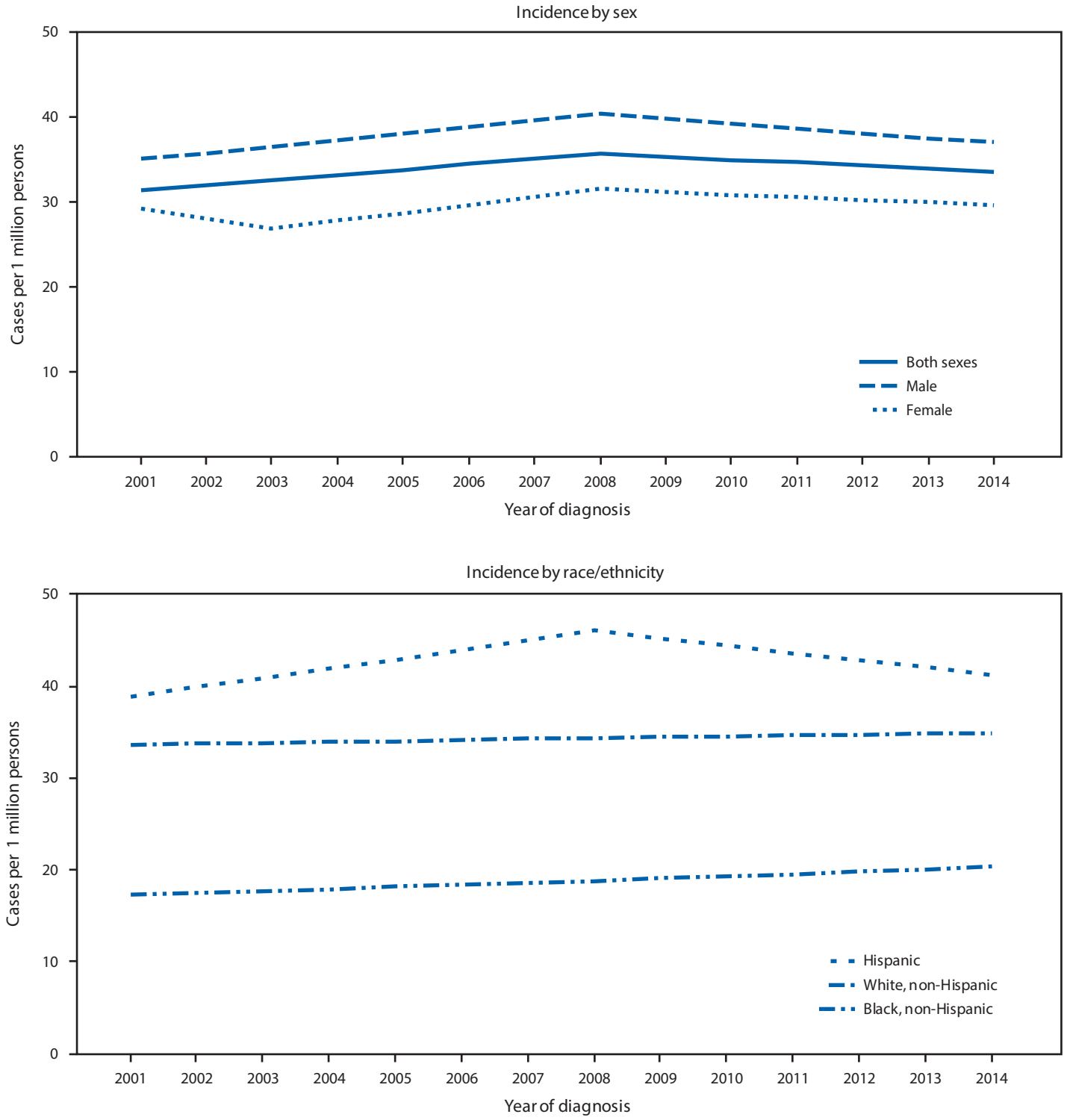
This report documents higher rates of ALL in persons aged <20 years living in counties in metropolitan areas with ≥1 million population and in counties in the top 25th income percentile. Past studies of pediatric leukemia have investigated possible associations with higher economic status or increased exposure to air pollution that is often found in large metropolitan areas (*5*,*6*). Etiologic studies examining potential causes of pediatric leukemia have documented associations between leukemia and exposures to solvents, traffic, pesticides, tobacco smoke, or radiation, or to specific nutritional exposures (*7*).

The findings in this report are subject to at least five limitations. First, the District of Columbia, Mississippi, and Nevada were excluded because of incomplete trend data, which limits the representativeness of the results. Second, although the United States Cancer Statistics data publication standards yield high quality data, misclassifications of race and ethnicity exist and might underestimate rates in American Indians, Alaska Natives, and Hispanics (*8*); ongoing procedures are used to ensure that this information is as accurate as possible. Third, the U.S. Census population estimates used in rate denominators might undercount some groups, including children and Hispanics, which could artificially raise incidence rates (*3*). Fourth, improvement in case ascertainment through advancements in electronic pathology reporting might affect trends: rates might appear to increase because current cancer registration methods are more accurately recording cases that were previously under-recorded. Finally, the possibility of a statistical error exists when analyzing subgroups with small numbers. Although APCs that are close to the significance cutoff might be truly significant, future studies will be needed to validate and monitor trends.

