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Outbreaks of Human Metapneumovirus in Two Skilled Nursing Facilities — West Virginia and Idaho, 2011–2012

During January and February 2012, state and local public health agencies in West Virginia and Idaho, with assistance from facility staff members and CDC, investigated outbreaks of unexplained respiratory illness characterized by high proportions of lower respiratory tract infections (LRTIs) at two skilled nursing facilities (SNFs). Investigations were conducted to determine the extent and etiology of each outbreak and make recommendations to prevent further spread. During both outbreaks, influenza was initially suspected; however, human metapneumovirus (hMPV) was identified as the etiologic agent. Among 57 cases of respiratory illness from both facilities, 45 (79%) patients had evidence of LRTI, of whom 25 (56%) had radiologically confirmed pneumonia; five (9%) had evidence of upper respiratory tract infection (URTI), and seven (12%) could not be classified. Six patients (11%) died. These outbreaks demonstrate that hMPV, a recently described pathogen that would not have been detected without the use of molecular diagnostics in these outbreaks, is associated with severe LRTI and should be considered as a possible etiology of respiratory outbreaks in SNFs.

West Virginia

On January 5, 2012, an outbreak of respiratory illness among SNF residents was reported to the local health department by an SNF in West Virginia. Clinical and epidemiologic data from ill residents were abstracted from medical records. A case was defined as a respiratory illness in a resident with onset during December 20, 2011–February 20, 2012.

Nasopharyngeal (NP) specimens were sent to a local hospital laboratory for rapid influenza diagnostic tests (RIDT) and to the West Virginia Office of Laboratory Services for influenza real-time reverse transcription–polymerase chain reaction (rRT-PCR) assay. Additional NP specimens were sent to CDC for testing for respiratory pathogens.

The SNF housed 83 residents in a two-wing, single-story building, and employed 95 staff members. Residents shared common dining and activity areas. Cases were identified among 28 (34%) of 83 residents and were distributed throughout the facility. The median age of the 28 patients was 84 years (range: 54–99 years); 15 (54%) were women. Comorbidities included chronic heart disease (64%) and dementia (50%). The median duration of illness was 21 days (range: 3–43 days). Cases were classified symptomatically into URTI or LRTI, with or without radiologically confirmed pneumonia (*1*) (Table 1). One patient had URTI, and 26 (93%) patients had LRTI, of whom 18 (69%) had radiologically confirmed pneumonia; one case could not be classified. Among the 28 patients, four (14%) were hospitalized, and four (14%) patients died, one of whom had been hospitalized. Among 74 (78%) of 95 staff

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TABLE 1. Number and percentage of patients with respiratory illness in skilled nursing facilities, by selected signs and symptoms — West Virginia and Idaho, 2011–2012

	West Virginia (N = 28)		Idaho (N = 29)	
Signs and symptoms	No.*	(%)	No.*	(%)
Cough	25	(89)	29	(100)
New findings on chest exam/New rales, rhonchi, or wheezes	22	(79)	16	(55)
New or increased sputum/Productive cough	12	(43)	11	(38)
Shortness of breath/Dyspnea	4	(14)	8	(28)
Runny nose/Congestion	3	(11)	4	(14)
Sore throat	1	(4)	1	(3)
Mental status/Functional status changes	1	(4)	5	(17)
Fever >100°F (37.8°C)	11	(39)	7	(24)
Received radiographic imaging	23	(82)	20	(69)
Positive radiographic imaging for pneumonia	18	(78)	7	(35)

* Patient numbers and proportions represent patients for whom this information was documented in medical records. Lack of documentation in medical records does not mean that the signs or symptoms were not present.

members who responded retrospectively to a questionnaire about respiratory illness experienced during the SNF resident outbreak, 24 (32%) reported symptoms of respiratory infection during the relevant period.

NP specimens from all 14 patients tested were negative for influenza by RIDT (12 patients) or rRT-PCR (two). Blood cultures from five patients were negative for bacterial growth. Nine NP specimens were submitted to CDC for comprehensive testing for respiratory pathogens by rRT-PCR (Table 2) (*2*). hMPV was detected in six of nine specimens; no other pathogens were detected. Among the six patients in whom hMPV was detected, five had LRTI, of whom three had radiologically confirmed pneumonia (Table 2). Among four patients who died, one had been tested and was positive for hMPV.

Idaho

On February 8, 2012, an SNF notified Idaho's Southwest District Health office of a pneumonia cluster among residents. Patient medical and laboratory records were reviewed. A case was defined as new cough onset in a facility resident during January 31–February 29.

The SNF housed 80 residents in a three-wing, single-story building and employed 119 staff members. Residents shared common dining and activity rooms. Cases were identified among 29 (36%) of 80 residents and were distributed throughout the facility. Among the 29 patients, the median age was 84 years (range: 51–97 years); 18 (62%) were women. Among 27 patients with information, 20 (74%) had two or more comorbid conditions, most frequently dementia (59%), diabetes (38%), and chronic renal failure (34%). Among 26 patients for whom information was available, the median duration of illness was 4.5 days (range: 1–14 days). Among 29 patients, four (14%) had URTI, and 19 (66%) had LRTI, of whom seven (37%) had radiologically confirmed pneumonia; six (21%) could not be classified (Table 1). Among 29 patients, five (17%) hospitalizations and two deaths were reported. Eleven (9%) of 119 staff members reported respiratory illness to the SNF infection control nurse during the outbreak period.

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TABLE 2. Results for specimens tested for human metapneumovirus (hMPV) at CDC from patients in skilled nursing facilities, by infection classification — West Virginia and Idaho, 2011–2012

Classification	West Virginia* No. (N = 28)	No. positive	No. tested	Idaho† No. (N = 29)	No. positive	No. tested
Upper respiratory tract infection	1	0	1	4	0	1
Lower respiratory tract infection	8	2	3	12	2	3
Radiologically confirmed pneumonia	18	3	4	7	4	4
Unclassified	1	1	1	6	0	2

* Specimens confirmed for hMPV by real-time reverse transcriptase–polymerase chain reaction (rRT-PCR). Specimens were screened for 16 viral and seven bacterial pathogens: adenovirus; hMPV; human parainfluenza viruses 1–4; influenza viruses A, B, and C; respiratory syncytial virus (RSV), rhinovirus; human coronaviruses 229E, NL63, OC43, HKU1; enterovirus; *Bordetella pertussis; Chlamydophila pneumoniae; Haemophilus influenzae: Legionella pneumophila; Mycoplasma pneumoniae; Streptococcus pneumoniae*; and *Streptococcus pyogenes*. All specimens were negative for all pathogens other than hMPV.

† Specimens confirmed for hMPV by rRT-PCR at CDC. Specimens were screened at the Idaho Bureau of Laboratories for adenovirus; hMPV; human parainfluenza viruses 1–3; influenza viruses A and B; RSV; entero-rhinovirus by rRT-PCR; viral culture; and qualitative nucleic acid multiplex panel (MP). One specimen from a patient with lower respiratory tract infection was positive for entero-rhinovirus by MP; otherwise all specimens were negative for all pathogens other than hMPV.

Physician-ordered diagnostic tests, including RIDT (eight patients), rapid test for respiratory syncytial virus (RSV) (one), *Legionella* urinary antigen (three), *Streptococcus pneumoniae* urinary antigen (one), and bacterial cultures on bronchoalveolar lavage (BAL) (one), sputum (one), and blood specimens (five) collected 0–7 days after illness onset all were negative; however, among two of the five patients with blood specimens, blood was collected for bacterial culture 4 days after antibiotic therapy was initiated.

NP specimens from nine nonhospitalized ill residents were collected <4 days after illness onset and tested at the Idaho Bureau of Laboratories, where hMPV was identified by multiplex molecular assay. The nine NP specimens and one BAL specimen subsequently were submitted to CDC for confirmatory testing for hMPV by rRT-PCR; hMPV was detected in six specimens. Among the six patients in whom hMPV was detected, all had LRTI, and half had radiologically confirmed pneumonia (Table 2). Of the two patients who died, one patient was tested and was positive for hMPV.

For both outbreaks, infection control measures included isolation of patients; droplet and contact precautions; enhanced environmental cleaning; cessation of group meals, activities, and new admissions; increased emphasis on identification and exclusion of ill employees; and increased emphasis on hand hygiene and respiratory etiquette among residents, staff members, and visitors.

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Editorial Note

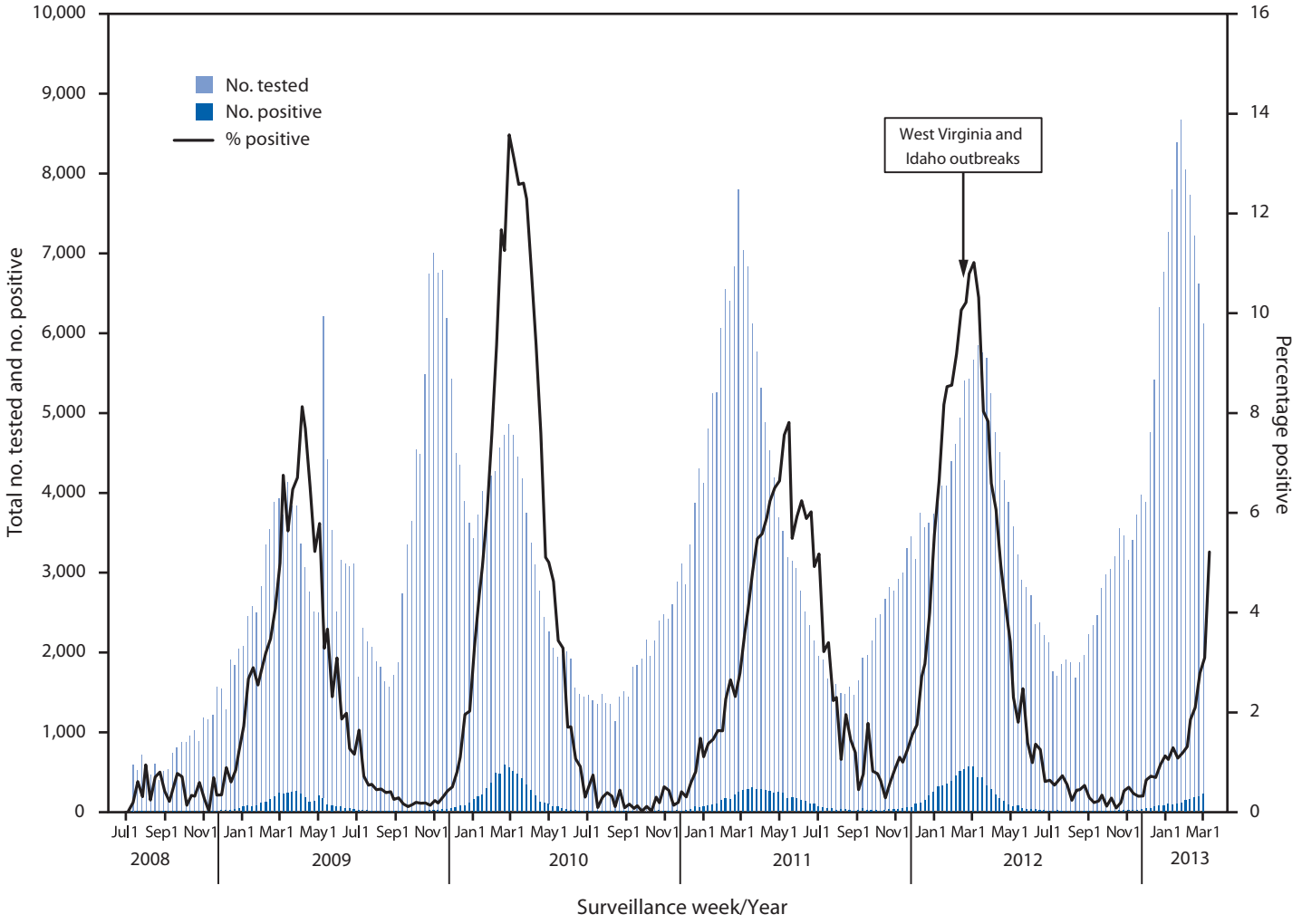
The outbreak in Idaho was the first reported caused by hMPV in an SNF in Idaho, and the outbreak in West Virginia was the second reported outbreak caused by hMPV at an SNF in that state (Sherif Ibrahim, West Virginia Bureau for Public Health, personal communication, 2013). hMPV was first identified during 2001 in respiratory specimens collected during the preceding 20 years in The Netherlands (*3*). hMPV is responsible for an estimated 5%–15% of LRTI hospitalizations among infants and young children, varying geographically and temporally (*4*). Although seroprevalence of hMPV-specific antibody is nearly 100% among adults, hMPV can cause symptomatic reinfection throughout life, especially among older adults and immunocompromised persons (*4*). Among adults, risk factors for severe hMPV disease are advanced age and underlying cardiopulmonary disease (*4,5*). In both outbreaks reported, the median age of patients was 84 years, and one or more comorbid conditions was present among the majority of patients. Among adults aged ≥65 years in Tennessee, hospitalization rates for hMPV infection have been estimated as 22 cases/10,000 person-years (95% confidence interval: 12.1–33.7) (*5*).

hMPV typically exhibits peak activity during late winter or early spring in temperate climates (*4*); however, summer outbreaks attributed to hMPV in LTCFs have been reported (*6*). hMPV surveillance data from the National Respiratory and Enteric Virus Surveillance System (Figure) and from GermWatch* indicate biennial activity peaks. Increased use of multipathogen molecular diagnostic testing has increased identification and awareness of hMPV as an important etiology of upper and lower respiratory infection (*2,7*).

Among previously reported outbreaks in SNFs attributed to hMPV, attack proportions up to 36% have been reported. Clinical characteristics of illness ranged from mild upper respiratory infection to respiratory failure and death, with reported case-fatality rates of 0%–31% of cases (*4,6,7*). In the West Virginia and Idaho outbreaks, 26 (93%) of 28 patients and 19

* Available at https://intermountainphysician.org/gw/respiratoryviruses/pages/default.aspx.

FIGURE. Number of respiratory samples tested and number and percentage of tests positive for human metapneumovirus, by week of report — National Respiratory and Enteric Virus Surveillance System, July 5, 2008–March 2, 2013



(66%) of 29 patients, respectively, had LRTI. Four residents in West Virginia and two in Idaho died. Median duration of illness varied widely between West Virginia and Idaho. The longer duration of illness observed in West Virginia might be explained by the higher proportion of patients with LRTI and radiologically confirmed pneumonia.

Unlike identification of a viral cause of a respiratory infection in a young child, identification of a viral cause in an older adult is difficult for many reasons, including protean clinical manifestations and lower viral loads in respiratory specimens. Identification of a cause of LRTI is especially difficult. Early clinical diagnosis and early respiratory specimen collection (e.g., 3–4 days after symptom onset) can increase detection of respiratory viruses by molecular diagnostic tests (*8*).

The incubation period for hMPV is 5–6 days, and transmission likely occurs as a result of direct or indirect contact with infected secretions spread by fomites or through large particle aerosols, similar to other respiratory viruses (*9*). In addition to recommended standard and droplet precautions for influenza control, SNF infection control measures for hMPV should include contact precautions to prevent transmission by contact with infected secretions and fomites (*10*). Consistent with CDC's long-term care facility influenza control guidelines[†] ill staff members should be excluded from work until at least 24 hours after they no longer have a fever. Ill staff members and visitors likely represent a significant source of community-acquired respiratory viral infection among SNF residents.

[†] Available at http://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm.

What is already known on this topic?

First identified in 2001, human metapneumovirus (hMPV) is believed to be responsible for an estimated 5%–15% of hospitalizations for lower respiratory tract infections among children. In addition, hMPV can cause symptomatic reinfection throughout life, especially among older adults and immunocompromised persons.

What is added by this report?

These outbreaks of hMPV respiratory illness in skilled nursing facilities (SNFs) caused severe lower respiratory disease in >75% of affected patients, with an overall fatality rate of 11% in a population with a high prevalence of comorbidities or advanced age.

