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Assessment of Emergency Responders After a Vinyl Chloride Release from a Train Derailment — New Jersey, 2012

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On November 30, 2012, at approximately 7:00 am, a freight train derailed near a small town in New Jersey. Four tank cars, including a breached tank car carrying vinyl chloride, landed in a tidal creek. Vinyl chloride, a colorless gas with a mild, sweet odor, is used in plastics manufacture. Acute exposure can cause respiratory irritation and headache, drowsiness, and dizziness; chronic occupational exposure can result in liver damage, accumulation of fat in the liver, and tumors (including angiosarcoma of the liver) (*1*). Because health effects associated with acute exposures have not been well studied, the New Jersey Department of Health requested assistance from the Agency for Toxic Substances and Disease Registry (ATSDR) and CDC. On December 11, teams from these agencies deployed to assist the New Jersey Department of Health in conducting an assessment of exposures in the community as well as the occupational health and safety of emergency personnel who responded to the incident. This report describes the results of the investigation of emergency personnel. A survey of 93 emergency responders found that 26% of respondents experienced headache and upper respiratory symptoms during the response. A minority (22%) reported using respiratory protection during the incident. Twenty-one (23%) of 92 respondents sought medical evaluation. Based on these findings, CDC recommended that response agencies 1) implement the Emergency Responder Health Monitoring and Surveillance (ERHMS) system (*2*) for ongoing health monitoring of the emergency responders involved in the train derailment response and 2) ensure that in future incidents, respiratory protection is used when exposure levels are unknown or above the established occupational exposure limits.

The CDC team created a self-administered survey based on the ATSDR toolkit for the assessment of chemical exposures (*3*) to assess health effects, use of personal protective equipment, and preparedness training among emergency responders who worked at the incident site at any time during November 30–December 7, 2012. The CDC team met with emergency response leaders and local responders during the period December 11–21. Emergency responders completed surveys during the meetings, and those who did not attend any meetings had the option of mailing in a survey; 93 completed surveys were received.

Responders were categorized by profession, including emergency medical services, firefighters, police officers, and hazardous material technicians, and by cumulative duration of exposure. Because a typical work shift lasts 12 hours, participants were categorized as working ≤12 hours or >12 hours at the incident site during the entire 8-day period.

Symptoms were grouped according to clinical presentation (i.e., neurologic [dizziness, weakness, and loss of balance], upper respiratory [runny nose, burning nose or throat, and

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hoarseness], and lower respiratory [shortness of breath, chest tightness, wheezing, and burning chest sensations]). Coughing, increased congestion, and increased phlegm are presented separately from other respiratory indicators because their causes could be upper or lower respiratory in nature. Headache; nausea and vomiting; irritation, pain, or burning of the eyes and skin; and diarrhea were also reported.

Use of personal protective equipment, including respiratory protection, was assessed as well. In addition, respondents were asked questions to evaluate preparedness training. A bivariate analysis was conducted using statistical software.

A total of 93 surveys were completed, though not all questions were answered in all surveys. Of these, 72 were completed during meetings with emergency response leaders and local responders, and 21 were mailed in at a later time. Ninety-six percent of respondents were male and white, and the median age of respondents was 42 years (range = 19–78 years). Forty-eight percent (44 of 92) of respondents reported spending >12 hours at the site, and 52% (48 of 92) reported spending ≤12 hours at the site.

The most frequently reported symptoms were headache (26%), upper respiratory symptoms (26%), and lower respiratory symptoms (22%) (Table 1). Other symptoms reported included coughing; neurologic symptoms; nausea and vomiting; congestion or phlegm; irritation, pain, or burning of the eyes; irritation, pain, or burning of the skin; and diarrhea (Table 1). The prevalence odds ratios for lower and upper respiratory symptoms; irritation, pain, or burning of the eyes; and headache were significantly associated with an exposure >12 hours (Table 2).

Twenty-three percent (21 of 92) of respondents reported wearing no personal protective equipment (Figure). When asked a separate question about respirator types, 20 respondents (22%) reported donning a self-contained breathing apparatus during the response, although it is unclear when respiratory protection was used during the response. Of these 20 respondents, one was an emergency medical services worker, one was a police officer, two were hazardous material technicians, and 16 were firefighters. One reported using both a self-contained breathing apparatus and a powered air-purifying respirator, another reported using a full-face air-purifying respirator, and one reported using an air-purifying respirator but did not specify which type. Forty-nine percent (35 of 72) of respondents who reported they did not wear respiratory protection on initial arrival at the site stated that respiratory protection was not required for their work, 24% (17 of 72) stated none was available, 17% (12 of 72) stated they were not advised to wear respiratory protection, and 17% (12 of 72) stated they did not think they needed it. Eight percent (six of 72) of respondents reported they were told respiratory protection was not necessary, and 1% (one of 72) stated that it got in the way of work. Categories are not mutually exclusive.

Discussion

The Occupational Safety and Health Administration (OSHA) permissible exposure limit for vinyl chloride is 1 part per million, based on an 8-hour time-weighted average (*4*).

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TABLE 1. Self-reported symptoms of emergency responders (N = 93) after a vinyl chloride release from a train derailment — New Jersey, 2012

Symptom*	No.	(%)
Headache	24	(26)
Upper respiratory	24	(26)
Lower respiratory	20	(22)
Coughing	15	(16)
Neurologic	14	(15)
Nausea or vomiting	14	(15)
Increased congestion or phlegm	11	(12)
Irritation, pain, or burning of eyes	11	(12)
Other	3	(3)
Irritation, pain, and burning of skin	2	(2)
Diarrhea	1	(1)

* Symptoms are not mutually exclusive.

TABLE 2. Odds of reporting selected symptoms, by hours worked in evacuation zone (>12 hours versus ≤12 hours), among emergency responders (N = 93) after a vinyl chloride release from a train derailment — New Jersey, 2012

Symptom*	Prevalence OR	95% CI
Lower respiratory	14.1	3.0–135.0
Irritation, pain, or burning of eyes	5.8	1.1–58.6
Upper respiratory	3.9	1.3–13.9
Headache	3.6	1.2–11.8
Coughing	3.2	0.8–15.2
Neurologic	3.2	0.8–15.2
Increased congestion or phlegm	2.8	0.6–18.0
Nausea or vomiting	2.2	0.6–9.1

Abbreviations: OR = odds ratio; CI = confidence interval.
* Symptoms are not mutually exclusive.