These recent state-based demographic cancer data can help local and national cancer control programs assess needs, allocate resources, and guide policy and public health strategies that can reduce cancer risk and improve the care of children and adolescents with ALL. Because cancer clinical trial participation has become an increasingly important part of quality clinical

†† https://www.census.gov/prod/cen2010/briefs/c2010br-04.pdf.

FIGURE 2. Trends* in age-adjusted rates† of acute lymphoblastic leukemia in persons aged <20 years, by sex§ and race/ethnicity¶ — National Program of Cancer Registries, and Surveillance, Epidemiology, and End Results program, United States, 2001–2014**



* Trends were measured with annual percent change (APC) in rates, calculated using joinpoint regression, which allowed different slopes for as many as three different periods.
† Rates are per 1 million persons and age-adjusted to the 2000 U.S. standard population.
§ APC for acute lymphoblastic leukemia for both sexes and for males was significantly different from zero during 2001–2008.
¶ APC for acute lymphoblastic leukemia for Hispanics was significantly different from zero during 2001–2008.
** Incidence data are compiled from cancer registries that meet the data quality criteria for all years 2001–2014 (covering approximately 98% of the U.S. population). https://www.cdc.gov/cancer/npcr/uscs/data/00_data_quality.htm.

Summary

What is already known about this topic?

Acute lymphoblastic leukemia (ALL) is the most common cancer in children and adolescents in the United States. Past studies using ≤28% population coverage have described increasing incidence of pediatric ALL, especially in Hispanic populations.

What is added by this report?

Analysis of data covering 98% of the U.S. population indicated that the incidence of pediatric ALL increased during 2001–2008 overall and for Hispanics, but then was stable during 2008–2014. The cause for the higher rates of ALL in Hispanic populations and the increase during 2001–2008 is unknown. Incidence of pediatric leukemia during 2001–2014 was highest in the West U.S. Census Region, possibly reflecting the high proportion of Hispanics in many of the region's constituent states.

What are the implications for public health practice?

Increasing incidence of pediatric ALL in certain demographic groups might necessitate changes to cancer control planning, affecting treatment and survivorship care. Continued cancer surveillance will be important in guiding future research, including etiologic studies.

care (*9*), many state health departments have created cancer control plans that aim to address the economic and sociocultural barriers that limit certain groups enrolling in these trials.[§§] Knowledge about rates and trends of pediatric ALL might help tailor the goals of these programs to address local and disease-specific needs. In addition, as incidence and survival of pediatric ALL increase (*1*), public health professionals can use recent ALL incidence data to improve local cancer survivorship programs that address chronic disease management, screen for late effects, and provide resources to help patients maintain a high quality of life (*10*). Public health planners can prioritize issues pertinent to pediatric cancer survivors such as transitioning to adult care and accessing the educational resources that might be available to these patients. Finally, health care professionals and researchers can use surveillance data to inform research questions. Continued surveillance data will be needed to further track incidence changes and public health needs relative to specific demographic groups and geographic areas.

[§§] https://www.cdc.gov/cancer/ncccp/index.htm.

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Conflict of Interest

No conflicts of interest were reported.

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Occupational Animal Exposure Among Persons with Campylobacteriosis and Cryptosporidiosis — Nebraska, 2005–2015

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Campylobacter and *Cryptosporidium* are two common causes of gastroenteritis in the United States. National incidence rates measured for these pathogens in 2015 were 17.7 and 3.0 per 100,000 population, respectively; Nebraska was among the states with the highest incidence for both campylobacteriosis (26.6) and cryptosporidiosis (≥6.01) (*1*). Although campylobacteriosis and cryptosporidiosis are primarily transmitted via consumption of contaminated food or water, they can also be acquired through contact with live animals or animal products, including through occupational exposure (*2*). This exposure route is of particular interest in Nebraska, where animal agriculture and associated industries are an important part of the state's economy. To estimate the percentage of disease that might be related to occupational animal exposure in Nebraska, the Nebraska Department of Health and Human Services (NDHHS) and CDC reviewed deidentified investigation reports from 2005 to 2015 of cases of campylobacteriosis and cryptosporidiosis among Nebraska residents aged ≥14 years. Case investigation notes were searched for evidence of occupational animal exposures, which were classified into discrete categories based on industry, animal/meat, and specific work activity/exposure. Occupational animal exposure was identified in 16.6% of 3,352 campylobacteriosis and 8.7% of 1,070 cryptosporidiosis cases, among which animal production (e.g., farming or ranching) was the most commonly mentioned industry type (68.2% and 78.5%, respectively), followed by employment in animal slaughter and processing facilities (16.3% and 5.4%, respectively). Among animal/meat occupational exposures, cattle/beef was most commonly mentioned, with exposure to feedlots (concentrated animal feeding operations in which animals are fed on stored feeds) reported in 29.9% of campylobacteriosis and 7.9% of cryptosporidiosis cases. Close contact with animals and manure in feedlots and other farm settings might place workers in these areas at increased risk for infection. It is important to educate workers with occupational animal exposure about the symptoms of enteric diseases and prevention measures. Targeting prevention strategies to high-risk workplaces and activities could help reduce disease.

