Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 64 / No. 25
July 3, 2015

Monitoring of Persons with Risk for Exposure to Ebola Virus Disease — United States, November 3, 2014–March 8, 2015

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On October 27, 2014, CDC released guidance for monitoring and movement of persons with potential Ebola virus disease (Ebola) exposure in the United States (*1*). For persons with possible exposure to Ebola, this guidance recommended risk categorization, daily monitoring during the 21-day incubation period, and, for persons in selected risk categories, movement restrictions. The purpose of the guidance was to delineate methods for early identification of symptoms among persons at potential risk for Ebola so that they could be isolated, tested, and if necessary, treated to improve their chance of survival and reduce transmission. Within 7 days, all 50 states and two local jurisdictions (New York City [NYC] and the District of Columbia [DC]) had implemented the guidelines. During November 3, 2014–March 8, 2015, a total of 10,344 persons were monitored for up to 21 days with >99% complete monitoring. This public health response demonstrated the ability of state, territorial, and local health agencies to rapidly implement systems to effectively monitor thousands of persons over a sustained period.

Enhanced entry screening was conducted at five U.S. international airports at which travelers from Ebola-affected West African countries were identified and assigned a risk categorization for Ebola exposure. The Ebola-affected West African countries and the U.S. risk categories have changed over time, as described in the CDC interim U.S. guidance (*1*). Enhanced entry screening identified symptomatic travelers needing further evaluation. Federal authorities screened, educated, and collected information on travelers. Traveler information was provided to state, territorial, and local public health authorities to conduct health monitoring (*2*). Health care workers (HCWs) who cared for Ebola patients domestically, including laboratory staff, were identified through their health care facilities. Guidance for monitoring and movement of persons with potential Ebola exposure recommended risk stratification and public health actions for each category (*1*). Four risk categories were created: high, some, low but not zero (in this report referred to as low), and no identifiable risk.*

After potential exposure to Ebola, one of two daily public health actions, either active monitoring (AM) or direct active monitoring (DAM), was required for 21 days. AM was recommended for low-risk travelers and consisted of twice-daily temperature checks and self-evaluation for symptoms consistent with Ebola (*1*,*3*). Persons under AM reported their health status to the public health authority overseeing monitoring at least once daily (*1*,*4*). DAM was recommended for persons at high risk or some risk, as well as for HCWs at low risk who

* Additional information available at http://www.cdc.gov/vhf/ebola/exposure/risk-factors-when-evaluating-person-for-exposure.html.

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had cared for Ebola patients in the United States. In addition to AM requirements, DAM included twice-daily reports to the monitoring jurisdiction with at least once-daily direct visualization of the individual by the health authority (*1*,*4*).

Complete monitoring (either AM or DAM) was defined as making contact with the monitored person with no gaps in reporting (e.g., no loss to follow-up) of >48 hours. Weekly estimates of the number of persons under monitoring and reporting symptoms, and calculations of incomplete monitoring were collected from the jurisdictions' weekly reports. The overall estimate of persons under monitoring was calculated as the sum of persons reported as 1) completing monitoring, 2) leaving the United States during their monitoring period, and 3) remaining under monitoring on March 8, 2015.

Monitoring was conducted by 60 jurisdictions: the 50 states, NYC and DC, five U.S. territories (American Samoa, Commonwealth of the Northern Mariana Islands, Guam, Puerto Rico, and U.S. Virgin Islands), and three freely-associated states (Federated States of Micronesia, Republic of the Marshall Islands, and Republic of Palau) (*4*). Until March 9, jurisdictions submitted individual-level, daily reports to CDC for all persons under monitoring who were at high risk or some risk. These reports included data on monitoring (e.g., compliance and reported symptoms), transportation plans should the person become symptomatic, assigned assessment hospitals, and intrastate and interstate travel plans of persons under monitoring. All jurisdictions submitted aggregate weekly reports for persons at low risk (including reports when no one was monitored) and reported the same monitoring data as in the daily reports. Information on returning Department of Defense personnel restricted to a military station for their 21-day monitoring period was not reported to CDC and is reported elsewhere (*5*).

During November 3, 2014–March 8, 2015, in the 60 jurisdictions, 10,344 persons were monitored (Table). Overall, 91.9% of the persons monitored were travelers at low risk, 5.1% were HCWs at low risk who had provided patient care in the United States, and 3.0% were persons at high or some risk (Figure 1).

During the study period, a median of 1,710 persons (range = 1,331–2,119) were monitored in a given reporting week (Figure 2). Among HCWs at low risk caring for patients in the United States, 96% were monitored during November and early December, after giving care to the first patients treated for Ebola in the United States. In mid-December and early February, the number of persons at high risk or some risk increased 240% and 307%, respectively, corresponding with the return of two teams of U.S. Public Health Service officers who had staffed an Ebola treatment unit in Monrovia, Liberia.

In a given week, a median of 1.5 persons for whom monitoring was indicated could not be contacted upon arrival in the jurisdiction (0.4%; range = 0–48 persons per week). The number of persons who could not be contacted in a given week decreased from a median of 23 persons per week (1.4%) in November to less than one person per week in February (0.03%). Of the persons ever contacted for monitoring, a median of 7.5 persons

The *MMWR* series of publications is published by the Center for Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30329-4027.

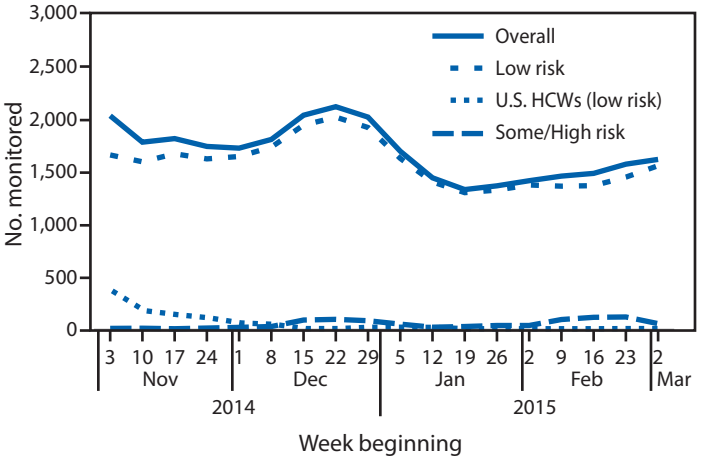
Suggested citation: [Author names; first three, then et al., if more than six.] [Report title]. MMWR Morb Mortal Wkly Rep 2015;64:[inclusive page numbers].

TABLE. Summary of active and direct active monitoring of persons with potential Ebola exposure, by risk category — United States, November 3, 2014–March 8, 2015

	Risk category			
		Low (but not zero) risk		
Monitoring element	High risk and some risk	Travelers	U.S. HCWs	Total
Type of daily monitoring	DAM	AM	DAM	—
Reporting frequency to CDC	Daily	Weekly	Weekly	—
No. of persons monitored	315	9,512	527	10,344*
No. of jurisdictions conducting monitoring	47	54	10	54

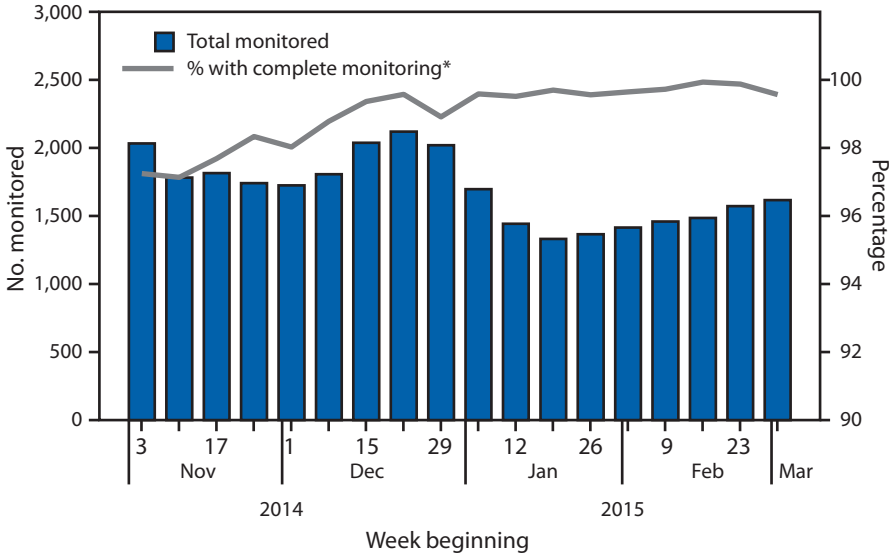
Abbreviations: AM = active monitoring; DAM = direct active monitoring; HCWs: Health care workers, including laboratory personnel.
* Adjusted for persons whose risk category changed from some risk to low risk.

FIGURE 1. Number of persons (N = 10,344) with potential Ebola exposure who were monitored, by risk category and week — United States, November 3, 2014–March 8, 2015



Abbreviation: HCWs = health care workers.

FIGURE 2. Number of persons (N = 10,344) with potential Ebola exposure who were monitored and percentage with complete monitoring, by week — United States, November 3, 2014–March 8, 2015



* Complete monitoring is defined as making contact with the monitored person with no gaps in reporting of >48 hours.

had gaps in being monitored that were >48 hours in a given week (0.6%; range = 1–26 persons per week). The median number of persons with >48-hour gaps in monitoring decreased from 20 persons per week (1.0%) in November to three per week (0.2%) in February.