CDC recommends reducing vinyl chloride exposures to the lowest feasible concentration because it has been designated a potential occupational carcinogen (*5*). According to OSHA regulations, employees engaged in emergency response who have potential exposures to hazardous substances should wear a positive pressure respirator until the incident commander determines (through the use of air monitoring) that a decreased level of respiratory protection will not result in hazardous exposures to employees (*6*). During the emergency response described in this report, exposure monitoring was unavailable, and the majority of respondents did not use respiratory protection. The need for respirators and selection of particular respirator types are determined by an exposure risk assessment. The implementation of a respiratory protection program, including the use of exposure monitoring to determine when respirator use is required, might assist emergency responders in future events.

Symptoms were commonly reported by first responders, most frequently headache, upper respiratory irritation, and lower respiratory irritation. Because personal breathing zone measurements of responders' exposures to vinyl chloride were not collected, it is impossible to correlate vinyl chloride exposure levels with symptoms. On the basis of the OSHA and CDC guidance described previously, respiratory protection would likely have been required for many first responders. Proximity to the evacuation zone and assigned job task could be used as proxy indicators of the need for respirator use.

The findings in this report are subject to at least three limitations. First, complete rosters of emergency responders who worked in the evacuation zone and the period over which work shifts occurred were unavailable; therefore, the study was lacking a strong denominator. Selection bias likely occurred because the sample consisted of emergency responders who attended the scheduled meetings and completed the survey there or who obtained surveys from emergency response leaders and mailed them in; an accurate account of responders who arrived on the scene is not available so it is possible that there were a number of emergency responders who could not attend the meetings or were never given a survey. Second, personal breathing zone measurements of responders' exposures to vinyl chloride were not collected, so it is impossible to correlate vinyl chloride exposure levels with symptoms. Finally, the small number of participants who completed the survey made it impossible to meaningfully analyze the associations between respirator use and symptoms.

For ongoing health monitoring of the emergency responders involved in the train derailment response, and to prepare for future incidents, the response agencies involved should consider implementing the ERHMS system, a framework that includes recommendations and specific tools to protect

What is already known on this topic?

Vinyl chloride, a gas used to make plastics, is an acute respiratory irritant that can cause headache, drowsiness, and dizziness. Chronic exposure can damage the liver.

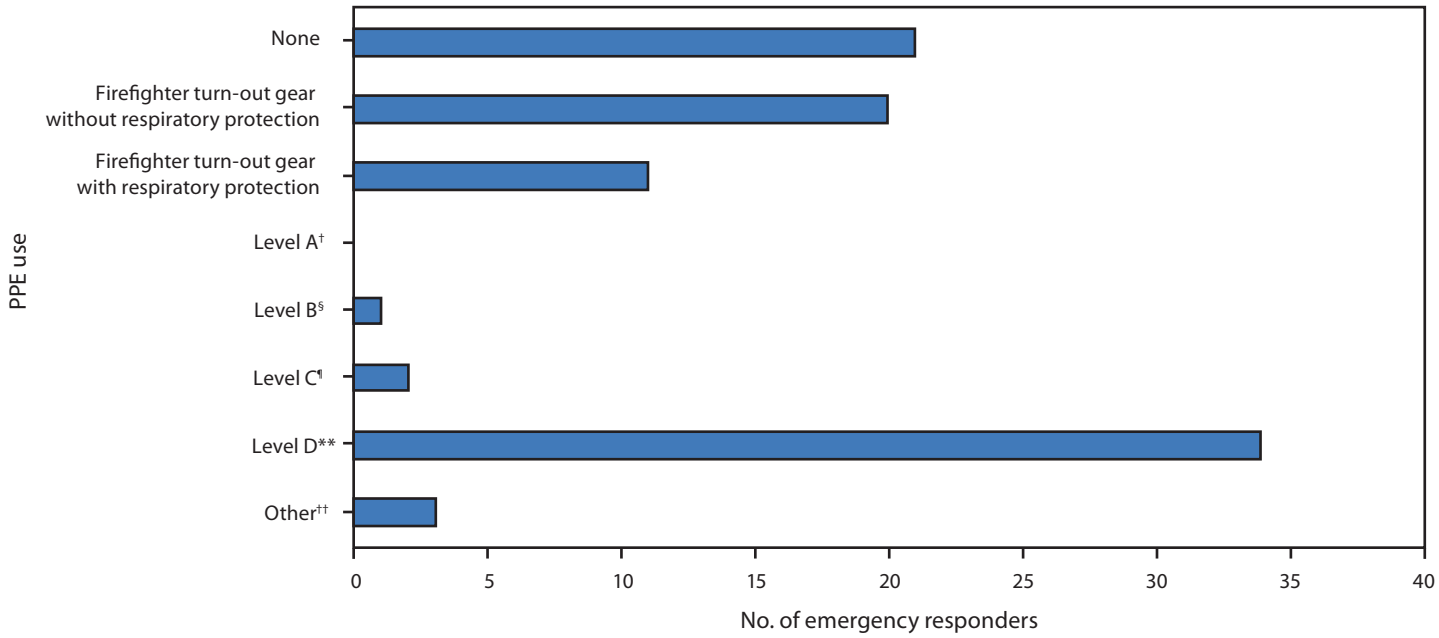
What is added by this report?

In December 2012, vinyl chloride was released from a breached tank car after a train derailment in New Jersey. A survey of 93 emergency responders found that 26% experienced headache and upper respiratory symptoms during the response. Only 22% reported using respiratory protection during the incident, and 23% sought medical evaluation. Most respondents reported having received some emergency responder training and felt they had sufficient instruction, indicating a possible gap in perception of risk.

What are the implications for public health practice?

In similar incidents, health officials are encouraged to implement a framework for health monitoring and surveillance of emergency responders, encourage use of respiratory protection until engineering controls and work practices can be implemented that reduce exposure to below the appropriate occupational exposure limit, and evaluate training needs for all emergency response roles.