After cases of campylobacteriosis or cryptosporidiosis are reported to the state, investigations are completed by surveillance staff members of local health departments, who contact patients and health care providers or use Electronic Medical Records to collect epidemiologic information, including the patient's occupation. NDHHS and CDC analyzed deidentified reports for all confirmed and probable campylobacteriosis and cryptosporidiosis cases among Nebraska residents aged ≥14 years during 2005–2015 from the Nebraska Electronic Disease Surveillance System. Occupational animal exposure information was abstracted from free text investigation notes by searching all records for relevant keywords. For patients with occupational animal exposure, records were reviewed for type of work and then classified into four industry categories: 1) animal production, 2) animal slaughtering and processing, 3) veterinary services, and 4) other. The animal/meat types mentioned in the free text comments also were classified into four discrete categories: 1) cattle and other bovines, 2) chicken and other poultry, 3) swine, and 4) other or multiple farm animals. Several specific work activities and exposures among cattle production workers, including feedlot exposure, fecal exposure, hauling, and branding cattle were identified.

During 2005–2015, occupational animal exposure was identified among 557 (16.6%) of 3,352 residents of Nebraska aged ≥14 years with campylobacteriosis and 93 (8.7%) of 1,070 with cryptosporidiosis (Table 1). Among both campylobacteriosis and cryptosporidiosis cases, male and younger patients were more likely to have occupational animal exposure than female and older patients. Among campylobacteriosis and cryptosporidiosis cases with occupational animal exposure, 380 (68.2%) and 73 (78.5%) patients, respectively, reported animal production, and 91 (16.3%) and five (5.4%) patients, respectively, reported animal slaughtering and processing (Table 2). Cattle were the most common animal types mentioned among workers in both industries for both diseases. Among workers with campylobacteriosis, poultry and swine were the second and third most commonly reported animal types in both industries. Among cattle production workers, feedlot exposure, fecal exposure, hauling cattle, and branding cattle were reported by 29.9%, 8.9%, 6.6%, and 3.0% of campylobacteriosis patients, respectively, and by 7.9%, 11.1%, 6.3%, and 6.3% of cryptosporidiosis patients, respectively (Figure).

Discussion

Although consumption of contaminated poultry and poultry products is known to be a common source of exposure to *Campylobacter* species (*3*), many other animals also can be infected, including cattle, and infection can be acquired through contact with live animals or contaminated meat.

TABLE 1. Number and percentage of campylobacteriosis and cryptosporidiosis cases, by occupational animal exposure status and selected characteristics — Nebraska, 2005–2015

Characteristic	Campylobacteriosis (N = 3,352)			Cryptosporidiosis (N = 1,070)		
	Occupational animal exposure No. (%)	No occupational animal exposure No. (%)	p-value	Occupational animal exposure No. (%)	No occupational animal exposure No. (%)	p-value
Total	**557 (16.6)**	**2,795 (83.4)**	—	**93 (8.7)**	**977 (91.3)**	—
Sex						
Male	433 (22.0)	1,539 (78.0)	<0.01	57 (12.5)	401 87.6)	<0.01
Female	122 (8.9)	1,243 (91.1)		34 (5.6)	573 (94.4)	
Unknown	2 (13.3)	13 (86.7)		2 (40.0)	3 (60.0)	
Age group (yrs)						
14–24	143 (23.4)	468 (76.6)	<0.01	39 (15.8)	208 (84.2)	<0.01
25–34	128 (20.9)	484 (79.1)		22 (9.2)	218 (90.8)	
35–44	91 (18.5)	400 (81.5)		11 (6.3)	164 (93.7)	
45–54	89 (16.0)	468 (84.0)		12 (9.8)	111 (90.2)	
55–64	53 (10.8)	437 (89.2)		7 (6.3)	105 (93.8)	
≥65	53 (9.0)	538 (91.0)		2 (1.2)	171 (98.8)	
Race/Ethnicity						
White	236 (16.9)	1,163 (83.1)	0.01	37 (8.4)	405 (91.6)	0.21
Black	4 (17.4)	19 (82.6)		0 (—)	20 (100.0)	
Hispanic	20 (32.8)	41 (67.2)		0 (—)	20 (100.0)	
Other	10 (19.6)	41 (80.4)		0 (—)	13 (100.0)	
Unknown	287 (15.8)	1,531 (84.2)		56 (9.7)	519 (90.3)	
Hospitalized						
Yes	102 (15.2)	568 (84.8)	<0.01	22 (10.7)	184 (89.3)	0.19
No	431 (21.1)	1,610 (78.9)		63 (8.9)	649 (91.2)	
Unknown	24 (3.7)	617 (96.3)		8 (5.3)	144 (94.7)	
Outcome						
Died	0 (—)	9 (100.0)	<0.01	0 (—)	3 (100.0)	0.11
Survived	513 (20.2)	2,031 (79.8)		83 (9.6)	785 (90.4)	
Unknown	44 (5.5)	755 (94.5)		10 (5.0)	189 (95.0)	