What are the implications for public health practice?

Clinicians should consider hMPV infection in the differential diagnosis of illness in patients with respiratory tract infection in SNFs, particularly when clusters of severe unexplained respiratory infections are detected.

Clinicians should be aware of hMPV as a cause of severe respiratory disease in SNFs. Clusters of unexplained respiratory illnesses should be reported to public health agencies. Prompt reporting of clusters, thorough documentation of clinical symptoms, collection of respiratory specimens early in the course of illness, and use of molecular diagnostic methods can help quickly identify outbreak etiologic agents to prioritize and guide infection control measures, treatment, and chemoprophylaxis decisions. Health departments may contact CDC for assistance with laboratory diagnostics or consultation through the CDC Unexplained Respiratory Disease Outbreaks work group.[§]

[§] Available at http://emergency.cdc.gov/urdo.

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Fixed Drug Eruption Associated with Sulfonamides Sold in Latino Grocery Stores — Greater Washington, DC, Area, 2012–2013

In March 2012, a Salvadoran-American boy aged 7 years living in Maryland developed three slightly painful, well-demarcated, flat, gray-brown patches on his torso. A dermatologist in Washington, DC, suspected a fixed drug eruption (an erythema multiforme-like adverse drug reaction that occurs in the same location each time the person uses a particular medication). The child had recently taken a cough and cold remedy, Baczol Antigripal, which was made in El Salvador and purchased in a Maryland suburb of Washington, DC, without a prescription. The Baczol Antigripal ingredients included the sulfonamide-containing antibiotic trimethoprim-sulfamethoxazole (TMP/SMX), which is a common cause of fixed drug eruption. In June 2013, another Salvadoran-American child, a girl aged 14 years living in northern Virginia, was evaluated for a similar fixed drug eruption likely caused by a Baczol product purchased near her home. In August 2013, staff members from the Children's National Medical Center investigated the availability of Baczol products in grocery stores in Salvadoran neighborhoods of Washington, DC, and neighboring suburbs. TMP/SMX-containing products were found in seven of 19 stores.

Four Baczol products were identified; two listed TMP/SMX as an ingredient and were labeled for sale in El Salvador only. TMP/SMX is a known cause of fixed drug eruptions and other adverse drug reactions and cannot be legally dispensed in the United States without a prescription. On August 20, the Food and Drug Administration (FDA) issued a Safety Alert in English and Spanish.* The FDA advised purchasers of these products to stop taking it and consult a health-care professional. Clinicians should be aware that patients might consume nonprescribed antibiotics and should specifically ask about over-the-counter cold and flu remedies, especially when an adverse drug reaction is suspected.

The dermatologist who diagnosed the first case and learned of the sale of Baczol Antigripal in Maryland notified Maryland's Department of Health and Mental Hygiene that an antibiotic was being sold without a prescription. In April 2012, the department issued an alert regarding Baczol, which is sold in El Salvador as an over-the-counter remedy for the common cold and cough in children. The FDA has issued import refusals for those Baczol formulations that contain TMP/SMX (*1*). Use of nonprescribed TMP/SMX poses a public health risk because of possible adverse drug reactions (*2*) and spread of antibiotic resistance; however, the availability of such drugs is unknown. An investigation was conducted to determine the availability of Baczol products in grocery stores in Salvadoran neighborhoods of Washington, DC, and neighboring suburbs.

Two investigators for the Children's National Medical Center used U.S. Census data to identify heavily Salvadoran neighborhoods in the Washington, DC, area and then searched the Internet for Latino grocery stores in Washington, DC (Columbia Heights and Adams Morgan neighborhoods), Virginia (Falls Church, Alexandria, and Springfield), and Maryland (Wheaton and Silver Spring). Search terms used included "Latino market," "Latino grocery," "Latin American market," and "Latin American grocery." The investigators identified areas within each neighborhood that appeared to have several Latino grocery stores in close proximity. They visited identified stores and conducted scripted questioning for Baczol. Latino grocery stores nearby that had not been found via the Internet search also were assessed with the same scripted materials. The investigators also searched the medical literature but found no cases of fixed drug eruption attributed to sulfonamide-containing drugs sold without prescription.

TMP/SMX-containing products were found in three of seven stores in Washington, DC, one of six stores in Virginia, and three of six stores in Maryland. Two products, Baczol Antigripal (Figure) and Baczol Expectorante, listed TMP/SMX as an ingredient. The labels for both products, written entirely in Spanish, stated that they were for sale in El Salvador only (Table). The label for Baczol Expectorante stated explicitly that it was for sale without a prescription. A third TMP/SMX-containing product identified by investigators was Bactrizole, which is made by a different manufacturer in El Salvador (Table). None of the three TMP/SMX-containing medications described potential adverse drug reactions on their packaging.

Two additional products, also called Baczol Antigripal (Figure) and Baczol Expectorante, did not contain TMP/SMX. The labels for these products, written in Spanish and English, but otherwise nearly identical to those of their sulfonamide-containing counterparts, stated that they were for sale in the United States without a prescription and had appropriate National Drug Code numbers.

* Available at http://www.fda.gov/drugs/drugsafety/ucm365650.htm.

FIGURE. Two Baczol products purchased without a prescription from Latino grocery stores in the greater Washington, DC, area: (left) a product with no sulfonamide component, which was exported legally to the United States; (right) a product with TMP-SMX, which according to the label, is intended for sale solely in El Salvador and requires a prescription — 2013

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Editorial Note

A survey in South Carolina showed that 20% of Latino immigrants have obtained or purchased oral antibiotics without a prescription in the United States (*3*). In most cases, the purchaser sought to treat common illnesses, often caused by viruses, including the common cold, ear infections, cough, sore throat, and diarrhea.

Self-medication with antibiotics for viral illnesses is not consistent with prudent use of antibiotics. TMP/SMX is a known cause of fixed drug eruptions and other rare but potentially serious adverse drug reactions, such as Stevens-Johnson syndrome, toxic epidermal necrolysis, and bone marrow suppression (*4*).

What is already known on this topic?

Self-medication with oral antibiotics obtained without a prescription has been observed among substantial numbers of persons in U.S. Latino communities.

What is added by this report?

Following reports of severe skin conditions in youths, approximately one third of Latino grocery stores surveyed in the greater Washington, DC, area were found to be selling illegally imported sulfonamide antibiotic preparations.

What are the implications for public health practice?

Clinicians should be aware that patients with severe skin conditions might have consumed nonprescribed antibiotics and should specifically ask about over-the-counter cold and flu remedies, especially when there is a suspicion of an adverse drug reaction. Health-care professionals and consumers are encouraged to report adverse events related to Baczol Antigripal and Baczol Expectorante to the Food and Drug Administration's MedWatch Safety Information and Adverse Event Reporting Program.

Compared with other antibiotic classes, sulfonamides, including the sulfamethoxazole that is contained in TMP/SMX, are responsible for higher rates of moderate-to-severe allergic reactions, hospitalizations, and hematologic or renal effects (*5*).

One Baczol formulation also contained metamizole (or dipyrone), a nonsteroidal antiinflammatory drug formerly widely prescribed outside the United States (under trade names including Analgin, Dipirona, Novalgin, and Optalgin) as an analgesic and antipyretic, and banned by the FDA in 1977 because of its association with agranulocytosis (*6*). The drug is still commonly used in developing countries as an analgesic and antipyretic. One study reported that 25% of surveyed Latinos who have used metamizole in the United States purchased it within the United States (*7*). Although this study did not address the availability of metamizole in Latino grocery stores, it was found in a Baczol Antigripal formulation.

This investigation showed that medications containing TMP/SMX are readily available from many Latino grocery stores in Washington, DC, and its suburbs. These products, Baczol Antigripal and Baczol Expectorante, might be confused with similar products legally sold in the United States. The legal formulations have the same names and nearly identical packaging as their TMP/SMX-containing counterparts. In response to this investigation, the FDA issued a Safety Alert in English and Spanish on August 20, 2013, advising consumers who have purchased one of these products to immediately stop taking it and consult a health care professional. Clinicians should be aware that patients might consume nonprescribed

TABLE. Properties of over-the-counter medications containing trimethoprim/sulfamethoxazole sold in Latino grocery stores — greater Washington, DC, area, 2012–2013

Product name	Indications for use	Recommended dose	Active ingredients (per 5-mL dose)	Contraindications	Label states product for sale solely in El Salvador	Prescription required in El Salvador
Baczol Antigripal	Influenza, pharyngitis, bronchopulmonary problems, fever, and general malaise	Adults and children aged ≥12 yrs: 20 mL Children aged 6–11 yrs: 10 mL Children aged 2–5 yrs: 5 mL Children aged <2 yrs: consult a physician Every 12 hrs	Trimethoprim 40 mg Sulfamethoxazole 200 mg Guaifenesin 50 mg Chlorpheniramine maleate 1 mg Phenylephrine HCL 2.5 mg Metamizole [dipyrone] 250 mg	Contraindicated for hypersensitivities to the components of the formula. Avoid use in pregnant or breastfeeding mothers.	Yes	Yes: "Venta bajo prescription médica"
Baczol Expectorante	Respiratory infections such as acute or chronic bronchitis or bronchial complications of viral diseases and bronchopneumonia, laryngitis, laryngotracheo-bronchitis	Adults: 20 mL Children aged 6–12 yrs: 5–10 mL Children aged 2–5 yrs: 5 mL Children aged 1–2 yrs: 2.5 mL Every 12 hrs	Trimethoprim 40 mg Sulfamethoxazole 200 mg Ambroxol HCl 15 mg	Contraindicated for hypersensitivities to the components of the formula. Avoid use in pregnant or breastfeeding mothers.	Yes	No: "Venta sin receta"
Bactrizole Balsámico Forte Suspensión	Indicated for bronchopulmonary infections resistant to antibiotics. Is a broad spectrum antibiotic agent effective in respiratory infections. Alleviates nasal obstruction.	Adults and children aged >12 yrs: 2 teaspoons (10 mL) every 6–12 hrs for 5–14 days	Trimethoprim 40 mg Sulfamethoxazole 200 mg Guaifenesin 50 mg Chlorpheniramine maleate 1 mg Phenylephrine HCL 2.5 mg	Hypersensitivity to any components. Pregnancy, lactation.	No	Yes: "Venta bajo receta médica."

antibiotics and should specifically ask about over-the-counter cold and flu remedies, especially when there is a suspicion of an adverse drug reaction. Health-care professionals and consumers are encouraged to report any adverse events related to Baczol Antigripal and Baczol Expectorante to FDA's MedWatch Safety Information and Adverse Event Reporting Program.[†]

[†] Available at http://www.fda.gov/medwatch/report.htm.

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Childhood Lead Exposure Associated with the Use of Kajal, an Eye Cosmetic from Afghanistan — Albuquerque, New Mexico, 2013

Lead is a toxic metal that damages blood cells, the kidneys, the cardiovascular system, and the developing nervous system. The risk for lead exposure causing subsequent cognitive and neurobehavioral deficits is especially high among toddlers because of their hand-to-mouth activities and their higher absorption of ingested lead compared with adults (*1*). In January 2013, the New Mexico Department of Health (NMDOH) received a report from an Albuquerque clinic of a refugee child aged 20 months (patient 1) with an elevated blood lead level (BLL) of 27.0 μg/dL (CDC reference value = 5.0 μg/dL). Medical staff informed NMDOH that the child and family used kajal, a traditional eye cosmetic brought from Afghanistan, their country of origin. Further investigation revealed that patient 1's brother, aged 4 months (patient 2), also had an elevated BLL of 33.5 μg/dL. Laboratory analysis of kajal used by the family showed a lead content of 54%. These two cases highlight the potential for lead poisoning among refugee populations in the United States and call attention to contaminated consumer products as a source of lead exposure. Physicians who provide health services to refugee and immigrant children should be aware of this potential exposure. Health-care providers who routinely screen refugee and immigrant children for elevated BLLs should consider asking questions about the use of traditional eye cosmetics.

In January 2013, in preparation for a preschool program, patient 1 was screened for lead and had a capillary blood lead test result of 27.0 μg/dL. Two weeks later, confirmatory venous blood lead testing of patients 1 and 2 showed BLLs of 18.9 μg/dL and 33.5 μg/dL, respectively; both results exceeded CDC's current reference value of 5.0 μg/dL.* The children's cousin, aged 3 years, also was tested and found to have a venous BLL of 5.3 μg/dL. All three children were asymptomatic, as reported by their physicians. Communication with the family indicated that the cultural practice of applying kajal to the children's eyelids was intended to promote eye health. Other traditional eye cosmetics (i.e., surma, tiro, and kohl) are widely used in Asia, Africa, and the Middle East and have been implicated as sources of lead poisoning (*2–4*). The children's physician recommended that the parents discontinue use of the eye cosmetic, and if continued use of eyeliner was desired, that they replace it with an over-the-counter cosmetic obtained in the United States.

On receipt of the elevated blood lead test results, NMDOH interviewed the family to investigate potential sources of lead exposure. Based on information about the family's residential conditions, the parent's occupations, and family hobbies, the use of kajal was suspected as the main source of the lead exposure. The use of an imported curry powder (gutti) was suspected as a secondary source. Because of the mother's simultaneous use of kajal during breastfeeding, the children's physician recommended a blood lead test for her. Venous lead testing of the children's mother showed a BLL of 6 μg/dL.

The kajal and the curry powder were collected and analyzed for lead content using Environmental Protection Agency method 200.8.† Quantitative analysis of the kajal found 54% lead by weight, and the curry powder contained 0.01% lead by weight. At the time of initial lead screening, the family had lived in an apartment in Albuquerque for approximately 2 months. Based on responses obtained from the questionnaire, no housing-related lead exposure sources could be identified. NMDOH ruled out other potential lead hazards from occupational exposures, kitchen utensils, hobbies, toys, inexpensive jewelry, pica, or neighborhood sources. The kajal and curry powder were brought with the family from Afghanistan. The primary lead exposure was likely a combination of dermal and conjunctival absorption and ingestion of lead-containing kajal from hand-to-mouth transfer (*2*).

Patients 1 and 2 were found to be healthy, with no apparent developmental delays or medical problems. In accordance with CDC guidelines, follow-up testing was performed on both patients approximately 1 month after the initial confirmatory testing. Patient 1's venous BLL dropped to 17.7 μg/dL, from 18.9 μg/dL. Patient 2's venous BLL dropped to 28.2 μg/dL, from 33.5 μg/dL. Four months after discontinuing use of kajal, patient 2's venous BLL further declined to 22.1 μg/dL and patient 1's venous BLL declined to 14.7 μg/dL. Monitoring of the children's BLLs will continue until their BLLs are <10.0 μg/dL for 3 months, in accordance with current state guidelines.§

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* Additional information available at http://www.cdc.gov/nceh/lead.

† Available at http://water.epa.gov/scitech/methods/cwa/bioindicators/upload/2007_07_10_methods_method_200_8.pdf.

§ Available at http://nmhealth.org/eheb/documents/Lead/Appendix_3_case_mngmnt_guidelines.pdf.

Editorial Note

These cases highlight the risk for pediatric lead exposure among refugee populations and draw attention to the potential exposures to lead-contaminated imported products. Historically, most U.S. childhood lead poisoning cases have been associated with ingestion of chips and dust from lead-based paint sources (*5,6*). Lead poisoning from nonpaint sources, including folk remedies (*5,7*), imported goods (*8*), toys (*9*), and food (*8*), also have been reported in recent years. Global free trade, immigration, and the frequency of international travel have contributed to the potential exposure of children in the United States to nonpaint sources of lead in unregulated consumer products, folk remedies, herbal supplements, and other cultural paraphernalia (*8*). As new sources of childhood lead exposure are identified, it is important to document information about these products and how they are used in cultural practices. This information can then be used to develop strategies that address cultural differences and language barriers to minimize health risks associated with lead-contaminated products.