FIGURE. Personal protective equipment (PPE)* use among emergency responders (N = 92) after a vinyl chloride release from a train derailment — New Jersey, 2012



* Information on PPE levels and risks available at https://www.csepportal.net/csepp_portal_resources/ppe_factsheet.pdf and http://www.cdc.gov/niosh/docs/2008-132/pdfs/2008-132.pdf.
† Level A: Recommended when greatest potential for exposure to skin and respiratory system exists. Includes a pressure-demand, full face-piece; a self-contained breathing apparatus; and a fully-encapsulating, chemical-resistant suit.
§ Level B: Recommended when highest level of respiratory protection is indicated but skin at a lesser level. Includes a pressure-demand, full face-piece; a self-contained breathing apparatus; and chemical-resistant clothing.
¶ Level C: Recommended when concentration or type of substance is known and criteria for respiratory use are met. Includes a full face-piece or half-mask; an air-purifying, canister-equipped respirator; and chemical-resistant clothing.
** Level D: Recommended when minimum protection is required. Includes a simple work uniform.
†† Other forms of PPE include coveralls, gloves, safety glasses, composite-toed shoes, and hard hats.

emergency responders during all phases of a response, including pre-deployment, deployment, and post-deployment. Respiratory protection should be used until engineering controls and work practices that reduce employees' exposures to below the appropriate occupational exposure limit (OSHA-permissible exposure limit or CDC-recommended exposure limit) can be implemented. Implementation should follow the OSHA respiratory protection standard (*7*). A positive pressure respirator should be used when exposure levels are unknown and until they have been determined to be below the appropriate occupation exposure limit. Furthermore, the authority having jurisdiction and the various emergency response departments can refer to existing National Fire Protection Association standards (*8*).

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Vital Signs: Alcohol Poisoning Deaths — United States, 2010–2012

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On January 6, 2015, this report was posted as an MMWR *Early Release on the* MMWR *website (http://www.cdc.gov/mmwr).*

Abstract

Background: Alcohol poisoning is typically caused by binge drinking at high intensity (i.e., consuming a very large amount of alcohol during an episode of binge drinking). Approximately 38 million U.S. adults report binge drinking an average of four times per month and consuming an average of eight drinks per episode.

Methods: CDC analyzed data for 2010–2012 from the National Vital Statistics System to assess average annual alcohol poisoning deaths and death rates (ICD-10 codes X45 and Y15; underlying cause of death) in the United States among persons aged ≥15 years, by sex, age group, race/ethnicity, and state.

Results: During 2010–2012, an annual average of 2,221 alcohol poisoning deaths (8.8 deaths per 1 million population) occurred among persons aged ≥15 years in the United States. Of those deaths, 1,681 (75.7%) involved adults aged 35–64 years, and 1,696 (76.4%) involved men. Although non-Hispanic whites accounted for the majority of alcohol poisoning deaths (67.5%; 1,500 deaths), the highest age-adjusted death rate was among American Indians/Alaska Natives (49.1 per 1 million). The age-adjusted rate of alcohol poisoning deaths in states ranged from 5.3 per 1 million in Alabama to 46.5 per 1 million in Alaska.

Conclusions: On average, six persons, mostly adult men, die from alcohol poisoning each day in the United States. Alcohol poisoning death rates vary substantially by state.

Implications for Public Health Practice: Evidence-based strategies for preventing excessive drinking (e.g., regulating alcohol outlet density and preventing illegal alcohol sales in retail settings) could reduce alcohol poisoning deaths by reducing the prevalence, frequency, and intensity of binge drinking.

Introduction

Excessive alcohol use accounted for an average of one in 10 deaths among working-age adults (aged 20–64 years) in the United States each year during 2006–2010 (*1*), and cost the United States $223.5 billion in 2006 (*2*). Binge drinking, defined as consuming four or more drinks for women or five or more drinks for men on an occasion, was responsible for more than half of these deaths (*1*) and three fourths of the economic costs (*2*). Binge drinking also is responsible for many health and social problems, including alcohol poisoning (*3*). Yet, approximately 38 million U.S. adults report binge drinking an average of four times per month, and consume an average of eight drinks per binge episode (*4*). Most binge drinkers (90%) are not alcohol dependent (*5*).

Alcohol poisoning is typically caused by binge drinking at high intensity. Such drinking can exceed the body's physiologic capacity to process alcohol, causing the blood alcohol concentration to rise. The clinical signs and symptoms of alcohol intoxication are progressive, and range from minimal impairment, decreased judgment and control, slurred speech, reduced muscle coordination, vomiting, and stupor (reduced level of consciousness and cognitive function) to coma and death. However, an individual's response to alcohol is variable depending on many factors, including the amount and rate of alcohol consumption, health status, consumption of other drugs, and metabolic and functional tolerance of the drinker (*6,7*).

Reducing the proportion of adults engaging in binge drinking (objective SA-14.3) and reducing the number of deaths attributable to alcohol (objective SA-20), including deaths from alcohol poisoning, are among the objectives in *Healthy People 2020* (*8*). Reducing drug abuse and excessive alcohol use are also key components of the National Prevention Strategy (*9*).

Methods

CDC analyzed multiple cause-of-death mortality files for 2010–2012 from the National Vital Statistics System (*10*) to

Key Points

- An annual average of 2,221 alcohol poisoning deaths, or six deaths per day, occurred in the United States during 2010–2012.
- Alcohol poisoning is typically caused by binge drinking at high intensity (i.e., consuming a very large amount of alcohol during an episode of binge drinking).
- Three in four of those who died were adults aged 35–64 years, and three in four decedents were men.
- Almost 70% of the deaths were among non-Hispanic whites; however, the highest age-adjusted alcohol poisoning death rate was among American Indians/Alaska Natives (49.1 deaths per 1 million).
- The age-adjusted alcohol poisoning death rate in states ranged from 5.3 deaths per 1 million in Alabama to 46.5 deaths per 1 million in Alaska.
- Several evidence-based strategies effective in reducing excessive alcohol use and related harms have been identified and recommended.
- Additional information is available at http://www.cdc.gov/vitalsigns.

assess average annual alcohol poisoning deaths among persons aged ≥15 years in the United States. Alcohol poisoning deaths were defined as those with *International Classification of Diseases, 10th Revision* (ICD-10) underlying (i.e., principal) cause of death codes X45 (accidental poisoning by and exposure to alcohol) and Y15 (poisoning by and exposure to alcohol, undetermined intent). Alcohol poisoning death rates per 1 million were calculated by sex, age group, and race/ethnicity for persons aged ≥15 years using the U.S. Census bridged-race population for 2010–2012 as the denominator, and were age-adjusted to the 2000 U.S. Census standard population. State death rates also were calculated and age-adjusted to the 2000 U.S. Census standard population.