TABLE 2. Number and percentage of campylobacteriosis and cryptosporidiosis patients who had occupational animal exposure, by industry and type of animal — Nebraska, 2005–2015

Industry (type of animal)	No. (%)	
	Campylobacteriosis	Cryptosporidiosis
Total	**557 (100.0)**	**93 (100.0)**
Animal production	**380 (68.2)**	**73 (78.5)**
(Cattle and other bovines)	271 (71.3)	63 (86.3)
(Chicken and other poultry)	35 (9.2)	0 (—)
(Swine)	21 (5.5)	0 (—)
(Other/Multiple farm animals)	53 (14.0)	10 (13.7)
Animal slaughtering and processing	**91 (16.3)**	**5 (5.4)**
(Beef cattle processing)	52 (57.1)	2 (40.0)
(Poultry processing)	13 (14.3)	0 (—)
(Swine processing)	10 (11.0)	2 (40.0)
(Multiple animals/Unspecified)	16 (17.6)	1 (20.0)
Veterinary services	**24 (4.3)**	**7 (7.5)**
Other (shelter, rescue, pet store)	**62 (11.1)**	**8 (8.6)**

Whereas cryptosporidiosis outbreaks often are associated with contaminated recreational water (*4*), *Cryptosporidium* infections in calves occur commonly, and outbreaks resulting from animal-to-person transmission have been reported (*5*). This report describes occupational animal exposure, including the type of animal, workplace, and activity, among campylobacteriosis and cryptosporidiosis patients in an agricultural state during 2005–2015. One possible explanation for the high incidence rates of these infections in Nebraska is a high rate of exposure to livestock. There were an estimated 6.5 million head of cattle and calves in Nebraska in 2017,* which is 3.4 times more than the state's population of 1.9 million persons.† The overall rate for the United States is 0.3 head of cattle and calves per person.§

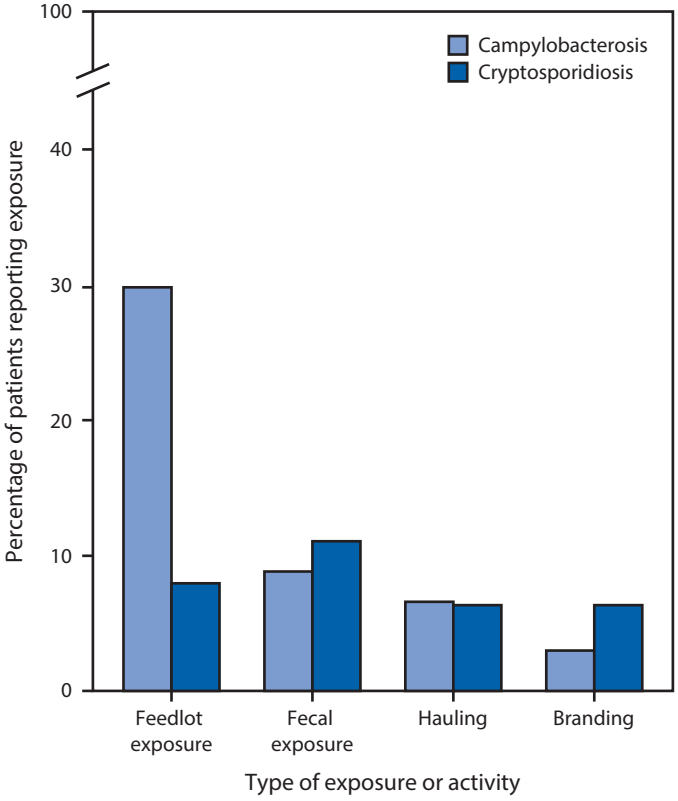
Workers in all animal-related industries, including animal production, animal slaughtering and processing, and other supportive services are at risk for zoonotic enteric diseases because of their daily and long-term exposure to live animals or animal products. Contact with farm animals and animal feces have been identified through a case-control study as risk factors for sporadic *Campylobacter* infection in the United States (*3*). Research has suggested that zoonotic transmission might be frequently associated with sporadic cryptosporidiosis cases (*6*) and that agricultural workers have increased potential for contracting various bovine zoonotic infections (*7*); in 2011, a cluster of *Campylobacter* infections was reported among persons working at a sheep ranch (*8*). Clusters of occupationally

* http://www.nda.nebraska.gov/facts.pdf.

† https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2016_PEPANNRES&src=pt.

§ According to the National Agricultural Statistics Service (https://www.nass.usda.gov/Charts_and_Maps/Cattle/), there were 93,584,600 head of cattle and calves in the United States. The U.S. population estimate was 323,127,513 in 2016.

FIGURE. Percentage of campylobacteriosis (N = 557) and cryptosporidiosis (N = 93) patients with occupational cattle exposure in the animal production industry, by type of exposure or activity* — Nebraska, 2005–2015



* Patients might have more than one exposure or activity.

Summary

What is already known about this topic?

Campylobacteriosis and cryptosporidiosis are two common causes of gastroenteritis, with incidence rates of 26.6 and ≥6.01 per 100,000 population in Nebraska, respectively. Although campylobacteriosis and cryptosporidiosis are primarily transmitted via consumption of contaminated food or water, they can also be acquired through contact with live animals or animal products, exposures which can be occupational.

