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U.S-Acquired Human Rabies with Symptom Onset and Diagnosis Abroad, 2012

On July 8, 2012, a U.S. resident was admitted to a hospital in Dubai, United Arab Emirates, for evaluation of right arm spasticity, anxiety, and malaise. By the next day, the patient had become comatose following a period of agitation. On July 31, he died. Investigators from CDC, state, and local health departments determined that the patient acquired rabies from contact in March with a bat in California. Person-to-person transmission of rabies has been documented in cases of organ and tissue transplantation and is theoretically possible if infectious saliva or tears are introduced into fresh open wounds or onto mucous membranes (*1*–*8*). Once symptoms begin, rabies is almost always fatal. While he was potentially infectious, during June 11–July 31, the patient traveled on eight international flights through six countries. To date, 59 persons have been identified as contacts, and 23 persons have been administered postexposure prophylaxis (PEP); no secondary cases have been identified. Bites or scratches from bats or other animals suspected of having rabies should be regarded seriously; victims should promptly seek consultation with public health practitioners and medical-care providers. This report highlights the need for collaboration to 1) identify persons who potentially had contact with infectious materials from a person infected with rabies, 2) conduct a risk assessment, and 3) provide prophylaxis to all those with a reasonable risk for contact with infectious materials (e.g., tears, saliva, or neural tissue from a person with rabies contacting open wounds or mucous membranes of an uninfected person).

Case Report

On June 25, 2012, a previously healthy California resident aged 34 years developed right arm and shoulder pain and exhaustion while vacationing in Thailand (Figure). On July 5, he traveled from Bangkok, Thailand, to Dubai, United Arab Emirates, to Iraq, where he returned to his civilian job in Basra. Upon arrival in Basra, he visited medical clinic A, where he was prescribed a topical steroid and phenobarbital for arm tremors and spasticity. On July 8, he visited medical clinic B with spastic arm movements, sweating, anxiety, and malaise. He was afebrile, had a pulse of 72 beats per minute, respiratory rate of 14 breaths per minute, and a blood pressure of 151/89 mmHg. He was treated with lorazepam and referred to a hospital in Dubai for suspected dystonia.

On July 8, the man flew from Iraq to Dubai, where he was hospitalized on the same day. On July 9, he developed progressive agitation and coma, and was intubated. Computed tomographic imaging demonstrated cerebral edema but no evidence of brain herniation. His persistent muscle spasms were treated with sedatives and paralytics. He developed rhabdomyolysis. On July 29, at his family's request, he was flown by air ambulance to Zurich, Switzerland. On July 31, he died; physicians at Uster Hospital in Zurich suspected rabies.

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

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Laboratory Diagnostic Testing at Swiss Rabies Center

Banked serum collected on July 29 and tested on August 8 was positive for antibodies to rabies virus by rapid fluorescent focus inhibition test. A rabies diagnosis was confirmed by fluorescent antibody testing of brain tissue at the Swiss Rabies Center on August 22. Reverse transcriptase polymerase chain reaction showed that the patient's viral RNA sequence was similar to a viral variant associated with the insectivorous Mexican free-tailed bat, *Tadarida brasiliensis*, a species common in the southern United States and Mexico (Andrea Nina Deubelbeiss, Institute of Veterinary Virology, Berne, Switzerland, personal communication, 2012).

Public Health Investigation

On August 27, a friend of the deceased telephoned CDC to report the U.S. resident's death in Switzerland from rabies. The friend said Swiss doctors had recommended that she receive rabies PEP. On August 28, the National Focal Point (NFP)* of Switzerland notified the NFP of the United States and CDC that a U.S. resident died of laboratory-confirmed rabies in Switzerland. The patient was considered to have been potentially infectious during June 11–July 31, the period from 2 weeks before onset of symptoms (when humans can begin to shed rabies virus in saliva and tears) until his death. CDC collaborated with international, state, and local public health officials to interview friends, family, and coworkers to identify persons with potential physical contact with the patient and determine how the patient was exposed to rabies. For countries with residents potentially exposed to the patient (e.g., via saliva or tears), CDC notified NFPs via e-mail that a public health investigation was ongoing.

During June 11–July 31, while potentially infectious, the patient had traveled extensively, including to California, the United Arab Emirates, Iraq, Taiwan, Thailand, and Switzerland (Table). During June 11–13, the patient worked in Iraq. During June 13–14, he flew from Iraq to Dubai to San Francisco, California. An in-flight contact was defined, per CDC rabies program guidelines, as anyone sitting immediately next to the patient. Two in-flight contacts were identified. The first, a resident of Iran, initiated PEP after risk assessment by the Iran Ministry of Health. The second was interviewed by officials in India, who identified no risk for exposure.

During June 14–18, the patient visited family and friends in California. Three of four contacts in California reported having possible exposure to the patient's saliva, and PEP was recommended. The patient flew from San Francisco to Thailand via Taiwan during June 18–19. One U.S. resident sat next to the patient during the flight from San Francisco to Taiwan. This person was interviewed, and no exposure to the patient's saliva or tears was identified. The patient vacationed in Thailand from June 19 to July 5 and reportedly had two

*A national center that is accessible at all times for communications with World Health Organization International Health Regulations points of contact. Additional information at http://www.who.int/ihr/English2.pdf.

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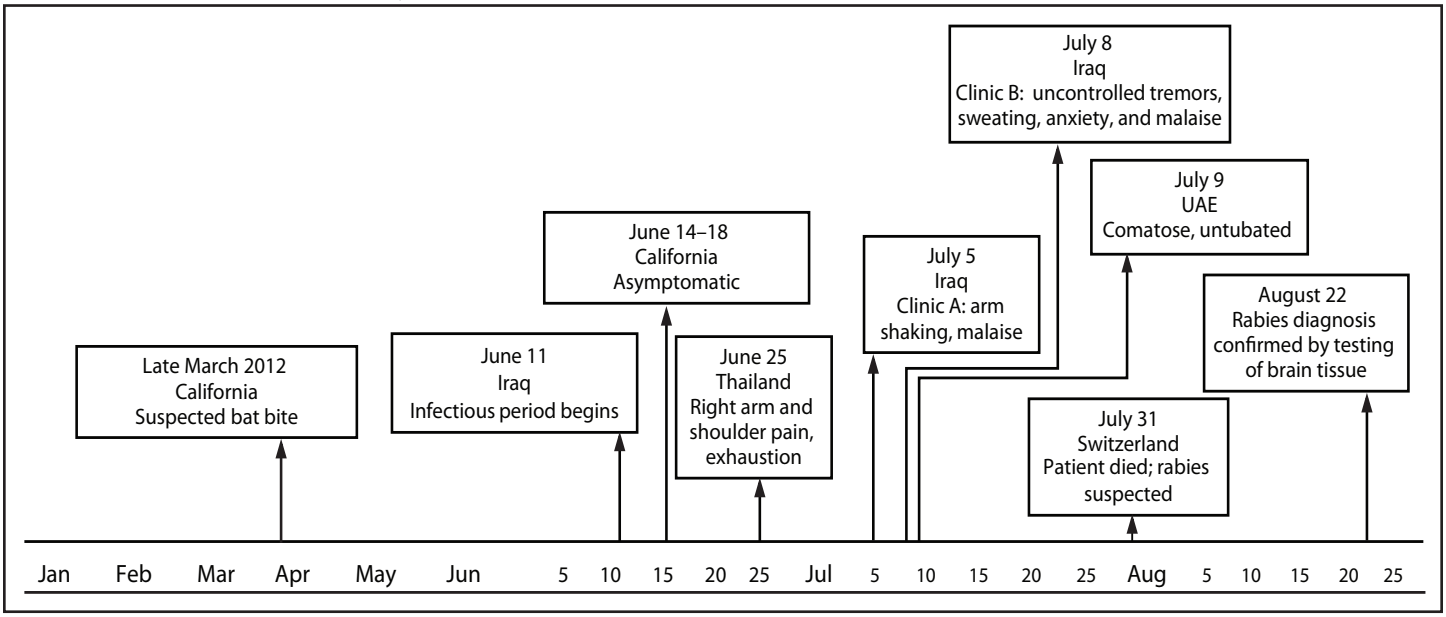
FIGURE. Timeline of events, reported symptoms, and diagnosis in a case of human rabies in a U.S. resident — March–August 2012



Abbreviations: UAE = United Arab Emirates.

TABLE. International travel history of U.S. resident with rabies and number of contacts identified and administered postexposure prophylaxis (PEP) — June 13–July 31, 2012

Date	Location	No. of contacts identified*	No. of contacts administered PEP†
June 13	Flight 1 - Iraq to Dubai, United Arab Emirates	—	—
June 14	Flight 2 - Dubai to San Francisco, California	2	1
June 14–18	Contra Costa County, California	4	3
June 18	Flight 3 – San Francisco, California to Taiwan	1	0
June 19	Flight 4 - Taiwan to Bangkok, Thailand	—	—
June 19–July 5	Thailand	2	1
July 5	Flight 5 - Bangkok to Dubai	—	—
July 5	Flight 6 - Dubai to Iraq	—	—
July 5–8	Iraq	12	2
July 8	Flight 7 - Iraq to Dubai	—	—
July 8–29	Dubai Hospital	18	0
July 29	Flight 8 - Dubai to Switzerland	4	0
July 29–31	Switzerland hospital	16	16
June 13–July 31	**TOTAL**	**59**	**23**

* A contact was any person identified by public health officials as potentially having contact with infectious materials from the U.S. resident with rabies.
† PEP was administered to those contacts whom public health officials determined had a reasonable risk for contact with infectious materials (e.g., tears, saliva, or neural tissue) from the person with rabies.

close contacts who were potentially exposed to infectious saliva or tears. One contact was a Thai national who received PEP. The second contact could not be located.

On July 5, the patient flew from Bangkok, Thailand, to Dubai, to Basra to report for work. On arrival in Basra he sought care at medical clinic A. Eight persons (one medical staff member and seven coworkers) were identified by the patient's employer as in physical contact with the patient and subsequently received risk assessments. One contact was administered PEP after risk assessment by a local physician. On July 8, the patient visited medical clinic B, where he had contact with four health-care workers. Of these, one was administered PEP after reporting direct contact with the patient's saliva. On July 8 the patient flew from Basra to Dubai, where he was immediately hospitalized. Eighteen health-care workers at the Dubai hospital were assessed for risk by the Ministry of Health. No Dubai hospital contacts had indications for PEP. On July 29, the patient was flown by emergency air ambulance to Switzerland where he was hospitalized until his death on July 31. Four contacts were identified on the medical flight;

none were indicated for PEP. Thirteen medical providers and three family members received PEP because of potential exposure at the Swiss hospital where he was treated.

Investigation of Animal Exposures

Numerous potential animal exposures were investigated, including potential contact with roosting bats while working on a bridge at night, potential feral cat contact, and bat sightings by neighbors, all occurring in 2012 in California, and a bat sighting inside his home in Texas in 2010. Definitive bat contact was not identified with any of these potential exposures. However, 3 weeks after initiating the investigation, on September 14, local public health officials in California were contacted by an acquaintance who reported that in late March 2012 she had observed the patient touch a bat while in California. The acquaintance recalled that the patient pulled his hand back as if the bat had bitten him, but they did not discuss this event further or seek medical assistance at that time. Subsequent investigation into this reported bat contact identified one other person who had contact with the bat. This person received PEP.

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Editorial Note

This is the first report of rabies acquired in the United States but with symptom onset, medical management, and diagnosis abroad. This case highlights the importance of continued efforts to raise awareness of the risk for rabies virus exposure posed by bats in the United States (*1*). Rabid bats have been documented in every state except Hawaii. Since 2002, 21 of 24 reported human rabies cases in the United States were linked epidemiologically to bats. Transmission of rabies virus can occur from minor or unrecognized bites from bats (*2*). The source of exposure in this case could not be confirmed by laboratory diagnostics because the bat was not available for testing. However, the reported contact with a bat in March 2012 as well as virus variant testing indicating a North American bat species makes this bat contact the likely source of rabies virus exposure.

What is already known on this topic?

Human-to-human transmission of rabies has been documented with transplantation of organs and also is theoretically possible if infectious materials, such as saliva or tears, are introduced into fresh open wounds or onto mucous membranes. Humans can begin to shed rabies virus in saliva up to 2 weeks before symptom onset.