Kajal and similar traditional eye cosmetic preparations have been found to contain lead concentrations as high as 70% and have been documented as sources of childhood lead poisoning for >30 years (*2,3*). The cultural significance and availability of these products among refugee and immigrant populations and the potential for unintentional toxic exposure pose a substantial public health risk. Despite the FDA import ban on kohl, surma, and kajal, these products still appear in households, transported in personal luggage and distributed illegally by retailers. The risk for high BLLs caused by repeated exposure to multiple lead-contaminated consumer products and accumulation is a concern.

Refugee children have been found to have a higher average BLL at their time of arrival in the United States, as compared with average BLLs measured in U.S. children (*10*). Education directed to health-care professionals and to refugee and immigrant populations is the prime strategy to prevent lead poisoning. Health-care professionals need to discuss lead exposure prevention with refugee patients and their families. Conveying the health risks from lead exposure in a culturally sensitive manner to patients who also might be stressed by recent immigration can be challenging, especially because not all symptoms of lead toxicity are outwardly apparent. Current CDC recommendations advise that all refugee children aged 6 months–16 years be screened for lead within 90 days of their arrival into the United States, and again 3–6 months after resettlement, regardless of initial testing results (*10*). Expanding lead screening to all refugee infants might be warranted. Both patients 1 and 2 are refugees; patient 2 was aged 4 months and might have been overlooked had he not had an older sibling who was identified with an elevated BLL.

Pediatricians and other health-care professionals should incorporate lead screening as part of routine medical evaluation of refugee and immigrant children, specifically, those who are relocating from countries with a documented history of increased lead exposure risks associated with cultural practices or unregulated industrial processes. Health communication addressing potential lead hazards should be provided in a culturally sensitive manner. Clinicians and other health-care workers providing services to refugees and immigrants from Africa, Asia, and the Middle East should be aware of potential sources of lead in these populations and ask about the use of traditional eye cosmetics, especially with women receiving prenatal care or during early childhood screening programs, and questions about the use of folk remedies should be included in lead-exposure risk assessment questionnaires. Additionally, public health education campaigns concerning lead exposure risks and geared to refugee and immigrant populations might increase awareness of lead content in traditional eye cosmetics.

What is already known on this topic?

Lead poisoning continues to be an important, preventable health problem. The common source of lead exposure in the United States is deteriorating lead-based paint and dust; however, some traditional remedies and cosmetics also contain lead.

What is added by this report?

Two male children in New Mexico, aged 20 and 4 months, were found to have elevated blood lead levels of 27.0 and 33.5 μg/dL, respectively. Investigation implicated kajal, a cosmetic imported from Afghanistan, that was applied as a folk remedy to the children's eyelids. The kajal was found to contain 54% lead.

What are the implications for public health practice?

Health-care providers who provide health services to refugee and immigrant children, even in small communities, should be aware of the unique lead exposure risk factors among this population. Expanding lead screening to all infants and children, and pregnant women, might avoid unintentionally excluding cases. Clinicians and other health-care workers might reduce the risk for lead exposures by discussing lead exposure hazards with their patients, especially with women receiving prenatal care or during early childhood screening programs.

Acknowledgments

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Health-Care Provider Screening for Tobacco Smoking and Advice to Quit — 17 Countries, 2008–2011

Tobacco use is the leading cause of preventable mortality in the world (*1*). Article 14 of the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) states that countries should promote cessation of tobacco use and adequate treatment for tobacco dependence (*2*). Health-care providers asking all patients about their tobacco use and advising tobacco users to quit are evidence-based strategies that increase tobacco abstinence (*3*). This report examines the proportion of tobacco smokers in 17 countries responding to the Global Adult Tobacco Survey (GATS) who saw a health-care provider in the past year and who reported that a health-care provider asked them about smoking and advised them to quit. Respondents were tobacco smokers aged ≥15 years surveyed during 2008–2011 in Bangladesh, Brazil, China, Egypt, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Thailand, Turkey, Ukraine, Uruguay, and Vietnam. The proportion of smokers who had visited a health-care provider during the previous 12 months ranged from 21.6% in Egypt to 62.3% in Poland. Among these, the proportion reporting that a health-care provider asked if they smoked ranged from 34.9% in Vietnam to 82.1% in Romania. Among those screened for tobacco use, those who reported their health-care providers advised them to quit ranged from 17.3% in Mexico to 67.3% in Romania. In most countries, persons aged ≥45 years were more likely to report being screened and advised to quit than were persons aged ≤24 years. Health-care providers should identify smokers and provide advice and assistance in quitting at each visit (*3*) as an adjunct to effective community interventions (e.g., increased price of tobacco products; smoke-free policies, mass media campaigns, and tobacco quitlines).

GATS is an ongoing, nationally representative, in-person household survey of persons aged ≥15 years (*4*). GATS was conducted in each of the 17 countries during 2008–2011 using a standardized questionnaire, sample design, data collection method, and analysis protocol to enhance data comparability.* Data were weighted to reflect the noninstitutionalized population aged ≥15 years in each country by sex and age groups. Smokers included persons who currently smoked tobacco† and former smokers who were abstinent for <12 months (*5*). Only smokers were asked, "Have you visited a doctor or other health-care provider in the past 12 months?" If they had been to see a health-care provider, they were then asked two follow-up questions. The first was, "During any visit to a doctor or health-care provider in the past 12 months, were you asked if you smoke tobacco?" Only those who answered "yes" were then asked, "During any visit to a doctor or health-care provider in the past 12 months, were you advised to quit smoking tobacco?"

Survey sampling and analysis followed standard global protocols but were conducted separately for each country. Overall response rates (number of interviews conducted divided by the number of eligible respondents, including those not interviewed) ranged from 65.1% in Poland (2009–2010) to 97.7% in Russia (2009). Survey sample sizes ranged from 4,250 in Malaysia to 69,296 in India (*1*). Proportions of smokers who were asked about smoking and advised to quit by a health-care provider were calculated by sex, age group, residence (urban versus rural) and education level. Logistic regression for complex sample designs was used to analyze two dependent variables: 1) whether or not the health-care provider asked if the respondent smokes and, 2) whether or not the health-care provider advised the respondent to quit smoking. The demographic characteristics of current smokers (i.e., sex, age group, residence, and education) were used as independent variables in the models. Estimates and 95% confidence intervals were calculated using statistical software. Differences in proportions were considered to be statistically significant if 95% confidence intervals did not overlap.

With the exception of Poland, the prevalence of smokers who reported that they visited a health-care provider in the past year was <60% in all countries surveyed (Table 1). Health-care provider screening for tobacco smoking during any visit in the past 12 months varied and was highest in Romania (82.1%), Uruguay (76.6%), and Egypt (74.1%) and lowest in Vietnam (34.9%), Indonesia (40.5%), and China (40.8%). Report of health-care providers asking and advising to quit varied across countries and was highest in Romania (67.3%), Egypt (67.0%), and Brazil (57.1%) and lowest in Mexico (17.3%), Vietnam (29.7%), and Ukraine (30.8%).

After multivariate adjustment (Table 2), in five of 17 countries, men were more likely to report being asked and advised to quit than women (China, Egypt, India, Indonesia, Thailand), with adjusted odds ratios (AORs) ranging from 1.6 to 8.5. In 14 of the 17 countries, older smokers (aged 45–64 years) were more likely to report being asked and advised to quit than younger smokers (aged ≤24 years), with AORs ranging from 1.8 to 6.7. In India and Mexico, rural smokers who had

* Additional information available at http://www.cdc.gov/tobacco/global.

† Respondents who reported currently smoking tobacco on a "daily" or "less than daily" basis.

a health-care visit were less likely to report being screened for tobacco use than urban smokers.

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Editorial Note

The findings in this report indicate that opportunities exist globally for health-care providers to screen for tobacco use and provide smokers with advice to quit. Health-care providers should screen all patients for tobacco use, and for those who use tobacco, provide advice to quit, offer assistance (i.e., counseling and medications), and arrange for follow-up (*3*). In January 2004, a unified code of practice on tobacco control for health professionals was adopted and signed by the participants at a WHO informal meeting on health professionals and tobacco control in Geneva, Switzerland, to encourage tobacco use prevention and cessation counseling internationally (*6*).

This international consensus for promoting effective cessation treatment can be used to further promote these practices in the clinical setting. "Offering help to quit tobacco use" is one of the six key focus areas in WHO's MPOWER package, which is intended to assist countries with the implementation of the WHO FCTC recommendations for tobacco control. Cessation assistance also is a key part of decreasing tobacco use, which is one of CDC's 10 winnable battles for public health action.[§] The WHO MPOWER package also acknowledges the important role health-care systems play in ensuring that health professionals routinely ask all patients about their tobacco use and provide advice to quit (*7*). Countries might consider implementing community-based tobacco control policies and interventions that both create an environment in which users can successfully stop and increase the likelihood of cessation, including increasing the price of tobacco products and implementing smoke-free policies, mass media campaigns, and tobacco cessation quitlines; these strategies are particularly important because, in some countries, a minority of smokers visited a health-care provider in the last year (*7*). Low- and middle-income countries might also consider optimizing population coverage and using health services, promoting community-based interventions, and developing partnerships with health-care systems to support cessation and treatment (*8*).

Disparities across demographic subgroups (sex, age group, and residence) in screening and cessation advice were observed across countries. Barriers to health-care provider counseling at the provider-level typically include time constraints, lack of reimbursement, and lack of professional training (*3,9*). Data from the 2005 Global Health Professionals Survey indicated that, whereas 87%–99% of health professions students believed they should have a role in counseling patients to quit smoking, only 5%–37% reported that they had received formal training on how to conduct such counseling (*10*). Reducing barriers to counseling is critical to increasing the number of tobacco users who successfully quit (*9*). To promote cessation counseling by all health-care providers, their training should include training on smoking cessation counseling (*9,10*).

The findings in this report are subject to at least six limitations. First, GATS data are self-reported and thus subject to recall bias that might vary across different cultural settings. Second, only screening for tobacco smoking and advice to quit questions were administered; other aspects promoting cessation

What is already known on this topic?

Smokers who quit reduce their risk for developing and dying from tobacco-related diseases. Identification of tobacco use and advice to quit by health professionals increases cessation among smokers. Health-care providers should screen all patients for tobacco use, and for those who use tobacco, provide advice to quit, offer assistance, and arrange for follow-up.

What is added by this report?

The proportion of tobacco smokers responding to the Global Adult Tobacco Surveys during 2008–2011 in 17 countries who saw a health-care provider in the past year and who reported that a health-care provider asked them about smoking ranged from 34.9% in Vietnam to 82.1% in Romania; the proportion who said that they were advised to quit ranged from 17.3% in Mexico to 67.3% in Romania. In five of the 17 countries, men were significantly more likely than women to report that a health-care provider asked about smoking and advised them to quit, with adjusted odds ratios ranging from 1.6 to 8.5. In 14 of the 17 countries, older (aged 45–64 years) compared with younger smokers (aged ≤24 years) were significantly more likely to report that a health-care provider asked or advised them to quit, with adjusted odds ratios ranging from 1.8 to 6.7.

What are the implications for public health practice?

Globally, health-care provider screening for tobacco smoking and advice to quit varies widely, and many opportunities to offer effective cessation treatment to tobacco users are being missed.

[§] Additional information available at http://www.cdc.gov/winnablebattles.

TABLE 1. Percentage of current tobacco smokers* aged ≥15 years who visited a health-care provider during the preceding 12 months and were asked about smoking and advised to quit, by selected characteristics — Global Adult Tobacco Survey, 17 countries, 2008–2011

Characteristic	Bangladesh (2009†)		Brazil (2008)		China (2010)		Egypt (2009)		India (2009–2010)		Indonesia (2011)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Percentage of current smokers	23.0	(21.9–24.2)	17.2	(16.7–17.7)	28.1	(26.7–29.7)	19.4	(18.8–20.1)	14.0	(13.4–14.6)	34.8	(33.2–36.4)
Percentage of current smokers who visited a health-care provider§	38.3	(35.0–41.7)	58.8	(57.3–60.3)	30.0	(26.7–33.5)	21.6	(19.9–23.5)	47.3	(45.3–49.4)	30.2	(26.5–34.2)
Percentage asked by a health-care provider if they smoked¶	56.0	(49.9–62.0)	71.0	(69.3–72.6)	40.8	(35.3–46.5)	74.1	(70.7–77.2)	53.0	(50.3–55.7)	40.5	(34.6–46.6)
Sex												
Male	55.9	(49.7–61.9)	70.2	(67.7–72.5)	41.7	(36.1–47.6)	75.3	(71.8–78.6)	54.0	(51.2–56.8)	41.6	(35.7–47.8)
Female	64.6	(40.4–83.0)	71.8	(69.5–74.0)	25.5	(18.2–34.5)	35.8	(19.8–55.8)	45.5	(37.6–53.7)	17.9	(9.0–32.4)
Age group (yrs)												
15–24	31.3	(20.4–44.9)	54.9	(49.3–60.4)	22.8	(12.2–38.6)	60.9	(46.0–74.0)	31.3	(23.6–40.2)	31.6	(21.6–43.5)
25–44	54.2	(44.1–63.9)	70.2	(67.8–72.5)	34.2	(26.6–42.6)	74.1	(68.8–78.8)	51.3	(47.6–55.0)	38.8	(30.9–47.4)
45–64	69.2	(61.8–75.8)	74.6	(71.9–77.2)	45.9	(39.6–52.4)	76.5	(70.7–81.4)	58.5	(54.1–62.8)	44.2	(37.1–51.4)
≥65	60.1	(45.7–73.0)	81.6	(76.9–85.5)	54.7	(45.9–63.2)	82.7	(71.5–90.1)	63.8	(57.0–70.1)	49.1	(38.3–59.9)
Residence												
Urban	52.3	(37.6–66.5)	71.5	(69.7–73.3)	39.4	(33.4–45.8)	74.3	(69.6–78.6)	57.9	(53.8–62.0)	42.1	(34.4–50.2)
Rural	57.4	(51.4–63.2)	67.8	(63.5–71.8)	41.7	(33.8–50.1)	73.9	(69.0–78.2)	51.5	(48.1–54.8)	39.2	(30.9–48.1)
Education level**												
Less than primary	56.9	(48.4–65.1)	NA	NA	47.6	(38.9–56.5)	78.2	(73.6–82.2)	54.6	(50.9–58.3)	42.3	(34.2–51.0)
Primary	51.9	(42.6–61.1)	NA	NA	41.0	(31.0–51.7)	72.8	(60.7–82.3)	52.3	(47.4–57.3)	35.4	(25.0–47.3)
Secondary	63.7	(47.3–77.4)	NA	NA	40.0	(33.9–46.5)	69.4	(62.2–75.7)	48.1	(41.9–54.3)	41.3	(33.7–49.2)
University	57.6	(34.6–77.8)	NA	NA	30.0	(20.2–42.1)	67.2	(53.9–78.2)	54.3	(45.0–63.2)	48.6	(36.2–61.2)
Percentage advised by a health-care provider to quit smoking††	52.9	(47.0–58.6)	57.1	(55.3–58.8)	33.9	(29.1–39.0)	67.0	(63.0–70.8)	46.3	(43.6–49.0)	34.6	(29.2–40.5)
Sex												
Male	52.7	(46.8–58.5)	55.7	(53.1–58.3)	34.5	(29.6–39.8)	68.4	(64.3–72.3)	47.3	(44.5–50.1)	35.7	(30.3–41.6)
Female	61.6	(38.0–80.7)	58.5	(56.1–60.8)	23.1	(15.0–34.0)	23.4	(12.5–39.4)	38.9	(31.5–46.8)	13.0	(5.6–27.2)
Age group (yrs)												
15–24	24.9	(15.5–37.4)	35.1	(30.1–40.4)	17.7	(8.4–33.6)	50.6	(35.7–65.4)	26.1	(19.0–34.8)	27.2	(17.3–39.8)
25–44	50.6	(41.0–60.1)	54.7	(52.1–57.3)	26.6	(21.1–32.9)	66.7	(60.8–72.1)	43.0	(39.4–46.7)	32.3	(25.6–39.7)
45–64	67.3	(59.8–73.9)	64.4	(61.5–67.2)	38.7	(32.4–45.5)	71.3	(64.9–76.9)	52.9	(48.5–57.2)	38.5	(31.5–46.1)
≥65	60.1	(45.7–73.0)	67.3	(61.8–72.4)	48.9	(39.3–58.6)	74.9	(63.6–83.5)	57.9	(51.1–64.4)	43.8	(32.4–55.9)
Residence												
Urban	49.0	(35.3–62.9)	57.3	(55.4–59.2)	31.1	(26.2–36.6)	67.6	(62.5–72.2)	50.6	(46.6–54.7)	35.6	(29.2–42.6)
Rural	54.3	(48.4–60.0)	55.8	(51.3–60.2)	35.7	(28.7–43.3)	66.7	(60.9–72.0)	44.9	(41.6–48.3)	33.9	(25.9–42.9)
Education level												
Less than primary	53.7	(45.7–61.5)	NA	NA	39.1	(30.1–49.0)	70.8	(64.8–76.0)	47.7	(44.1–51.4)	34.7	(27.3–42.9)
Primary	50.0	(40.8–59.1)	NA	NA	36.9	(27.4–47.6)	70.3	(58.4–80.0)	46.3	(41.4–51.2)	29.8	(20.5–41.2)
Secondary	63.7	(47.3–77.4)	NA	NA	32.4	(27.4–38.0)	62.2	(55.0–69.0)	41.4	(35.7–47.4)	37.5	(29.9–45.7)
University	36.0	(18.4–58.4)	NA	NA	23.2	(14.7–34.6)	58.6	(44.6–71.3)	46.1	(37.1–55.3)	38.3	(26.0–52.4)

See table footnotes on page 924.

counseling or medication, reasons for the health-care visit, type of advice provided, or whether follow-up occurred, were not assessed. Third, screening for smoking was only assessed among smokers aged ≥15 years, whereas all adolescents and adults should be screened for tobacco use (*3*). Fourth, some smokers might have quit before they visited a health-care provider and might, therefore, not have been advised to quit by a health-care provider. Fifth, because response rates ranged from 97.7% to 65.1%, survey respondents might not represent all smokers in some countries. Finally, screening was only assessed among tobacco smokers and not users of other forms of tobacco.