What is added by this report?

During 2005–2015, occupational animal exposure was identified in 557 of 3,352 (16.6%) campylobacteriosis and 93 of 1,070 (8.7%) cryptosporidiosis cases in Nebraska in persons aged ≥14 years. Animal production (e.g., farming or ranching) was the most common type of industry among patients with occupational animal exposure, and cattle were the most commonly mentioned animal.

What are the implications for public health practice?

It is important that workers with occupational animal exposure be educated about symptoms of enteric diseases and prevention measures, which include using dedicated clothing at work and proper handwashing after touching animals. Routine collection of information on occupation in dedicated fields in infectious disease surveillance systems could improve the use of data to ascertain the extent of occupationally acquired disease and protect workers' health.

acquired cryptosporidiosis also have been reported among veterinary students, firefighters who responded to a fire on a cattle farm, and emergency responders attending to the rollover of a truck carrying calves (*5*). However, the proportion of cases of specific enteric diseases with occupational animal exposure has not been well characterized because occupational information is not universally collected in current infectious disease surveillance systems. In addition, when occupational information is collected, it is usually not recorded in standardized or discrete fields, often precluding data abstraction and analysis.

In this analysis, Nebraska feedlots, farms, and ranches were the most common workplace exposure settings for campylobacteriosis and cryptosporidiosis. Cattle were the animal type most commonly mentioned by patients with both conditions who had occupational animal exposure. Several specific activities and exposures in these workplace settings were mentioned in the investigation reports, including fecal exposure, hauling, and branding cattle. Close contact with animals and manure in feedlots and other farm settings where cattle are more concentrated might place workers in these areas at increased risk for infection. Studies have shown that prevalence of *Campylobacter* in feedlot cattle increases throughout the feeding period (*9*). In addition to having direct exposure, exposed workers might also carry pathogens beyond the workplace, placing family members or other close contacts at risk for exposure and illness.

Beyond on-farm exposures, cases of both campylobacteriosis and cryptosporidiosis were also reported among workers in animal slaughtering and processing facilities in Nebraska. Campylobacteriosis has been previously reported among workers at poultry processing plants, which are known to have a high potential for contamination with *Campylobacter* (*10*). However, most cases reported in Nebraska had occupational animal exposure through cattle slaughtering and processing, which is more prevalent in the state than poultry processing.

The findings in this report are subject to at least three limitations. First, it is not possible to infer causation from reported occupational animal exposure. Other possible exposure sources were not evaluated in this analysis. Second, because occupational animal exposure information was collected only if a patient volunteered such information or if an investigator asked for it informally, these estimates likely are conservative, and the actual proportion of ill persons having occupational animal exposures remains unknown. Finally, standardization of data collection was not emphasized among staff members who completed the interviews and investigations in multiple

local health departments. As a result, misclassification and underestimation might have occurred despite use of a consistent process to manually review and classify cases.

This report describes types and percentages of occupational animal exposures among campylobacteriosis and cryptosporidiosis patients in Nebraska, which could represent important disease transmission routes in an agricultural state and have not been reported previously. Studies specifically focusing on pathogen transmission between animals and workers are needed to clarify the role of occupational animal contact in such diseases and identify effective strategies to minimize occupational risk. It is important that workers with occupational animal exposure be educated about symptoms of diseases and preventive measures, which include using dedicated clothing at work and proper handwashing after touching animals.¶ Routine collection of information on occupation via infectious disease surveillance systems could improve capture of data to ascertain the extent of occupationally acquired disease and establish causation. Regular review by employers and public health professionals of all cases of illness among animal industry workers in order to detect the potential for workplace acquisition could help in planning interventions to promote workers' health.

¶ http://umash.umn.edu/wp-content/uploads/2015/11/Cryptosporidium-MDH.pdf and http://umash.umn.edu/wp-content/uploads/2015/11/Campylobacter-MDH.pdf.

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Conflict of Interest

No conflicts of interest were reported.

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Updated Dosing Instructions for Immune Globulin (Human) GamaSTAN S/D for Hepatitis A Virus Prophylaxis

Noele P. Nelson, MD[1]

GamaSTAN S/D (Grifols Therapeutics, Inc., Research Triangle Park, North Carolina) is a sterile, preservative-free solution of immune globulin (IG) for intramuscular administration and is used for prophylaxis against disease caused by infection with hepatitis A, measles, varicella, and rubella viruses (*1*). GamaSTAN S/D is the only IG product approved by the Food and Drug Administration for hepatitis A virus (HAV) prophylaxis. In July 2017, GamaSTAN S/D prescribing information was updated with changes to the dosing instructions for hepatitis A preexposure and postexposure prophylaxis indications. These changes were made because of concerns about decreased HAV immunoglobulin G antibody (anti-HAV IgG) potency, likely resulting from decreasing prevalence of previous HAV infection among plasma donors, leading to declining anti-HAV antibody levels in donor plasma (*2*). No changes in dosing instructions were made for measles, varicella, or rubella preexposure or postexposure prophylaxis.