What is added by this report?

This investigation identified a fatal case of rabies, acquired from a bat in California, by a man who traveled on eight international flights and visited four medical facilities during his likely infectious period. Fifty-nine contacts were identified, 23 of whom were administered postexposure prophylaxis. No secondary cases have been detected.

What are the implications for public health practice?

Bites or scratches from animals with suspected rabies should be taken seriously, and consultation with public health officials and medical-care providers should be undertaken promptly. This report highlights the need for international collaboration to identify, notify, assess, and provide prophylaxis to contacts with potential exposure to persons infected with rabies.

Person-to-person rabies virus transmission has been documented only in cases of tissue or organ transplantation (*3*–*8*). However, person-to-person rabies transmission also is theoretically possible if infectious material, such as saliva or tears, are introduced into fresh open wounds or onto mucous membranes (*2*). For contact investigation purposes, any potential exposure to saliva, tears, or nervous tissue should be investigated. For this investigation, the patient's family, friends, coworkers, and health-care workers were contacted, as were travelers seated immediately next to the patient on flights, to assess their risk for exposure to the patient and their need for PEP. Health-care professionals should adhere to standard personal protection protocols for bacterial and viral pathogens when caring for a patient suspected of having rabies (*2*,*9*). Health-care workers should take particular precautions to avoid direct contact with saliva during intubation, extubation, and suctioning.

This patient's extensive travel during his 7-week potentially infectious period presented a challenge to identify contacts in four states, nine countries, four medical facilities, and on eight international flights and two train trips. Eventually, 59 contacts were identified, 23 of whom received PEP. The only international flights that CDC has jurisdiction over are those arriving into the United States; other in-flight information was voluntarily provided to CDC when available, from the responsible health authority. All countries were notified of flight numbers of the patient for their own investigations. CDC recommendations for contact investigation and PEP

administration were provided to partner countries; however, the decisions on how and when to administer PEP were the responsibility of the ministries of health for each country, and information regarding persons who received risk assessments and PEP was reported in aggregate.

Although the patient was a global traveler, he was infected by a rabid bat near his residence in the United States. Bat rabies is the most common type of rabies virus infecting humans in the United States (*1*). Bites or scratches from any domestic or wild animal should be washed with soap and water immediately (*2*). Once symptoms begin, rabies is almost always fatal. Consequently, any exposure to or contact with bats or other wildlife should be promptly reported to the state and local health department so that the person's viral exposure can be assessed quickly, and PEP administered appropriately. This case report highlights the importance of international public health collaboration to identify, notify, assess, and provide prophylaxis to contacts potentially exposed to rabies virus during international travel.

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Botulism From Drinking Prison-Made Illicit Alcohol — Utah 2011

Foodborne botulism is a rare, potentially fatal paralytic illness caused by eating food contaminated by *Clostridium botulinum* toxin. It occurs most often as a single case not linked to others by a common food source. As a result of improvements in food canning, when outbreaks do occur, they typically involve fewer than five persons. During October 2–4 2011, eight maximum security inmates at the Utah State Prison in Salt Lake County were diagnosed with foodborne botulism. An investigation by Salt Lake Valley Heath Department, Utah Department of Health, and CDC identified pruno, an illicit alcoholic brew, as the vehicle. The principal ingredients in pruno are fruit, sugar, and water. Many additional ingredients, including root vegetables, are sometimes added, depending on the availability of foods in prison. A baked potato saved from a meal served weeks earlier and added to the pruno was the suspected source of *C. botulinum* spores. Many of the affected inmates suffered severe morbidity, and some required prolonged hospitalizations. Knowing the link between pruno and botulism might help public health and correctional authorities prevent future outbreaks, respond quickly with appropriate health-care to inmates with acute descending paralysis and/or other symptoms, and reduce associated treatment costs to states.

Epidemiologic Investigation

A case of botulism was defined as signs and symptoms of cranial nerve palsies (e.g. double vision, blurred vision, dysphagia, or impaired gag reflex) and weakness, with onset during September 30–October 4, 2011, in a Utah State Prison inmate who had either a clinical specimen positive for C. botulinum (organism or toxin) or a history of consuming the same batch of pruno as an inmate with a positive clinical specimen. Eight inmates had illnesses that met the case definition. Salt Lake Valley Heath Department and Utah Department of Health were notified of a patient with suspected botulism when an inmate at the Utah State Prison was hospitalized at a local hospital (hospital A) on October 2, 2011, with a 3-day history of dysphagia, double vision, progressive weakness, and vomiting. He reported that his symptoms began within 12 hours of drinking pruno. Inmates who had consumed pruno or had symptoms of botulism were urged through a series of announcements and cell-to-cell visits by prison correctional officers and medical staff members to accept medical treatment. The inmates were assured that no punitive actions would be taken if they admitted to drinking pruno. By October 4, an additional 12 inmates sought medical attention for clinical complaints or history of recent pruno consumption. Of the 13 inmates who reported drinking pruno, eight met the case definition by having signs or symptoms compatible with botulism. These eight inmates were admitted to the neuro-critical care unit of hospital A and treated. The other five inmates who drank pruno were evaluated on October 4 by a physician at hospital A and were determined to not have clinical findings consistent with botulism. They were observed in the prison infirmary for 7 days and remained well.

The eight hospitalized patients were aged 24–35 years and lived in close proximity within the same maximum security prison unit. The median time to onset of symptoms was 37 hours after consumption of brew A (range: <12–80 hours). The eight hospitalized patients all drank pruno from the same batch (brew A) on September 30, 2011; in addition, two of the eight drank pruno from a second batch (brew B) on October 2, 2011. Of the five inmates who did not develop botulism, one reported tasting a small amount of brew A, which he spit out, and four reported consuming only brew B. Although most ingredients used in the two brews were the same, a baked potato was included in brew A but not brew B.

Among the eight hospitalized patients, three were placed on mechanical ventilation within 24 hours of admission. The median neuro-critical care unit hospitalization stay was 4 days (range: 2–23 days); time spent in nonprison health-care facilities ranged from 2–58 days. All patients received heptavalent botulinum antitoxin (HBAT), an investigational new drug that is available through CDC (*1*) and is the mainstay of treatment for noninfant botulism. Because of a misunderstanding at hospital A, informed consent for HBAT administration was not obtained before infusion. HBAT was administered without adverse events and recipients were later informed of its investigational status. After hospital discharge, all eight patients were evaluated in the prison infirmary where they received care for 1–76 days. According to prison medical personnel, most of the inmates continued to have various clinical complaints 11 months after the outbreak, including weakness and loss of muscle mass, dysphagia and reflux. Difficulty sleeping, increased anxiety, and depression also were reported, but did not appear to be from causes other than the botulism incident. One inmate still reported difficulty breathing and another reported double vision. No deaths resulted from the outbreak.

Laboratory Results

Serum, stool, and gastric aspirate specimens collected before antitoxin administration were submitted to the Utah Unified State Laboratory: Public Health and CDC for *C. botulinum* and botulinum toxin testing. A moist sock used to filter brew A also was submitted for testing at the Utah laboratory. Specimens

from five of the eight confirmed patients were positive for *C. botulinum* type A or its toxin. A small amount of pruno squeezed out of the sock yielded *C. botulinum* type A.

Field Investigation

Several batches of pruno were reportedly in circulation among inmates at the time of the outbreak. Pruno batch A was made with oranges, grapefruit, canned fruit, water, powdered drink mix (a source of sugar), and a baked potato. Among these ingredients, the baked potato was the only ingredient used in brew A that was not used in simultaneously circulating pruno batches. Consequently, preparation of baked potatoes in the prison kitchen and methods used to prepare brew A were the primary focus of the field investigation.

Investigators performed a systematic retrospective risk assessment, including interviews with food service workers and inspection of the prison kitchen, to determine whether practices that increase the risk for botulism occurred during preparation of baked potatoes. Cooking practices were not observed directly, and no baked potatoes were available for testing. Food service workers reported that baked potatoes were prepared twice a month from raw whole potatoes, and not baked in foil. No other preparation or storage methods that would produce the anaerobic environment necessary for toxin production were identified, making it unlikely that potatoes served to inmates contained toxin.

The inmate who prepared brew A reported the potato was removed from a meal tray, stored at ambient temperature for an undetermined number of weeks in either a sealed plastic bag or jar obtained from the commissary, peeled using his fingernails, and added to a plastic bag containing other ingredients a few days before brew A consumption. The ingredients were fermented in this bag for several days before being distributed to other inmates in resealable plastic bags. Toxin likely was produced when the potato was added to a bag containing low-acidity pruno ingredients under warm, anaerobic conditions during pruno fermentation. Warm conditions commonly are obtained by placing the bagged mixture in warm water and insulating the bag with clothing, towels, or bedding (*2*). Plastic bags and jars used in pruno fermentation are easily accessible to inmates. Laundry and items purchased from the commissary are delivered in plastic bags and foods packaged in jars and resealable bags can be purchased from the commissary. During the investigation, many types of plastic bags and jars were observed in cells.

In addition to clinical morbidity, the outbreak resulted in considerable cost to Utah taxpayers. These included hospital charges of nearly $500,000; secure emergency transport and correctional facility monitoring at hospital A; and local, state, and federal public health and correctional facility resources for the investigation.

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Editorial Note

The association between botulism and pruno, an illicit alcoholic beverage often made by inmates, is not well known, and cases of botulism from pruno might be underrecognized. This is the largest outbreak of botulism associated with pruno consumption; two previously reported outbreaks affected one and two inmates, respectively (*3*). This also is the second largest botulism outbreak in the United States since 2006, surpassed only by a 2007 outbreak attributed to a widely distributed commercial hotdog chili sauce that affected 10 persons (*4*). Since this investigation, four confirmed cases of botulism among inmates at a federal prison in Arizona were identified on August 3, 2012. As in Utah, potato-containing pruno or food containing leftover pulp from potato-containing pruno was consumed by all four affected inmates and is the suspected vehicle (*5*).

Botulism is a rare but serious, potentially life-threatening paralytic illness that is a public health emergency because many persons can be sickened by a contaminated food. The classic symptoms of botulism (e.g., blurred or double vision, slurred speech, difficulty swallowing, and muscle weakness) are not unique to botulism. Clinicians who act promptly when botulism is suspected can reduce the associated morbidity and mortality of botulism. The disease and long-term sequelae can be reduced by prompt treatment and HBAT administration. Although the eight inmates sickened by one batch of pruno in this outbreak were identified quickly through active case finding by prison employees, they still required prolonged hospitalizations, including treatment in the neuro-critical care unit, inpatient and outpatient rehabilitation, continued mental health support, and additional medical follow-up. Most of the inmates continued to complain of clinical sequelae 11 months after the outbreak.

Botulism is uncommon because special, rarely obtained conditions are necessary for botulinum toxin production from *C. botulinum* spores, including an anaerobic, low-salt, low-acid, low-sugar environment at ambient temperatures (*6*). This investigation, and investigations in California during previous

outbreaks, determined that pruno containing potato can provide this favorable environment for botulinum toxin production from *C. botulinum*. Potatoes and other root vegetables commonly have botulinum spores from the soil on their surfaces (*7*). Although most batches of pruno reportedly do not contain potatoes, pruno-associated botulism outbreaks all have involved pruno made with potatoes, The addition of potatoes to pruno, therefore, might introduce spores to pruno ingredients. Botulinum spores, however, are omnipresent; although potatoes are the likely source of botulinum spores from outbreaks associated with pruno, other possible sources of contamination include other root vegetables, if added to the brew, and bags used for pruno fermentation. Pruno ingredients commonly include fruits and sugar. When proportion of these ingredients available for inclusion in pruno is less, the pH of the mixture might exceed 4.6 and sugar content might be low, promoting toxin production. Fermentation occurs in the anaerobic environment of a sealed bag, a condition necessary for toxin production.