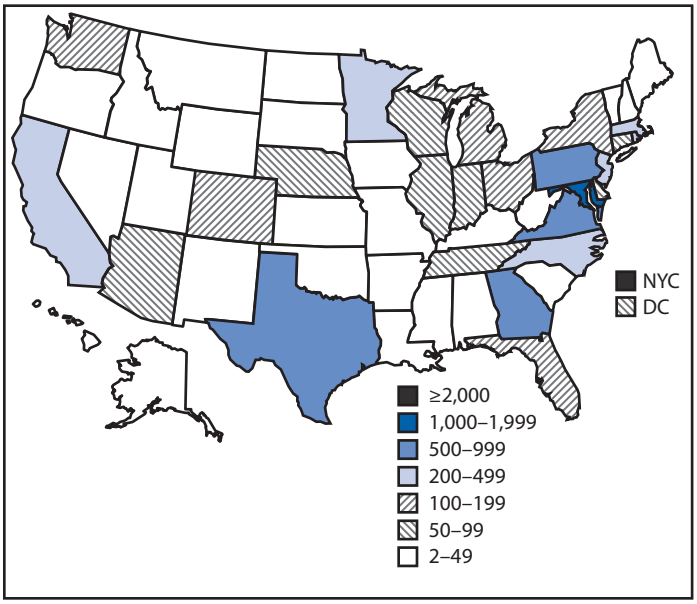
During a given reporting week, a median of 20 persons under monitoring (1.2%, range = 9–43 persons) reported Ebola-compatible symptoms. The number of symptomatic persons peaked in December 2014. Of the symptomatic persons in the low-risk and some-risk categories, 39 were tested for Ebola during their monitoring period; none tested positive for Ebola. No persons at high risk reported Ebola-compatible symptoms.

All 50 states, DC, NYC, Puerto Rico, and the U.S. Virgin Islands monitored persons at low risk (Figure 3). Forty-four states, DC, NYC, and Puerto Rico monitored one or more persons at high risk or some risk. Three territories and three freely-associated states had no persons under monitoring. More than half (54%) of the persons were monitored in five jurisdictions. The most persons were monitored in NYC, followed by Maryland, Pennsylvania, Georgia, and Virginia (Figure 3). NYC monitored nearly twice as many persons as Maryland.

Discussion

Within 7 days of issuance of CDC guidance on movement and monitoring in October 2014, all 50 states and two local jurisdictions were effectively monitoring travelers arriving from countries with widespread Ebola transmission and HCWs caring for patients with Ebola in the United States. By December 22, all U.S. territories were reporting to CDC. Less than 1% of monitoring was incomplete. Anecdotally reported reasons for incomplete monitoring included missing or incorrect contact information, logistical issues (e.g., transfer from one jurisdiction to another), and noncompliance by persons being monitored.

FIGURE 3. Number of persons with potential Ebola exposure monitored in 50 states, New York City, and the District of Columbia — November 3, 2014–March 8, 2015



These efforts demonstrate the capacity and infrastructure developed by U.S. jurisdictions to urgently respond to a large-scale monitoring need. Since 2002, considerable resources have been distributed to public health departments to effectively respond to infectious disease outbreaks and other public health threats (*6*). Additional resources also have been awarded to jurisdictions for Ebola-related activities.

The findings in this report are subject to at least two limitations. First, because weekly data were reported in aggregate, the estimated numbers of persons monitored might be inexact. For example, overestimates would result if a jurisdiction reported the same person in both low-risk and some-risk categories for a given reporting period. This likely would occur when a person's risk classification changed during the 21-day monitoring period (e.g., an HCW who completed work in an Ebola treatment unit days before departing the country could change from some risk to low risk). Duplicates were corrected whenever identified. Second, the calculation of the overall number of persons under monitoring might be an underestimate if all persons were not reported as having completed their monitoring, leaving the United States, or still being under monitoring on March 8, 2015.

Summary

What is already known on this topic?

The 2014–2015 Ebola virus disease (Ebola) epidemic is the largest ever reported. During March 25, 2014– June 23, 2015, a total of 15,109 laboratory-confirmed cases of Ebola were reported and 11,232 persons died, primarily in Guinea, Liberia, and Sierra Leone. To prevent transmission of Ebola in the United States, CDC issued monitoring and movement guidance on October 27, 2014, and provided epidemiologic and clinical expertise in support of 60 jurisdictions' implementation of this guidance.

What is added by this report?

This report is the first to present results from the 60 U.S. jurisdictions that monitored persons with potential exposure to Ebola, including those returning from Ebola-affected countries. A total of 10,344 persons were monitored during November 3, 2014–March 8, 2015, with >99% complete monitoring.

What are the implications for public health practice?

This report provides evidence that jurisdictions can rapidly implement a complex monitoring system and monitor thousands of persons with potential exposure to Ebola over a sustained period. In addition, this report provides documentation that among the 10,344 monitored, none were diagnosed with Ebola.

These results provide evidence of successful U.S. monitoring for Ebola. Jurisdictions demonstrated public health capacity to rapidly conduct and effectively monitor thousands of persons over a sustained period. After monitoring of 10,344 persons, no transmission of Ebola was reported during the study period, and few persons under monitoring reported symptoms suggesting potential Ebola infection (*7*). Given the complexity and amount of coordination of effort required, the Ebola monitoring program in the United States provided systemic evidence of the capability of state, territorial, and local health departments to ensure and protect the health of the U.S. public.

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Acknowledgments

The 60 jurisdictions that conducted monitoring; Steve Boedigheimer, Christine Kosmos, and staff members of CDC's State Coordination Task Force and Global Migration Task Force.

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Monitoring Exposure to Ebola and Health of U.S. Military Personnel Deployed in Support of Ebola Control Efforts — Liberia, October 25, 2014–February 27, 2015

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In response to the unprecedented Ebola virus disease (Ebola) outbreak in West Africa, the U.S. government deployed approximately 2,500 military personnel to support the government of Liberia. Their primary missions were to construct Ebola treatment units (ETUs), train health care workers to staff ETUs, and provide laboratory testing capacity for Ebola. Service members were explicitly prohibited from engaging in activities that could result in close contact with an Ebola-infected patient or coming in contact with the remains of persons who had died from unknown causes. Military units performed twice-daily monitoring of temperature and review of exposures and symptoms ("unit monitoring") on all persons throughout deployment, exit screening at the time of departure from Liberia, and post-deployment monitoring for 21 days at segregated, controlled monitoring areas on U.S. military installations. A total of 32 persons developed a fever during deployment from October 25, 2014, through February 27, 2015; none had a known Ebola exposure or developed Ebola infection. Monitoring of all deployed service members revealed no Ebola exposures or infections. Given their activity restrictions and comprehensive monitoring while deployed to Liberia, U.S. military personnel constitute a unique population with a lower risk for Ebola exposure compared with those working in the country without such measures.

Background

The Ebola epidemic in West Africa has caused approximately 11,000 deaths in Sierra Leone, Liberia, and Guinea (January 5, 2014–May 27, 2015) (*1*). The U.S. military deployed approximately 2,500 service members to construct ETUs, conduct World Health Organization–based training of Liberian and international health care workers to staff the units, establish laboratories for Ebola testing, and deliver sustainable logistical ETU support.

CDC, the U.S. Department of Defense (DoD), and other agencies established exposure risk categories and clinical criteria to guide public health actions for potentially exposed or infected persons traveling from Ebola-affected countries (*2*–*6*). Risk categories for deployed DoD personnel differed from CDC categories for civilian populations (Table 1). From October 25, 2014, through February 27, 2015, the 101st Airborne Division (Air Assault) commanded military forces under Operation United Assistance. Monitoring and surveillance data from DoD personnel deployed to Liberia during this period were analyzed to evaluate the effectiveness of activity restrictions and unit monitoring in identifying potential Ebola exposures, and to describe the types of illnesses that occurred among deployed DoD personnel who developed fever.

DoD Disease Monitoring and Screening Procedures

U.S. military units in Liberia conducted unit monitoring twice daily on all deployed service members (*2*). Any person with a temperature ≥100.4°F (≥38.0°C), or any exposure or symptom concerns, was taken to the nearest DoD medical facility for evaluation by medical personnel. These personnel completed an Ebola risk assessment using a standard screening form (available at http://www.dtic.mil/whs/directives/forms/eforms/dd2990.pdf) (*2*). Service members' adherence with prescribed malaria chemoprophylaxis also was assessed as part of the daily unit monitoring program. At locations where U.S. military units were based, Liberian government employees screened temperatures of all entering persons at controlled access points. Non-U.S. personnel with fever were denied entry, and febrile U.S. personnel were referred for on-site medical evaluation. Service members were prohibited through military orders from providing medical care to local nationals, being in close proximity to or having physical contact with any person known to have Ebola, eating local food including "bush-meat," and having contact with the remains of persons who might have died from Ebola or whose cause of death was unknown.

Military public health authorities also monitored disease surveillance trends and febrile illness in deployed service members (Table 2). Final diagnoses were based on clinical assessment, because laboratory capabilities were limited to rapid diagnostic tests for malaria (BinaxNOW, Alere Inc.) and limited blood chemistry and hematology laboratory tests. Testing for Ebola virus by reverse transcription–polymerase chain reaction (RT-PCR) was available for patients with consistent signs and symptoms and an epidemiologic risk factor. Decisions about Ebola testing were made in consultation with U.S. military infectious disease and public health authorities deployed to Liberia.