Following are the updated recommended doses of GamaSTAN S/D for hepatitis A preexposure and postexposure prophylaxis (*2*).

Preexposure Prophylaxis in Persons Who Plan to Travel in Areas with High or Intermediate Hepatitis A Endemicity

The recommended dosages of GamaSTAN S/D, which vary according to planned duration of travel are as follows (Table):

- Up to 1 month: 0.1 mL/kg
- Up to 2 months: 0.2 mL/kg
- 2 months or longer: repeat dose of 0.2 mL/kg every 2 months.

Postexposure Prophylaxis of Household and Institutional Hepatitis A Case Contacts

The recommended dosage of GamaSTAN S/D is 0.1 mL/kg (Table). There is no maximum dosage of GamaSTAN S/D for hepatitis A prophylaxis (*1*).

The effect of IG preparations on the response to certain live-virus vaccines is unknown, but antibodies in GamaSTAN S/D might interfere with live-virus vaccines such as measles, mumps, and rubella (MMR) vaccine and varicella vaccine (*1*,*3*). The recommendations for the timing of administration of GamaSTAN S/D with live-virus vaccines has not changed (*1*,*3*). The Advisory Committee on Immunization Practices (ACIP) recommends that MMR and varicella vaccines should be administered at least 2 weeks before or at least 3 months after the administration of IG preparations (*1*). If an IG preparation must be administered less than 2 weeks after the administration of MMR or varicella vaccine, the patient should be revaccinated no sooner than 3 months after receipt of the IG preparation.

TABLE. Indications and updated dosage recommendations for GamaSTAN S/D human immune globulin for preexposure and postexposure prophylaxis against hepatitis A infection

Indication	Updated dosage recommendation
Preexposure prophylaxis	
Up to 1 month of travel	0.1 mL/kg
Up to 2 months of travel	0.2 mL/kg
2 months of travel or longer	0.2 mL/kg (repeat every 2 months)
Postexposure prophylaxis	0.1 mL/kg

The absolute lower limit of anti-HAV IgG required to prevent HAV infection has not been defined; however, 10 mIU/mL is considered to be the minimum protective level for HAV prophylaxis (*1*,*4*). The minimum anti-HAV IgG potency specified by the European Pharmacopoeia for intramuscular IG preparations indicated for HAV prophylaxis is >100 IU/mL (*5*). A recent study showed that only two of nine tested lots of commercially available IG preparations manufactured in the United States, Europe, and Asia had anti-HAV IgG potency of 100 IU/mL (*6*). In addition, anti-HAV IgG decay models indicate that only five of nine lots of IG dosed at 0.02 mL/kg achieved postabsorption plasma anti-HAV IgG levels above the minimum protective level of 10 mIU/mL (*6*). The decay model also showed that none of the tested IG lots maintained the proposed minimal protective anti-HAV IgG level of 10 mIU/mL for 3 months (*6*).

Indications for the use of IG are based on ACIP recommendations published in 2007 for prevention of hepatitis A infection after exposure to HAV and in international travelers (*7*).

Preexposure Prophylaxis for International Travel

Hepatitis A vaccine at the age-appropriate dose is preferred to IG. For travel that will begin in ≤2 weeks to countries with high or intermediate hepatitis A endemicity, older adults, immunocompromised persons, and persons with chronic liver disease or other chronic medical conditions may receive IG simultaneously with hepatitis A vaccine at a separate anatomic injection site. Travelers who elect not to receive hepatitis A vaccine, who are aged <12 months, or who are allergic to a component of hepatitis A vaccine should receive a single dose of IG before travel (*7*).

Postexposure Prophylaxis

IG should be used for children aged <12 months, immunocompromised persons, persons who have chronic liver disease, and persons for whom vaccine is contraindicated. IG is also preferred over hepatitis A vaccine for persons aged >40 years; however, vaccine may be used if IG cannot be obtained (*7*).

Conflict of Interest

No conflicts of interest were reported.

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2. Important change in prescribing information immune globulin (human): GamaSTAN S/D https://www.hypermunes.com/documents/24720443/24803488/Healthcare+Provider+Letter+GamaSTAN+SD+Revised+Dosage+July+7+2017_with+LIT+CODE.pdf/b831e517-9d0b-472c-b5b5-719f5bb5e47c
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Notes from the Field

Vibrio cholerae Serogroup O1, Serotype Inaba — Minnesota, August 2016

Victoria Hall, DVM[1,2]; Carlota Medus, PhD[2]; George Wahl, MPH[2]; Alida Sorenson, MPH[3]; Melanie Orth[2]; Monica Santovenia, MS[4]; Erin Burdette, MPH[4]; Kirk Smith, DVM, PhD[2]

On August 20, 2016, the Minnesota Department of Health (MDH) was notified of a case of *Vibrio cholerae* infection. The isolate was identified as serogroup O1, serotype Inaba at MDH. CDC determined that the isolate was nontoxigenic. The patient was a previously healthy woman, aged 43 years, with history of gastric bypass surgery. On August 16, she experienced profuse watery diarrhea, vomiting, abdominal cramps, and headache. On August 18, she sought care and submitted the stool specimen that yielded the *V. cholerae* isolate. She reported no recent travel. However, she had consumed ceviche made with raw shrimp and raw oysters at restaurant A on August 14, 49 hours before illness onset. Her husband had a similar illness with a similar incubation period after eating the same foods at restaurant A.