This outbreak underscores the need for health department and correctional facility awareness of the association between pruno and botulism. Prison health-care providers should notify health departments immediately if they suspect botulism from pruno so that an investigation can begin quickly and botulinum antitoxin requested from CDC immediately. When pruno is the suspected vehicle, case finding strategies should account for the possibility that one pruno batch might be shared among many inmates, even in areas where inmate movements and interactions are highly restricted (e.g., maximum security). Bags, socks, and other equipment used to make pruno might be shared between batches, and pulp left over from pruno might be added to other foods consumed by prisoners. These factors all might increase the number of affected patients. Aggressive case finding in both recent outbreaks enabled timely identification of ill persons. Timely identification is critical to minimizing morbidity, averting fatalities, and minimizing economic burden to states. Prompt HBAT administration can reduce botulism morbidity and mortality. During this investigation, inmates reported that pruno is widely used in correctional facilities throughout the country and is an ingrained part of prison culture. Although illness might be reduced though education of inmates about the association between pruno and botulism, pruno production in prisons likely will not stop.

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What is already known on this topic?

Foodborne botulism is rare, but it can kill rapidly, and contaminated products might expose many persons. Symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, and muscle weakness. These symptoms are not unique to botulism; prompt treatment and heptavalent botulinum antitoxin (HBAT) administration can reduce botulism morbidity and mortality.

What is added by this report?

This report documents an outbreak of severe illness with prolonged morbidity and great public expense that occurred in a prison from "pruno," alcohol made illicitly by inmates. When a potato or other root vegetable is added to pruno, the risk for foodborne botulism increases. The cost of the outbreak was approximately $500,000 and involved many hours of investigation and prompt hospital treatment. Long-term sequelae, even with prompt treatment, can result.

What are the implications for public health practice?

Preparation of pruno is common in correctional facilities. Public health authorities should know the risk for botulism in correctional facilities and its association with pruno that contains potatoes. When botulism associated with pruno is suspected, state health departments should immediately be notified and more cases should be sought because one pruno batch might be shared among many inmates, even in restricted areas. Timely identification of cases and administration of botulinum antitoxin is critical to minimize morbidity, avert fatalities, and reduce the economic burden to states.

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Update: Influenza Activity — United States and Worldwide, May 20–September 22, 2012

During May 20–September 22, 2012, the United States experienced low levels of seasonal influenza activity overall; however, more seasonal influenza viruses were detected than in the summer months of previous years. Influenza A (H1N1) pdm09 (pH1N1), influenza A (H3N2), and influenza B viruses were detected worldwide and were identified sporadically in the United States. In July, influenza A (H3N2) variant viruses (H3N2v) were first detected in Indiana, and since July 12, a total of 306 cases have been reported from 10 states. This report summarizes influenza activity in the United States and worldwide since May 20, 2012.

United States

The U.S. influenza surveillance system is a collaborative effort between CDC and its federal, state, local, and territorial partners. CDC uses eight systems* to collect influenza information (*1*), six of which operate year-round: 1) U.S. World Health Organization (WHO) collaborating laboratories; 2) the National Respiratory and Enteric Virus Surveillance System (NREVSS); 3) reports of novel influenza A virus cases from the National Notifiable Disease Surveillance System (NNDSS); 4) the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet); 5) the 122 Cities Mortality Reporting System; and 6) the Influenza-Associated Pediatric Mortality Reporting System.

During May 20–September 22, 2012,† U.S. WHO and NREVSS collaborating laboratories tested 42,562 respiratory specimens for influenza viruses; 2,986 (7.0%) tested positive for influenza (Figure), indicating higher levels of activity than typically seen in summer months, but lower levels than during winter months and the height of influenza virus circulation. During the summer months of the previous 6 years (excluding the summer during the 2009 pandemic) the average number of respiratory specimens tested for influenza was 29,728 (range: 20,652–39,523), with an average of 375 (1.3%) specimens testing positive (range: 245–541). Of the 2,986 specimens positive for influenza in the summer months of 2012, a total of 1,497 (50%) were influenza A viruses, and 1,489 (50%) were influenza B viruses. Influenza B viruses predominated and were reported more frequently than influenza A viruses from May until mid-July; influenza A (H3N2) viruses were more commonly reported from mid-July to September. Of the influenza A viruses, 1,117 (75%) were subtyped: 759 (68%) were influenza A (H3N2) viruses, 263 (24%) were H3N2v viruses,§ and 95 (9%) were pH1N1 viruses. Influenza viruses were reported from 44 states and Puerto Rico in all 10 U.S. Department of Health and Human Services (HHS) Regions. The largest proportion of positive samples came from the southeastern United States (HHS Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee) with 1,133 (38%), followed by western states (HHS Region 9: Arizona, California, Hawaii, and Nevada) with 726 (24%).

During May 20–September 22, 2012, data from ILINet indicated that the weekly percentage of outpatient visits to ILINet providers for influenza-like illness (ILI)¶ remained below the national baseline** of 2.4% and ranged from 0.9% to 1.3%. The percentage of deaths attributed to pneumonia and influenza (P&I), as reported by the 122 Cities Mortality Reporting System, remained below the epidemic threshold†† and ranged from 5.5% to 6.6%. Two influenza-associated pediatric deaths during the period May 20–September 22 were reported; one was associated with an influenza B virus, and one was associated with a pH1N1 virus.

* The CDC influenza surveillance system collects five categories of information from eight data sources: 1) viral surveillance (World Health Organization collaborating laboratories, the National Respiratory and Enteric Virus Surveillance System, and novel influenza A virus case reporting); 2) outpatient illness surveillance (U.S. Outpatient Influenza-like Illness Surveillance Network); 3) mortality (122 Cities Mortality Reporting System and influenza-associated pediatric mortality reports); 4) hospitalizations (FluSurv-NET, which includes the Emerging Infections Program and surveillance in four additional states); and 5) summary of the geographic spread of influenza (state and territorial epidemiologist reports).

† Data as of September 28, 2012.

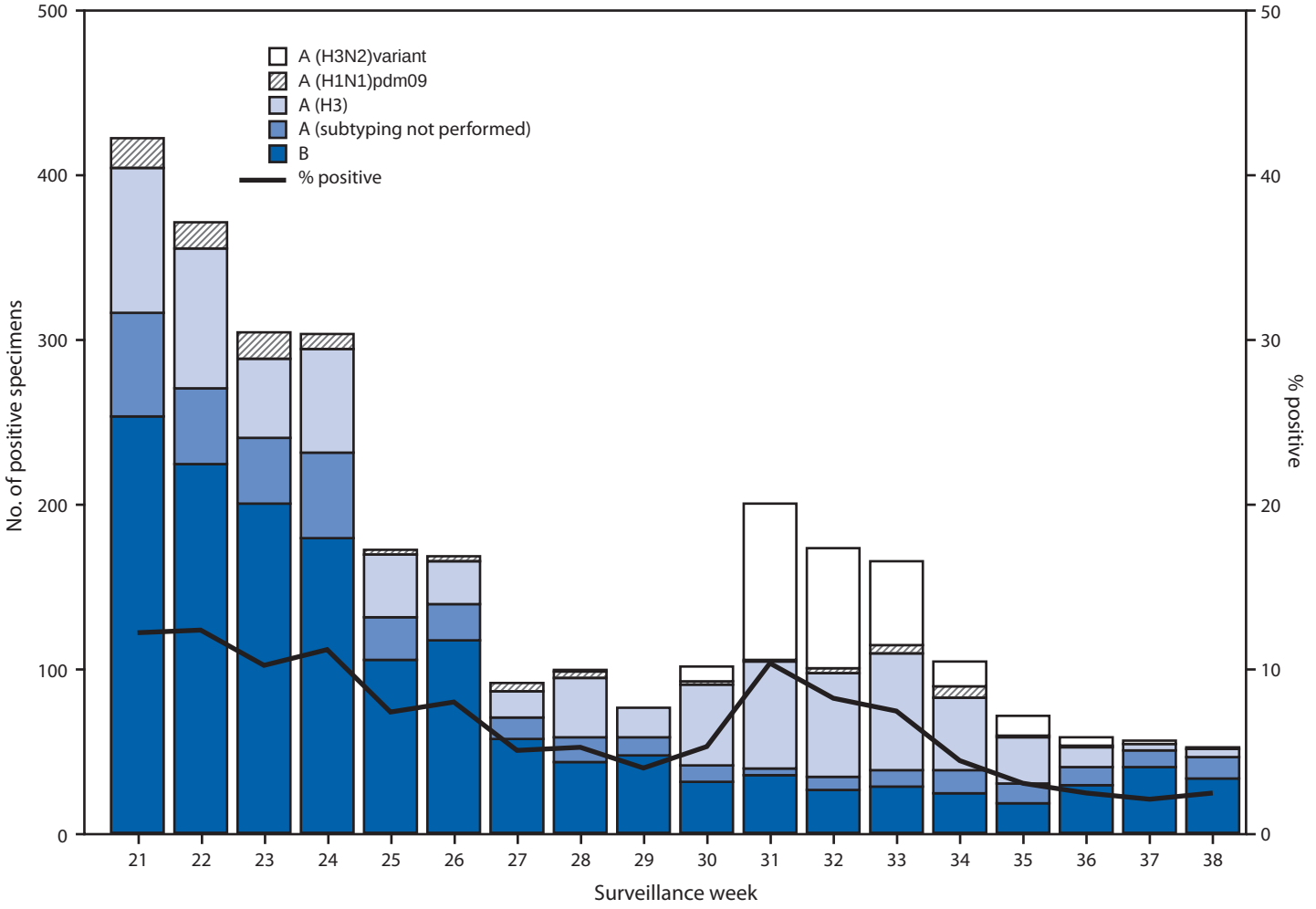
§ Influenza viruses that circulate in swine are called swine influenza viruses when isolated from swine, but are called variant viruses when isolated from humans. A variant virus (human isolate) might or might not have the M gene from the influenza A (H1N1)pdm09 virus, along with other genetic changes. Seasonal influenza A (H3N2) viruses that circulate worldwide in the human population have significant antigenic and genetic differences from influenza A (H3N2) viruses circulating in swine. Additional information is available at http://www.who.int/influenza/gisrs_laboratory/terminology_ah3n2v/en/index.html.

¶ Defined as a temperature of ≥100°F (≥37.8°C), oral or equivalent, and cough and/or sore throat, without a known cause other than influenza.

** The national and regional baselines are the mean percentage of visits for ILI during noninfluenza weeks for the previous three seasons plus two standard deviations. A noninfluenza week is a week during which <10% of specimens tested positive for influenza. National and regional percentages of patient visits for ILI are weighted on the basis of state population. Use of the national baseline for regional data is not appropriate.

†† The seasonal baseline proportion of P&I deaths is projected using a robust regression procedure in which a periodic regression model is applied to the observed percentage of deaths from P&I that were reported by the 122 Cities Mortality Reporting System during the preceding 5 years. The epidemic threshold is set at 1.645 standard deviations above the seasonal baseline.

FIGURE. Number* and percentage of respiratory specimens testing positive for influenza reported to CDC, by type, subtype, and surveillance week — World Health Organization and National Respiratory and Enteric Virus Surveillance System collaborating laboratories, United States, May 20–September 22, 2012.†



* N = 2,986.
† As of September 28, 2012.

Novel Influenza A Virus Infection

During July 12–September 28, 2012, 306 cases of H3N2v virus were reported from 10 states (Hawaii [one], Illinois [four], Indiana [138], Maryland [12], Michigan [six], Minnesota [four], Ohio [107], Pennsylvania [11], West Virginia [three], and Wisconsin [20]), with 16 H3N2v-associated hospitalizations and one H3N2v-associated death. Although cases have been identified from 10 states, two states (Indiana and Ohio) have reported 245 (80%) of the 306 cases. Direct contact with swine has been reported by the vast majority of cases, and influenza A (H3N2) viruses have been identified from swine that are genetically similar to H3N2v viruses from humans (*2*). Suspected human-to-human transmission has been identified in a small number of cases, but ongoing community transmission of this virus has not been detected. The median age of patients was 6 years, with 284 (93%) aged <18 years; 52% were female (CDC, unpublished data, 2012).

In addition, three cases of influenza A (H1N2) variant (H1N2v) virus infection and one case of influenza A (H1N1) variant (H1N1v) virus were detected during this period as a result of enhanced surveillance activities for H3N2v. All four patients reported direct exposure to swine in the week before illness onset; one was hospitalized, and all four have recovered.