Selected conditions that might have directly contributed to alcohol poisoning deaths, including alcohol dependence (F10.2), hypothermia (X31, T68, T69.9), drug poisoning (T36–T50), and drug use mental disorders (F11–F16, F18, F19), also were assessed among persons who died of alcohol poisoning.

Results

During 2010–2012, there was an annual average of 2,221 alcohol poisoning deaths, an age-adjusted rate of 8.8 deaths per 1 million population, among persons aged ≥15 years in the United States (Table 1). Of these deaths, 1,681 (75.7%) were among adults aged 35–64 years, and 1,696 (76.4%) were among men. The highest death rate from alcohol poisoning was among men aged 45–54 years (25.6 deaths per 1 million). Although non-Hispanic whites accounted for the majority of alcohol poisoning deaths (67.5%; 1,500 deaths), the highest age-adjusted alcohol poisoning death rate was among American Indians/Alaska Natives (49.1 deaths per 1 million). A total annual average of 44 deaths (2.0%) involved persons aged 15–20 years, who were under the legal drinking age of 21.

The age-adjusted alcohol poisoning death rate in states ranged from 5.3 per 1 million in Alabama to 46.5 per 1 million in Alaska (Table 2). Twenty states had alcohol poisoning death rates greater than the overall national rate of 8.8 per 1 million, and two states (Alaska and New Mexico) had alcohol poisoning death rates >30 per 1 million. States with the highest death rates were located mostly in the Great Plains and western United States, but also included two New England states (Rhode Island and Massachusetts) (Figure).

Alcohol dependence was listed as a contributing cause of death in an annual average of 677 (30.4%) of the deaths from alcohol poisoning, and hypothermia was listed as a contributing cause of death in an annual average of 134 (6.0%) deaths. Drug poisoning and drug use mental disorders were listed as contributing causes of death in an annual average of 62 (2.8%) and 86 (3.9%) deaths from alcohol poisoning, respectively.

Conclusions and Comment

The results in this report indicate that during 2010–2012 there was an average of six deaths from alcohol poisoning each day among persons aged ≥15 years in the United States. Three in four of these deaths involved adults aged 35–64 years, and three in four of these deaths involved males. Nearly 70% of the deaths were among non-Hispanic whites; however, the highest alcohol poisoning death rate was among American Indians/Alaska Natives (49.1 deaths per 1 million).

The large proportion of alcohol poisoning deaths (75.7%) among adults aged 35–64 years is consistent with recent findings that two thirds (69%) of all average annual alcohol-attributable deaths in the United States involve adults aged 20–64 years (*1*). Alcohol-attributable deaths also result in substantial losses in workplace productivity and were responsible for >70% of the $223.5 billion in economic costs attributed to excessive drinking in the United States in 2006 (*2*). This finding also is consistent with the distribution of binge drinking episodes in the United States, most of which are reported by adults aged ≥26 years (*11*).

The large proportion of alcohol poisoning deaths among non-Hispanic whites is consistent with the high prevalence of binge drinking in this population (*4*). The high alcohol poisoning death rate among American Indians/Alaska Natives also is consistent with the high binge drinking intensity that has been

TABLE 1. Alcohol poisoning deaths,* by sex, age group, and race/ethnicity — National Vital Statistics System, United States, 2010–2012

Characteristic	Total			Male			Female		
	Average annual no. of deaths	% of total deaths	Age-adjusted rate†	Average annual no. of deaths	% of male deaths	Age-adjusted rate†	Average annual no. of deaths	% of female deaths	Age-adjusted rate†
Overall	**2,221**	**100.0**	**8.8**	**1,696**	**100.0**	**13.7**	**525**	**100.0**	**4.1**
Age group§ (yrs)									
15–24	113	5.1	2.6	85	5.0	3.8	28	5.4	1.3
25–34	288	13.0	6.9	228	13.4	10.9	60	11.4	2.9
35–44	476	21.4	11.7	370	21.8	18.2	106	20.2	5.2
45–54	747	33.6	16.7	564	33.3	25.6	183	34.8	8.1
55–64	458	20.6	12.2	352	20.7	19.3	107	20.3	5.5
≥65	139	6.3	3.3	98	5.8	5.4	41	7.9	1.8
Race/Ethnicity									
White, non-Hispanic	1,500	67.5	8.8	1,103	65.0	13.1	397	75.6	4.6
Black, non-Hispanic	191	8.6	6.2	149	8.8	10.6	42	8.1	2.6
Hispanic	338	15.2	9.0	296	17.5	15.6	41	7.9	2.4
American Indian/ Alaska Native	154	6.9	49.1	114	6.7	75.0	39	7.5	24.3
Asian/Pacific Islander	32	1.5	2.2	28	1.7	4.1	4	0.8	—¶

* Alcohol poisoning deaths included those occurring among persons aged ≥15 years in which alcohol poisoning was classified as the underlying (i.e., principal) cause of death based on *International Classification of Diseases, 10th Revision* (ICD-10) codes X45 (accidental poisoning by and exposure to alcohol) and Y15 (poisoning by and exposure to alcohol, undetermined intent).

† Rates per 1 million population for persons aged ≥15 years were calculated using U.S. Census bridged-race population for 2010–2012, and were age-adjusted to the 2000 U.S. Census standard population.

§ Age-specific rate.

¶ Number of deaths was too small to meet standards of reliability and precision to calculate age-adjusted death rate.

reported by binge drinkers in this population (*4*). A recent study found that American Indians/Alaska Natives were seven times more likely to die from alcohol poisoning than whites, reflecting both the higher intensity of binge drinking among binge drinkers in this population and other factors, such as geographic isolation and reduced access to medical care (*12*).

Differences in alcohol poisoning death rates in states reflect known differences in state binge drinking patterns, which are strongly influenced by state and local laws governing the price and availability of alcohol (*13*), as well as other cultural and religious factors (*14*). A recent study that examined the relationship between various subgroups of state alcohol policies and binge drinking among adults found that a small number of policies that raised alcohol prices and reduced its availability had the greatest impact on binge drinking in states (*15*). However, other factors, in addition to differences in binge drinking rates, also might be important contributors to differences in alcohol poisoning death rates. For example, living in geographically isolated rural areas might increase the likelihood that a person with alcohol poisoning will not be found before death or that timely emergency medical services will not be available.