Globally, health-care provider screening for tobacco smoking and advice to quit varies widely, and many opportunities to offer effective cessation treatment to tobacco users are being missed. To reduce the worldwide burden of tobacco use, implementation of WHO FCTC, WHO's MPOWER package, and further implementation of the cessation guidelines to promote cessation and increase tobacco dependence treatment is warranted.

TABLE 1. (*Continued*) Percentage of current tobacco smokers aged ≥15 years who visited a health-care provider during the preceding 12 months and were asked about smoking and advised to quit, by selected characteristics — Global Adult Tobacco Survey, 17 countries, 2008–2011

	Malaysia (2011)		Mexico (2009)		Philippines (2009)		Poland (2009–2010)		Romania (2011)		Russia (2009)	
Characteristic	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**
Percentage of current smokers	23.1	(21.2–25.2)	15.9	(14.8–17.1)	28.2	(27.0–29.5)	30.3	(29.0–31.7)	26.7	(25.0–28.4)	39.1	(37.8–40.5)
Percentage of current smokers who visited a health-care provider	32.4	(27.9–7.3)	25.0	(22.3–27.8)	24.9	(22.9–27.1)	62.3	(59.6–64.8)	50.4	(46.7–54.0)	54.5	(51.7–57.2)
Percentage asked by a health-care provider if they smoked	67.6	(60.0–74.3)	64.7	(59.2–69.9)	67.5	(62.6–72.0)	57.2	(54.2–60.1)	82.1	(77.1–86.3)	45.4	(42.4–48.4)
Sex												
Male	67.3	(59.6–74.2)	64.3	(57.5–70.6)	71.6	(66.4–76.3)	58.9	(55.0–62.6)	85.1	(78.5–90.0)	47.7	(44.5–50.9)
Female	75.2	(36.9–94.0)	65.6	(55.5–74.5)	53.4	(43.5–62.9)	55.4	(50.8–59.8)	77.6	(70.9–83.2)	41.3	(35.7–47.1)
Age group (yrs)												
15–24	72.5	(47.7–88.4)	56.7	(46.1–66.8)	56.4	(42.5–69.4)	42.5	(33.2–52.4)	66.3	(47.2–81.3)	45.9	(39.9–52.0)
25–44	65.7	(53.8–75.8)	67.6	(59.0–75.2)	71.7	(65.5–77.3)	49.4	(44.8–53.9)	79.4	(73.2–84.4)	39.7	(35.7–43.9)
45–64	68.4	(53.7–80.2)	66.1	(52.5–77.5)	69.7	(61.4–76.8)	65.7	(61.1–70.0)	90.9	(86.0–94.2)	49.2	(44.1–54.3)
≥65	65.5	(43.7–82.3)	78.3	(65.0–87.5)	61.0	(47.6–72.8)	77.4	(67.2–85.2)	87.7	(74.5–94.5)	64.4	(53.9–73.6)
Residence												
Urban	65.5	(55.7–74.2)	66.5	(60.1–72.4)	68.0	(60.0–75.0)	58.8	(54.9–62.5)	82.7	(76.9–87.3)	45.8	(42.2–49.4)
Rural	72.8	(64.7–79.7)	54.8	(46.4–63.0)	66.9	(60.9–72.4)	53.8	(49.4–58.1)	81.0	(70.8–88.3)	44.0	(39.6–48.5)
Education level												
Less than primary	69.8	(51.3–83.6)	67.4	(56.3–76.8)	61.0	(51.4–69.9)	72.1	(22.4–95.8)	92.6	(77.9–97.8)	0.0	—
Primary	66.4	(52.4–78.0)	66.8	(56.0–76.0)	66.9	(54.5–77.3)	63.4	(55.2–70.9)	89.4	(82.7–93.7)	52.4	(36.9–67.4)
Secondary	69.3	(57.4–79.1)	61.5	(53.8–68.7)	69.8	(62.6–76.1)	55.9	(52.4–59.3)	76.5	(66.9–83.9)	45.7	(42.5–49.0)
University	67.1	(40.1–86.1)	74.8	(59.3–85.8)	73.1	(63.4–80.9)	58.4	(49.7–66.6)	80.8	(73.2–86.6)	44.5	(39.3–49.9)
Percentage advised by a health-care provider to quit smoking	52.6	(43.8–61.2)	17.3	(12.3–23.7)	51.6	(47.1–56.1)	41.8	(38.8–44.8)	67.3	(61.9–72.2)	31.8	(29.0–34.7)
Sex												
Male	52.2	(43.2–61.0)	17.9	(11.1–27.4)	53.2	(48.0–58.4)	41.2	(37.3–45.2)	68.8	(61.9–74.8)	34.2	(31.1–37.4)
Female	67.4	(31.8–90.1)	16.1	(10.2–24.6)	46.2	(37.1–55.5)	42.5	(37.9–47.2)	65.0	(56.8–72.4)	27.5	(23.1–32.4)
Age group (yrs)												
15–24	54.0	(32.3–74.3)	15.7	(8.2–28.2)	43.2	(30.6–56.6)	20.7	(13.9–29.6)	41.7	(25.8–59.5)	24.3	(19.3–30.0)
25–44	47.8	(35.4–60.5)	15.7	(9.4–25.0)	49.3	(42.8–55.9)	32.7	(28.4–37.2)	63.1	(56.2–69.5)	27.0	(23.4–30.9)
45–64	59.3	(45.8–71.6)	20.8	(13.4–30.9)	60.5	(52.4–68.0)	52.0	(47.5–56.5)	80.3	(73.1–85.9)	38.3	(33.1–43.7)
≥65	56.5	(34.6–76.2)	24.5	(13.3–40.6)	48.3	(35.8–61.0)	71.0	(60.8–79.5)	79.8	(66.3–88.8)	59.5	(48.1–69.9)
Residence												
Urban	49.6	(38.4–61.0)	17.5	(11.8–25.1)	48.8	(41.9–55.7)	42.2	(38.3–46.3)	66.5	(59.7–72.7)	31.6	(28.3–35.2)
Rural	60.2	(51.9–68.1)	16.4	(10.7–24.2)	54.5	(48.8–60.1)	40.9	(36.9–44.9)	68.8	(59.5–76.7)	32.3	(28.3–36.5)
Education level												
Less than primary	65.2	(44.8–81.2)	25.0	(16.2–36.3)	46.2	(37.5–55.1)	63.3	(22.2–91.3)	90.0	(74.8–96.5)	0.0	—
Primary	51.6	(38.9–64.0)	17.9	(9.3–31.5)	56.9	(44.7–68.3)	49.4	(41.4–57.3)	77.5	(68.2–84.6)	45.0	(29.8–61.2)
Secondary	54.0	(42.3–65.2)	17.9	(11.5–26.7)	54.4	(47.5–61.1)	40.4	(37.0–43.9)	59.0	(50.1–67.4)	32.2	(28.9–35.7)
University	43.1	(20.5–68.9)	3.2	(0.6–15.8)	49.7	(39.3–60.2)	41.9	(34.2–50.1)	64.4	(55.4–72.5)	30.4	(25.9–35.3)

See table footnotes on page 924.

Acknowledgments

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TABLE 1. (*Continued*) Percentage of current tobacco smokers aged ≥15 years who visited a health-care provider during the preceding 12 months and were asked about smoking and advised to quit, by selected characteristics — Global Adult Tobacco Survey, 17 countries, 2008–2011

	Thailand (2009)		Turkey (2008)		Ukraine (2010)		Uruguay (2009)		Vietnam (2010)	
Characteristic	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**
Percentage of current smokers	23.7	(22.8–24.7)	31.2	(30.0–32.6)	28.9	(27.7–30.1)	25.0	(23.3–26.6)	23.8	(22.7–24.9)
Percentage of current smokers who visited a health-care provider	34.9	(32.7–37.1)	46.9	(44.2–49.7)	32.3	(29.6–35.1)	55.8	(51.8–59.8)	27.2	(25.0–29.5)
Percentage asked by a health-care provider if they smoked	60.2	(56.7–63.6)	49.0	(45.8–52.3)	41.7	(36.9–46.6)	76.6	(72.3–80.3)	34.9	(30.9–39.1)
Sex										
Male	59.9	(56.1–63.5)	49.1	(45.4–52.9)	43.1	(37.8–48.5)	75.1	(68.2–80.9)	35.3	(31.2–39.7)
Female	63.9	(55.3–71.6)	48.8	(43.3–54.4)	38.2	(29.4–47.8)	77.9	(71.8–83.0)	25.6	(11.8–46.7)
Age group (yrs)										
15–24	38.0	(27.0–50.4)	42.0	(33.9–50.5)	36.4	(27.5–46.3)	75.9	(64.1–84.7)	16.8	(8.7–30.0)
25–44	56.5	(50.8–62.1)	45.8	(41.5–50.1)	37.2	(30.9–43.9)	73.7	(67.2–79.3)	32.5	(26.7–38.8)
45–64	66.0	(61.4–70.4)	57.7	(51.8–63.4)	52.2	(43.4–60.9)	83.7	(76.0–89.3)	47.5	(40.2–54.9)
≥65	72.6	(66.6–77.8)	61.0	(47.1–73.3)	62.2	(47.1–75.3)	62.3	(47.7–75.1)	32.6	(22.8–44.3)
Residence										
Urban	59.2	(55.2–63.1)	50.6	(46.6–54.5)	39.2	(33.6–45.2)	76.6	(72.1–80.6)	40.9	(35.2–47.0)
Rural	60.7	(56.0–65.1)	44.1	(38.8–49.4)	50.0	(42.5–57.6)	75.8	(65.8–83.6)	31.8	(26.7–37.4)
Education level										
Less than primary	69.3	(65.2–73.2)	50.8	(39.6–61.9)	0.0	—	72.2	(56.6–83.8)	36.1	(27.9–45.3)
Primary	57.9	(48.5–66.8)	47.8	(43.1–52.6)	52.9	(33.9–71.0)	76.7	(68.3–83.4)	33.5	(25.7–42.3)
Secondary	49.5	(43.5–55.6)	49.6	(44.2–55.1)	43.0	(37.9–48.2)	77.3	(71.4–82.3)	33.5	(27.3–40.4)
University	55.3	(41.0–68.8)	51.4	(42.8–59.9)	35.7	(26.2–46.5)	75.4	(58.9–86.7)	43.0	(33.7–52.8)
Percentage advised by a health-care provider to quit smoking	51.9	(48.4–55.4)	40.7	(37.6–44.0)	30.8	(26.7–35.3)	54.5	(49.4–59.4)	29.7	(25.8–34.0)
Sex										
Male	52.3	(48.5–56.0)	42.2	(38.5–46.0)	32.4	(27.8–37.4)	56.7	(49.8–63.3)	30.2	(26.1–34.5)
Female	48.7	(40.1–57.4)	38.0	(32.8–43.5)	26.9	(19.2–36.3)	52.3	(46.0–58.5)	20.3	(8.1–42.4)
Age group (yrs)										
15–24	24.2	(15.3–36.0)	33.3	(25.6–42.1)	27.2	(19.7–36.2)	55.6	(43.7–66.9)	14.9	(7.3–28.2)
25–44	48.2	(42.4–54.1)	36.0	(32.1–40.0)	25.0	(19.9–31.0)	48.3	(41.7–54.9)	28.3	(22.7–34.6)
45–64	59.1	(54.5–63.5)	51.5	(45.5–57.4)	41.1	(33.0–49.6)	63.5	(55.2–71.0)	39.6	(32.5–47.1)
≥65	64.8	(58.0–71.0)	60.4	(46.6–72.7)	56.8	(41.1–71.2)	46.0	(31.7–60.9)	27.3	(18.3–38.6)
Residence										
Urban	48.8	(44.8–52.8)	42.0	(38.2–46.0)	27.8	(23.0–33.2)	54.5	(49.2–59.7)	33.8	(28.2–39.8)
Rural	53.2	(48.5–57.8)	36.6	(31.6–41.8)	41.1	(33.8–48.9)	53.3	(43.7–62.6)	27.7	(22.8–33.4)
Education level										
Less than primary	62.2	(57.8–66.4)	45.0	(33.6–57.0)	0.0	(.–.)	56.5	(43.0–69.1)	28.6	(20.8–38.1)
Primary	50.6	(41.5–59.6)	41.0	(36.4–45.9)	35.9	(19.6–56.3)	58.9	(50.5–66.7)	25.7	(18.8–34.2)
Secondary	39.0	(33.6–44.7)	38.9	(33.9–44.1)	32.4	(27.8–37.4)	52.0	(45.1–58.7)	31.4	(25.3–38.3)
University	46.7	(33.9–60.0)	42.3	(34.2–50.9)	25.0	(17.1–34.9)	46.7	(31.3–62.7)	34.2	(25.5–44.2)

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

* Current smokers included former smokers who had abstained for <12 months.

† Year(s) data were collected.

§ During the preceding 12 months.

¶ Among current smokers who had visited a health-care provider during the preceding 12 months.

** Less than primary = no formal education; primary = some primary or completed primary; secondary = some secondary or completed secondary; university = some college/university or more.

†† Among current smokers who had visited a health-care provider during the preceding 12 months, and were asked if they smoked.