TABLE 1. Summary of CDC and U.S. Department of Defense Ebola virus disease (Ebola) exposure risk categories

Exposure category	U.S. Department of Defense (October 10 and 31, 2014)	CDC (December 24, 2014)
High risk	Percutaneous (e.g., needle stick) or mucous membrane exposure to blood or body fluids of an Ebola patient	Percutaneous (e.g., needle stick) or mucous membrane exposure to blood or body fluids (including but not limited to feces, saliva, sweat, urine, vomit, and semen) from a person with Ebola while the person was symptomatic
	Direct skin contact to blood/body fluids	Direct contact without appropriate PPE with a person with Ebola while the person was symptomatic or the person's body fluids
	Processing blood/body fluids of an Ebola patient without standard biosafety precautions	Laboratory processing of blood or body fluids from a person with Ebola while the person was symptomatic without appropriate PPE or standard biosafety precautions
	Direct contact with a dead body	Direct contact with a dead body without appropriate PPE in a country with widespread transmission or a country with cases in urban settings with uncertain control measures
		In countries with widespread transmission, having provided direct care in a household setting to a person with Ebola while the person was symptomatic
Some risk	Brief direct contact (e.g., shaking hands) with an Ebola patient	Direct contact while using appropriate PPE with a person with Ebola while the person was symptomatic or the person's body fluids or being in the patient-care area of an Ebola treatment unit
		Any direct patient care in non-Ebola health care settings
	Household contact with an Ebola patient	Close contact in households, health care facilities, or community settings with a person with Ebola while the person was symptomatic
	Close contact (within 3 feet [1 meter] of an Ebola patient)	Close contact is defined as being within approximately 3 feet (1 meter) of a person with Ebola while the person was symptomatic for a prolonged period while not using appropriate PPE
	Prolonged period in an Ebola patient-care area	
No known exposure	Not in the some-risk or high-risk exposure category	NA
Low (but not zero) risk	NA	Having been in a country with widespread transmission, a country with cases in urban settings with uncertain control measures, or a country with former widespread transmission and now established control measures and having had no known exposures
		Brief direct contact (e.g., shaking hands), while not using appropriate PPE, with a person with Ebola while the person was in the early stage of disease
		Brief proximity with a person with Ebola while the person was symptomatic, such as being in the same room (not the patient-care area of an Ebola treatment unit) for a brief period
		In countries other than those with widespread transmission, direct contact while using appropriate PPE with a person with Ebola while the person was symptomatic or the person's body fluids or being in the patient-care area of an Ebola treatment unit
		Laboratory processing of blood or body fluids from a person with Ebola while the person was symptomatic while using appropriate PPE and standard biosafety precautions
		Having traveled on an airplane with a person with Ebola while the person was symptomatic and having had no identified some-risk or high-risk exposures

See table footnotes on page 692

Approximately 12 hours before departing Liberia, and after verification of compliance with unit monitoring during the preceding 21 days, medical providers screened departing service members for Ebola exposures, fever, and symptoms of possible Ebola, using a separate exit screening form (available at http://www.dtic.mil/whs/directives/forms/eforms/dd2991.pdf) (*2*). Upon returning to the United States, service members underwent controlled monitoring for 21 days at segregated locations on predesignated U.S. military installations.

DoD Disease Monitoring and Screening Findings

The prevalence of illness among the deployed force averaged 1.8%, with gastrointestinal (33%), respiratory (22%), and dermatologic (20%) conditions accounting for the highest

TABLE 1. (*Continued*) Summary of CDC and U.S. Department of Defense Ebola virus disease (Ebola) exposure risk categories

Exposure category	U.S. Department of Defense (October 10 and 31, 2014)	CDC (December 24, 2014)
No identifiable risk	NA	Laboratory processing Ebola-containing specimens in a biosafety level 4 facility
		Any contact with an asymptomatic person who had potential exposure to Ebola virus
		Contact with a person with Ebola before the person developed symptoms
		Any potential exposure to Ebola virus that occurred more than 21 days previously
		Having been in a country with Ebola cases but without widespread transmission, cases in urban settings with uncertain control measures, or former widespread transmission and now established control measures, and not having had any other exposures
		Having remained on or in the immediate vicinity of an aircraft or ship during the entire time that the aircraft or ship was in a country with widespread transmission or a country with cases in urban settings with uncertain control measures, and having had no direct contact with anyone from the community
		Having had laboratory-confirmed Ebola and subsequently been determined by public health authorities to no longer be infectious (i.e., Ebola survivors)

Abbreviations: NA = not applicable; PPE = personal protective equipment .
* Some-risk and high-risk exposure categories apply to persons who had the listed exposure during the preceding 21 days without wearing appropriate PPE.

proportions of diagnoses. Thirty-two service members with febrile illness were identified (Table 2), representing 1% of all clinic visits and an estimated febrile illness rate of one case per 9,100 person-days in Liberia (estimated exposure time in Liberia for 2,540 service members was approximately 290,000 person-days, with mean duration of deployment of 110 days). The median time from date of country arrival to fever onset was 30 days (interquartile range = 14–50 days). Twenty (63%) persons reported being within 3 feet of a non-U.S. military person; none reported being within 3 feet of a known ill person or having direct contact with an ill person's skin, blood, or body fluids. Fourteen (44%) febrile patients had never left their access-controlled facility since arriving in Liberia, and five (16%) persons with fever were detected through unit monitoring and unaware that they had fever. None of the 17 (53%) patients with fever and three or more Ebola-compatible symptoms had a close contact with an ill person. After receiving medical care and resolution of fever and symptoms, all patients resumed twice-daily unit monitoring. No febrile patient had an epidemiologic risk factor for Ebola that warranted Ebola RT-PCR testing, although two patients were tested for other reasons (a specimen collection exercise and a medical evacuation requirement) (Table 2). All 32 patients with fever completed a minimum of 21 days of post-fever monitoring by medical personnel.

No deployed service member had contact with a known or suspected Ebola patient, and exit screening on 2,540 persons identified no Ebola exposures, fever, or Ebola symptoms at the time of departure. After completion of an additional 21 days of twice-daily monitoring at controlled monitoring areas in the United States, no Ebola infections were identified.

Discussion

Having been in a country with widespread transmission, deployed service members would be categorized, by CDC criteria, as low (but not zero) risk upon return to the United States. However, based on their non-Ebola care mission and stringent activity restrictions while deployed, they might be at lower risk for exposure than returning U.S. travelers who spent time in Liberia without such restrictions. A comparable assessment of an employer-directed program that actively monitored persons while they worked in an Ebola-affected country has not been published. A report of U.S. airport entry screenings of 1,993 travelers from Ebola-affected countries found that 86 (4%) were referred to CDC public health officers for medical evaluation, seven developed Ebola-compatible symptoms, and none had Ebola (*7*). This report supports observations that without close contact with an Ebola-infected patient, travel to an Ebola-affected country alone does not place a person at higher risk for Ebola infection.

An advantage of twice-daily monitoring in this deployed setting was that exposure assessments were less likely to be subject to recall bias. In addition, enforced military orders compelling adherence to activity restrictions ensured compliance with the monitoring program. Civilian employers might not have the same capacity to validate temperature, activity, exposure, and symptom history over an extended period of service in an Ebola-affected country. A further benefit of twice-daily symptom and temperature monitoring is that in the event of an Ebola exposure, an infection would be detected early, permitting expedited isolation and more timely treatment and medical evacuation.

Although the precautions put into place to prevent Ebola exposures appear effective, a full assessment of the effectiveness

TABLE 2. Demographic and clinical characteristics of U.S. military service members (N = 32) who developed febrile illness during Operation United Assistance — Liberia, October 25, 2014–February 27, 2015

Demographic or clinical characteristic	No.	(%)
Male	24	(75)
Age in years, median (interquartile range)	26	(25–36)
Days in Liberia, median (interquartile range)	30	(14–50)
Having been within 3 feet of a non-U.S. military person during preceding 21 days*	20	(63)
Maximum temperature (°F), median (interquartile range)	101.5	(101.0–102.7)
Self-referral for medical evaluation	27	(84)
Referred by unit monitoring program for medical evaluation	5	(16)
DoD Ebola risk exposure category		
No known exposure	32	(100)
Some risk for exposure	0	—
High risk for exposure	0	—
Associated symptoms		
Headache	17	(53)
Weakness	16	(50)
Myalgias	10	(31)
Arthralgias	6	(19)
Nausea	14	(44)
Vomiting	10	(31)
Diarrhea	18	(56)
Sore throat	4	(13)
Rigors/Chills	16	(52)
Cough	4	(13)
Rash	3	(9)
Back pain	6	(19)
Unexplained hemorrhage†	1	(3)
Confusion	1	(3)
Fever and ≥3 potential Ebola-compatible symptoms§	17	(53)
Ebola virus RT-PCR result¶		
Positive	0	—
Negative	2	(6)
Malaria rapid diagnostic test result**		
Positive	0	—
Negative	26	(81)
Clinical diagnosis		
Viral syndrome	11	(34)
Gastroenteritis	12	(38)
Undifferentiated fever	6	(19)
Pharyngitis	1	(3)
Meningitis	1	(3)
Urinary tract infection	1	(3)
Patient requiring medical evacuation from Liberia††	1	(3)
Patients with recurrent fever§§ and/or symptoms within 21 days	2	(6)

Abbreviations: DoD = U.S. Department of Defense; RT-PCR = reverse transcription–polymerase chain reaction.