Although alcohol dependence was a contributing cause of death in 30% of alcohol poisoning deaths, the majority of these deaths involved persons for whom alcohol dependence was not listed as a contributing cause of death. This result is consistent with the results of a recent study that found that nine in 10 adults who drink excessively were not alcohol dependent, including more than two thirds of those who reported binge drinking ≥10 times per month (*5*).

The findings in this analysis are subject to at least three limitations. First, alcohol-attributable deaths, including alcohol poisoning, are underreported (*16*–*18*). Second, this study was restricted to deaths in which alcohol poisoning was the underlying cause of death, and did not include deaths in which alcohol poisoning was a contributing cause of death. A previous study found that there were three times as many deaths in which alcohol poisoning was a contributing, rather than underlying cause of death (*19*). Finally, mortality data might underestimate the actual number of deaths for American Indians/Alaska Natives (*12*) and certain other racial/ethnic populations (e.g., Hispanics) because of misclassification of race/ethnicity of the decedents on death certificates (*20*).

There are several recommended evidence-based, population-level strategies to reduce excessive drinking and related harms, such as regulating alcohol outlet density (i.e., the concentration of retail alcohol establishments, including bars and restaurants and liquor or package stores, in a given geographic area) and preventing illegal alcohol sales in retail settings (e.g., commercial host [dram shop] liability) (*21*,*22*). The status of each state's policies related to some of these recommendations are available from CDC online (at http://www.cdc.gov/psr/alcohol). Screening and brief intervention for excessive alcohol use, including binge drinking, among adults has also been recommended

TABLE 2. Average annual number of alcohol poisoning deaths,* by state — National Vital Statistics System, United States, 2010–2012

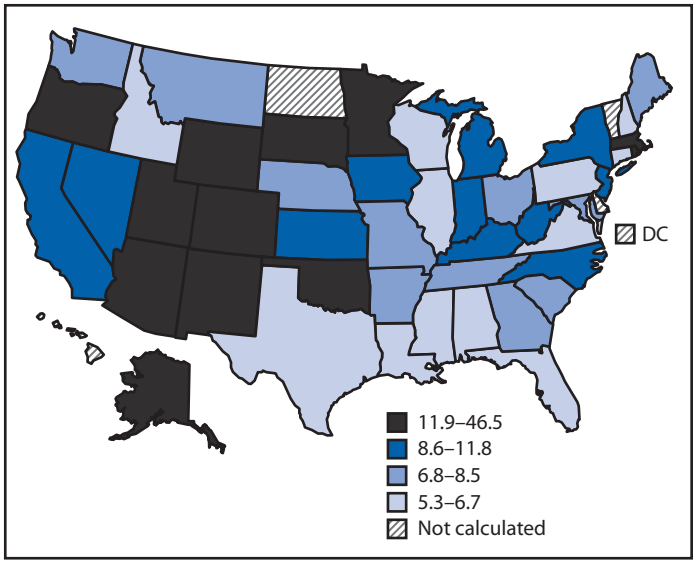
State†	Average annual no. of deaths	Age-adjusted rate§
Quartile 1 (5.3–6.7 death rate)		
Alabama	20	5.3
Texas	109	5.4
Illinois	57	5.6
Virginia	40	5.9
Wisconsin	28	6.0
Idaho	8	6.1
Louisiana	22	6.2
Pennsylvania	68	6.5
Connecticut	19	6.6
Florida	103	6.7
Mississippi	15	6.7
New Hampshire	8	6.7
Quartile 2 (6.8–8.5 death rate)		
Ohio	64	6.9
South Carolina	28	7.4
Missouri	38	7.7
Tennessee	41	7.8
Georgia	62	7.8
Arkansas	17	7.8
Maryland	37	7.8
Washington	46	8.1
Maine	9	8.1
Nebraska	11	8.1
Montana	7	8.5
Quartile 3 (8.6–11.8 death rate)		
Indiana	43	8.6
North Carolina	68	8.6
New York	143	8.8
Kentucky	32	9.1
Kansas	22	9.6
Iowa	23	9.7
Michigan	77	9.7
Nevada	21	9.8
New Jersey	74	9.9
California	299	9.9
West Virginia	17	11.2
Quartile 4 (11.9–46.5 death rate)		
Massachusetts	67	11.9
Oklahoma	37	12.6
Oregon	42	12.7
Colorado	60	14.4
Minnesota	73	16.4
Utah	33	16.7
South Dakota	11	17.0
Wyoming	8	17.7
Arizona	93	18.7
Rhode Island	21	22.8
New Mexico	52	32.7
Alaska	27	46.5

* Alcohol poisoning deaths included those occurring among those aged ≥15 years in which alcohol poisoning was classified as the underlying (i.e., principal) cause of death based on *International Classification of Diseases, 10th Revision* (ICD-10) Codes: X45 (Accidental poisoning by and exposure to alcohol), Y15 (Poisoning by and exposure to alcohol, undetermined intent).

† The average annual number of alcohol poisoning deaths in Delaware, District of Columbia, Hawaii, North Dakota, and Vermont was less than seven and therefore, did not meet standards of reliability and precision to calculate age-adjusted death rates.

§ Rates per 1 million population for persons aged ≥15 years were calculated using U.S. Census bridged-race population for 2010–2012, and were age-adjusted to the 2000 U.S. Census standard population.

FIGURE. Age-adjusted alcohol poisoning* death rates,† by state§ — National Vital Statistics System, United States, 2010–2012



* Alcohol poisoning deaths included those occurring among those aged ≥15 years in which alcohol poisoning was classified as the underlying (i.e., principal) cause of death based on *International Classification of Diseases, 10th Revision* (ICD-10) codes X45 (accidental poisoning by and exposure to alcohol) and Y15 (poisoning by and exposure to alcohol, undetermined intent).

† Rates per 1 million population for persons aged ≥15 years were calculated using U.S. Census bridged-race population for 2010–2012, and were age-adjusted to the 2000 U.S. Census standard population.

§ The average annual number of alcohol poisoning deaths in Delaware, District of Columbia, Hawaii, North Dakota, and Vermont was less than seven and therefore, did not meet standards of reliability and precision to calculate age-adjusted death rates.

(*23*). However, a recent study found that only one in six U.S. adults overall, one in five current drinkers, and one in four binge drinkers in 44 states and the District of Columbia reported ever discussing alcohol use with a doctor or other health professional. Furthermore, 65.1% of those who reported binge drinking ≥10 times in the past month had never had this dialogue (*24*).