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TABLE 2. Adjusted odds ratios (AORs) for current tobacco smokers* aged >15 years who visited a health-care provider during the preceding 12 months and were asked about smoking and advised to quit — Global Adult Tobacco Survey, 17 countries, 2008–2011

	Bangladesh (2009†)		Brazil (2008)		China (2010)		Egypt (2009)		India (2009–2010)		Indonesia (2011)	
Characteristic	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**
Asked by a health-care provider if they smoked§												
Sex												
Male	0.6	(0.2–1.7)	1.0	(0.8–1.1)	**2.9**¶	(1.7–4.8)	**6.8**	(3.0–15.2)	**1.7**	(1.2–2.4)	**4.1**	(2.0–8.6)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)												
15–24	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
25–44	**2.6**	(1.4–5.1)	**1.9**	(1.5–2.5)	1.7	(0.7–3.9)	1.8	(0.9–3.4)	**2.4**	(1.6–3.6)	1.4	(0.8–2.5)
45–64	**5.0**	(2.5–10.0)	**2.4**	(1.9–3.2)	**2.8**	(1.3–6.1)	1.8	(0.9–3.4)	**3.3**	(2.1–5.1)	**1.9**	(1.1–3.3)
≥65	**3.4**	(1.5–7.7)	**3.8**	(2.6–5.4)	**4.5**	(2.0–10.5)	**2.5**	(1.0–6.5)	**4.5**	(2.6–7.5)	**2.6**	(1.3–5.3)
Residence												
Urban	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Rural	1.2	(0.6–5.4)	0.8	(0.6–1.0)	1.0	(0.6–1.5)	0.9	(0.6–1.3)	**0.7**	(0.6–0.9)	0.9	(0.6–1.5)
Education level**												
Less than primary	Ref	Ref	NA	NA	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Primary	1.1	(0.7–1.8)	NA	NA	0.8	(0.5–1.4)	0.7	(0.4–1.4)	1.0	(0.7–1.2)	0.7	(0.4–1.3)
Secondary	1.5	(0.7–3.2)	NA	NA	1.0	(0.7–1.5)	0.7	(0.4–1.0)	0.8	(0.6–1.1)	1.1	(0.7–1.7)
University	1.1	(0.4–3.5)	NA	NA	0.7	(0.4–1.4)	0.5	(0.3–1.0)	0.9	(0.6–1.4)	1.3	(0.6–2.5)
Advised by a health-care provider to quit smoking††												
Sex												
Male	0.6	(0.2–1.7)	0.9	(0.8–1.1)	**2.3**	(1.2–4.3)	**8.5**	(3.9–18.6)	**1.7**	(1.2–2.5)	**4.5**	(1.9–10.9)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)												
15–24	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
25–44	**3.3**	(1.7–6.4)	**2.2**	(1.7–2.8)	1.6	(0.6–4.0)	1.9	(0.9–3.9)	**2.2**	(1.4–3.4)	1.4	(0.8–2.5)
45–64	**6.7**	(3.3–13.7)	**3.3**	(2.6–4.4)	**2.9**	(1.3–6.6)	**2.3**	(1.1–4.6)	**3.4**	(2.2–5.3)	**2.1**	(1.1–3.8)
≥65	**4.9**	(2.1–11.5)	**3.9**	(2.8–5.3)	**5.0**	(2.0–12.4)	**2.6**	(1.0–6.5)	**4.5**	(2.6–7.7)	**3.1**	(1.4–6.6)
Residence												
Urban	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Rural	1.20	(0.6–2.3)	0.9	(0.7–1.1)	1.1	(0.6–1.2)	0.9	(0.6–1.2)	**0.8**	(0.6–0.9)	1.0	(0.6–1.6)
Education level												
Less than primary	Ref	Ref	NA	NA	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Primary	1.2	(0.7–1.9)	NA	NA	1.1	(0.6–1.8)	1.0	(0.5–1.8)	1.0	(0.8–1.3)	0.87	(0.5–1.5)
Secondary	1.7	(0.8–3.7)	NA	NA	1.2	(0.7–1.9)	0.8	(0.5–1.2)	0.8	(0.6–1.1)	1.4	(0.8–2.3)
University	0.5	(0.2–1.4)	NA	NA	0.9	(0.4–1.7)	0.6	(0.3–1.1)	0.9	(0.6–1.4)	1.2	(0.6–2.5)

See table footnotes on page 927.

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TABLE 2. (*Continued*) Adjusted odds ratios (AORs) for current tobacco smokers* aged >15 years who visited a health-care provider during the preceding 12 months and were asked about smoking and advised to quit — Global Adult Tobacco Survey, 17 countries, 2008–2011

	Malaysia (2011)		Mexico (2009)		Philippines (2009)		Poland (2009–2010)		Romania (2011)		Russia (2009)	
Characteristic	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**
Asked by a health-care provider if they smoked												
Sex												
Male	0.6	(0.1–2.9)	1.0	(0.6–1.6)	**2.2**	(1.4–3.5)	1.2	(0.9–1.5)	1.6	(0.9–2.7)	1.2	(0.9–1.6)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)												
15–24	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
25–44	0.7	(0.2–2.7)	1.5	(0.8–2.7)	**2.1**	(1.1–3.9)	1.3	(0.8–1.9)	2.0	(0.9–4.3)	0.8	(0.6–1.0)
45–64	0.8	(0.2–2.8)	1.4	(0.6–3.4)	**2.3**	(1.2–4.5)	**2.5**	(1.6–4.0)	**5.0**	(2.1–11.9)	1.1	(0.8–1.6)
≥65	0.5	(0.1–2.6)	**2.7**	(1.0–7.4)	**2.3**	(1.0–5.0)	**4.2**	(2.1–8.5)	2.5	(0.8–7.7)	**2.1**	(1.2–3.4)
Residence												
Urban	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Rural	1.4	(0.8–2.6)	**0.6**	(0.4–0.9)	1.0	(0.7–1.6)	0.9	(0.7–1.1)	0.7	(0.3–1.5)	0.9	(0.7–1.1)
Education level												
Less than primary	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	NA	NA
Primary	0.9	(0.3–2.6)	1.0	(0.5–2.2)	1.2	(0.6–2.2)	1.1	(0.1–12.3)	0.7	(0.1–3.4)	NA	NA
Secondary	1.0	(0.3–3.1)	0.9	(0.4–1.9)	1.5	(0.9–2.5)	1.0	(0.1–12.3)	0.3	(0.1–1.1)	NA	NA
University	0.9	(0.2–4.5)	1.5	(0.6–4.0)	1.8	(0.9–3.6)	1.2	(0.1–15.8)	0.3	(0.1–1.1)	NA	NA
Advised by a health-care provider to quit smoking												
Sex												
Male	0.5	(0.1–2.5)	1.1	(0.5–2.7)	1.4	(0.9–2.1)	1.0	(0.7–1.2)	1.1	(0.7–1.8)	1.2	(0.9–1.5)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)												
15–24	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
25–44	0.8	(0.3–2.3)	1.1	(0.6–2.1)	1.3	(0.7–2.4)	**1.9**	(1.1–3.1)	**2.5**	(1.2–5.3)	1.2	(0.8–1.6)
45–64	1.2	(0.4–3.5)	1.4	(0.5–3.9)	**2.2**	(1.2–4.2)	**4.2**	(2.5–7.0)	**5.8**	(2.6–12.7)	**1.9**	(1.3–2.8)
≥65	0.7	(0.2–2.9)	1.5	(0.4–4.9)	1.7	(0.8–3.7)	**9.3**	(4.7–18.3)	**4.7**	(1.8–12.3)	**4.5**	(2.5–8.0)
Residence												
Urban	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Rural	1.5	(0.8–2.6)	0.8	(0.4–1.6)	1.3	(0.9–1.9)	1.1	(0.9–1.4)	0.9	(0.5–1.5)	1.0	(0.8–1.3)
Education level												
Less than primary	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	NA	NA
Primary	0.6	(0.2–1.8)	0.7	(0.3–1.7)	1.5	(0.8–2.8)	1.1	(0.2–7.2)	0.4	(0.1–1.6)	NA	NA
Secondary	0.7	(0.3–2.1)	0.8	(0.3–1.7)	**1.7**	(1.0–2.7)	1.1	(0.1–7.5)	**0.2**	(0.0–0.7)	NA	NA
University	0.5	(0.1–2.2)	**0.1**	(0.0–0.7)	1.5	(0.8–2.7)	1.3	(0.2–9.6)	**0.2**	(0.0–0.7)	NA	NA

See table footnotes on page 927.

TABLE 2. (*Continued*) Adjusted odds ratios (AORs) for current tobacco smokers* aged >15 years who visited a health-care provider during the preceding 12 months and were asked about smoking and advised to quit — Global Adult Tobacco Survey, 17 countries, 2008–2011

	Thailand (2009)		Turkey (2008)		Ukraine (2010)		Uruguay (2009)		Vietnam (2010)	
Characteristic	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**
Asked by a health-care provider if they smoked										
Sex										
Male	1.1	(0.7–1.6)	1.0	(0.8–1.3)	1.0	(0.6–1.6)	0.9	(0.5–1.4)	1.9	(0.6–6.2)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)										
15–24	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
25–44	**1.9**	(1.1–3.3)	1.2	(0.8–1.7)	1.1	(0.6–1.7)	0.9	(0.5–1.7)	**2.3**	(1.0–5.0)
45–64	2.4	(0.3–4.4)	**1.9**	(1.2–2.9)	**1.9**	(1.1–3.4)	1.7	(0.8–3.4)	**4.3**	(1.9–9.8)
≥65	**3.0**	(1.5–5.8)	**2.3**	(1.2–4.6)	**2.5**	(1.1–5.3)	0.6	(0.2–1.3)	2.4	(0.9–5.9)
Residence										
Urban	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Rural	0.9	(0.7–1.2)	0.8	(0.6–1.0)	1.4	(0.9–2.1)	1.0	(0.5–1.8)	0.7	(0.5–1.0)
Education level										
Less than primary	Ref	Ref	Ref	Ref	NA	NA	Ref	Ref	Ref	Ref
Primary	0.8	(0.5–1.3)	1.0	(0.6–1.7)	NA	NA	1.2	(0.5–2.8)	0.9	(0.5–1.6)
Secondary	0.6	(0.4–0.8)	1.1	(0.6–1.9)	NA	NA	1.3	(0.6–2.8)	0.8	(0.5–1.4)
University	0.6	(0.3–1.2)	1.1	(0.6–1.9)	NA	NA	1.2	(0.4–3.3)	1.1	(0.6–2.0)
Advised by a health-care provider to quit smoking										
Sex										
Male	**1.6**	(1.1–2.3)	1.2	(0.9–1.6)	1.0	(0.6–1.7)	1.2	(0.8–1.6)	1.8	(0.5–6.5)
Female	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Age group (yrs)										
15–24	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
25–44	**2.6**	(1.4–4.7)	1.1	(0.7–1.7)	0.9	(0.5–1.5)	0.8	(0.5–1.4)	**2.2**	(1.0–5.2)
45–64	**3.3**	(1.7–6.5)	**2.1**	(1.3–3.2)	**1.8**	(1.1–3.1)	1.4	(0.8–2.4)	**3.7**	(1.5–9.0)
≥65	**4.0**	(2.0–8.0)	**3.1**	(1.5–6.0)	**3.2**	(1.4–7.2)	0.7	(0.3–1.5)	2.3	(0.8–6.3)
Residence										
Urban	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Rural	1.0	(0.8–1.3)	0.7	(0.5–1.0)	**1.6**	(1.1–2.5)	0.9	(0.6–1.4)	0.8	(0.6–1.2)
Education level										
Less than primary	Ref	Ref	Ref	Ref	NA	NA	Ref	Ref	Ref	Ref
Primary	0.8	(0.5–1.3)	0.98	(0.6–1.7)	NA	NA	1.1	(0.6–2.1)	0.8	(0.4–1.6)
Secondary	**0.6**	(0.4–0.8)	0.9	(0.5–1.7)	NA	NA	0.9	(0.5–1.6)	1.1	(0.6–2.0)
University	0.6	(0.3–1.1)	1.0	(0.5–1.7)	NA	NA	0.7	(0.3–1.7)	1.1	(0.6–2.2)

Abbreviations: CI = confidence interval; Ref = referent; NA = not available.

* Current smokers included former smokers who had abstained for <12 months.

† Year(s) data were collected.

§ Among current smokers who had visited a health-care provider during the preceding 12 months.

¶ Bolded values indicate statistically significant (p≤0.05) AORs (adjusted for sex, age group, residence, and education level).

** Less than primary = no formal education; primary = some primary or completed primary; secondary = some secondary or completed secondary; university = some college/university or more.

†† Among current smokers who had visited a health-care provider during the preceding 12 months, and were asked if they smoked.

Progress Toward Poliomyelitis Eradication — Afghanistan, January 2012–September 2013

Since 2012, transmission of indigenous wild poliovirus (WPV) has been limited to three countries: Afghanistan, Pakistan, and Nigeria (*1*). This report describes polio eradication activities and progress in Afghanistan during January 2012–September 2013 and updates previous reports (*2,3*). During 2012, 37 WPV type 1 (WPV1) cases were confirmed in Afghanistan, compared with 80 cases in 2011; nine WPV1 cases were confirmed during January–September, 2013, compared with 26 WPV1 cases during the same period in 2012. Since November 2012, no WPV1 cases have been reported from the Southern Region, previously the main WPV reservoir in Afghanistan; all nine polio cases in 2013 were in the Eastern Region and caused by WPV1 that originated in Pakistan.* From October 2012 to March 2013, 14 polio cases caused by circulating vaccine-derived poliovirus type 2 (cVDPV2) were detected in the Southern Region.† During 2012–2013, strategies to improve supplemental immunization activity (SIA)§ effectiveness in 11 low-performing districts (LPDs)¶ in the Southern Region included increasing staff and supervisory training, implementing short-interval-additional-dose (SIAD) campaigns,** placing transit vaccination teams at the borders of districts inaccessible because of insecurity, and establishing permanent polio vaccination teams to vaccinate children quarterly. From March 2012 to August 2013, the percentage of children unreached during SIAs declined by 43% in the Southern Region but increased by 122% in the Eastern Region. Despite ongoing challenges, the government of Afghanistan continues to expand the application of innovative solutions to reach unvaccinated children in accessible and inaccessible districts.

Immunization Activities

Children aged <1 year are recommended to receive 3 doses of trivalent oral poliovirus vaccine (tOPV) through routine immunization services. The estimated national coverage with 3 tOPV doses (OPV3) at age 1 year was 71% in 2012, compared with 68% in 2011 (*4*). OPV coverage through routine immunization services reported among children aged 6–23 months with nonpolio acute flaccid paralysis (NPAFP)†† is used as a proxy indicator for OPV3 coverage nationally and was 61% in 2011 and 62% in 2012, with considerable regional variability in 2012: Central, 87%; Badakhshan, 82%; Eastern, 79%; Northern, 75%; Western, 71%; Northeastern, 69%; Southeastern, 34%; and Southern, 15%.

All children aged <5 years are targeted to receive OPV through SIAs. During January 2012–September 2013, 14 SIAs were conducted, including seven national and seven subnational SIAs. Of these, nine SIAs used bivalent (types 1 and 3) OPV (bOPV), three used tOPV, and two used a combination of tOPV and bOPV (Figure 1). National SIAs targeted an estimated 8.3 million children aged <5 years. Subnational SIAs targeted an estimated 3.2 million children aged <5 years, primarily in the Eastern, Southeastern, Southern, and Western Regions. In 2013 to date, two SIAD rounds were implemented in the Southern and Eastern regions, targeting approximately 800,000 children aged <5 years with bOPV 1–2 weeks after the March and May SIAs.

The impact of SIAs in reaching children is monitored through post-SIA coverage assessment surveys in accessible areas, which are used to estimate the number of children missed because of programmatic issues, such as weak team performance or noncompliance of caretakers. The number of children unreached because of insecurity is estimated by using the target population in inaccessible areas.§§ During the first national SIA covered by this report, conducted in March 2012, an estimated 660,389 (9%) of 7,517,279 eligible children were unreached; of these, 331,824 (50%) were in the Southern Region, and 35,847 (5%) were in the Eastern Region.

In the Southern Region, during the March 2012 national SIA, the estimated number of unreached children was 331,824

* The Southern Region includes Helmand, Kandahar, Zabul, Uruzgan, and Nimroz provinces; the Eastern Region includes Nangarhar, Kunar, Nuristan, and Laghman provinces.