* No service member reported close contact with an ill person, or contact with skin, blood, or body fluids of any person.

† Petechiae on soft palate and bilateral lower extremities.

§ DoD-defined potential Ebola symptoms include headache, myalgias, arthralgias, abdominal pain, vomiting, diarrhea, new skin rash, and unexplained bruising or bleeding.

¶ Ebola RT-PCR testing was not conducted because of epidemiologic risk: one was conducted as an initial test of system processes and response times; the other to fulfill an air evacuation requirement despite a non-Ebola illness.

** BinaxNOW (Alere Inc.).

†† One febrile patient, who also had no known Ebola exposure, was medically evacuated for meningitis (subsequently diagnosed with enterovirus infection by RT-PCR), recovered, and returned to full duty in Liberia.

§§ One person with recurrent fever was identified through twice-daily unit monitoring with a temperature of 101.9°F (38.8°C) after being afebrile for 96 hours, and was unaware of an elevated temperature. The patient had no associated symptoms, a normal physical examination, a negative BinaxNOW test for malaria, and resolution of fever within 24 hours. A second patient had a repeat episode of gastroenteritis that was successfully treated with azithromycin. Both recurrent fever patients had no known Ebola exposure. Neither patient had recurrence of fever after resuming daily unit monitoring for 21 days after the second fever episode.

of the monitoring program for Ebola disease is not possible. The accuracy of the screening questionnaire might have been impacted by a respondent's knowledge of a close contact's clinical status. In addition, the potential for secondary gain from not telling the truth, such as avoiding isolation or quarantine, may underestimate exposure risk.

Health ministries in Ebola-affected countries, working directly with CDC and the World Health Organization, have established country exit screening and control measures, which include denying aircraft boarding to ill travelers and persons who report a high Ebola exposure risk (*7*). Knowledge of the activity restrictions and comprehensive monitoring of deployed U.S. military personnel might better inform clinical decision-making for returning military personnel and increase general awareness for communities receiving them.

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Summary

What is already known on this topic?

Health ministries in countries affected by Ebola virus disease (Ebola), working with CDC and the World Health Organization, have established country exit screening measures to limit the spread of Ebola, and CDC established guidance for monitoring and movement of persons entering the U.S. from Ebola-affected countries. A recent study of 1,993 airport entry screenings of U.S. travelers returning from Ebola-affected countries found that none developed Ebola, suggesting that travel alone does not increase risk for infection.

What is added by this report?

U.S. military personnel deployed to Liberia were subjected to strict activity restrictions and twice-daily monitoring for fever, exposure to Ebola, or Ebola symptoms. Among approximately 2,500 deployed personnel, 32 had a febrile illness, including five who were unaware of their fever. The most frequent diagnoses were gastrointestinal, respiratory, and dermatologic conditions. No febrile person had had contact with an Ebola patient; no documented Ebola exposures or infections occurred among U.S. service members while they were in Liberia or after returning to the United States.

What are the implications for public health practice?

U.S. military personnel constitute a unique population because of their activity restrictions and aggressive monitoring. Knowledge of these measures might better inform clinical decision-making for these returning U.S. travelers and increase public awareness about their low exposure risk.

Sodium Intake Among U.S. Adults — 26 States, the District of Columbia, and Puerto Rico, 2013

Jing Fang, MD[1]; Mary E. Cogswell, DrPH[1]; Soyoun Park, PhD[1]; Sandra L. Jackson, PhD[1]; Erika C. Odom, PhD[1] (Author affiliations at end of text)

Excess sodium intake is a major risk factor for hypertension, and subsequently, heart disease and stroke, the first and fifth leading causes of U.S. deaths, respectively (*1*). During 2011–2012, the average daily sodium intake among U.S. adults was estimated to be 3,592 mg (*2*), above the *Healthy People 2020* target of 2,300 mg (*3*). To support strategies to reduce dietary sodium intake, 2013 Behavioral Risk Factor Surveillance System (BRFSS) data from states and territories that implemented the new sodium-related behavior module were assessed. Across 26 states, the District of Columbia (DC), and Puerto Rico, 39%–73% of adults reported taking action (i.e., watching or reducing sodium intake) (median = 51%), and 14%–41% reported receiving advice from a health professional to reduce sodium intake (median = 22%). Compared with adults without hypertension, a higher percentage of adults with self-reported hypertension reported taking action and receiving advice to reduce sodium intake. For states that implemented the module, these results can serve as a baseline to monitor the effects of programs designed to reduce sodium intake.

BRFSS is an annual, random-digit–dialed telephone survey representative of noninstitutionalized, civilian adults aged ≥18 years in each U.S. state and territory. Detailed information on the survey is available at http://www.cdc.gov/brfss. In 2013, 26 states, DC, and Puerto Rico implemented the new, optional sodium-related behavior module. The median American Association of Public Opinion Research location-specific response rate was 48.1% (range = 31.1%–60.3%) (*4*).

Taking action to reduce sodium intake was defined by a "yes" response to the question, "Are you currently watching or reducing your sodium or salt intake?" Receiving health professional advice to reduce sodium intake was defined by a "yes" response to the question, "Has a doctor or other health professional ever advised you to reduce sodium or salt intake?" Self-reported hypertension was defined by a "yes" response to the question, "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?" The percentage of respondents taking action or receiving advice to reduce sodium intake was estimated for each state overall and by self-reported hypertension status. All estimates were age-standardized using the 2000 U.S. standard projected population. States were categorized in quartiles based on age-standardized proportions of respondents reporting taking action to reduce sodium intake and on proportions reporting having received advice to reduce sodium intake.

A total of 185,463 participants answered questions from the optional sodium module. After excluding 5,396 participants with missing information on key variables, 180,067 participants were included. State sample sizes ranged from 3,332 (Massachusetts) to 12,363 (Minnesota). The proportion of respondents who reported taking action to reduce sodium intake ranged from 38.7% (Utah) to 73.4% (Puerto Rico), with a median of 50.6% (Table 1). Across all participating locations, a higher proportion of participants with hypertension reported taking action to reduce sodium intake compared with those without hypertension ($p<0.001$ for all comparisons) (Table 1).

The proportion of participants who reported receiving advice from a health professional to reduce sodium intake ranged from 13.5% (Minnesota) to 41.4% (Puerto Rico), with a median of 21.1%. Across all locations, a higher proportion of participants with hypertension reported receiving health professional advice to reduce sodium intake compared with those without hypertension ($p<0.001$ for all comparisons) (Table 2).

Although only 10 of the 28 survey areas were in the Southern U.S. Census Region,* most of the survey areas with the highest proportions of respondents reporting taking action to reduce sodium intake and most of those with the highest proportion of respondents reporting having received advice from a health professional to reduce sodium intake were in the South. Eight of 10 states in the South were in the top two quartiles for taking action; the two that were not in the top two quartiles were West Virginia and Kentucky (Figure 1). All 10 states in the South were in the top two quartiles for receiving advice. The other four survey areas in the top half were Connecticut, New Jersey, Hawaii, and Puerto Rico (Figure 2).

Discussion

In 2013, across 26 states, DC, and Puerto Rico, the proportion of respondents who reported both taking action and receiving advice to reduce sodium intake varied, with generally higher proportions in states in the Southern U.S. Census Region, Missouri, some states in the Northeastern U.S. Census Region, and Puerto Rico. Overall, approximately half of U.S. adults in participating states and territories reported taking action to reduce sodium intake, and about one in five reported receiving advice from a health professional to reduce sodium

* South Census region includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

TABLE 1. Age-adjusted percentage of adults aged ≥18 years who reported taking action to reduce their dietary sodium intake, by hypertension status — 26 states, the District of Columbia, and Puerto Rico, Behavioral Risk Factor Surveillance System, 2013