Worldwide

During May 20–September 22, 2012, typical seasonal patterns of influenza activity occurred in the temperate climate Southern Hemisphere countries. In Australia, influenza activity began increasing in late May, and peaked in mid-July; influenza A (H3N2) virus predominated with smaller numbers of cases of influenza B virus infection reported. In New Zealand, influenza activity began increasing in late June, peaked in early August, and has since been decreasing. Influenza A (H3N2)

virus was overwhelmingly predominant, with lower levels of influenza B virus detected. In South Africa, influenza activity began to increase in early June with increased levels of activity being reported through August. Influenza A (H3N2) viruses have been reported most commonly, but a larger proportion of influenza-positive specimens in South Africa are influenza B viruses than in Australia or New Zealand. In South America, influenza activity peaked earlier in the season and is now decreasing. Influenza A viruses were reported more frequently than influenza B viruses, but the predominant subtype varied by country. Argentina reported a larger proportion of positive specimens as pH1N1 viruses than other countries in the region, but the overall number of influenza positive specimens there was lower than in previous seasons.

Influenza activity also has been reported from countries with tropical influenza seasonality. The overall level of activity compared with previous seasons and the predominant subtype have varied by country. In South America, influenza A viruses have predominated in Brazil, but in Ecuador and Peru influenza B viruses have been reported most commonly. Southern and Southeast Asia also have seen a mix of predominant influenza types and subtypes with influenza B and pH1N1 viruses cocirculating in several countries, including Bangladesh, India, Sri Lanka, and Thailand. In temperate climate Northern Hemisphere countries, influenza activity remains low, compared with levels of activity during the usual influenza season, with small numbers of influenza A (H3N2), pH1N1, and influenza B viruses identified.

Antigenic Characterization of Influenza Virus Isolates

The WHO Collaborating Center for Surveillance, Epidemiology, and Control of Influenza, located at CDC, receives and analyzes virus isolates from laboratories worldwide. Among the 111 pH1N1 viruses collected from May 20 to September 22, 2012 and analyzed (28 from the United States, 57 from South America, one from Oceania, 17 from Asia, and eight from Africa), 102 (92%) were antigenically similar to A/California/7/2009, the influenza A (H1N1) component of the 2012-2013 influenza vaccine for the Northern Hemisphere. Of the 241 influenza A (H3N2) viruses characterized (157 from the United States, 55 from South America, four from North America, four from Oceania, 20 from Asia, and one from Africa), all were antigenically similar to A/Victoria/361/2011, the recommended influenza A (H3) vaccine component for the 2012–2013 Northern Hemisphere influenza season. Finally, of 271 influenza B isolates from specimens collected during this period and analyzed by CDC, 113 (42%) belong to the B/Yamagata lineage (76 from the United States, 17 from Asia, two from Oceania, and 18 from South America) and were antigenically similar to B/Wisconsin/1/2010, the recommended influenza B component for the 2012–2013 Northern Hemisphere influenza vaccine. The remaining 158 (58%) belonged to the B/Victoria lineage (93 from the United States, 47 from South America, 15 from Asia, and three from Africa), nearly all of which (95%) were antigenically similar to B/Brisbane/60/2008, the recommended influenza B component in the 2011–2012 Northern Hemisphere influenza vaccine.

What is already known on this topic?

CDC collects, compiles, and analyzes data year-round on influenza activity in the United States. The influenza season generally begins in the fall and continues through the winter and spring months; however, the timing and severity of circulating influenza viruses can vary by geographic location and season.

What is added by this report?

Worldwide, influenza activity from May 20 to September 22, 2012, was elevated in the temperate Southern Hemisphere and tropical regions, compared with their levels outside the usual influenza season. In the United States, low levels of seasonal influenza activity were detected, and influenza A (H3N2) viruses were most commonly identified. More than 300 cases of influenza A (H3N2) variant virus were detected in 10 states; the majority of these cases were associated with direct contact with swine. The majority of recent influenza A viruses are well-matched to the influenza vaccine for this season

What are the implications for public health practice?

To prevent influenza and its associated complications, influenza vaccination is recommended for all persons aged ≥6 months. While vaccination is the best way to prevent influenza, treatment with influenza antiviral medications can reduce severe outcomes of influenza, especially when initiated as early as possible, in patients with confirmed or suspected influenza.

Antiviral Resistance Profiles of Influenza Virus Isolates

The WHO Collaborating Center for Surveillance, Epidemiology, and Control of Influenza at CDC tested 594 isolates from specimens collected during May 20–September 22, 2012, for resistance to influenza antiviral medications. Of the 594 isolates tested for resistance to the neuraminidase inhibitor medications oseltamivir and zanamivir, 238 were international isolates (84 were pH1N1, 76 were influenza A (H3N2), and 78 were influenza B viruses), and 356 were U.S. isolates (30 were pH1N1, 158 were influenza A (H3N2), and 168 were influenza B viruses). Only one virus (a pH1N1 virus from the United States) was found to be resistant to oseltamivir but sensitive to zanamivir, and it contained the H275Y mutation in the neuraminidase. High levels of resistance to the adamantanes (amantadine and rimantadine) persist among pH1N1 viruses and influenza A (H3N2) viruses currently circulating globally (*3*). All 117 H3N2v viruses available for testing were sensitive to oseltamivir and resistant to the adamantanes.

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Editorial Note

During May 20–September 22, 2012, pH1N1, influenza A (H3N2), and influenza B viruses cocirculated worldwide. In the United States, more seasonal influenza viruses were detected than in the summer months of previous years (excluding the 2009 pandemic), and influenza A (H3N2) viruses were predominant. Although neither the influenza viruses that will predominate nor the severity of influenza-related disease during the 2012–13 season in the United States can be predicted, antigenic characterization of viral isolates from specimens submitted during the summer demonstrated that the majority of influenza A viruses are antigenically similar to the influenza vaccine strains contained in the Northern Hemisphere 2012–13 vaccine.

H3N2v viruses with the matrix (M) gene from the pH1N1 virus were first detected in the United States in July 2011 (*4*). Since the first identification of this virus in humans, direct contact with swine has been documented in almost all cases, but limited human-to-human spread also is suspected. Consistent with the age distribution of cases, serologic studies suggest there is little or no cross-reactive antibody to H3N2v in young children, but some cross-reactive antibodies are evident in older children and adults (*5*). Although community transmission of this virus has not been identified, the potential for this virus to develop the ability to transmit efficiently from person-to-person is of concern. Rapid and intensive investigation of each variant case is necessary to evaluate the spread of disease and the possibility of person-to-person transmission. State and local health departments should consider increased specimen collection among patients with ILI who 1) seek care at an ILINet provider; 2) are part of an ILI outbreak among children in child-care and school settings, because these settings were associated with person-to-person H3N2v virus transmission in 2011; 3) have an unusual or severe presentation of ILI, including a need for hospitalization; or 4) have medically attended ILI or acute respiratory infection, especially children in counties or states where H3N2v cases have occurred (*6*).

Annual influenza vaccination remains the best method for preventing influenza and its associated complications (*7*), but the 2012–13 seasonal influenza vaccine does not provide protection against the H3N2v virus. Treatment with influenza antiviral medications is recommended as early as possible for patients with confirmed or suspected influenza (either seasonal influenza or variant influenza infection) who have severe, complicated, or progressive illness; who require hospitalization; or who are at higher risk for influenza-related complications (*8*).[§§]

Influenza surveillance reports for the United States are posted online weekly and are available at http://www.cdc.gov/flu/weekly. Additional information regarding influenza viruses, influenza surveillance, influenza vaccine, influenza antiviral medications, and novel influenza A infections in humans is available at http://www.cdc.gov/flu.

[§§] Persons at higher risk include children aged <5 years (especially those aged <2 years); adults aged ≥65 years; persons with chronic pulmonary (including asthma), cardiovascular (except hypertension alone), renal, hepatic, hematologic (including sickle cell disease), metabolic disorders (including diabetes mellitus), or neurologic or neurodevelopmental conditions (including disorders of the brain, spinal cord, peripheral nerve, and muscle, such as cerebral palsy, epilepsy [seizure disorders], stroke, intellectual disability [mental retardation], moderate to severe developmental delay, muscular dystrophy, or spinal cord injury); persons with immunosuppression, including that caused by medications or by human immunodeficiency virus infection; women who are pregnant or postpartum (within 2 weeks after delivery); persons aged ≤18 years who are receiving long-term aspirin therapy; American Indians/Alaska Natives; persons who are morbidly obese (i.e., body mass index ≥40); and residents of nursing homes and other chronic-care facilities.

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State, local, and territorial health departments and public health laboratories; U.S. WHO collaborating laboratories; National Respiratory and Enteric Virus Surveillance System collaborating laboratories; U.S. Outpatient Influenza-like Illness Surveillance Network; Influenza-Associated Pediatric Mortality Surveillance System; 122 Cities Mortality Reporting System; WHO FluNet.

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Progress Toward Poliomyelitis Eradication — Afghanistan and Pakistan, January 2011–August 2012

In 1988, the World Health Assembly resolved to eradicate polio, which led to the establishment of the Global Polio Eradication Initiative (GPEI). In 2012, however, the transmission of indigenous wild poliovirus (WPV) continued uninterrupted in Afghanistan, Pakistan, and Nigeria (*1,2*), leading the World Health Assembly to declare completion of polio eradication a programmatic emergency for global public health (*3*). This report updates previous reports (*1,4,5*) and describes polio eradication activities and progress in Afghanistan and Pakistan during January 2011–August 2012, as of September 9, 2012. During 2011, 80 WPV cases were confirmed in Afghanistan, compared with 25 WPV cases in 2010; 17 WPV cases were confirmed during January–August 2012, compared with 34 WPV cases for the same period in 2011. In Pakistan, 198 WPV cases were confirmed in 2011, compared with 144 WPV cases in 2010; 30 WPV cases were confirmed during January–August 2012, compared with 88 WPV cases during the same period in 2011. During January 2011–August 2012, no WPV type 3 (WPV3) cases were confirmed in Afghanistan, and four confirmed WPV3 cases and one case with coinfection of WPV3 and WPV type 1 (WPV1) were reported in Pakistan. Violence targeting vaccinators has occurred previously in Afghanistan and recently in Pakistan. To progress further toward interruption of WPV transmission within their countries and across their shared border, the governments of Afghanistan and Pakistan might consider reviewing the implementation of their national emergency action plans (*6,7*) and determine how to enhance the safety of vaccination teams within conflict-affected areas of both countries.

Immunization Activities

Estimated national routine immunization coverage of infants with 3 doses of oral polio vaccine (OPV3) is 66% in Afghanistan and 75% in Pakistan, with subnational variation in both countries (*8*). A surrogate measure of routine OPV3 coverage based on parental recall and immunization cards of children aged 6–23 months with acute flaccid paralysis (AFP) not the result of polio (non-polio AFP)* was 61% nationally in Afghanistan; 15% in the conflict-affected South Region and Farah Province in the West Region combined; 71% in the West Region, excluding Farah Province; and 78% in the rest of the country. OPV3 coverage among children aged 6–23 months with non-polio AFP cases in Pakistan was 63% nationally, 26% in the conflict-affected Federally Administered Tribal Areas (FATA), 63% in Khyber Pakhtunkhwa (KP) Province, 52% in Sindh Province, 18% in Balochistan Province, and 77% in Punjab Province. Nationally, only 3.3% of children aged 6–23 months with non-polio AFP did not receive any oral polio vaccine (OPV) doses through routine or supplementary immunization activities (SIAs).†

During January 2011–August 2012, house-to-house SIAs generally targeted children aged ≤59 months using different OPV formulations, including bivalent types 1 and 3 and trivalent. During this period, six national immunization days and 10 subnational immunization days were conducted in Afghanistan in the East, Southeast, and South regions, and in Farah Province in the West Region. During a combined measles and OPV campaign, children aged ≤10 years were targeted. SIA planning and implementation in 2011 apparently worsened compared with previous years, as indicated by the proportion of children aged 6–23 months with non-polio AFP in high-risk districts having not received any doses of OPV vaccine, which rose from 9% in 2010 in the South Region to 21% in 2011. In Pakistan, 7 national immunization days were conducted and 8 subnational immunization days were conducted in high-risk districts in the main WPV transmission areas of FATA, KP, Sindh, Balochistan, and southern Punjab. Several smaller SIAs targeting high-risk areas and migratory, internally displaced, and underserved or marginalized groups were conducted. Most campaigns targeted children aged <5 years; however, in Khyber Agency (Bara), FATA, a short interval additional dose (SIAD) strategy§ campaign in 2012 targeted children aged <15 years because much of this area had not been reached in 3 years. A significant population exodus, from Bara Tehsil of Khyber Agency to neighboring parts of KP (mainly Peshawar and Nowshera), occurred during April and May 2012. The displaced population was targeted with multiple SIA rounds using bivalent types 1 and 3 in the hosting communities (target age group: <5 years) and in a camp for displaced persons in Jalozai Nowshera (target age group: <15 years).