† VDPVs can cause paralytic polio in humans and have the potential for sustained circulation of poliovirus. VDPVs resemble WPVs biologically and differ from the majority of Sabin vaccine–related poliovirus isolates by having genetic properties consistent with prolonged replication or transmission.

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

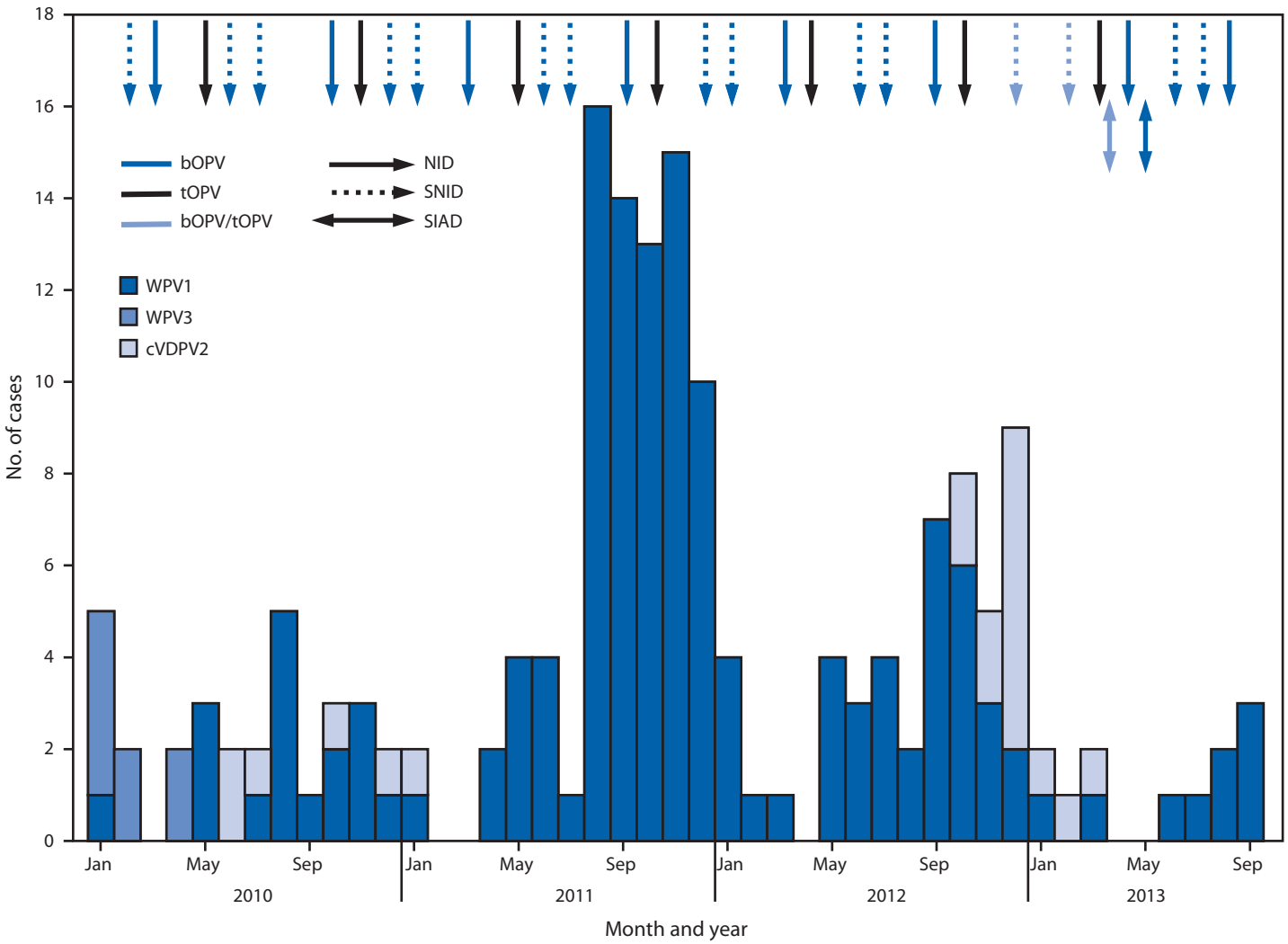
¶ Defined in November 2012, LPD were districts with 1) confirmed polio cases in the previous 2 years, or 2) confirmed polio cases in one of the previous 2 years, plus reported "zero-dose" nonpolio acute flaccid paralysis cases in the previous 2 years, <90% estimated oral polio vaccine coverage in the previous three SIAs, average level of community awareness of SIAs <50% in previous three SIAs, and inaccessibility in the previous three SIAs.

** SIAD campaigns 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 previous dose.

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

§§ Areas considered too dangerous by the World Health Organization and the local government to conduct an SIA.

FIGURE 1. Number of cases of wild poliovirus types 1 (WPV1) and 3 (WPV3) and circulating vaccine-derived poliovirus type 2 (cVPDV2), type of supplementary immunization activity conducted, and type of vaccine used, by month — Afghanistan, 2010–2013*



Abbreviations: NID = national immunization days; SNID = subnational immunization days; SIAD = short-interval-additional-dose campaign; bOPV = bivalent oral poliovirus vaccine; tOPV = trivalent oral poliovirus vaccine.
* Data as of November 4, 2013.

(24%) of the 1,380,127 regional target population (303,402 [22%] missed in accessible areas and 28,422 [2%] because of insecurity, respectively). During the last national SIA covered by this report, in August 2013, an estimated 190,044 (13%) of the 1,434,833 regional target population were unreached (176,952 [12%] and 13,092 [1%], respectively, in accessible and inaccessible areas), representing a 43% decline from March 2012, because of improvements in reaching inaccessible children after negotiations with local leaders over access and in reducing the number of children missed for programmatic reasons.

In the Eastern Region, during the March 2012 national SIA, the estimated number of unreached children was 35,847 (5%) of the 748,285 regional target population (20,250 [3%] missed in accessible areas and 15,597 [2%] in areas inaccessible because of insecurity, respectively). During the August 2013 national SIA, an estimated 79,741 (10%) of the 834,944 regional target population were unreached (62,738 [8%] and 17,003 [2%] in accessible and inaccessible areas, respectively), an increase of 122% from March 2012, predominantly because of a threefold increase in children missed for programmatic reasons.

As determined by postcampaign coverage surveys, the quality of SIA implementation in the field remained the major challenge: approximately 50% of children were missed because they were not available at time of the vaccination team's visit, and in most areas, the policy to revisit households with previously absent children was not implemented correctly. Nearly 25%

TABLE. Acute flaccid paralysis (AFP) surveillance indicators and reported cases of wild poliovirus (WPV) and circulating vaccine-derived poliovirus type 2 (cVDPV2), by region, period, and poliovirus type — Afghanistan, January 2012–September 2013*

	AFP surveillance indicators (2012)			Reported WPV cases					Reported cVDPV2 cases	
				Period			Type			
Country/Area	No. of AFP cases	Nonpolio AFP rate†	% with adequate specimens§	Jan–Jun 2012	Jul–Dec 2012	Jan–Sep 2013	WPV1	WPV3	Jul–Dec 2012	Jan–Sep 2013
Afghanistan	**1,829**	**9.5**	**92**	**13**	**24**	**9**	**46**	**0**	**11**	**3**
Badakhshan	53	9.8	98	0	0	0	0	0	0	0
Northeastern	233	10.9	93	0	0	0	0	0	0	0
Northern	267	11.2	94	0	0	0	0	0	0	0
Central	352	8.0	95	0	0	0	0	0	0	0
Eastern	172	8.8	94	1	5	9	15	0	0	0
Southeastern	129	6.7	93	1	4	0	5	0	0	0
Southern	315	8.9	82	10	14	0	24	0	11	3
Western	308	12.1	95	1	1	0	2	0	0	0

* Data as of November 4, 2013.
† Per 100,000 children aged <15 years.
§ Two stool specimens collected ≥24 hours apart, both within 14 days of paralysis onset, and shipped on ice or frozen packs to a World Health Organization–accredited laboratory, arriving in good condition.

of children were missed because caretakers reported that no vaccination team came to their house, suggesting weak SIA planning and supervision in these areas.

The proportion of children aged 6–23 months with NPAFP who have never received OPV ("zero-dose children") is used as a combined proxy measure of the quality of routine and supplementary vaccination. In the Southern Region, the proportion of zero-dose children was 19% in 2011, 14% in 2012, and 3% in 2013. In the Eastern Region, the proportion of zero-dose children was 0% in 2011, 1% in 2012, and 8% in 2013. In the rest of the country, where accessibility is not a major problem, the proportions of zero-dose children were 1%, 2%, and 0% in 2011, 2012, and 2013, respectively.

Acute Flaccid Paralysis (AFP) Surveillance

The indicators used to monitor the quality of AFP surveillance have been defined previously (*5*).¶¶ In 2012, the annual NPAFP rate was 9.5 per 100,000 population aged <15 years nationally (range among the eight regions: 6.7–12.1). In 2012, adequate specimens were collected for 92% of AFP cases nationally (range: 82%–98%) (Table).

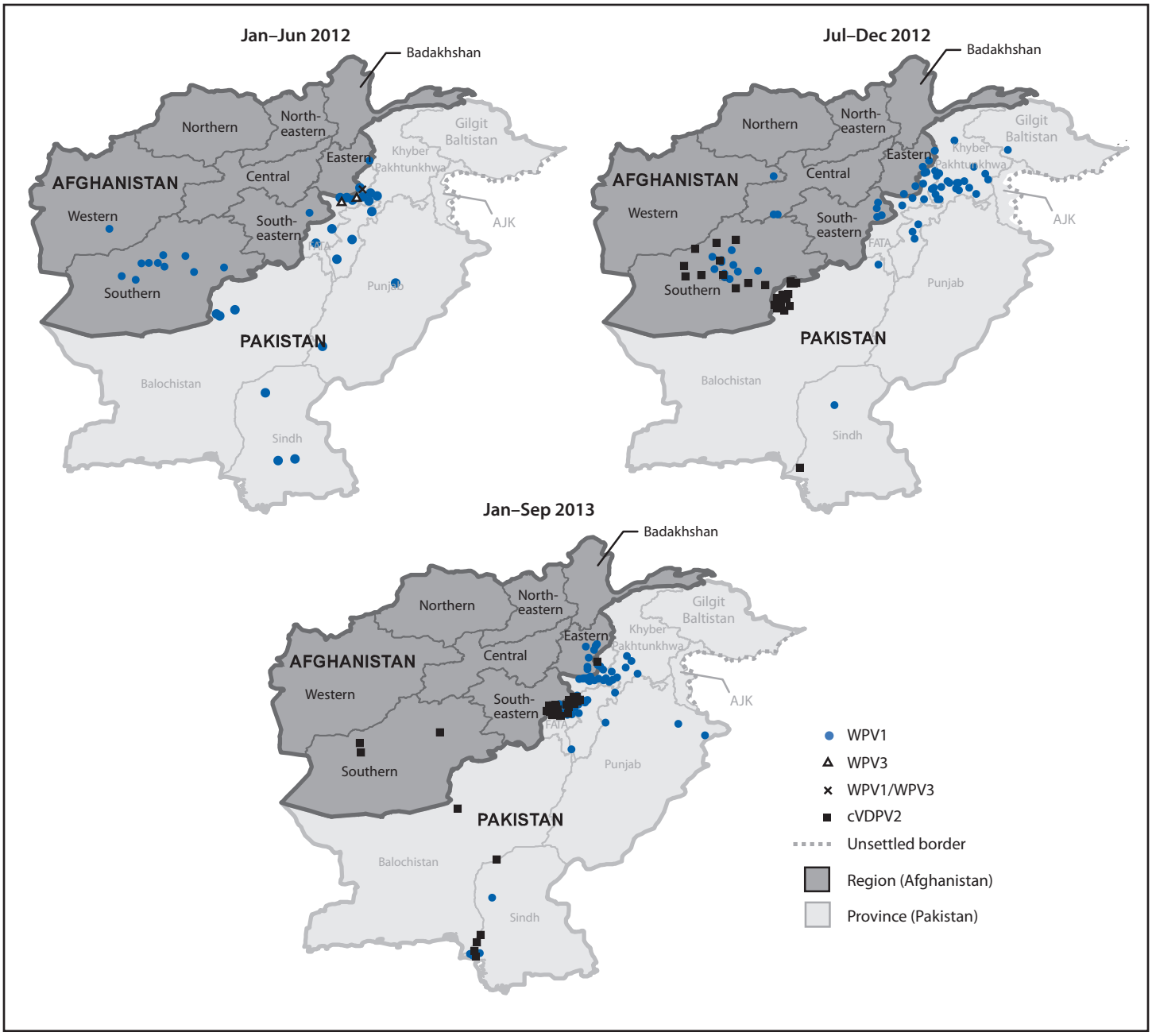
¶¶ The quality of AFP surveillance is monitored by performance indicators that include 1) detection rate of NPAFP cases and 2) the proportion of AFP cases with adequate stool specimens. World Health Organization (WHO) operational targets for countries with endemic poliovirus transmission are an NPAFP 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 ≥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.

WPV and Vaccine-Derived Poliovirus (VDPV) Epidemiology

In 2012, 37 WPV1 cases were reported from 21 (5%) of 399 districts in nine (26%) of 34 provinces, compared with 80 WPV1 cases from 34 (8%) districts in 14 (41%) provinces in 2011. Of 37 WPV1 cases in 2012, 24 were reported from the Southern Region (20 cases from the 11 LPDs), six from the Eastern Region, five from the Southeastern Region, and two from the Western Region (Table, Figures 1 and 2). All nine WPV1 cases reported in 2013 to date were reported from Kunar and Nangarhar provinces in the Eastern Region; genomic sequence analysis indicates that all nine cases were caused by WPV1 originating in the bordering Federally Administered Tribal Areas (FATA) of Pakistan (Table) (*2,3*). Since November 2012, no WPV cases have been reported from the Southern Region. Among the 46 WPV cases reported from Afghanistan during January 2012–September 2013, 42 (91%) occurred in children aged <36 months; 16 (35%) children had not received any OPV doses through routine immunization services or SIAs, and 12 (28%) had received only 1–3 OPV doses.

From October 2012 to March 2013, 14 polio cases caused by cVDPV2 (*6*) were reported in the Southern Region; genomic sequence analysis indicated new emergences of cVDPV2 in 2012 as well as silent circulation of cVDPV2 lineages previously present in Afghanistan, including one lineage that had first emerged in 2009 (Table, Figures 1 and 2). The median age of children with cVDPV2 infection was 18 months, and five (36%) had never received OPV.

FIGURE 2. Cases of wild poliovirus types 1 (WPV1), 3 (WPV3), 1 and 3 (WPV1/WPV3), and circulating vaccine-derived poliovirus type 2 (cVDPV2) — Afghanistan, January 2012–September 2013*†



Abbreviations: FATA = Federally Administered Tribal Areas; AJK = Azad Jammu and Kashmir.
* Data as of November 4, 2013.
† Each dot represents one poliovirus case. Dots drawn at random within districts.

Reported by

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What is already known on this topic?

Afghanistan is one of the three remaining countries (including Pakistan and Nigeria) where indigenous wild poliovirus (WPV) transmission has never been interrupted. The Southern Region has been the main WPV reservoir area in Afghanistan.

What is added by this report?

During 2013, WPV type 1 (WPV1) transmission has declined to the lowest level since 2004. No cases of WPV1 have been reported in the Southern Region since November 2012, and WPV1 transmission in 2013 has been limited to the Eastern Region. Genomic sequence analysis indicates that all cases in 2013 were caused by WPV1 originating in the bordering Federally Administered Tribal Areas of Pakistan. WPV type 3 has not been detected since 2010. From October 2012 to March 2013, however, 14 cases of circulating vaccine-derived poliovirus type 2 were reported in the Southern Region, suggesting significant immunity gaps and raising concerns about the strength of surveillance for acute flaccid paralysis.

What are the implications for public health practice?

To achieve and maintain WPV elimination, the government of Afghanistan is improving program accountability and management capacity, strengthening surveillance, and continuing to develop and implement district level strategies to reach and vaccinate the thousands of repeatedly missed children, particularly in areas bordering Pakistan.