	Overall			Self-reported hypertension			No self-reported hypertension		
State/Area	No.	%	(95% CI)	No.	%	(95% CI)	No.	%	(95% CI)
Arkansas	4,469	52.6	(50.3–54.9)	2,231	62.9	(57.6–67.8)	2,238	47.1	(44.4–49.8)
Connecticut	6,547	50.7	(48.8–52.6)	2,589	67.7	(62.6–72.4)	3,958	44.0	(41.9–46.2)
DC	3,990	54.8	(52.2–57.4)	1,623	70.8	(63.7–77.0)	2,367	47.8	(44.7–50.8)
Hawaii	6,992	55.8	(54.0–57.5)	2,204	63.2	(57.9–68.2)	4,788	52.8	(50.8–54.8)
Indiana	4,362	45.2	(43.3–47.3)	1,904	57.0	(51.9–62.0)	2,458	39.8	(37.5–42.1)
Iowa	7,210	45.5	(43.9–47.1)	2,889	57.7	(53.1–62.2)	4,321	40.6	(38.9–42.4)
Kansas	10,947	43.3	(42.1–44.4)	4,455	55.9	(52.5–59.1)	6,492	37.7	(36.4–39.1)
Kentucky	9,704	50.5	(48.9–52.1)	4,717	72.4	(69.0–75.6)	4,987	39.2	(37.2–41.1)
Maine	4,496	52.3	(50.3–54.4)	1,807	67.7	(61.5–73.3)	2,689	47.6	(45.2–49.9)
Maryland	11,473	52.2	(50.7–53.7)	4,907	63.7	(60.1–67.2)	6,566	46.4	(44.6–48.1)
Massachusetts	3,332	49.8	(46.5–53.2)	1,343	61.7	(50.9–71.5)	1,989	45.4	(41.7–49.1)
Minnesota	12,363	40.7	(39.2–42.3)	4,256	52.9	(48.9–56.8)	8,107	35.2	(33.3–37.1)
Mississippi	6,628	56.3	(54.4–58.1)	3,514	66.1	(61.8–70.1)	3,114	48.6	(46.2–50.9)
Missouri	5,478	51.2	(48.9–53.5)	2,527	58.6	(53.3–63.6)	2,951	46.9	(44.2–49.6)
Montana	4,517	44.9	(42.9–46.9)	1,706	55.3	(50.0–60.6)	2,811	40.0	(37.7–42.3)
Nebraska	7,667	44.8	(43.0–46.6)	3,095	56.2	(51.4–61.0)	4,572	39.5	(37.4–41.5)
New Jersey	3,700	59.3	(56.8–61.8)	1,365	71.9	(63.6–79.0)	2,335	54.5	(51.5–57.3)
North Carolina	3,824	58.2	(56.1–60.4)	1,749	70.8	(65.2–75.8)	2,075	53.2	(50.6–55.8)
North Dakota	6,932	45.7	(44.0–47.3)	2,583	60.7	(55.2–65.9)	4,349	40.4	(38.5–42.3)
Ohio	7,138	46.0	(44.3–47.7)	3,078	56.8	(52.5–61.0)	4,060	40.0	(38.0–42.1)
Oklahoma	3,846	51.8	(49.6–53.9)	1,808	59.8	(54.4–65.0)	2,038	46.9	(44.3–49.4)
Tennessee	4,771	53.8	(51.7–55.9)	2,343	63.3	(56.9–69.3)	2,428	47.3	(44.7–50.0)
Utah	5,997	38.8	(37.3–40.2)	1,854	49.6	(45.3–54.0)	4,143	34.8	(33.1–36.5)
Virginia	7,045	55.2	(53.6–56.8)	2,859	67.9	(64.0–71.6)	4,186	49.1	(47.2–51.0)
Washington	9,918	49.0	(47.6–50.4)	3,888	60.2	(56.4–63.9)	6,030	42.6	(42.0–45.2)
West Virginia	5,578	43.4	(41.8–45.1)	2,619	56.5	(52.8–60.2)	2,959	35.9	(34.0–37.9)
Wisconsin	5,360	44.3	(42.1–46.5)	2,174	60.1	(54.0–65.9)	3,186	37.0	(34.5–39.7)
Puerto Rico	5,783	73.4	(71.8–74.9)	2,896	80.0	(76.6–83.0)	2,887	70.0	(67.9–72.0)

Abbreviations: CI = confidence interval; DC = District of Columbia.

intake. Respondents with self-reported hypertension were more likely to take action and receive advice to reduce sodium intake than those without. However, among adults with self-reported hypertension, 20% (Puerto Rico) to 50% (Utah) did not report taking action to reduce sodium intake. In all but four locations (DC, Kentucky, New Jersey, and Puerto Rico), less than half of respondents reported receiving advice to reduce sodium intake. Among adults without hypertension, most did not report taking action to reduce sodium intake, and an even smaller proportion reported receiving professional advice to reduced sodium. These findings suggest an opportunity for promoting strategies to reduce sodium consumption among all adults, with and without hypertension.

This is the first report with state-level estimates of sodium intake behavior among the general population. The geographic pattern of the prevalence of taking action or receiving advice to reduce sodium intake appears to roughly correspond with the pattern of the prevalence of self-reported hypertension (*5*). BRFSS 2009 data indicate the prevalence of self-reported hypertension is generally higher in the Southern U.S. Census Region, plus Indiana, Michigan, Missouri, Ohio, Pennsylvania, and Rhode Island. A possible explanation for the higher prevalence of taking action and receiving health professional advice to reduce sodium intake in Connecticut and New Jersey could be proximity to New York City's (NYC) media campaign promoting sodium reduction and other NYC and state programs aimed at reducing sodium intake. For example, in April 2013, NYC launched a communication campaign for consumers to purchase lower-sodium foods.[†]

The finding that Puerto Rico had the highest percentage of respondents both taking action and receiving advice for sodium reduction is new. The high percentages might be related to high hypertension prevalence. Based on 2013 BRFSS data, the prevalence of self-reported hypertension in Puerto Rico was 42.3%, whereas the national prevalence was 31.4% (*6*).

The findings in this report are subject to at least four limitations. First, BRFSS data are self-reported and subject to recall and social desirability bias, which might overestimate or underestimate prevalence. Second, the methods used by participants to watch or reduce sodium intake were not assessed. Third, these results are not generalizable to the entire United States. Although CDC encouraged states to use the module to assess the sodium-related behavior, the reasons individual states chose

[†] Available at http://www.nyc.gov/html/doh/html/pr2013/pr008-13.shtml.

TABLE 2. Age-adjusted percentage of adults aged ≥18 years who reported being advised by a health professional to reduce dietary sodium intake, by hypertension status — 26 states, the District of Columbia, and Puerto Rico, Behavioral Risk Factor Surveillance System, 2013

	Overall			Self-reported hypertension			No self-reported hypertension		
State/Area	No.	%	(95% CI)	No.	%	(95% CI)	No.	%	(95% CI)
Arkansas	4,475	22.6	(20.8–24.4)	2,225	44.5	(39.6–49.5)	2,250	10.7	(9.1–12.6)
Connecticut	6,551	21.7	(20.2–23.2)	2,586	49.9	(44.9–55.0)	3,965	10.9	(9.5–12.5)
DC	3,996	27.4	(25.3–29.6)	1,622	60.7	(53.8–67.2)	2,374	13.3	(11.4–15.5)
Hawaii	6,977	24.3	(22.8–25.8)	2,195	49.1	(44.6–53.7)	4,782	14.8	(13.4–16.4)
Indiana	4,360	20.5	(19.1–22.0)	1,898	40.5	(36.3–44.9)	2,462	9.8	(8.5–11.3)
Iowa	7,186	17.8	(16.7–19.0)	2,874	40.4	(36.2–44.7)	4,312	8.9	(7.9–10.1)
Kansas	10,932	17.0	(16.2–17.8)	4,428	37.1	(34.0–40.3)	6,504	7.9	(7.2–8.7)
Kentucky	9,677	28.2	(26.9–29.5)	4,689	60.3	(56.5–63.9)	4,988	10.1	(9.0–11.3)
Maine	4,490	19.3	(17.8–20.8)	1,794	45.8	(39.7–52.0)	2,696	9.1	(7.9–10.6)
Maryland	11,489	23.8	(22.6–25.0)	4,898	48.5	(44.7–52.4)	6,591	12.4	(11.2–13.6)
Massachusetts	3,323	18.1	(16.1–20.3)	1,336	37.8	(31.4–44.7)	1,987	9.2	(7.4–11.5)
Minnesota	12,398	13.5	(12.4–14.6)	4,249	31.7	(28.0–35.7)	8,149	7.0	(6.0–8.2)
Mississippi	6,610	27.0	(25.5–28.5)	3,503	49.3	(45.0–53.5)	3,107	12.6	(11.1–14.2)
Missouri	5,457	19.8	(18.3–21.4)	2,502	45.0	(39.2–51.0)	2,955	9.9	(8.5–11.4)
Montana	4,508	13.8	(12.5–15.1)	1,693	33.3	(28.1–38.8)	2,815	6.2	(5.2–7.3)
Nebraska	7,660	17.1	(15.9–18.3)	3,086	35.1	(31.0–39.5)	4,574	8.5	(7.4–9.7)
New Jersey	3,715	23.5	(21.6–25.5)	1,359	50.5	(42.8–58.2)	2,356	12.5	(10.7–14.6)
North Carolina	3,808	24.1	(22.4–25.8)	1,735	47.1	(41.9–52.4)	2,073	12.3	(10.7–14.0)
North Dakota	6,941	15.1	(14.1–16.2)	2,569	36.6	(31.9–41.5)	4,372	6.5	(5.6–7.5)
Ohio	7,160	20.2	(18.9–21.5)	3,076	40.9	(37.0–44.9)	4,084	9.8	(8.6–11.2)
Oklahoma	3,835	22.6	(21.0–24.2)	1,798	40.3	(35.4–45.4)	2,037	12.4	(10.9–14.2)
Tennessee	4,756	23.2	(21.5–25.0)	2,329	41.9	(37.9–46.0)	2,427	11.5	(9.9–13.3)
Utah	5,988	14.5	(13.5–15.6)	1,842	35.5	(31.3–39.8)	4,146	6.7	(5.9–7.7)
Virginia	7,065	22.6	(21.4–23.9)	2,857	48.8	(45.0–52.6)	4,208	10.1	(9.0–11.2)
Washington	9,926	17.7	(16.7–18.7)	3,871	40.3	(36.6–44.1)	6,055	8.3	(7.4–9.2)
West Virginia	5,557	22.4	(21.1–23.6)	2,597	43.1	(39.4–46.9)	2,960	9.8	(8.7–11.0)
Wisconsin	5,350	18.6	(16.9–20.4)	2,169	41.4	(35.6–47.3)	3,181	8.6	(7.0–10.6)
Puerto Rico	5,781	41.4	(39.7–43.0)	2,896	61.6	(57.9–65.1)	2,885	27.2	(25.2–29.2)

Abbreviations: CI = confidence interval; DC = District of Columbia.