During 2011–2012, as in past years, SIA teams were unable to reach thousands of children living in areas that have been inaccessible¶ to vaccination teams because of insecurity. In Afghanistan, the estimated proportion of targeted children

* Vaccination histories of children aged 6–23 months with AFP who do not test WPV-positive are used to estimate OPV coverage of the overall target population and to corroborate national reported routine immunization coverage estimates.

† Mass campaigns conducted for a brief period (days to weeks) in which 1 dose of OPV is administered to all children aged <5 years, regardless of vaccination history. Campaigns can be conducted nationally or in sections of the country.

§ SIADs are used during negotiated periods of nonviolence in otherwise inaccessible areas to vaccinate children with a monovalent OPV or bivalent OPV dose, which is administered within 1–2 weeks of the prior dose.

¶ Areas considered too dangerous by the World Health Organization (WHO) and the local government to conduct an SIA.

living in inaccessible areas in the South Region was 6%–21% (72,500–273,000 children) during SIAs conducted in 2010 and 2011, and 2%–5% (28,400–65,000 children) in SIAs during January–June 2012. In Pakistan, the proportion of targeted children living in inaccessible areas of KP during SIAs decreased from <1%–2% (<30,000–100,000 children) during January–March 2010 to <0.2% (<6,000 children) during April 2010–December 2011. In FATA, however, the proportion of targeted children living in inaccessible areas was 20%–31% during 2010 and 9%–24% during 2011, leaving approximately 99,000–350,000 children unreached during each SIA conducted during 2010 and 2011. During January–July 2012, 6%–23% (64,000–257,500) of children in the target population in FATA were not accessible. Despite a gradual improvement in access to children in FATA, approximately 200,000 children were unreachable because of a ban on polio SIAs recently imposed by some local authorities in the tribal agencies of North and South Waziristan. All areas have been accessible in KP since September 2011.

WPV Surveillance

AFP surveillance. Standard indicators are used to monitor AFP surveillance performance.** In 2011, the annual national non-polio AFP rate (per 100,000 population aged <15 years) was 10.5 in Afghanistan (range among the eight regions: 6.0–12.8), and 7.2 in Pakistan (range among the seven provinces/regions: 2.3–9.7). The percentage of AFP cases for which adequate specimens were collected was 92% in Afghanistan (range: 80%–98%) and 88% in Pakistan (range: 78%–93%). Despite overall high AFP surveillance performance indicators, genomic sequencing data from WPVs obtained from confirmed polio cases and environmental surveillance samples continue to indicate surveillance gaps of WPV in certain areas of Pakistan and Afghanistan.

Environmental surveillance. In Pakistan, AFP surveillance is supplemented by environmental surveillance. During 2011–August 2012, 353 sewage samples from 21 sites in 11 cities from all major provinces of Pakistan were tested for polioviruses. The number of cities with sewage sampling increased from eight in 2011 to 11 in 2012. WPVs frequently have been isolated from sewage samples collected in all major cities in Pakistan since testing began in mid-July 2009, including several large urban areas where there was absence of confirmed WPV in reported AFP cases: Lahore in Punjab (latest confirmed case: December 2011, latest positive sewage sample: August 2012), Rawalpindi (latest confirmed case: April 2010, latest positive sewage sample: May 2012), and Sukkur (latest confirmed case: September 2010, latest positive sewage sample: July 2012). WPV continues to be isolated from the majority of environmental samples at most sampling sites, although the frequency of WPV-positive environmental samples decreased in Quetta, Balochistan, which has had no WPV-positive environmental sample since February 2012. WPV3 has not been detected in sewage samples at any site since October 2010.

WPV Epidemiology

In Afghanistan, 80 WPV1 cases were reported during 2011, compared with 25 WPV cases (17 WPV1, eight WPV3) in 2010, and 17 WPV1 cases were reported during January–August 2012, compared with 34 WPV1 cases during the same period in 2011 (Table, Figures 1 and 2) (*4,5*). The last WPV3 case reported in Afghanistan was in South Region in April 2010. During January 2011–August 2012, 72 (74%) WPV cases were reported among children aged <36 months. Among the 72 children, 24 (33%) received no OPV doses, 23 (32%) received 1–3 OPV doses, and 25 (35%) received ≥4 OPV doses. During this period, WPV cases were reported in 40 (12%) of 329 districts, including 13 high-risk districts†† in the southwestern provinces of Kandahar, Helmand, Urozgan, and Farah.

In Pakistan, 198 WPV cases (196 WPV1, two WPV3) were reported during 2011, compared with 144 WPV cases (120 WPV1, 24 WPV3) during 2010; 30 WPV cases (27 WPV1, two WPV3, and one case with isolation of both WPV1 and WPV3) were reported during January–August 2012, compared with 88 during the same period in 2011 (Table, Figures 1 and 2). All WPV3 cases reported in Pakistan since 2011 were from Khyber Agency, FATA; the most recent cases were reported in April 2012. During January 2011–August 2012, 192 (84%) of 228 WPV cases were among children aged <36 months. Among the 228 children aged <36 months, 68 (30%) received no OPV doses, 51 (22%) received 1–3 OPV doses, and nine (4%) received ≥4 OPV doses. WPV cases were reported in 60 (38%) of 157 districts in Pakistan during 2011, compared with 40 (30%) districts during 2010, and from 17 (11%) districts during January–August 2012. During 2010, 98 (68%) of 144 cases were from KP and FATA and 39 (27%) were from Balochistan and Sindh; during 2011, 82 (41%) of 198 cases were from KP and FATA and 105 (53%) were from

** The quality of AFP surveillance is monitored by performance indicators that include 1) detection rate of non-polio AFP cases and 2) the proportion of AFP cases with adequate stool specimens. WHO operational targets for countries with endemic polio transmission are a non-polio AFP detection rate of at least two cases per 100,000 population aged <15 years and adequate stool specimen collection from >80% of AFP cases, in which two specimens are collected at least 24 hours apart, both within 14 days of paralysis onset, and shipped on ice or frozen packs to a WHO-accredited laboratory, arriving in good condition.

†† High-risk districts include those persistently affected by WPV transmission and those in proximity to the persistently affected districts.

TABLE. Acute flaccid paralysis (AFP) surveillance indicators and reported wild poliovirus (WPV) cases, by country and area, period and WPV type — Afghanistan and Pakistan, January 2011–August 2012*

Country/Area	AFP surveillance indicators (2011)			Reported WPV cases					
				Period			Type		
	No. of AFP cases	Non-polio AFP rate†	Adequate specimens (%)§	Jan–Jun 2011	July–Dec 2011	Jan–Aug 2012	WPV1	WPV3	WPV1 and 3
Afghanistan	**1,831**	**10.51**	**(92)**	**11**	**69**	**17**	**97**	**0**	**0**
Badakhshan	47	9.26	(96)	0	0	0	0	0	0
Northeast	233	11.61	(93)	0	3	0	0	0	0
North	304	12.44	(93)	0	2	0	0	0	0
Central	300	9.12	(98)	0	4	0	0	0	0
East	168	10.86	(93)	0	2	3	5	0	0
Southeast	106	5.96	(97)	0	1	1	2	0	0
South	384	12.80	(80)	9	53	12	74	0	0
West	289	10.13	(96)	2	4	1	7	0	0
Pakistan	**5,762**	**7.2**	**(88)**	**60**	**138**	**30**	**223**	**4**	**1**
Azad Jammu Kashmir	45	2.8	(91)	0	0	0	0	0	0
Gilgit-Baltistan	26	3.6	(92)	1	0	0	1	0	0
Islamabad	15	2.5	(93)	0	0	0	0	0	0
Khyber Pakhtunkhwa¶	1,074	9.7	(86)	6	17	9	32	0	0
Punjab	2,632	6.4	(90)	0	9	2	11	0	0
Balochistan	341	7.3	(78)	19	54	3	76	0	0
Sindh	1,415	7.9	(87)	14	19	3	36	0	0
Federally Administered Tribal Areas	214	9.6	(88)	20	39	13	67	4	1

* Data as of September 9, 2012.
† Per 100,000 children aged <15 years; excluding AFP cases pending for classification as of September 9, 2012.
§ Two stool specimens collected at an interval of at least 24 hours within 14 days of paralysis onset and properly shipped to the laboratory.
¶ Formerly Northwest Frontier Province.

Balochistan and Sindh; by comparison, 22 (73%) of 30 cases reported during January–August 2012 were from KP and FATA. Of the 13 polio cases reported from FATA in 2012, nine (69%) were from Bara Tehsil of Khyber Agency, which has not been accessible for polio SIAs since September 2009.

Reported by

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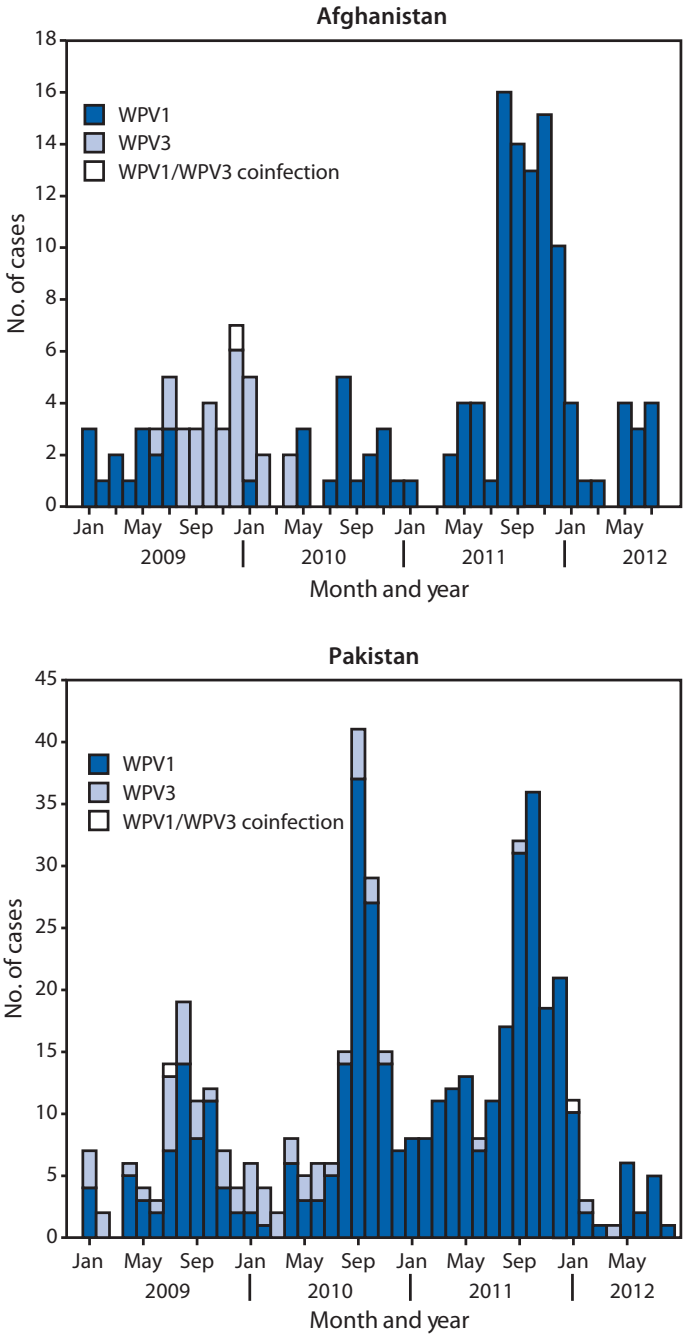
Editorial Note

In Afghanistan, more than three times as many WPV cases occurred in 2011 as in 2010; in Pakistan, WPV cases increased by 37% in 2011 compared with 2010. In 2012, WPV1 transmission continues in the known endemic areas of southwestern Afghanistan. WPV1 transmission is widespread in high-risk districts in Pakistan; however, the number of reported WPV cases in Pakistan in 2012 has decreased 66% compared with the same period in 2011. Only five WPV3-associated cases have been reported since January 2011, all from a limited area in Pakistan.