Editorial Note

In 2013, WPV1 transmission in Afghanistan has declined to the lowest level since 2004. After a surge in the number of WPV cases in 2011, the government of Afghanistan and key stakeholders developed the 2012–2013 National Emergency Action Plan (NEAP) (*7*). Implementation of the NEAP strategies resulted in improved management and program performance and increased access to children in insecure areas. With support from the International Committee of the Red Cross and Red Crescent, negotiations with local leaders resulted in obtaining access for SIA teams into insecure areas of the Southern Region to vaccinate previously inaccessible children. Since November 2012, no WPV1 cases were reported in the Southern Region, which had been the major WPV1 reservoir area in Afghanistan. More than 3 years have passed since the last WPV3 case was reported in Afghanistan in April 2010. In addition to the observed impact on WPV transmission from 2012 to 2013, improved coverage has been indicated by the declining proportion of zero-dose NPAFP cases in children aged 6–23 months.

Staffing and training in the Southern Region LPDs were increased to improve management and accountability and to strengthen SIA planning and data management. Since early 2012, permanent polio vaccination teams comprised of local staff have worked in the Southern Region to increase OPV coverage by making quarterly visits to all households. During the first half of 2013, SIAD immunization campaigns were conducted in LPDs 1–2 weeks after SIAs to rapidly boost childhood immunity.

The magnitude of and reasons for the problem with unreached children during SIAs differed between the Southern and Eastern regions during 2012–2013. In the Southern Region, there was intermittent access to most areas, and children had opportunities to receive OPV doses. On the other hand, in some districts of the Eastern Region, children were consistently missed during successive rounds in 2013, either because of inaccessibility or poor quality SIA implementation. To provide access to OPV for children living in inaccessible areas, transit vaccination teams have been placed at border crossings into Pakistan and at the borders of inaccessible districts in the Southern and Eastern regions.

The national immunization program in Afghanistan faces major challenges because of insufficient infrastructure and financing, suboptimal cold chain equipment and procedures, low data quality for program monitoring, and lack of community engagement. Major efforts are underway to encourage development partners to work with the Ministry of Health to enhance components of the immunization program and strengthen service delivery for all vaccines in the national program. The reported cVDPV2 cases in the Southern Region indicate a major gap in poliovirus type 2 immunity because of very weak routine immunization services there; genetic sequencing of cVDPV isolates also indicate weaknesses in AFP surveillance in the past because cVDPV transmission was not detected for nearly 2 years. These weaknesses can be addressed with additional training and supervision of immunization and surveillance staff.

In August 2013, the NEAP was updated to address the current challenges faced by the program from 2013 to 2014 and to focus on those interventions that have proven effective in reaching children previously missed consistently in LPDs. Additionally, the government of Afghanistan and partners should sustain and enhance progress in vaccination team performance, community demand for vaccination, and surveillance quality, including the introduction of environmental sampling and testing. To achieve a polio-free Afghanistan, however, similar progress is needed in the remaining pockets of transmission in bordering areas of Pakistan (*8*).

Acknowledgment

Brian C. Kaplan, MS, MA, Div of Toxicology and Human Health Sciences, Agency for Toxic Substances and Disease Registry.

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Progress Toward Poliomyelitis Eradication — Pakistan, January 2012–September 2013

Pakistan is one of three countries where transmission of indigenous wild poliovirus (WPV) has never been interrupted (*1*). This report describes polio eradication activities and progress in Pakistan during January 2012–September 2013 and updates previous reports (*2,3*). During 2012, 58 WPV cases were reported in selected areas, compared with 198 cases throughout the country in 2011; 52 WPV cases were reported during January–September 2013, compared with 54 cases during the same period in 2012. Of the 110 WPV cases reported since January 2012, 92 cases (84%) occurred in the conflict-affected Federally Administered Tribal Areas (FATA) and in security-compromised Khyber Pakhtunkhwa (KP) Province. WPV type 3 (WPV3) was isolated from only three persons with polio in a single district in 2012; the most recent case occurred in April 2012. During August 2012–September 2013, 52 circulating vaccine-derived poliovirus type 2 (cVDPV2) cases were detected, including 30 cases (58%) identified in FATA during January–September 2013. Approximately 350,000 children in certain districts of FATA have not received polio vaccine during supplementary immunization activities (SIAs)* conducted since mid-2012 because local authorities have banned polio vaccination. In some other areas of Pakistan, SIAs have been compromised by attacks targeting polio workers that started in mid-2012. Further efforts to reach children in conflict-affected and security-compromised areas, including vaccinating at transit points and conducting additional short-interval-additional-dose (SIAD)† SIAs as areas become accessible, will be necessary to prevent reintroduction of WPV into other areas of Pakistan and other parts of the world.

Immunization Activities

Estimated national routine vaccination coverage among infants aged <1 year with 3 doses of oral polio vaccine (OPV3) was 89% in 2012, unchanged from 2011 (*4*). However, based on parental recall and immunization cards, routine OPV3 coverage among children aged 6–23 months with nonpolio acute flaccid paralysis (NPAFP)§ was 65% nationally, with a large range among provinces and territories: 28% in Balochistan, 38% in FATA, 54% in Sindh, 57% in KP, 78% in Punjab, and 89% in Azad Jammu and Kashmir, Gilgit-Baltistan, and Islamabad Capitol Territory combined.

During January 2012–September 2013, seven national and nine subnational SIAs targeting children aged <5 years were conducted. Three national SIAs used trivalent OPV, three national and all subnational SIAs used bivalent OPV types 1 and 3 (bOPV), and one national SIA used both vaccines (in different areas) (Figure 1). Eleven SIAD SIAs and several smaller mop-up campaigns using bOPV or monovalent OPV type 1 were conducted, targeting areas with recent confirmed polio cases or districts with children at high risk for polio.

During January–July 2012, an estimated 15% of children targeted during SIAs (nearly 170,000 children) in FATA were not accessible because of security limitations for vaccination teams.¶ From July 2012 to September 2013, the estimated percentage of targeted children living in SIA-inaccessible areas of FATA increased to 33%–35% (approximately 377,000 to 400,000 children) because of security limitations, bans on polio vaccination by local authorities, or both. In additional areas of FATA and in Sindh and KP provinces, targeted attacks against polio workers during SIAs from July 2012 to September 2013 increased costs, limited full implementation, and prevented monitors and supervisors from assessing the quality and coverage of SIAs.

Nationally, using acute flaccid paralysis (AFP) surveillance data to provide a proxy measure of OPV coverage, 95% and 92% of children aged 6–23 months with NPAFP were reported to have received ≥4 OPV doses through routine vaccination or SIAs in 2012 and 2013, respectively. Only 2% and 5% of children with NPAFP had never received a dose of OPV ("zero-dose children") in 2012 and 2013. However, the percentage of children with NPAFP who received ≥4 OPV doses was >90% in Azad Jammu and Kashmir, Gilgit-Baltistan, Islamabad Capitol Territory, KP, Punjab, and Sindh during 2012 and 2013; it was only 78% in Balochistan during both years; and in FATA, it declined from 71% in 2012 to 35% in 2013. The proportion of zero-dose children among those with NPAFP

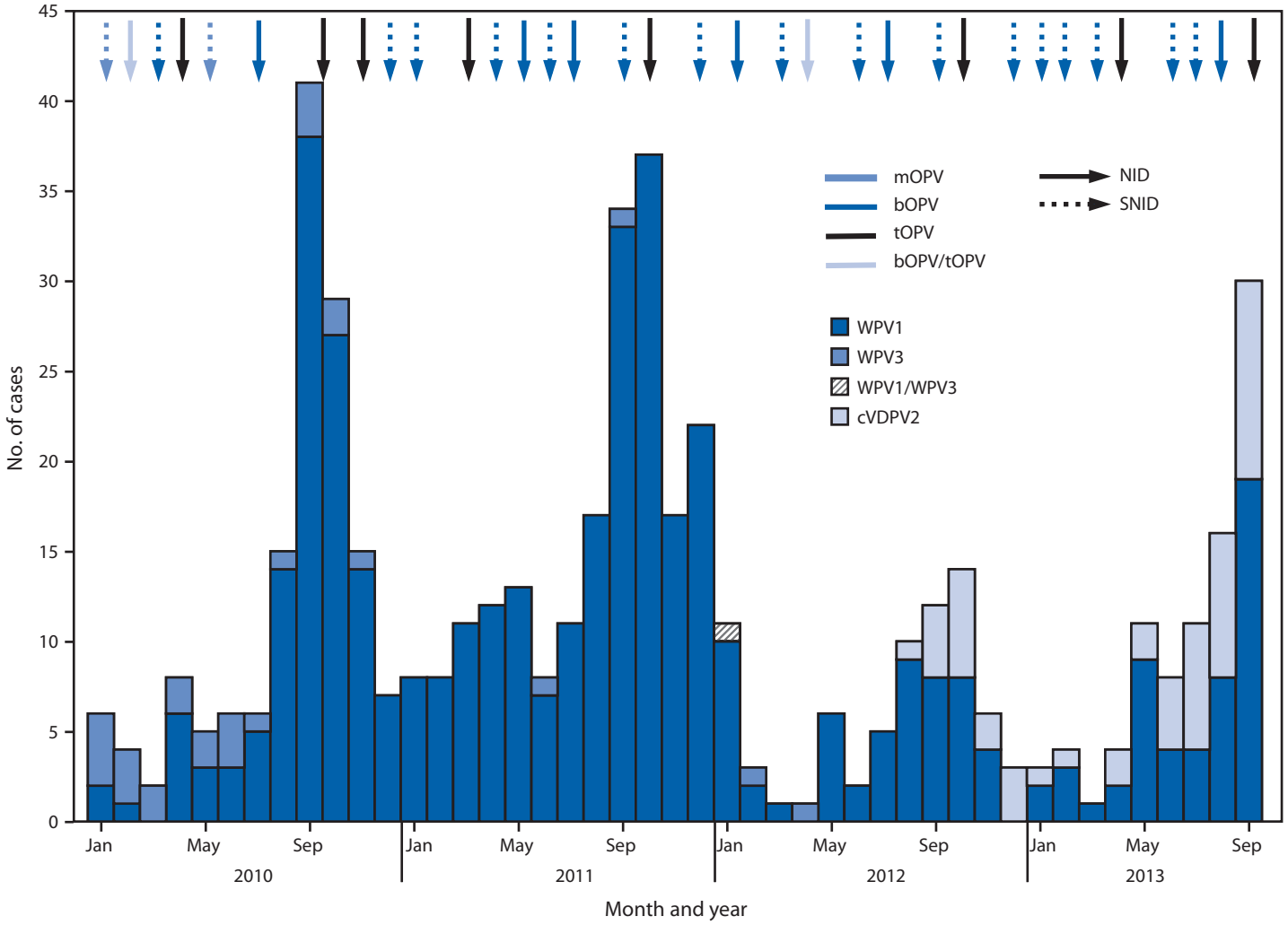
* Mass campaigns conducted for a brief period (days to weeks) in which 1 dose of oral poliovirus vaccine is administered to all children aged <5 years, regardless of vaccination history. Campaigns can be conducted nationally or in portions of the country.

† Short-interval-additional-dose campaigns are used during negotiated periods of nonviolence in otherwise inaccessible areas to administer a second dose of monovalent oral polio vaccine or bivalent oral polio vaccine within 1–2 weeks of the previous dose.

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

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

FIGURE 1. Number of cases of wild poliovirus types 1 (WPV1), 3 (WPV3), 1 and 3 (WPV1/WPV3), and circulating vaccine-derived poliovirus type 2 (cVDPV2), type of supplementary immunization activity conducted, and type of vaccine used, by month — Pakistan, 2010–2013*



Abbreviations: NID = national immunization days; SNID = subnational immunization days; mOPV = monovalent oral poliovirus vaccine; bOPV = bivalent oral poliovirus vaccine; tOPV = trivalent oral poliovirus vaccine.
* Data as of November 4, 2013.

increased in FATA, from 17% in 2012 to 52% in 2013, but remained unchanged in Balochistan (10%), KP (<5%), and elsewhere (<1%).

Poliovirus Surveillance

Standard indicators are used to monitor AFP surveillance performance globally (*5*).** In 2012, the annual national NPAFP rate in Pakistan (per 100,000 population aged <15 years) was 6.3 (range among the six provinces/territories: 2.4–9.1). The percentage of AFP cases for which adequate specimens were collected was 89% (range: 73%–92%) (Table).

During 2012–2013, to supplement AFP surveillance in Pakistan, environmental surveillance with monthly testing of sewage samples for polioviruses was conducted in 23 sites in 11 cities in all major provinces of Pakistan. During 2011, WPV1 was detected from all sites, and 136 (65%) of 205 samples collected were positive. During 2012–2013, WPV1 was isolated in nearly all samples in Peshawar (KP) and Hyderabad (Sindh), but the frequency of isolation declined in other sites. In 2012, 87 (36%) of 239 samples were WPV1-positive; during January–September 2013, 40 (16%) of 247 samples were

** The quality of AFP surveillance is monitored by performance indicators that include 1) detection rate of NPAFP cases and 2) the proportion of AFP cases with adequate stool specimens. World Health Organization (WHO) operational targets for countries with endemic poliovirus transmission are an NPAFP 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.

TABLE. Acute flaccid paralysis (AFP) surveillance indicators and reported cases of wild poliovirus (WPV) and circulating vaccine-derived poliovirus type 2 (cVDPV2), by province, period, and poliovirus type — Pakistan, January 2012–September 2013*

	AFP surveillance indicators (2012)			Reported WPV cases						Reported cVDPV2 cases	
				Period			Type			Period	
Country/Area	No. of AFP cases	Nonpolio AFP rate†	% with adequate specimens§	Jan–Jun 2012	Jul–Dec 2012	Jan–Sep 2013	WPV1	WPV3	WPV1/WPV3¶	Jul–Dec 2012	Jan–Sep 2013
Pakistan	**5,037**	**6.3**	**89**	**24**	**34**	**52**	**107**	**2**	**1**	**16**	**36**
AJK, GB, ICT	74	2.4	92	0	1	0	1	0	0	0	0
KP	990	9.1	85	5	22	9	36	0	0	0	0
FATA	149	7.9	73	11	9	36	53	2	1	0	30
Punjab	2,407	5.8	91	2	0	3	5	0	0	0	0
Balochistan	205	5.0	83	3	1	0	4	0	0	15	2
Sindh	1,212	6.8	90	3	1	4	8	0	0	1	4

Abbreviations: AJK = Azad Jammu and Kashmir; GB = Gilgit-Baltistan; ICT = Islamabad Capital Territory; KP = Khyber Pakhtunkhwa (formerly Northwest Frontier Province); FATA = Federally Administered Tribal Areas.
* Data as of November 4, 2013.
† Per 100,000 children aged <15 years.
§ Two stool specimens collected ≥24 hours apart, both within 14 days of paralysis onset, and shipped on ice or frozen packs to a World Health Organization–accredited laboratory, arriving in good condition.
¶ One case had coinfection with WPV1 and WPV3.

WPV1-positive, compared with 74 (40%) of 187 samples collected during the same period in 2012.

WPV and Vaccine-Derived Poliovirus (VDPV) Epidemiology

During 2012, 58 WPV cases (55 WPV1, two WPV3, and one WPV1/WPV3 coinfection) were reported, compared with 198 WPV cases (196 WPV1 and two WPV3) during 2011; 52 cases (all WPV1) were reported during January–September 2013, compared with 54 cases for the same period in 2012 (Table, Figures 1 and 2). Of 110 WPV cases reported during January 2012–September 2013, 96 (87%) cases were among children aged <36 months; 45 (41%) were reported to have received no OPV doses, 16 (15%) received 1–3 OPV doses, and 49 (45%) received ≥4 OPV doses.