Death from alcohol poisoning is a serious and preventable public health problem in the United States. A comprehensive approach to the prevention of excessive drinking that includes evidence-based community and clinical prevention strategies is needed to decrease alcohol poisoning deaths and other harms attributable to excessive alcohol use.

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Notes from the Field

Acute Flaccid Myelitis Among Persons Aged ≤21 Years — United States, August 1–November 13, 2014

Division of Viral Diseases, National Centers for Immunization and Respiratory Diseases, CDC; Division of Vector-Borne Diseases, Division of High-Consequence Pathogens and Pathology, National Center for Emerging and Zoonotic Infectious Diseases, CDC; Children's Hospital Colorado; Council of State and Territorial Epidemiologists

In August 2014, physicians at Children's Hospital Colorado in Aurora, Colorado, noted a cluster of cases of acute limb weakness among children (*1*). Most patients were found to have distinctive abnormalities of the central spinal cord (i.e., gray matter) on magnetic resonance imaging, and most reported a respiratory or febrile illness preceding the onset of neurologic symptoms. On September 12, the Colorado Department of Public Health and Environment alerted CDC about this cluster. These cases coincided with a national outbreak of severe respiratory disease among children caused by enterovirus D68 (EV-D68) (*2*).

On September 26, CDC issued a health advisory requesting state and local health departments to report cases and send specimens to CDC for testing (*3*). A case was defined as acute onset of focal limb weakness occurring on or after August 1, 2014, and a magnetic resonance image showing a spinal cord lesion largely restricted to gray matter in a patient aged ≤21 years.

As of November 13, CDC had verified reports of 88 cases in 32 states (Figure). The median age of patients was 7.6 years (range = 5 months–20 years), and 54 (61%) were males. Limb weakness was asymmetrical in most patients. Cranial nerve motor dysfunction was reported in 30 (34%) cases. Six (7%) patients had altered mental status, and three (3%) had seizures. Most patients reported a respiratory illness (81%), a febrile illness (68%), or both, occurring before neurologic symptom onset; 8% had neither condition. Among 86 patients for whom past medical history was reported, 65 (76%) were previously healthy, and 21 (24%) had underlying illnesses, most commonly asthma (nine [10%]). All but one patient was hospitalized because of neurologic illness, and 17 (19%) required ventilator support. Among 80 patients from whom cerebrospinal fluid was obtained, 68 (85%) showed a moderate pleocytosis and normal or mildly elevated protein. Information regarding current clinical status was reported for 77 patients (median follow-up = 19 days). Of those, 49 (64%) reported some symptom improvement, and 28 (36%) showed no improvement; none were fully recovered. No deaths were reported.

Among 71 patients with cerebrospinal fluid testing performed by their health care providers, state and local public health departments, or CDC, no enteroviruses or other pathogens have been confirmed to date. Among 41 patients whose upper respiratory tract samples were available for enterovirus/rhinovirus testing at CDC, 17 (41%) tested positive: eight (20%) for EV-D68 and nine (22%) for eight other enterovirus/rhinovirus types. Of the 19 patients whose upper respiratory tract samples were obtained <14 days from respiratory illness onset, 10 (53%) were positive: seven (37%) for EV-D68 and three (16%) for rhinoviruses. Laboratory testing for other pathogens is ongoing.

On November 7, CDC published interim clinical management considerations, summarizing expert opinion based on current evidence on management and care of children with acute flaccid myelitis (*4*). CDC continues to collaborate with partners nationally to investigate reported cases, risk factors, and possible etiologies of this condition. Although the specific causes of this illness are still under investigation, and causal relationship to EV-D68 has not yet been substantiated, being up to date on all recommended vaccinations is essential to prevent a number of severe diseases. Vaccine-preventable diseases include poliomyelitis, which is caused by poliovirus; infection with this enterovirus can present with acute flaccid paralysis. There are also numerous other vaccine-preventable diseases that can result in severe illness. Prevention of viral infections includes general hygienic measures, such as frequent hand washing with soap and water, avoiding close contact with sick persons, and disinfecting frequently touched surfaces. Additional information is available at http://www.cdc.gov/flu/protect/habits/index.htm. If a child appears to have a sudden onset of weakness in arms or legs, caregivers should contact a health care provider to have the child assessed for possible neurologic illness. Health care providers are encouraged to report patients meeting the case definition to their state or local health department. Health departments should report patients with illness meeting the case definition to CDC using a brief patient summary form* and may contact CDC by e-mail to arrange further laboratory testing (limbweakness@cdc.gov). Additional information is available at http://www.cdc.gov/ncird/investigation/viral/sep2014.html.

* Available at http://www.cdc.gov/ncird/downloads/patient-summary-form.pdf.