FIGURE 1. Age-adjusted percentage of adults aged ≥18 years who reported taking action to reduce their dietary sodium intake — 26 states, the District of Columbia, and Puerto Rico, Behavioral Risk Factor Surveillance System, 2013

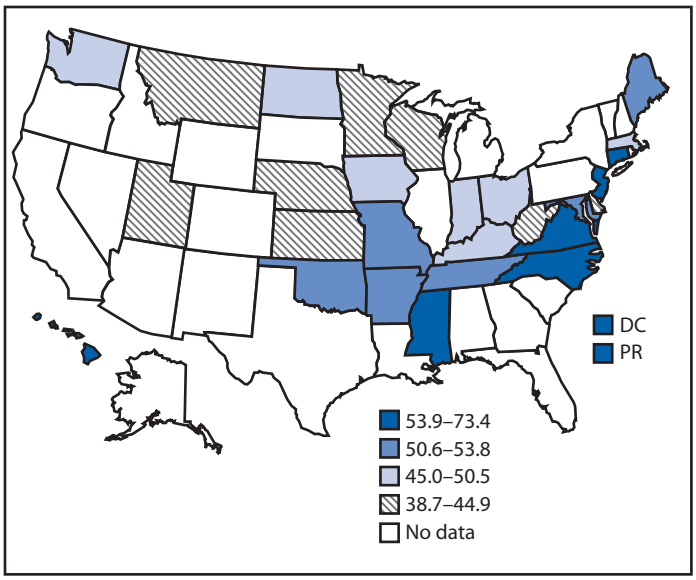
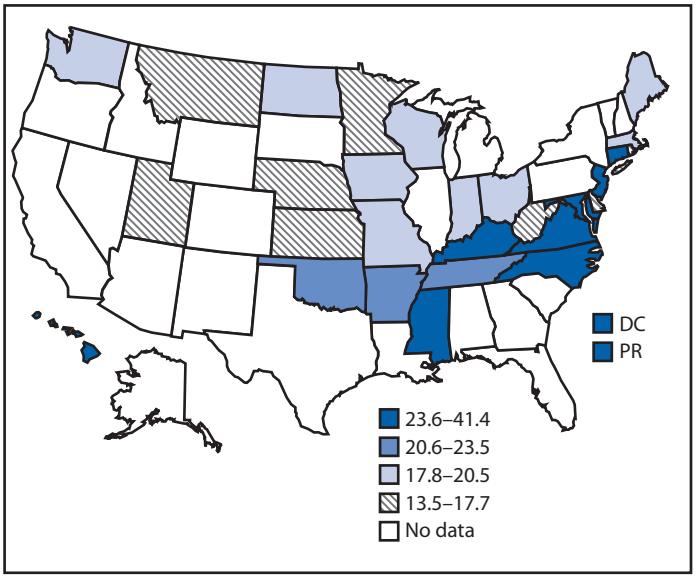


FIGURE 2. Age-adjusted percentage of adults aged ≥18 years who reported being advised by a health professional to reduce dietary sodium intake — 26 states, the District of Columbia, and Puerto Rico, Behavioral Risk Factor Surveillance System, 2013



to use the module is unknown. Finally, response bias is possible because BRFSS response rates were <50%. Despite these limitations, this report is the first to provide multistate data on sodium-reduction behavior among all BRFSS respondents.

The data in this report highlight the opportunity to increase the proportion of health care professionals who advise their patients to reduce sodium intake and the proportion of U.S. adults who take action to reduce sodium intake. During 2011–2012, approximately 48% of hypertension among U.S. adults was uncontrolled (*7*). From 2010 to 2030, total direct medical costs of cardiovascular disease are projected to triple, increasing from $273 billion to $818 billion (in 2008 U.S. dollars) (*8*). Reducing sodium intake by 1,200 mg daily is projected to save $18 billion in health care costs yearly (*9*). Health care professionals can make a difference by recommending healthy dietary patterns, such as the Dietary Approaches to Stop Hypertension (*10*). By expanding the use of the sodium-related behavior module, states can enhance the ability to evaluate the effects of sodium-reduction campaigns.

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Summary

What is already known on this topic?

National surveillance data show that current sodium intake in the United States is substantially higher than recommended. Excess sodium intake is an important risk factor for hypertension.

What is added by this report?

In 2013, among 26 states, the District of Columbia, and Puerto Rico, the median prevalence of taking action to reduce sodium intake was 51%, ranging from 39% to 73%. The median prevalence of receiving health professional advice to reduce sodium intake was 22%, ranging from 14% to 41%. Although action and advice were higher among hypertensive participants across locations, 20%–50% did not report taking action, and 38%–68% reported not receiving advice to reduce sodium intake.

What are the implications for public health practice?

These data highlight the opportunity to increase the proportion of health professionals who advise their patients to reduce sodium intake and the proportion of U.S. adults who take action to reduce sodium intake.

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Introduction of Inactivated Poliovirus Vaccine and Switch from Trivalent to Bivalent Oral Poliovirus Vaccine — Worldwide, 2013–2016

Immunization Systems Management Group of the Global Polio Eradication Initiative

Since the 1988 World Health Assembly resolution to eradicate poliomyelitis (polio), transmission of wild poliovirus (WPV) has been interrupted in all countries except Afghanistan, Nigeria, and Pakistan (*1*). No polio cases caused by WPV type 2 (WPV2) have been identified since 1999, and WPV type 3 has not been detected since November 11, 2012 (*2*). This progress has been achieved through widespread use of oral poliovirus vaccine (OPV), most commonly trivalent OPV (tOPV), which contains types 1, 2, and 3 live, attenuated polioviruses. OPV polioviruses can undergo genetic changes during intestinal replication, and rarely, in communities with low vaccination coverage, such changes can result in vaccine-derived polioviruses (VDPVs) capable of causing paralytic polio (*3*). Eliminating the risk for polio caused by VDPVs will require stopping all OPV use. Among 686 cases of paralytic polio caused by circulating VDPVs (cVDPVs) that have been detected since 2006, type 2 cVDPVs (cVDPV2s) accounted for >97% (*3*). To eliminate the risks posed by cVDPV2s, OPV serotype 2 will be withdrawn from all immunization activities and programs through a global, synchronized replacement of all tOPV with bivalent OPV (bOPV) containing only types 1 and 3 polioviruses (*4*,*5*). This switch from tOPV to bOPV is scheduled for April 2016 (*4*). To reduce the risk for cVDPV2 outbreaks and to facilitate responses to outbreaks that do occur, injectable trivalent inactivated poliovirus vaccine (IPV) is being introduced into routine immunization schedules in all countries. As of June 24, 2015, 90 (46%) of 194 World Health Organization (WHO) member states were using IPV, 102 (53%) had established dates for the introduction of IPV, and two (1%) intended to introduce IPV in 2015 but had not set dates for doing so. In addition to IPV introduction in all countries, careful synchronization of the switch from tOPV to bOPV will be needed within and across all 156 countries currently using tOPV. This report summarizes progress in introducing IPV and preparations for the switch from tOPV to bOPV.

Global Introduction of Inactivated Poliovirus Vaccine

To prepare for the global switch from tOPV to bOPV, as recommended in the Global Polio Eradication Initiative's *Polio Eradication and Endgame Strategic Plan 2013–2018* (*5*), the WHO Strategic Advisory Group of Experts (SAGE) on Immunization recommended in 2012 that at least one IPV dose be introduced into routine immunization schedules in all countries (*5*). IPV will help protect against paralytic polio from type 2 polioviruses, provide a degree of population protection against type 2 poliovirus outbreaks, facilitate responses to any cVDPV2 outbreaks after the switch to bOPV, and aid in eradicating WPV by boosting immunity to types 1 and 3 polioviruses (*5*).

Among the 90 WHO member states that were using IPV as of June 24, 2015, 22 had introduced the vaccine since January 2013. In addition, 102 countries using only OPV had planned IPV introduction dates: six were planning to introduce IPV in the second quarter of 2015, 32 in the third quarter of 2015, 41 in the fourth quarter of 2015, 22 in the first quarter of 2016, and one in the third quarter of 2016 (Figure 1). Two additional countries planned to introduce IPV in 2015 but had not yet set dates for doing so.

Global Switch from Trivalent to Bivalent Oral Poliovirus Vaccines

The synchronized global switch from tOPV to bOPV will affect both the routine immunization delivery systems and the supplemental immunization activities* of all 156 countries now using or stockpiling tOPV† (Figure 2). Countries using tOPV should continue to administer it until the date of the switch, with bOPV reserved only for supplemental immunization campaigns before the switch.§ Following the switch, bOPV should be exclusively used, and remaining tOPV should no longer be used and instead, should be promptly destroyed. SAGE is reviewing all preparations for the switch; in April 2015, SAGE recommended that April 2016 should be firmly planned for as the date of the switch and indicated that it would consider recommending a delay for the switch only if the risk for continued cVDPV2 transmission was deemed to be high in October 2015 (*6*).