WPV cases were reported in 27 (17%) of 157 districts during 2012, compared with 60 (38%) districts during 2011, and from 16 (10%) districts during January–September 2013. During 2012, 27 (47%) of 58 WPV cases were from KP, 20 (34%) from FATA, and eight (14%) from Balochistan and Sindh combined (Table, Figure 2). During January–September 2013, 36 (69%) of 52 cases were from FATA, nine (17%) from KP, four (8%) from Sindh, and none from Balochistan.

WPV genomic sequencing identified six genetic clusters†† of WPV1 during 2012 and four clusters during January–September 2013. During 2013, some clusters have only been detected in sewage samples but not in specimens from AFP cases. During 2012–2013, only three WPV3 cases were reported; all were from the same district in FATA (Khyber), and the WPV3 isolates belonged to a single genetic cluster. The date of onset for the most recent WPV3 case was April 2012. The latest WPV3 isolated from a sewage sample was collected in Karachi in October 2010.

The first circulating VDPV-associated polio case ever reported in Pakistan was detected in Killa Abdullah District, Balochistan, with onset on August 30, 2012 (*6*). Genomic sequencing suggested that circulation was undetected for nearly 2 years since emergence. During August 2012–September 2013, 52 cVDPV2 cases were reported: 17 in Balochistan, 30 in FATA (primarily in areas where vaccination teams do not have access), and five in Sindh (Table, Figures 1 and 2). Of the 52 cases reported, 47 (90%) were among children aged <36 months; 26 (50%) had received zero OPV doses (either routine or SIA), and 17 (33%) had received ≥4 OPV doses.

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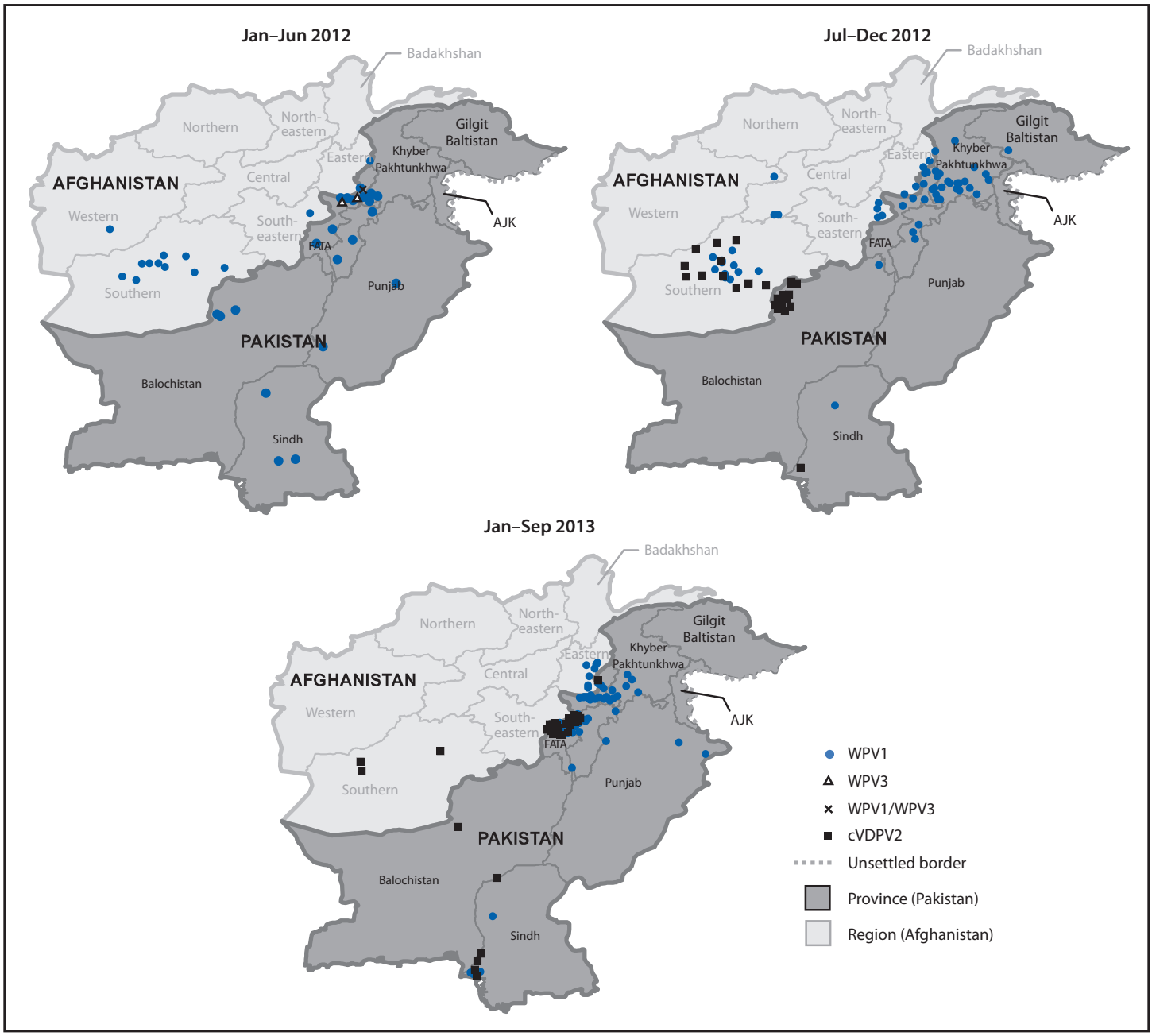
Editorial Note

During 2012, WPV cases declined 70% compared with 2011 (58 cases versus 198 cases) and were more geographically restricted. In 2013 to date, a similar number of WPV cases were

†† All WPVs isolated are sequenced across the interval encoding the major capsid protein (VP1) (approximately 900 nucleotides), and results are analyzed to monitor pathways of virus transmission. Isolates within a cluster share >95% VP1 nucleotide sequence identity.

FIGURE 2. Cases of wild poliovirus types 1 (WPV1), 3 (WPV3), 1 and 3 (WPV1/WPV3), and circulating vaccine-derived poliovirus type 2 (cVDPV2) — Pakistan, January 2012–September 2013*†



Abbreviations: FATA = Federally Administered Tribal Areas; AJK = Azad Jammu and Kashmir.
* Data as of November 4, 2013.
† Each dot represents one poliovirus case. Dots drawn at random within districts.

reported compared with a similar period in 2012, with further geographic restriction. In 2013, AFP and environmental surveillance suggest that WPV1 transmission generally has been restricted to high-risk areas of FATA and KP, and WPV1 circulation apparently has been interrupted in the Quetta block, Balochistan, one of the historical reservoir areas. WPV3 has not been detected in any stool or sewage sample in Pakistan for >1 year. During 2012, however, cVDPV2 emerged in the Quetta block because of long-standing, low routine vaccination coverage and poor-quality SIAs. More importantly, during 2013, WPV1 transmission in FATA has intensified, and cVDPV2 originating from Quetta block has quickly spread in certain areas of FATA where conflict and local bans on polio vaccination have prevented access by vaccination teams for >1 year.

What is already known on this topic?

Pakistan is one of the three remaining countries (including Afghanistan and Nigeria) where indigenous wild poliovirus (WPV) transmission has never been interrupted. Pakistan has been the source for imported WPV outbreaks in Afghanistan, China, and Syria and for WPV circulation in Egypt, Israel, the West Bank, and Gaza.

What is added by this report?

Compared with the same period in 2010–2011, WPV type 1 transmission decreased in magnitude and geographic spread, and WPV type 3 has not been detected for >1 year. However, bans on polio vaccination and attacks targeting polio workers in certain areas have resulted in intense WPV type 1 transmission and rapid spread of circulating vaccine-derived poliovirus type 2, especially in the Federally Administered Tribal Areas (FATA).

What are the implications for public health practice?

Improvements in polio program performance and the decreased extent of WPV transmission in Pakistan suggest that the successful eradication of polio is achievable. The intense transmission of WPV type 1 and circulating vaccine-derived poliovirus type 2 in FATA, with transmission within and outside Pakistan, demonstrates the ongoing threat to achievement of polio eradication. Efforts by humanitarian, religious, and governmental bodies to improve community acceptance of vaccination and to reach children in conflict-affected and security-compromised areas of Pakistan will be necessary to achieve polio eradication in Pakistan and globally.

During 2010 and 2011, WPV cases increased substantially in number and dispersion, spreading throughout the country (*2,3*). This surge in WPV cases was attributed primarily to population displacement after severe flooding in 2010, low routine OPV3 vaccination coverage, and the low quality of SIAs because of insufficient political involvement at the federal, provincial, and district levels. The quality of SIAs improved in 2012, after implementation of management and accountability strategies included in the 2012 Enhanced National Emergency Action Plan (*7*). However, since July 2012, targeted attacks, resulting in the death of 22 polio workers and four police officers and the injury of many others, have seriously compromised implementation of SIAs in many areas of FATA, KP, and Karachi. SIAs were resumed in some areas of FATA, KP, and Karachi after initial suspension after the attacks against polio workers. However, the quality of vaccination activities in these areas likely has been reduced because of strategies implemented to minimize the risk for attacks, such as conducting SIAs without advance notice, reducing or suspending house-to-house visits in some locales, and having police escorts for vaccination teams. Furthermore, cancellation of post-SIA surveys prevented assessments of SIA quality and management of vaccination team performance problems. In addition, in the North and South Waziristan agencies of FATA, bans by local authorities have prohibited polio vaccination for approximately 350,000 children since June 2012.

Major improvements in polio program performance and the decreased extent of transmission of WPV in Pakistan suggest that the successful eradication of polio is achievable. However, the high proportion of children infected with WPV or with NPAFP who are underimmunized and the simultaneous WPV1 and cVDPV2 outbreaks in FATA during 2013 highlight the serious consequences to population immunity that have resulted from conflict and insecurity. WPV1 from inaccessible areas of FATA has spread to other areas in Pakistan and to other countries. All WPV1 cases in Afghanistan in 2013 have occurred in the Eastern Region adjoining FATA and were caused by WPV1 originating in FATA. Recent WPV1 transmission in Egypt, Israel, the West Bank and Gaza, and Syria (*8*) can be linked to WPV1 originating in Pakistan. This situation puts recent achievements in Pakistan at risk for reversal and puts achievement of the objective of global polio eradication in peril. Enhanced efforts by humanitarian, religious, and governmental bodies to improve community acceptance of vaccination and reach children in conflict-affected and security-compromised areas of Pakistan will be necessary to interrupt all poliovirus transmission in Pakistan.

Acknowledgment

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Notes from the Field

Severe Illness Associated with Synthetic Cannabinoid Use — Brunswick, Georgia, 2013

On August 23, 2013, the Georgia Poison Center was notified of eight persons examined in an emergency department in Brunswick, Georgia, after smoking or inhaling fumes from synthetic cannabinoids. The Georgia Poison Center notified the Georgia Drug and Narcotics Agency, which informed the Georgia Department of Public Health (DPH). The Brunswick emergency department was asked to report any additional patients who reported use of synthetic cannabinoid to the Coastal District Health Department. DPH investigators reviewed recent medical records of patients who had gone to the emergency department and found that 22 patients had been examined after using synthetic cannabinoids during August 22–September 9, 2013.

The 22 patients were aged 16–57 years (median: 25 years); 18 (82%) were male. Patients experienced hyperglycemia (13 [59%]), hypokalemia (nine [41%]), acidosis (seven [32%]), tachycardia (13 [59%]), nausea/vomiting (eight [36%]), confusion/disorientation (seven [32%]), aggression (seven [32%]), somnolence/unresponsiveness (seven [32%]), and seizures (three [14%]). Complications included pneumonia (two patients), rhabdomyolysis (one), and myocardial infarction (one). Six (27%) patients were admitted to the intensive care unit; five (23%) required assisted ventilation; none died. Serum from seven of the initial eight patients was tested for synthetic cannabinoid by the Clinical and Environmental Toxicology Laboratory at the University of California, San Francisco. Five tested positive for ADB-PINACA (N-(1-amino-3,3-dimethy-1-oxobutan-2-yl)-1-pentyl-1H-indazole-3-carboxamide), a previously unrecognized synthetic cannabinoid related to indole compounds recently identified in Europe and Japan (*1*).

Law enforcement authorities removed the synthetic cannabinoid from the implicated Brunswick smoke shop,* which sold all types of tobacco products and smoking paraphernalia. The product, "Crazy Clown," was tested by the Georgia Bureau of Investigation Crime Laboratory, which identified ADB-PINACA, an indazole classified under Georgia law as Schedule 1 on the basis of its close relationship to Schedule 1 compounds already specified. The smoke shop owners were charged on September 10, 2013, with possession of a Schedule 1 controlled substance with intent to distribute; no additional patients who used synthetic cannabinoids have been reported by the ED.

Synthetic cannabinoids are designer drugs often smoked as a marijuana alternative. Despite laws prohibiting synthetic cannabinoid sales, they are still widely available, and recent increases in reports of synthetic cannabinoid use and adverse health effects have occurred (*2*,*3*). Common adverse effects include altered mental status and tachycardia. Clinicians examining patients with suspected drug abuse and these symptoms should consider synthetic cannabinoid intoxication (*4*). Public health authorities can raise awareness of adverse events associated with synthetic cannabinoids and establish mechanisms for surveillance by partnering with poison centers, health-care providers, and law enforcement.

*The initial eight patients reported buying the synthetic cannabinoid from the same smoke shop. Additional patients interviewed also named the smoke shop as the source.

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Erratum

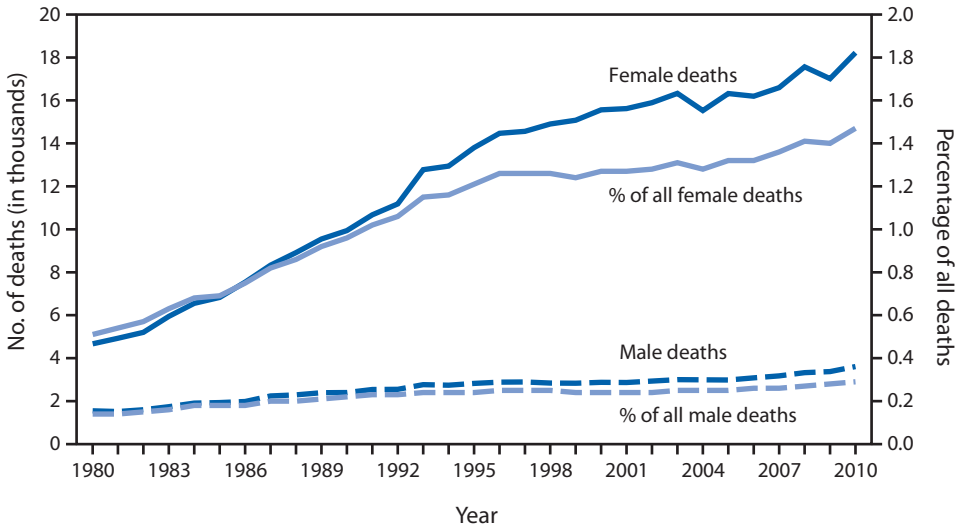
Vol. 62, No. 45

In the report, "Tobacco Product Use Among Middle and High School Students — United States, 2011 and 2012," an error occurred in the first paragraph on pages 893 and 894. The sixth sentence of that paragraph should read, "During the same period, significant decreases occurred in bidi* and kretek† use among middle and high school students."

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Number of Deaths Among Centenarians and Percentage Among All Deaths, by Sex — United States, 1980–2010



As more persons in the United States reach the age of 100 years, the number of deaths of those aged ≥100 years has been increasing. From 1980 to 2010, the number of deaths among female centenarians increased from 4,668 to 18,222, and the number of deaths among male centenarians increased from 1,552 to 3,607. Throughout the period, the number of deaths among female centenarians ranged from three to five times higher than the number among males. The percentage of centenarian deaths among all deaths also increased, from 0.51% to 1.47% among females and from 0.14% to 0.29% among males.

Source: National Vital Statistics System. Mortality public use data files, 1980–2010. Available at http://www.cdc.gov/nchs/data_access/vitalstatsonline.htm.

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