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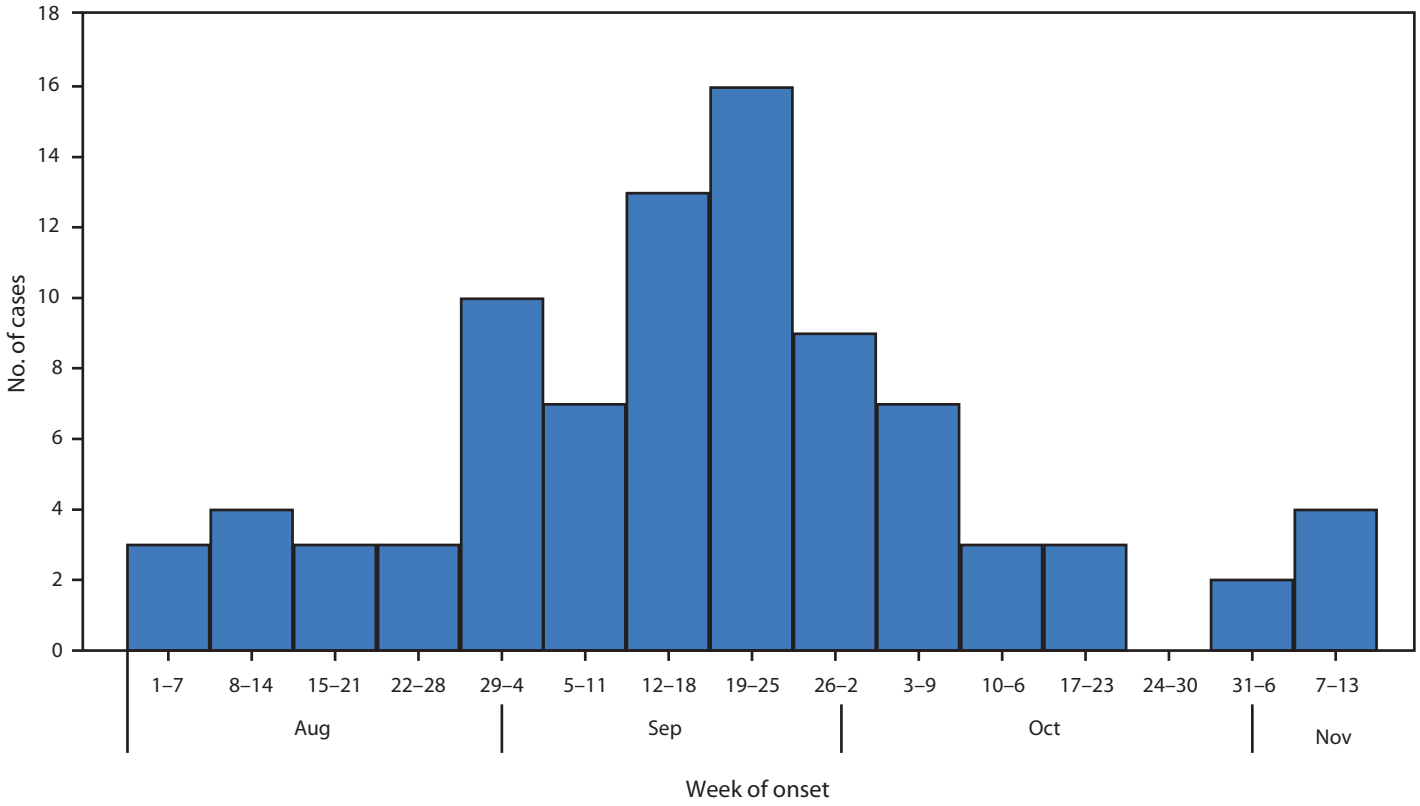
FIGURE. Number of confirmed cases of neurologic illness with limb weakness (N = 87), by week of onset — United States, August 1–November 13, 2014*



* Exact onset date was not reported for one case (for this case the neurologic symptom onset was reported in an unspecified date during the last week of September).

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Notes from the Field

Occupationally Acquired HIV Infection Among Health Care Workers — United States, 1985–2013

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(Author affiliations at end of text)

Case investigations of human immunodeficiency virus (HIV) infection in health care workers (HCWs) possibly acquired by exposure to HIV in the workplace are conducted by state health department HIV surveillance staff members with assistance from CDC. Since 1991, reports of occupationally acquired HIV in HCWs have been recorded by the National HIV Surveillance System following a standardized case investigation protocol. HCWs are defined as all paid and unpaid persons working in health care settings with the potential for exposure to infectious materials (e.g., blood, tissue, and specific body fluids) or contaminated medical supplies, equipment, or environmental surfaces. HCWs can include but are not limited to physicians, nurses, dental personnel, laboratory personnel, students and trainees, and persons not directly involved in patient care (e.g., housekeeping, security, and volunteer personnel). In 1987, CDC recommended the use of "universal precautions," which became a part of "standard precautions" in 1995, to prevent occupational HIV exposures. Since 1996, occupational postexposure prophylaxis with antiretrovirals to prevent infection has been recommended.

A confirmed case of occupationally acquired HIV infection requires documentation that seroconversion in the exposed HCW is temporally related to a specific exposure to a known HIV-positive source. An HCW should immediately report an exposure event to a supervisor or facility-designated person in accordance with the institution's infection control procedures. The serostatus of the source patient and of the exposed HCW should be documented at the time of the exposure and, exposed HCWs should be counseled on risk and offered postexposure prophylaxis as appropriate.

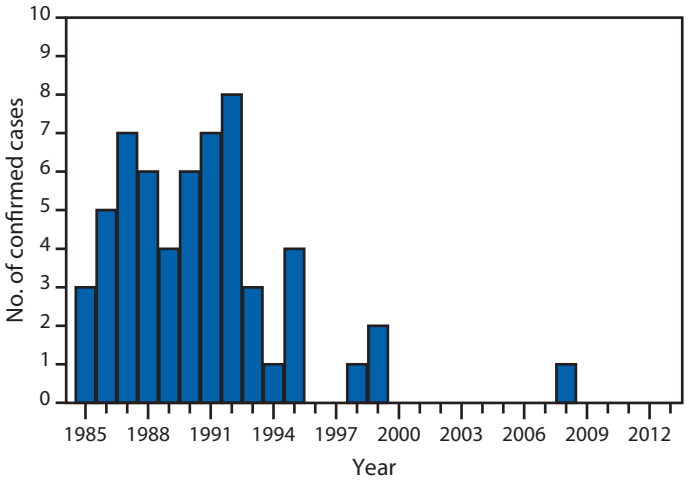
A possible case of occupationally acquired HIV infection is defined as an infection in an HCW whose job duties might have exposed the HCW to HIV but who lacks a documented workplace exposure. If the HIV status of the source patient is unknown or the HCW's seroconversion after exposure was not documented as temporally related, occupational acquisition of HIV infection is possible but cannot be confirmed.

During 1985–2013, 58 confirmed and 150 possible cases of occupationally acquired HIV infection among HCWs were reported to CDC; since 1999, only one confirmed case (a laboratory technician sustaining a needle puncture while working with a live HIV culture in 2008) has been reported (*1*; Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC, unpublished data, 2014) (Figure). Among the 58 confirmed cases, the routes of exposure resulting in infection were: percutaneous puncture or cut (49 cases), mucocutaneous exposure (five), both percutaneous and mucocutaneous exposure (two), and unknown (two). A total of 49 HCWs were exposed to HIV-infected blood, four to concentrated virus in a laboratory, one to visibly bloody fluid, and four to unspecified body fluids. Occupations of the HCWs with confirmed or possible HIV infection have varied widely (Table).

CDC recommends the use of standard precautions to prevent exposure of HCWs to potentially infectious body fluids when working with any patient, whether known to be infected with HIV or not (*2*). HCWs should assume that body fluids from all patients are infectious even if the patients are not known to be infected with HIV. Proper implementation of standard precautions (e.g., use of safety devices and barriers such as gloves and goggles) minimizes exposure risk. To prevent unintentional puncture injuries, CDC recommends a comprehensive prevention program consistent with requirements of the Occupational Safety and Health Administration's bloodborne pathogens standard.* Medical devices engineered for sharps† protection (e.g., needleless systems) should be used. Used devices such

* 29 CFR 1910.1030.
† Needles, blades, broken glass, and other sharp objects.