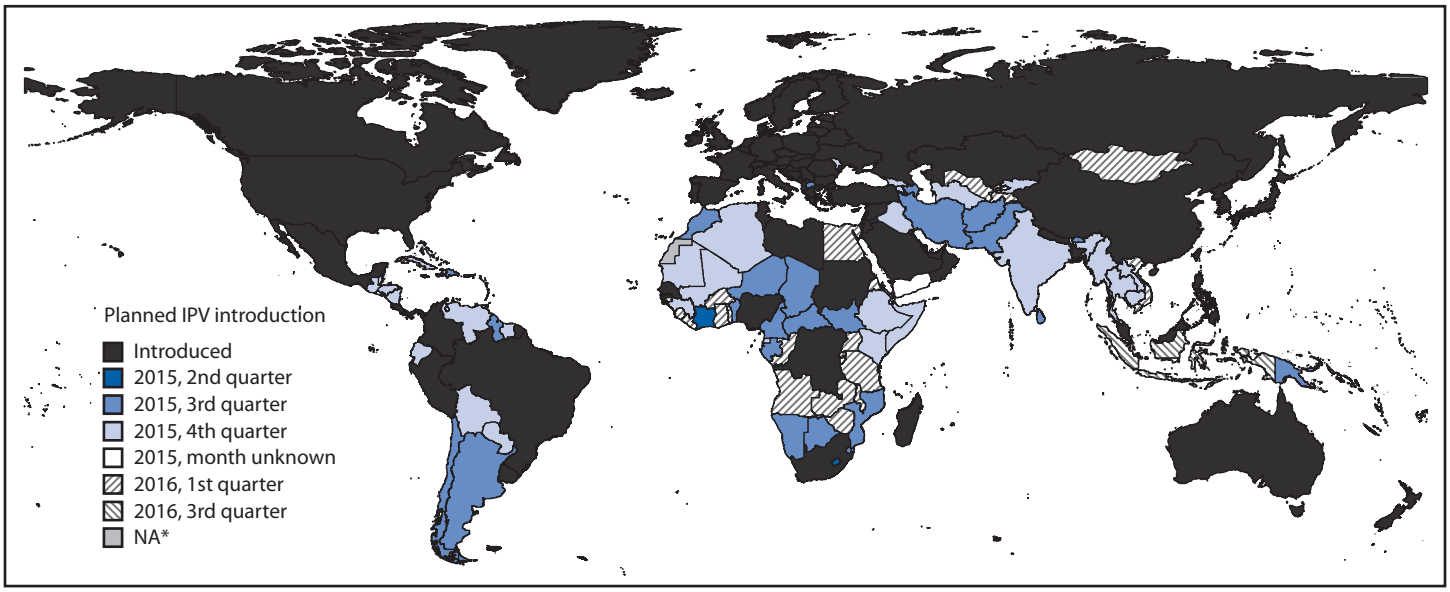
During 2014, cVDPV2 circulation was detected only in Nigeria, Pakistan, and South Sudan (*3*). In addition, a case of cVDPV1 with onset of symptoms in September 2014 was detected in Madagascar, and in June 2015, several additional

* Supplemental immunization activities are mass vaccination campaigns conducted in a short period (days to weeks) during which a dose of OPV is administered to all children aged <5 years, regardless of previous vaccination history. Campaigns can be conducted nationally or in portions of a country.

† Israel is administering bOPV in its immunization activities but is maintaining a stockpile of tOPV.

§ bOPV is sometimes used in supplemental immunization activities focused on dealing with outbreaks of types 1 or 3 polioviruses. In general, countries should continue to administer tOPV until the switch from tOPV to bOPV to maximize population immunity to type 2 polioviruses.

FIGURE 1. Status of introduction of inactivated poliovirus vaccine, by country — worldwide, June 24, 2015



Source: World Health Organization Immunization Repository.
Abbreviation: IPV = inactivated poliovirus vaccine.
* Data not available.

cases were linked to this outbreak through genetic testing. Persistent cVDPV2s (those circulating for >6 months) were found in both Nigeria and Pakistan, indicating ongoing weaknesses in routine immunization efforts in the affected areas. Such persistent cVDPV2s need to be eliminated before the withdrawal of tOPV. Although no cases of acute flaccid paralysis caused by cVDPV2s have been identified since December 2014, cVDPV2s have been identified from environmental samples collected in Nigeria on March 4, 2015, and in Pakistan on March 28 (*3*). These findings indicate that cVDPV2s were infecting persons in Nigeria and Pakistan even if they were not causing acute flaccid paralysis. Multiple supplemental immunization campaigns with tOPV are planned in all countries with an ongoing cVDPV2 outbreak or at high risk for such an outbreak (*6*).

WPV2 and cVDPV2 strains held in research or manufacturing facilities could also cause polio outbreaks if released into a population, and are expected to be destroyed or contained by the end of 2015, as specified in the current draft of the WHO *Global Action Plan to Minimize Poliovirus Facility-associated Risk after Type-specific Eradication of Wild Polioviruses and Sequential Cessation of Routine OPV Use* (known as GAP-III) (*7*). Similarly, within 3 months of the switch all type 2 Sabin poliovirus strains in manufacturing facilities using them for making the attenuated type 2 polioviruses in tOPV should be contained, and all type 2 Sabin strains in research facilities should be contained or destroyed.

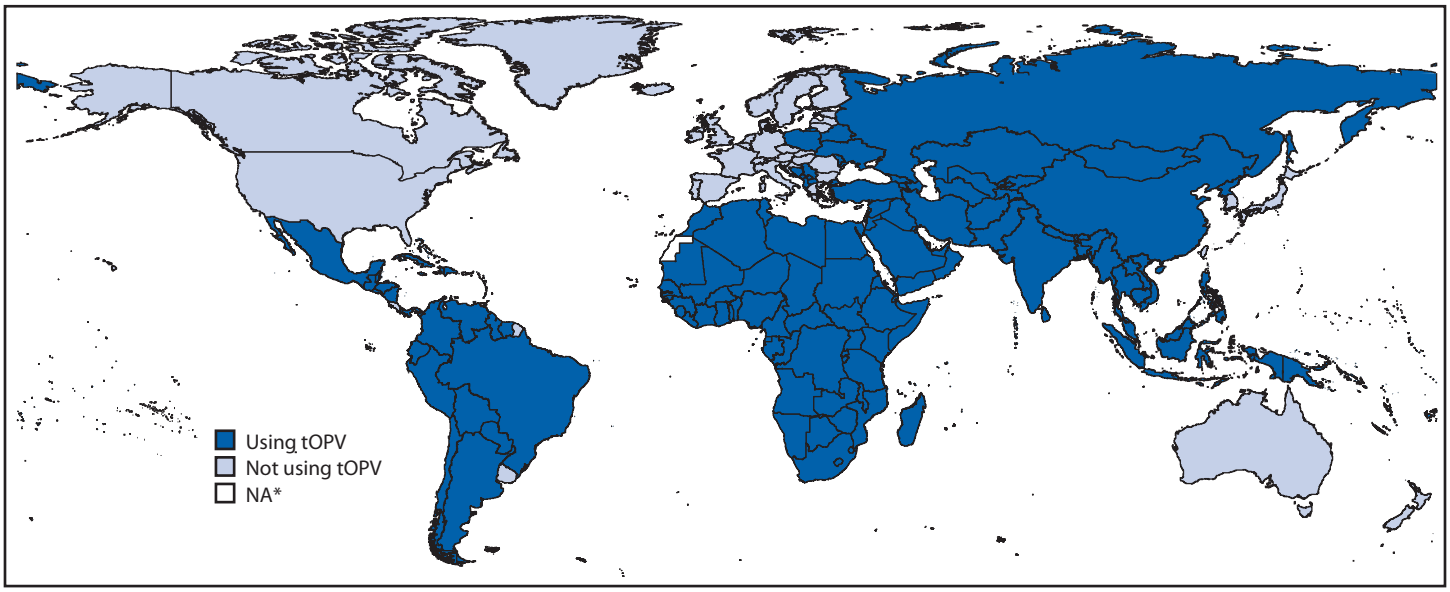
To facilitate the response to any type 2 poliovirus outbreaks that occur despite these efforts, a protocol has been developed and a global stockpile of monovalent OPV type 2 is being assembled (*7*). Surveillance for acute flaccid paralysis cases is currently supplemented by environmental surveillance for polioviruses in sewage in at least 23 countries (*8*), which will help ensure that any circulation or outbreaks of type 2 poliovirus are identified and responded to quickly.

The global switch from tOPV to bOPV depends on all OPV-using countries having access to sufficient bOPV for use in routine immunization programs and in supplemental immunization activities. Although bOPV is already licensed for routine use in many countries, in others it lacks regulatory approval. Because of the April 2016 target date for the global switch to bOPV and the importance of that switch occurring in a synchronized manner, the World Health Assembly has urged countries to expedite the licensure of bOPV for use in routine immunization programs and, if the switch occurs before completion of that licensing, to temporarily allow the use of bOPV based on WHO prequalification (*4*).