On August 22, MDH sanitarians visited restaurant A and obtained tags and invoices for oyster and shrimp products; the oysters were a product of the United States, and the shrimp was a product of India. Sanitarians also gathered patron contact information and credit card receipts for August 12–14. Two additional patrons reported experiencing a gastrointestinal illness that met the case definition of three or more episodes of watery stool in a 24-hour period within 5 days of eating at restaurant A; one reported eating ceviche and oysters at restaurant A. Review of complaints to the MDH foodborne illness hotline revealed a previous complaint from two persons who reported experiencing watery diarrhea after eating raw shrimp ceviche (but no oysters) at restaurant A on August 2. These persons did not provide stool specimens, but their gastrointestinal illnesses met the case definition, resulting in a total of six cases, including one laboratory-confirmed case. No other *V. cholerae* O1 Inaba cases were reported in the United States during this outbreak.

The Minnesota Department of Agriculture facilitated sampling of shrimp at the distributor from the same lots served at restaurant A on August 14, and most likely during August 2–13, and sent them to the Food and Drug Administration for culture. Shrimp samples yielded *V. cholerae* non-O1, non-O139, but *V. cholerae* O1 was not isolated. In response to the outbreak results, restaurant A placed consumer warnings on their menus about the risks of consuming raw or undercooked food items and identified raw menu items for consumers. Restaurant A also focused on other actions that might facilitate reduction of *V. cholerae*, including appropriate freezing of food items, and allowing raw food items to soak in lime juice before being served, rather than serving the items immediately after adding lime juice (*1*,*2*).

V. cholera has over 150 serogroups and has been identified in a wide range of aquatic life, including seafood (*3*). Whereas multiple serogroups can cause vibriosis, only serogroups O1 and O139 that also contain the cholera toxin are classified as causes of cholera (*4*). Previous studies have documented the presence of nontoxigenic *V. cholerae* O1 from environmental and shrimp samples in India and Southeast Asia (*5*–*7*).

This outbreak of domestically acquired, nontoxigenic *V. cholerae* infections, likely from shrimp consumption, included the first *V. cholerae* O1 case identified in a nontraveler in Minnesota since active surveillance for *Vibrio* began in 1996. Since 1996, MDH has detected 26 *V. cholerae* infections, 21 (81%) of which were non-O1, non- O139, and five of which were O1. Among the four O1 type cases identified before the current outbreak, all patients had a recent travel history to Micronesia or India. This outbreak demonstrates the importance of investigating all seafood eaten by patients with vibriosis. In addition, investigators should include nontoxigenic *V. cholerae* as a possible etiology of domestic foodborne outbreaks, particularly when foods eaten include those from *V. cholerae* O1–endemic areas.

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Karen Wong, Cheryl Tarr, Division of Foodborne, Waterborne and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases, CDC; Heidi DeBeck, Food and Drug Administration; Minnesota Department of Health, Team Diarrhea.

Conflict of Interest

No conflicts of interest were reported.

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Announcements

Childhood Cancer Awareness Month — September 2017

September marks Childhood Cancer Awareness Month. Each year, approximately 15,000 U.S. children and adolescents aged <20 years receive a cancer diagnosis; leukemia, brain tumors, and lymphoma are the most common types of cancers that affect this age group (*1*). During the past 4 decades, largely because of advances in the efficacy of treatment and supportive care, 5-year relative survival for childhood cancers increased from 62% to 85% (*2*). However, for some childhood cancers, such as brain or bone tumors, 5-year relative survival remains <75% (*2*). In addition, child and adolescent cancer survivors often face long-term complications, including heart disease, infertility, or secondary cancers related to their treatment, and need lifelong survivorship care planning (*3*).

CDC addresses the needs of children and adolescents living with, through, and beyond cancer by collecting and analyzing data and using scientific knowledge to develop and implement interventions. CDC works with local, state, and national partners to address disparities in referral to, enrollment in, and availability of childhood cancer clinical trials. To strengthen cancer survivorship care for children and adolescents, CDC collaborates with partner agencies to research barriers to clinical trial enrollment and interventions to improve care planning and self-management after completion of cancer treatment.

United States Cancer Statistics surveillance data (https://nccd.cdc.gov/uscs/) are important for monitoring childhood cancer incidence and mortality. CDC's Pediatric and Young Adult Early Case Capture program (https://www.cdc.gov/cancer/npcr/early-case-capture.htm) specializes in rapid reporting of childhood cancer data, which can provide clinicians, researchers, and public health professionals with timely, relevant data. Additional information is available at https://www.cdc.gov/cancer/.