In the southwestern endemic zone of Afghanistan, SIA planning and implementation in 2011 worsened compared with previous years, even though access to children in high-risk areas continued to improve. The 2012 Afghanistan National Polio Eradication Emergency Action Plan defined major challenges and key activities to address these challenges (*6*). New strategic approaches include a major surge in human resources, particularly at district and provincial administrative levels, management training, and use of locally recruited permanent polio teams in high-risk districts for continuous house-to-house vaccination. Even with the new strategies to partly address the security concerns, the national emergency action plan highlights other key obstacles to interrupting transmission, such as low quality program management and lack of accountability (*6*).

In Pakistan, 73% of WPV cases reported in 2012 were in insecure areas of FATA and KP. One third of these cases were reported from one tribal agency, Khyber, the only known remaining focus of WPV3 transmission in Asia. Recent bans on polio vaccination by some local authorities in North Waziristan and South Waziristan in FATA, and deadly attacks on polio workers in Gaddap, a high-risk area of Karachi in Sindh

FIGURE 1. Number of cases of wild poliovirus types 1 (WPV1) and 3 (WPV3), by month — Afghanistan and Pakistan, January 2009–August 2012*



* Data as of September 9, 2012.

Province, have further increased the difficulties in reaching underimmunized children. To achieve polio eradication, both Pakistan and Afghanistan might consider how to enhance the safety of vaccination teams within conflict-affected areas.

Implementation of the Pakistan Polio Eradication National Emergency Action Plan, launched in early 2011, augmented in early 2012, and monitored at the highest political level, has made district commissioners and union council medical officers responsible for program implementation. Staffing also has increased substantially, particularly at the union council level (*7*). SIA preparations are being monitored systematically; if preparations in union councils or districts are not meeting quality benchmarks, SIAs are deferred.

Although WPV transmission within Afghanistan and Pakistan still occurs separately, genetic sequencing of polioviruses detected during AFP surveillance and environmental sewage sampling indicate that population movement (cross-border and internal) contributes substantially to the spread of poliovirus in Afghanistan and Pakistan. The number of transit teams in Pakistan providing OPV to children passing through border crossings and bus stops has increased, and regular cross-border planning and coordination of SIAs and surveillance activities with Afghanistan is taking place.

GPEI's 2012–2013 Global Emergency Action Plan (*9*), together with the national emergency action plans, seeks to accelerate activities to put the remaining countries with WPV transmission back on track toward interruption of WPV transmission (*1,6,7*). Although GPEI activities in Afghanistan and Pakistan have been accelerated, ongoing WPV transmission in both countries remains a threat to achieving the GPEI goal (*10*).

What is already known on this topic?

Afghanistan and Pakistan are two of the three remaining countries (including Nigeria) in which indigenous wild poliovirus (WPV) transmission has never been interrupted. Conflict in both countries has made some areas inaccessible for polio eradication activities.

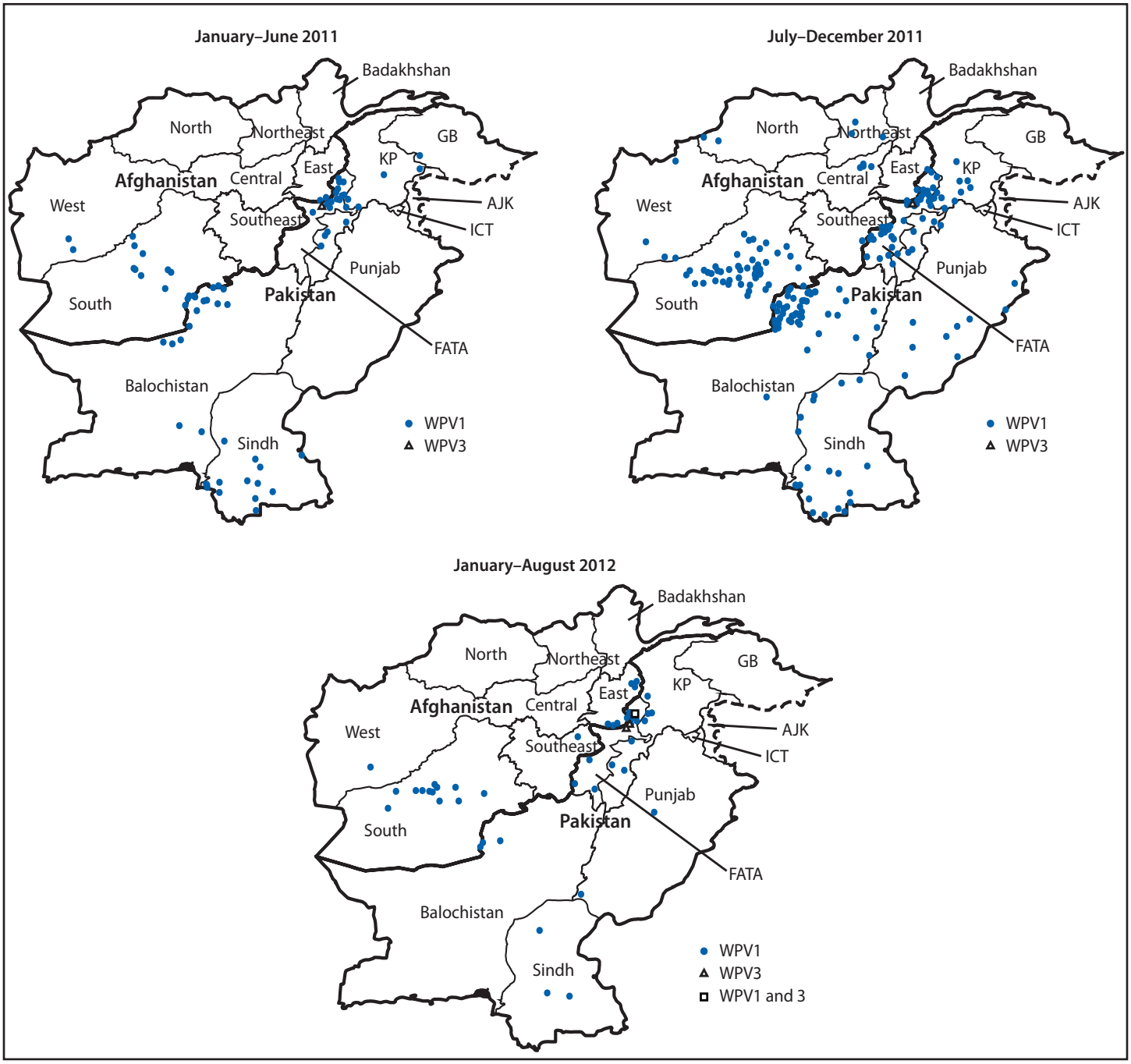
What is added by this report?

WPV type 1 (WPV1) transmission occurred in conflict-affected areas in the South Region of Afghanistan, and in three groups of districts in Pakistan in 1) districts bordering Afghanistan in the Federally Administered Tribal Areas and Khyber Pakhtunkhwa, 2) southern Sindh Province, and 3) the northwest border area in Balochistan. In addition to transmission within each country, genetic sequencing data confirms cross-border transmission between Pakistan and Afghanistan resulting from substantial population movements within and between countries. Positive sewage samples in Pakistan, in areas with no recent confirmed cases, highlight unrecognized continued polio transmission.

What are the implications for public health practice?

Ongoing WPV1 transmission in parts of Afghanistan and Pakistan remains a substantial threat to the Global Polio Eradication Initiative goal of a polio-free world. To achieve polio eradication, both Afghanistan and Pakistan might consider reviewing how their national emergency action plans address commitment, management, and oversight by provincial and district authorities, as well as cross-border transmission of WPV and the safety of vaccination teams in insecure areas.

FIGURE 2. Cases of wild poliovirus types 1 (WPV1) and 3 (WPV3) — Afghanistan and Pakistan, January 2011–August 2012



Abbreviations: AJK = Azad Jammu and Kashmir; FATA = Federally Administered Tribal Areas; GB = Gilgit-Baltistan; ICT = Islamabad Capital Territory; KP = Khyber Pakhtunkhwa (formerly Northwest Frontier Province).

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Vital Signs: Drinking and Driving Among High School Students Aged ≥16 Years — United States, 1991–2011

On October 2, 2012, this report was posted as an MMWR *Early Release on the* MMWR *website (http://www.cdc.gov/mmwr).*

Abstract

Background: Although every state prohibits persons aged <21 years from driving with any measurable amount of blood alcohol, many young persons still drink and drive. Additionally, fatal crash data indicate that most teen drivers with positive (>0.00%) blood alcohol concentrations (BACs) who are involved in fatal crashes have BACs ≥0.08%, the level designated as illegal for adult drivers.

Methods: CDC analyzed data from the 1991–2011 national Youth Risk Behavior Surveys (YRBS) to describe the trend in prevalence of drinking and driving (defined as driving one or more times when they had been drinking alcohol during the 30 days before the survey) among U.S. high school students aged ≥16 years. The 2011 national YRBS data were used to describe selected subgroup differences in drinking and driving, and 2011 state YRBSs data were used to describe drinking and driving prevalence in 41 states.

Results: During 1991–2011, the national prevalence of self-reported drinking and driving among high school students aged ≥16 years declined by 54%, from 22.3% to 10.3%. In 2011, 84.6% of students who drove after drinking also binge drank. Drinking and driving prevalence varied threefold across 41 states, from 4.6% in Utah to 14.5% in North Dakota; higher prevalences were clustered among states in the upper Midwest and along the Gulf Coast.

Conclusions: Although substantial progress has been made during the past 2 decades to reduce drinking and driving among teens, in 2011, one in 10 students aged ≥16 years reported driving after drinking during the past 30 days. Most students who drove after drinking alcohol also binge drank.

Implications for Public Health Practice: Effective interventions to reduce drinking and driving among teens include enforcement of minimum legal drinking age laws, zero tolerance laws (i.e., no alcohol consumption allowed before driving for persons aged <21 years), and graduated driver licensing systems.

Introduction

Motor vehicle crashes are the leading cause of death among teens aged 16–19 years in the United States (*1*). In 2010, a total of 2,211 passenger vehicle occupants aged 16–19 years died in crashes on public roadways; 1,280 (58%) were drivers (*2*). Although every state prohibits persons aged <21 years from driving with any measurable amount of blood alcohol, in 2010, one in five drivers aged 16–19 years involved in fatal crashes had a positive (>0.00%) blood alcohol concentration (BAC) (*2*). For this report, CDC used data from the 1991–2011 national Youth Risk Behavior Surveys (YRBS) to describe the trend in drinking and driving among students aged ≥16 years, data from the 2011 national YRBS to describe selected subgroup differences, and data from 41 state YRBSs to examine drinking and driving by state.

Methods

The national YRBS, a component of CDC's Youth Risk Behavior Surveillance System (YRBSS), used independent, three-stage cluster samples for the 1991–2011 surveys to obtain cross-sectional data representative of public and private school students in grades 9–12 in all 50 states and the District of Columbia (*3*). Sample sizes ranged from 10,904 to 16,410 students per year. School response rates ranged from 70% to 81%, student response rates ranged from 83% to 90%, and overall response rates* ranged from 60% to 71%. The state YRBSs, another component of the YRBSS conducted by state education and health agencies, used two-stage cluster samples for the 2011 surveys to obtain cross-sectional data representative of public school students in grades 9–12 in 39 states and of public and private school students in grades 9–12 in two states (Ohio and South Dakota). Sample sizes across states ranged from 1,147 to 13,201 students. School response rates ranged from 73% to 100%, student response rates ranged from 64% to 88%, and overall response rates ranged from 60% to 84%.

* Overall response rate = (number of participating schools/number of eligible sampled schools) × (number of usable questionnaires/number of eligible students sampled).

For each national survey and the 41 state surveys, students completed a voluntary and anonymous, self-administered questionnaire that included identically worded questions about drinking and driving, current alcohol use, and binge drinking. Drinking and driving was defined as having driven a car or other vehicle one or more times during the 30 days before the survey when they had been drinking alcohol. Current alcohol use was defined as having had at least one drink of alcohol on at least 1 day during the 30 days before the survey. Binge drinking was defined as having had five or more drinks of alcohol in a row (i.e., within a couple of hours) on at least 1 day during the 30 days before the survey. Race/ethnicity data are presented for non-Hispanic black, non-Hispanic white, and Hispanic students (who might be of any race); the numbers of students from other racial/ethnic groups were too small for meaningful analyses.