FIGURE. Number of confirmed cases (N = 58) of occupationally acquired HIV infection among health care workers reported to CDC — United States, 1985–2013



Abbreviation: HIV = human immunodeficiency virus.
Source: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.

TABLE. Number of confirmed or possible cases of occupationally acquired HIV infection among health care workers reported to CDC — United States, 1985–2013

Occupation	Confirmed (N = 58)		Possible (N = 150)	
	No.	(%)	No.	(%)
Nurse	24	(41.4)	37	(24.7)
Laboratory technician, clinical	16	(27.6)	21	(14.0)
Physician, nonsurgical	6	(10.3)	13	(8.7)
Laboratory technician, nonclinical	4	(6.9)	—	—
Housekeeper/maintenance	2	(3.4)	14	(9.3)
Technician, surgical	2	(3.4)	2	(1.3)
Embalmer/morgue technician	1	(1.7)	2	(1.3)
Hospice caregiver/attendant	1	(1.7)	16	(10.7)
Respiratory therapist	1	(1.7)	2	(1.3)
Technician, dialysis	1	(1.7)	3	(2.0)
Dental worker, including dentist	—	—	6	(4.0)
Emergency medical technician/ paramedic	—	—	13	(8.7)
Physician, surgical	—	—	6	(4.0)
Technician/Therapist, other	—	—	9	(6.0)
Other health care occupations	—	—	6	(4.0)

Abbreviation: HIV = human immunodeficiency virus.
Source: Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.

as syringes or other sharp instruments should be disposed of in sharps containers without any attempt to recap needles. HCWs should immediately wash hands and other skin surfaces after contact with blood or body fluids. Although preventing exposures to blood and body fluids is the most important strategy for preventing occupationally acquired HIV, when occupational exposures do occur, appropriate postexposure management is critical. Guidelines for the management of occupational exposures to HIV and recommendations for postexposure prophylaxis have been published (*3*).

Documented occupational acquisition of HIV infection in HCWs has become rare in the United States. Few confirmed cases have been reported since the late 1990s. Whereas the paucity of cases could be the result of underreporting, it might indicate the effectiveness of more widespread and earlier treatment to reduce patient viral loads, combined with prevention strategies such as postexposure management and prophylaxis as well as improved technologies and training to reduce sharps injuries and other exposures. All cases of suspected occupationally acquired HIV infection in HCWs need to be promptly reported to state health department HIV surveillance staff and the CDC coordinator for Cases of Public Health Importance, Division of HIV/AIDS Prevention, at 404-639-0934 or 404-639-2050.

[1]Division of HIV/AIDS Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC; [2]Division of Healthcare Quality Promotion, National Center for Emerging and Zoonotic Infectious Diseases, CDC (Corresponding author: M. Patricia Joyce, pjoyce@cdc.gov, 404-639-0934)

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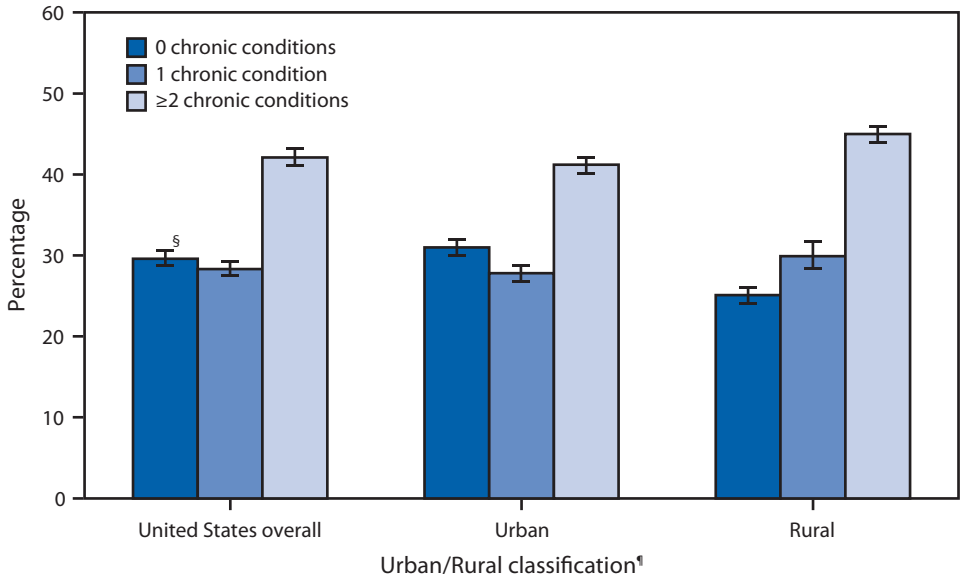
QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Adults Aged ≥45 Years with Selected Diagnosed Chronic Conditions,* by Number of Conditions and Urban/Rural Classification — National Health Interview Survey, 2013†



* The 10 selected chronic conditions are hypertension, coronary heart disease, stroke, diabetes, cancer, arthritis, hepatitis, chronic obstructive pulmonary disease (COPD), weak or failing kidneys during the past 12 months, currently having asthma. COPD was defined as having emphysema or chronic bronchitis during the past 12 months, or both. Unless a timeframe is otherwise noted, chronic conditions are based on ever being told by a doctor or other health professional that the respondent has the condition.

† Estimates are based on household interviews of a sample of the noninstitutionalized U.S. civilian population and are derived from the National Health Interview Survey sample adult component.

§ 95% confidence interval.

¶ The 2000 U.S. Census definition was used in this classification, where adults residing in a core of census tracts and/or census blocks with a population of 2,500 persons or more were considered living in an urban area. Adults living in census tracts and/or census blocks with fewer than 2,500 were considered living in a rural area.

In 2013, 29.6% of U.S. adults aged ≥45 years had none of the 10 selected diagnosed chronic conditions, 28.3% had one condition, and 42.1% had multiple (two or more) conditions. A higher percentage of adults aged ≥45 years living in rural areas had multiple chronic conditions compared with adults in urban areas (45.0% versus 41.2%), whereas a lower percentage had none (25.1% versus 31.0%).

Source: National Health Interview Survey, 2013 data. Available at http://www.cdc.gov/nchs/nhis.htm.

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