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National Child Passenger Safety Week — September 17–23, 2017

In 2017, National Child Passenger Safety Week is being observed during September 17–23. In the United States, motor vehicle–related injuries are a leading cause of death among children (*1*). In 2015, a total of 663 passenger-vehicle occupants aged ≤12 years died as a result of a crash (*2*), and nearly 132,000 were injured (*1*). Among the children who died in 2015, 35% were known to be unrestrained (*2*). To keep child passengers as safe as possible, drivers should use age- and size–appropriate restraints for all child passengers until adult seat belts fit properly (lap belts should lay across upper thighs, not abdomen, and shoulder belts should lay across the middle of the shoulder and chest, not the neck or face) and follow the American Academy of Pediatrics' child passenger safety recommendations (*3*). Children aged <13 years should be properly restrained in the back seat.

As part of National Child Passenger Safety Week, September 23 has been designated "National Seat Check Saturday." On this day, drivers with children who ride in car seats or booster seats are encouraged to visit a child safety seat inspection station to have a certified technician inspect their car seat for proper installation and proper use, free of charge. Additional information and an inspection station locator are available from CDC at https://www.cdc.gov/motorvehiclesafety/child_passenger_safety and the National Highway Traffic Safety Administration at https://www.safercar.gov/parents/index.htm. Campaign promotional materials in English and Spanish are available at https://www.trafficsafetymarketing.gov/get-materials/child-car-safety/child-passenger-safety-week.

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Announcements

Community Preventive Services Task Force Recommendation for Interventions Engaging Community Health Workers for Diabetes Management

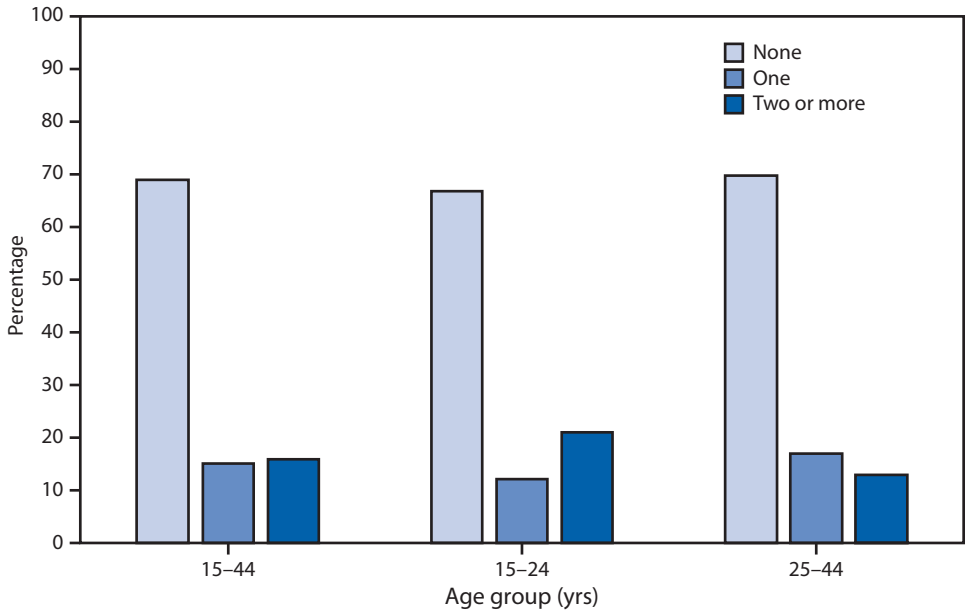
The Community Preventive Services Task Force (CPSTF) recently posted new information on its website: "Diabetes Management: Interventions Engaging Community Health Workers." The information is available at https://www.thecommunityguide.org/findings/diabetes-management-interventions-engaging-community-health-workers.

Established in 1996 by the U.S. Department of Health and Human Services, the CPSTF is an independent, nonfederal panel of public health and prevention experts whose members are appointed by the director of CDC. The CPSTF provides information for a wide range of persons who make decisions about programs, services, and other interventions to improve population health. Although CDC provides administrative, scientific, and technical support for the CPSTF, the recommendations developed are those of the CPSTF and do not undergo review or approval by CDC.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Women Who Missed Taking Oral Contraceptive Pills* Among Women Aged 15–44 Years Who Used Oral Contraceptive Pills and Had Sexual Intercourse, Overall and by Age and Number of Pills Missed — National Survey Of Family Growth, United States, 2013–2015†



* Percentages are based on women who used oral contraceptive pills in the past 4 weeks and had sexual intercourse in the past 12 months, who were asked the question "Still thinking about the past 4 weeks, how many pills that you were supposed to take did you miss? Would you say you never missed a pill, missed only one pill, or missed two or more pills?"

† Estimates are based on interviews of the U.S. household population aged 15–44 years.

Among women aged 15-44 years who used oral contraceptive pills in the last 4 weeks and had sexual intercourse in the past 12 months, 69% of women reported missing no pills, 15% missed one pill, and 16% missed two or more pills. Across the two age groups (15–24 years and 25–44 years), similar percentages of women aged 15–24 years reported missing no pills (67%) compared with women aged 25–44 years (70%). Similar percentages of women aged 15–24 years reported missing one pill (12%) compared with women aged 25–44 years (17%). A higher percentage of women aged 15–24 years (21%) reported missing two or more pills compared with women aged 25–44 years (13%).

Source: National Survey of Family Growth, 2013–2015. https://www.cdc.gov/nchs/nsfg/index.htm.

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