Data were weighted to provide national or state-level estimates, and the statistical software used accounted for the complex sample designs. All analyses were conducted only among students aged ≥16 years, the age at which teens in every jurisdiction except New Jersey and New York City could be licensed (*4*). Temporal changes during 1991–2011 were analyzed using logistic regression analyses, which controlled for sex, race/ethnicity, and grade and simultaneously assessed significant ($p<0.05$) linear and quadratic time effects.† T-tests were used to test for significant ($p<0.05$) differences between subgroups.

National YRBS Results

During 1991–2011, a significant linear decrease occurred in the prevalence of drinking and driving among U.S. high school students aged ≥16 years (22.3% to 10.3%) (Figure 1). A significant quadratic trend also was detected, indicating the prevalence of drinking and driving was stable until 1997 and then declined during 1997–2011.

In 2011, the overall prevalence of drinking and driving was 10.3%, representing approximately 950,000 high school students aged 16–19 years in the United States and approximately 2.4 million episodes of drinking and driving during the past 30 days. Male students (11.7%) were significantly more likely than female students (8.8%) to drink and drive. Drinking and driving was significantly more prevalent among white (10.6%) and Hispanic (11.5%) students than black (6.6%) students. Drinking and driving increased significantly by age, from 7.2% among students aged 16 years to 11.5% among students aged 17 years and 14.5% among students aged ≥18 years (Table 1).

† A quadratic trend indicates a significant but nonlinear trend in the data over time; whereas a linear trend is depicted with a straight line, a quadratic trend is depicted with a curve with one bend. Trends that include significant quadratic and linear components demonstrate nonlinear variation in addition to an overall increase or decrease over time.

Overall, 26.4% of students reported binge drinking. However, among students who reported drinking and driving, 84.6% reported binge drinking. Prevalence of drinking and driving was more than three times higher among those who binge drank compared with those who reported current alcohol use but did not binge drink (32.1% versus 9.7%).

State YRBS Results

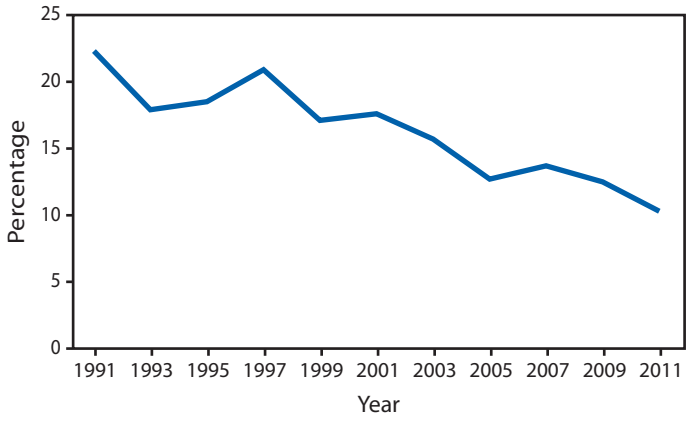
Among the 41 states with available YRBS results in 2011, prevalence of drinking and driving varied threefold, from 4.6% in Utah to 14.5% in North Dakota (median: 10.1%) (Table 2). States in the highest tertile included much of the upper Midwest; the western states of Montana, Wyoming, and New Mexico; South Carolina; and states along the Gulf Coast, except for Florida (Figure 2). Prevalence of drinking and driving was significantly higher than the national prevalence in six states (Iowa, Louisiana, Montana, North Dakota, Texas, and Wyoming), lower in nine states (Alaska, Indiana, Kentucky, Michigan, New York, North Carolina, Rhode Island, Utah, and Virginia), and not statistically different in the remaining 26 states.

Conclusions and Comment

The findings in this report indicate that substantial progress has been made during the past 2 decades to reduce drinking and driving among teens. However, the findings point to the need to further reduce teen access to alcohol and reduce opportunities to drink and drive. In 2011, one in 10 U.S. high school students aged ≥16 years reported drinking and driving during the past 30 days, and 85% of those students also engaged in binge drinking during the past 30 days.

Declines in both alcohol consumption and driving likely have contributed to the reduction in drinking and driving among high school students. YRBS trend data indicate that

FIGURE 1. Percentage of high school students aged ≥16 years who drove a car or other vehicle when they had been drinking alcohol,* — Youth Risk Behavior Surveys, United States, 1991–2011



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

TABLE 1. Percentage of high school students aged ≥16 years who drove a car or other vehicle when they had been drinking alcohol,* by sex, race/ethnicity, and age — Youth Risk Behavior Survey, United States, 2011

	Female		Male		Total	
Category	%	(95% CI)	%	(95% CI)	%	(95% CI)
Total	**8.8**	**(7.4–10.4)**	**11.7**	**(10.7–12.7)**	**10.3**	**(9.4–11.3)**
Race/Ethnicity						
White, non-Hispanic	9.7	(7.9–11.8)	11.4	(10.2–12.7)	**10.6**	**(9.3–12.0)**
Black, non-Hispanic	4.6	(3.1–6.9)	8.6	(6.1–12.0)	**6.6**	**(5.0–8.8)**
Hispanic	9.3	(7.4–11.5)	13.6	(11.3–16.3)	**11.5**	**(9.9–13.3)**
Age (yrs)						
16	6.4	(5.1–8.1)	7.8	(6.4–9.4)	**7.2**	**(6.1–8.5)**
17	10.4	(8.4–12.9)	12.4	(10.7–14.3)	**11.5**	**(10.0–13.1)**
≥18	10.6	(7.9–14.1)	17.5	(15.1–20.1)	**14.5**	**(12.8–16.4)**

Abbreviation: CI = confidence interval.
* One or more times during the 30 days before the survey.

alcohol use and binge drinking have declined since the late 1990s (*5*). Similar declines in alcohol use and binge drinking have been reported by another national survey of students, Monitoring the Future.§ Additionally, driving among teens, as reported by that survey, declined substantially during 2000–2010; the proportion of high school seniors who did not drive during an average week increased by nearly one-third during that period, from 15% to 22%.¶ Reasons for the decline in driving among teens are not understood fully, but two factors are widely thought to contribute. First, widespread implementation of graduated driver licensing systems has delayed full licensure for teen drivers by extending the learner driver period and initially restricting independent driving under high-risk conditions such as nighttime driving and transporting young passengers (*6*). Second, teens are especially sensitive to increases in gasoline prices and declines in economic conditions, which might have decreased their miles driven since 2007 (*7*).

Young persons who drive after consuming any amount of alcohol pose an inordinate risk to themselves, their passengers, and other road users. For each 0.02% increase in BAC, the relative risk of a driver aged 16–20 years dying in a crash is estimated to more than double (*8*). Compared with a sober driver of the same age, a driver aged 16–20 years with a BAC of 0.08%–0.099% is estimated to be 32 times as likely to die in a single-vehicle crash and 13 times as likely to be in a crash in which the young driver lives but someone else dies (*8*). These estimates are especially alarming because, unlike most adults, most high school students who drink alcohol usually do so to the point of intoxication (*9*). Crash fatality data confirm that some teens are drinking heavily before driving. In 2010, according to the National Highway Traffic Safety Administration's Fatality Analysis Reporting System, 697 (20%) of the 3,405 drivers aged 16–19 years involved in fatal crashes (defined as a crash in which at least one person involved in the crash died within 30 days) had positive BACs. Among those 697 teen drivers, 568 (81%) had BACs ≥0.08%, the level designated as illegal for adult drivers (National Highway Traffic Safety Administration, unpublished data, 2012).

Policy developments since the 1980s are credited with reducing alcohol-involved fatal crashes among teens (*6,10,11*). By

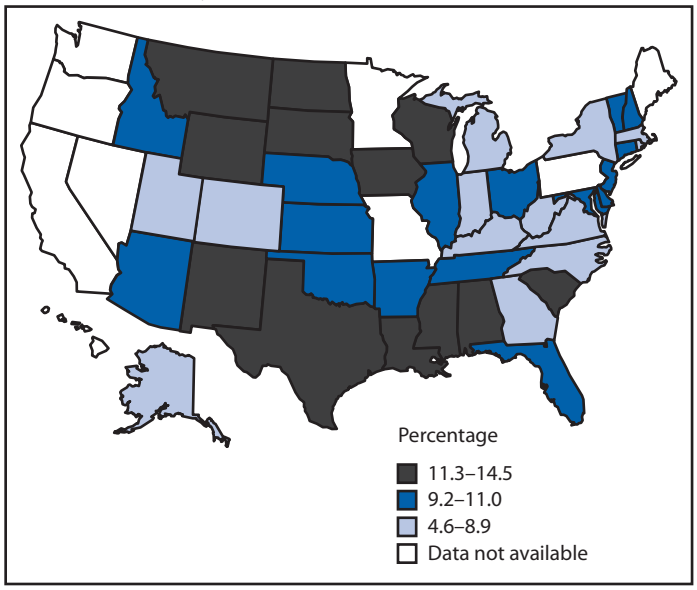
§ Data available at http://monitoringthefuture.org/data/11data.html#2011data-drugs.
¶ Data available at http://monitoringthefuture.org/pubs.html#refvols.

TABLE 2. Percentage of high school students aged ≥16 years who drove a car or other vehicle when they had been drinking alcohol,* — Youth Risk Behavior Surveys, 41 states,† 2011

State	%	(95% CI)
Alabama	11.7	(9.0–15.1)
Alaska	6.7¶	(5.1–8.8)
Arizona	10.7	(8.6–13.1)
Arkansas	11.0	(8.1–14.8)
Colorado	8.5	(6.4–11.3)
Connecticut	9.4	(7.9–11.1)
Delaware	9.7	(8.1–11.5)
Florida	11.0	(9.8–12.4)
Georgia	8.4	(6.4–10.9)
Idaho	10.1	(7.6–13.3)
Illinois	10.4	(8.2–12.9)
Indiana	6.5¶	(5.0–8.4)
Iowa	13.6§	(10.7–17.0)
Kansas	10.9	(8.9–13.3)
Kentucky	7.9¶	(6.4–9.7)
Louisiana	13.9§	(11.1–17.4)
Maryland	10.4	(8.1–13.2)
Massachusetts	8.9	(7.4–10.7)
Michigan	7.5¶	(6.0–9.3)
Mississippi	12.6	(9.3–16.7)
Montana	13.4§	(12.0–14.8)
Nebraska	11.0	(8.8–13.7)
New Hampshire	10.5	(8.4–12.9)
New Jersey	9.2	(6.7–12.4)
New Mexico	11.3	(9.4–13.5)
New York	6.7¶	(5.5–8.1)
North Carolina	7.7¶	(6.2–9.6)
North Dakota	14.5§	(12.1–17.3)
Ohio	9.3	(7.3–11.6)
Oklahoma	9.2	(6.5–12.8)
Rhode Island	8.3¶	(6.9–9.9)
South Carolina	11.7	(8.1–16.7)
South Dakota	12.7	(9.6–16.6)
Tennessee	9.7	(7.7–12.0)
Texas	12.6§	(10.7–14.8)
Utah	4.6¶	(3.4–6.3)
Vermont	9.2	(7.5–11.2)
Virginia	6.8¶	(5.1–9.1)
West Virginia	8.6	(6.8–10.8)
Wisconsin	12.0	(10.0–14.3)
Wyoming	14.3§	(12.3–16.6)
Median	*10.1*	
Range	*(4.6–14.5)*	

Abbreviation: CI = confidence interval.
* One or more times during the 30 days before the survey.
† Data not available for California, Hawaii, Maine, Minnesota, Missouri, Nevada, Oregon, Pennsylvania, and Washington.
§ Significantly higher than the national prevalence (p<0.05).
¶ Significantly lower than the national prevalence (p<0.05).

FIGURE 2. Percentage of high school students aged ≥16 years who drove a car or other vehicle when they had been drinking alcohol,* — Youth Risk Behavior Surveys, 41 states,† 2011



* One or more times during the 30 days before the survey.
† Data not available for California, Hawaii, Maine, Minnesota, Missouri, Nevada, Oregon, Pennsylvania, and Washington.

1988, every state had enacted laws establishing the minimum legal drinking age of 21 years, leading to an estimated median reduction of 17% in alcohol-involved fatal crashes among teen drivers (*11*). Minimum legal drinking age laws are estimated to produce $3.60 in total benefits (i.e., reductions in medical costs, work loss, and lost quality of life) for each $1.00 spent (i.e., a 3.6 benefit:cost ratio) (*12*). During 1983–1998, every state enacted laws establishing a lower BAC (≤0.02%) for drivers aged <21 years. These laws, referred to as "zero tolerance" laws, are estimated to have reduced alcohol-involved fatal crashes among inexperienced drivers by 9%–24% (*11*), resulting in an estimated 25.0 benefit:cost ratio (*12*). More recently, states have introduced graduated driver licensing (GDL) systems. First enacted by Florida in 1996, GDL systems have since been adopted in all 50 states and the District of Columbia (*4*). Although GDL does not directly address drinking and driving, it reduces the behavior by restricting nighttime driving and transporting of young passengers during the first months of licensure (*6,13*). A recent national study found that GDL nighttime driving restrictions were associated with a 13% reduction in fatal drinking driver crashes among drivers aged 16 or 17 years relative to drivers aged 19 or 20 years, who are not subject to the restriction (*6*). Although every state except Vermont has a nighttime driving restriction, start times vary from 6 p.m. to 1 a.m. (*4*). GDL, with a midnight nighttime driving restriction, is estimated to result in an 8.1 benefit:cost ratio (*12*).

Key Points

- Every state prohibits persons aged <21 years from driving with any measurable amount of blood alcohol.
- During 1991–2011, the prevalence of drinking and driving among high school students aged ≥16 years declined by 54%, from 22.3% to 10.3%.
- In 2011, one in 10 high school students aged ≥16 years reported drinking and driving during the past 30 days.
- 85% of students who drove after drinking also binge drank during the past 30 days.
- 81% of teen drivers with positive (>0.00%) blood alcohol concentrations (BACs) who are involved in fatal crashes have BACs of ≥0.08%, the level designated as illegal for adult drivers.
- Although drinking and driving among teens has declined by >50% in the past 2 decades, it still contributes to >800 deaths each year. Effective interventions to reduce drinking and driving among teens include enforcing minimum legal drinking age laws, zero tolerance laws, and graduated driver licensing systems.

The findings in this report are subject to at least six limitations. First, YRBS does not measure whether a student has driven during the 30 days before the survey, so it is not possible to assess prevalence of drinking and driving only among students who drive. According to results from the Monitoring the Future survey, 22% of 12th grade students in 2010 did not drive at all "during an average week." Second, YRBS defines binge drinking for boys and girls as five or more drinks within a couple hours, which differs from the nationally recommended definition.** The prevalence of binge drinking among girls likely would have been higher if it were defined using a four-drink threshold, consistent with national recommendations. Third, although binge drinking and drinking and driving were strongly associated, data were not available to determine whether binge drinking occurred before driving. Fourth, the extent of underreporting or overreporting of behaviors in YRBS cannot be determined, although the survey questions demonstrate good test-retest reliability (*14*). Fifth, these data apply only to youths who attend school and, therefore, are not representative of all persons in this age group. Nationwide, in 2009, of persons aged 16–17 years, approximately 4% were not

** Definition available at http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/moderate-binge-drinking.

enrolled in a high school program and had not completed high school (*15*). Finally, state-level prevalence estimates of drinking and driving were not available for nine states, including four contiguous western states (Washington, Oregon, California, and Nevada).

Effective interventions that reduce drinking and driving among teens include minimum legal drinking age laws, zero tolerance laws, and GDL. Enhanced enforcement of minimum legal drinking age laws using retailer compliance checks has proven effective in reducing retail sales of alcohol to minors (*16*). Families could consider using a parent–teen driver agreement (*17*) to establish and enforce the "rules of the road" for their newly licensed teen, including complying with all state GDL provisions, never drinking and driving, and always wearing a seat belt. Additionally, teen alcohol consumption (*9,18*) and drinking and driving patterns (*18*) are correlated with those of adults living in the same state. Effective strategies to reduce alcohol consumption and drinking and driving aimed at the general population, such as those recommended by the Community Preventive Services Task Force, also can reduce both behaviors among teens (*10,11,16,19*). Multifaceted community-based programs that address the local social, economic, and legal context in which teens access alcohol and drink and drive (*20*) are more likely to succeed than any single approach. Lastly, effective strategies to increase seat belt use, such as primary seat belt laws and enhanced enforcement of seat belt laws, reduce injury severity when crashes occur (*21*).

Reported by

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Notes from the Field

Tuberculosis Outbreak in a Long-Term–Care Facility for Mentally Ill Persons — Puerto Rico, 2010–2012

During January 2012, the Puerto Rico Department of Health (PRDOH) detected a tuberculosis (TB) outbreak among residents of a long-term–care facility in the San Juan metropolitan area. The same rare *Mycobacterium tuberculosis* genotype was identified in isolates from four patients. This facility housed 40 men, aged 40–71 years, with severe mental illness. During April 2012, CDC assisted PRDOH with the investigation to describe outbreak epidemiology, identify and prioritize contacts for evaluation and treatment, and provide recommendations on interventions aimed at stopping TB transmission.

A confirmed case was defined as TB disease diagnosed during July 2010–April 2012 in a facility resident caused by *M. tuberculosis* with the outbreak genotype; a probable case was TB disease during the same period in a facility resident without isolates available for genotyping analysis but with epidemiologic links to a confirmed case. Four confirmed and three probable cases were identified. Median age of the seven men was 52 years (range: 49–71 years), and none had evidence of human immunodeficiency virus infection. Three patients died; two died of respiratory failure presumed to be related to TB, the third died of cardiorespiratory arrest of unknown etiology. Patients were considered to be infectious from 3 months before development of symptoms if they had acid-fast bacilli in their sputum or cavitary lesions on chest radiography or from 1 month before onset of symptoms for other cases, to 14 days after the beginning of treatment (*1*). The median estimated length of time the patients were infectious at the facility was 99 days (range: 91–214 days). A review of medical records identified a possible eighth TB case in a facility resident who had died of respiratory failure in April 2011 without testing for TB.

Since the initial case was identified in July 2010, tuberculin skin tests were administered to 187 contacts during 2010–2012; 26 (81%) of 32 residents and seven (5%) of 155 nonresident contacts (facility employees and residents' family members) had evidence of latent TB infection. Among residents, median time between a positive tuberculin skin test and chest radiography was 29 days (range: 3–515 days) and between chest radiography and latent TB infection treatment initiation was 66 days (range: 15–555 days). The congregate setting, with extended close contact among facility residents and extended infectious periods provided a prolonged opportunity for exposure. Contributing factors for the extended infectious periods included the local TB clinic's lack of on-site radiography equipment, delays in preapproval for radiographs among Medicaid beneficiary residents, and difficulty in transporting residents with severe mental illness to a medical facility.

To prevent similar outbreaks, PRDOH recommended more timely access to medical services for facility residents, placement of radiography equipment at the TB clinic, and dissemination of educational materials to facility employees. CDC guidelines recommend TB education, symptom screening, and possibly testing of new employees and residents of long-term–care facilities (*2,3*). Because of difficulties with symptom screening among persons with severe mental illness, PRDOH recommended that new residents undergo more intensive screening (e.g., tuberculin skin testing, chest radiography, and sputum evaluation) before admission to long-term–care facilities in Puerto Rico.

Reported by

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Announcement

Application Deadline for The CDC Experience Applied Epidemiology Fellowship — December 7, 2012

The CDC Experience is a 1-year fellowship in applied epidemiology for third- and fourth-year medical students. Eight competitively selected fellows spend 10–12 months at CDC in Atlanta, Georgia, where they conduct epidemiologic analyses in areas of public health that interest them. The fellowship provides opportunities to enhance skills in research and analytic thinking, written and oral scientific presentations, and the practices of preventive medicine and public health.

Through this training, fellows acquire practical tools for approaching population-based health problems. Graduates of The CDC Experience have an appreciation of the role of epidemiology in medicine and health and are able to apply their knowledge and skills to enhance their clinical acumen and help improve the quality of the U.S. health-care system.

Information on applying for The CDC Experience is available at http://www.cdc.gov/cdcexperiencefellowship. Applications for the class of 2013–14 must be submitted by December 7, 2012. Questions can be addressed to Virginia Watson, program coordinator, via e-mail (vwatson1@cdc.gov).

Erratum

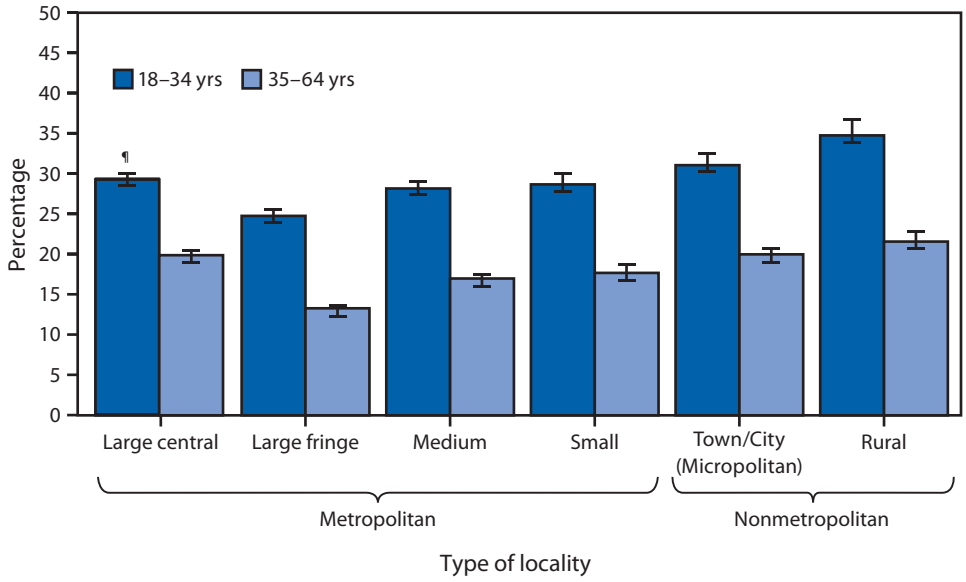
Vol. 61, No. 38

In the printed version of the report, "Influenza A (H3N2) Variant Virus-Related Hospitalizations — Ohio, 2012," an error occurred on p. 764, in the third sentence of the second paragraph. The sentence should read as follows: "Respiratory specimens were confirmed as positive for **H3N2v** virus by testing at the Ohio Department of Health (ODH) laboratory using the CDC FLU real-time reverse transcription polymerase chain reaction (rRT-PCR) Dx Panel for influenza A (H3N2)v and at CDC by rRT-PCR and genetic sequencing (*1*)." The online versions at http://www.cdc.gov/mmwr have been corrected.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Uninsured Adults Who Did Not Have Health Coverage*, by Age Group and Type of Locality† — National Health Interview Survey, 2009–2011§



* Health insurance coverage is at the time of the NHIS interview. Persons not covered by private insurance, Medicaid, Children's Health Insurance Program (CHIP), state-sponsored or other government-sponsored health plans, Medicare, or military plans are considered uninsured. Persons with only Indian Health Service coverage are considered uninsured.

† Counties were classified into urbanization levels based on a classification scheme developed by NCHS that considers metropolitan–nonmetropolitan status, population, and other factors.

§ Estimates are based on household interviews of a sample of the civilian, noninstitutionalized U.S. population and are derived from the National Health Interview Survey family core and sample adult questionnaires.

¶ 95% confidence interval.

The percentage of uninsured adults in 2009–2011 was lowest (25% of adults aged 18–34 years and 13% of those aged 35–64 years) among those residing in large fringe metropolitan counties (suburbs of large cities). Among adults aged 18–34 years, the percentage uninsured was highest in the most rural counties (35%) and ranged from 28% to 31% in other urbanization levels. Among adults aged 35–64 years, 17%–18% in medium and small metropolitan areas and 20%–22% in large central metropolitan and nonmetropolitan counties lacked insurance. For all urbanization levels, the percentage uninsured was lower for adults aged 35–54 years than for younger adults.

Sources: National Health Interview Survey. Available at http://www.cdc.gov/nchs/nhis.htm.

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