Discussion

The global withdrawal of tOPV, specifically its type 2 component, will represent a substantial milestone in the effort to eradicate polio, because it will mark the eradication of WPV2 and, in the long-term, should lead to the elimination of type 2 VDPVs. However, cVDPV2 outbreaks, caused either by strains that are already circulating or those that newly emerge, could occur after the switch because the number of persons susceptible to infections with type 2 polioviruses will increase over

FIGURE 2. Status of trivalent oral poliovirus vaccine use, by country — worldwide, June 24, 2015



Source: World Health Organization Immunization Repository.
Abbreviation: tOPV = trivalent oral poliovirus vaccine.
* Data not available.

time from new birth cohorts not receiving tOPV and because multiple low income countries already have low polio vaccination coverage (*9*). As a result, following the switch from tOPV to bOPV, reducing the likelihood and potential extent of cVDPV2 outbreaks is essential, as is the ability to detect and respond to any such outbreaks that do occur.

Careful synchronization of the switch from tOPV to bOPV within and across OPV-using countries will be critical to minimize the risk for new cVDPV2 outbreaks. If, for example, a country continues to use tOPV after its neighbors have switched to bOPV, that country could export type 2 VDPVs to populations that are becoming increasingly susceptible to infection (*9*). The more tightly the switch to bOPV is synchronized, the lower the risk for new cVDPV2 outbreaks following it. Preceding the switch with high-quality tOPV supplemental immunization activities to increase population immunity in countries at risk for cVDPV2 outbreaks also will reduce the likelihood of cVDPV2 outbreaks following the switch (*6*,*9*).

The global introduction of IPV should aid in preventing paralytic polio from wild or vaccine-derived type 2 polioviruses in many persons who have received only bOPV by providing them immunity to type 2 viruses. Strengthening the routine immunization systems that distribute and administer IPV and, in case of limitations in the global IPV supply, prioritizing IPV for countries at high risk for cVDPV2 outbreaks will help maximize the impact of IPV use. Unfortunately, use of IPV alone might not always be sufficient to prevent the spread of poliovirus infections, as evidenced by the recent repeated isolation of type 1 wild polioviruses through environmental surveillance in Israel, where the population had high IPV coverage, but, because OPV had not been used since 2004, silent circulation of introduced wild polioviruses occurred (*10*). As tOPV is withdrawn, high quality surveillance for circulating polioviruses, both through acute flaccid paralysis surveillance and environmental surveillance, will be crucial, as will prompt, aggressive responses to any identified type 2 poliovirus outbreaks.

The global effort to introduce IPV in all countries has been facilitated by support, including technical assistance and funding for IPV purchases and operational expenses, from the Global Polio Eradication Initiative. As of June 24, 71 were receiving support provided through Gavi, the Vaccine Alliance,¶ and 18 were receiving or had been approved for support provided through WHO and the United Nations Children's Fund (UNICEF) (7).

Through UNICEF, manufacturers are coordinating the appropriate level of production of both tOPV and bOPV, to ensure that the switch occurs as planned. The global withdrawal of the type 2 component of OPV offers a valuable opportunity to develop and test measures for conducting such a withdrawal efficiently and safely, including measures related to vaccine procurement and stock management, which also will be needed during the eventual global withdrawal of all OPV after eradication of all wild polioviruses.

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¶ Formerly known as the Global Alliance for Vaccines and Immunization.

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Summary

What is already known on this topic?

No cases of poliomyelitis caused by wild poliovirus type 2 have been detected since 1999, but hundreds of cases of paralytic polio have been caused by circulating vaccine derived poliovirus type 2 since 2006. As a result, the type 2 component of oral poliovirus vaccine is slated for global withdrawal through a switch from trivalent oral poliovirus vaccine (tOPV) to bivalent oral poliovirus vaccine (bOPV).

What is added by this report?

tOPV is currently being used or stockpiled in 156 countries, all of which will need to switch from tOPV to bOPV. Inactivated poliovirus vaccine (IPV) is currently being used in the routine immunization programs of 90 countries, and because of the switch, 102 additional countries have set dates for introducing IPV. The World Health Assembly has asked that all countries currently using oral poliovirus vaccine prepare for the global switch from tOPV to bOPV in April 2016.

What are the implications for public health practice?

Because of the progress made in eradicating polio, all 156 countries using or stockpiling tOPV need to fully prepare to execute the synchronized switch from tOPV to bOPV in April 2016, one of the largest coordinated public health efforts in history, to best protect the world's children against outbreaks of poliomyelitis caused by circulating vaccine-derived poliovirus type 2.

Announcement

National Cleft and Craniofacial Awareness and Prevention Month — July 2015

July is National Cleft and Craniofacial Awareness and Prevention Month, a time to raise awareness and improve understanding of orofacial clefts (clefts of the lip and palate) and other conditions of the head and face. Each year in the United States, approximately 2,600 babies are born with a cleft palate and 4,400 babies are born with a cleft lip, with or without a cleft palate (*1*). Other craniofacial birth defects include craniosynostosis (skull sutures fusing prematurely), anotia/microtia (ear is missing or underdeveloped), and anophthalmia/microphthalmia (missing or abnormally small eye).

Children with orofacial clefts and other craniofacial conditions often have impaired ability to feed and impaired language development, and might be at increased risk for a greater number of ear infections, hearing issues, and problems with their teeth. Because of the high prevalence of orofacial clefts and health care use and costs associated with treatment, improving the health of these children is an important public health goal (*2*). CDC and its partners are working to better understand the preventable causes of clefts and craniofacial defects, and how these conditions affect children and their families, by focusing on risk factors, health care–service use, access to care, quality of life, health outcomes, and management and treatment of these conditions.

To help reduce a woman's risk for having a baby with an orofacial cleft or other craniofacial condition, health care providers should encourage patients who are thinking about becoming pregnant to commit to a healthy lifestyle (e.g., control diabetes, quit smoking) before becoming pregnant. Health care providers should also work with them to make informed decisions about medication treatment during pregnancy. Additional information regarding National Cleft and Craniofacial Awareness and Prevention Month is available at http://www.nccapm.org/about.html.

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Errata

Vol. 64, No. 19

In the report, "Fatal and Nonfatal Drowning Outcomes Related to Dangerous Underwater Breath-Holding Behaviors — New York State, 1988–2011," errors occurred. The author list and author affiliations should read as follows:

Christopher Boyd[1]; Amanda Levy, MSPH[1]; Trevor McProud, MS[1]; **Li** Huang, PE[1]; Eli Raneses, MPH[1]; Carolyn Olson, MPH[1]; **Eric Wiegert, MPH[2]** (Author affiliations at end of text)

[1]Division of Environmental Health, New York City Department of Health and Mental Hygiene**; [2]Bureau of Community Environmental Health and Food Protection, New York State Department of Health**.

In addition, on page 520, in the second paragraph, the fourth and fifth sentences should read:

"Fifteen of the 16 incidents in this case study occurred at **New York state** bathing facilities that require an operating permit from **their local health department, or under the oversight of the New York State Office of Parks, Recreation and Historic Preservation. All incidents had witnesses who reported predrowning behaviors.** However, research suggests that more than half of drowning incidents are not witnessed (*9,10*)."

Finally, the following acknowledgments should be included:

"**Douglas Sackett, Timothy Shay, Amanda Tarrier, Bureau of Community Environmental Health and Food Protection, New York State Department of Health. Regional office and local health department staff members throughout New York state.**"

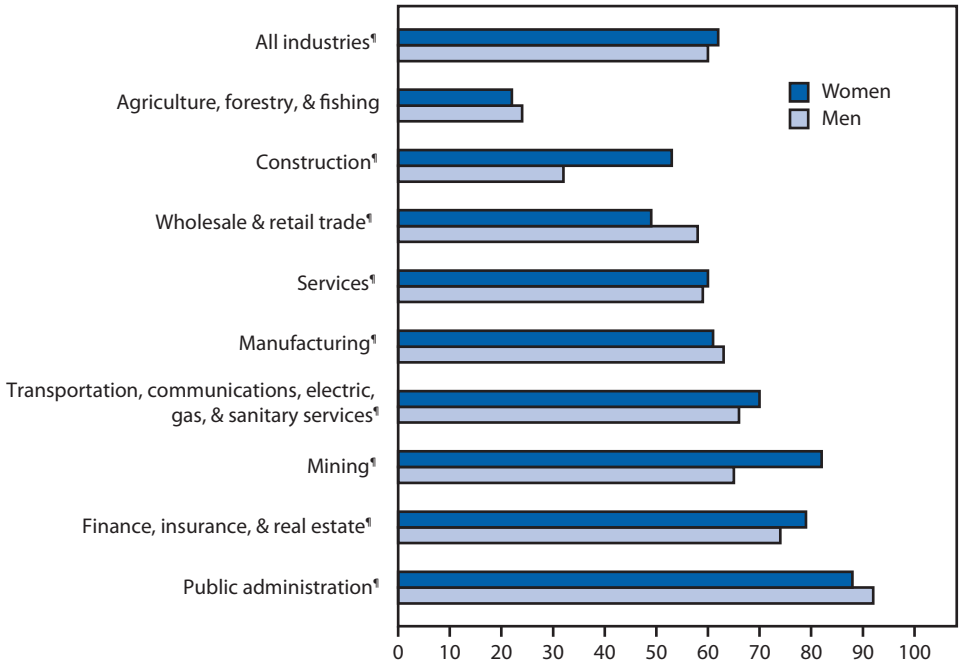
Vol. 64, No. 23

In the report, "Opioid Overdose Prevention Programs Providing Naloxone to Laypersons — United States, 2014," an error occurred. On page 633, in the second full paragraph, the fifth sentence should read: "A total of 111,607 vials (79.7%) of injectable naloxone (21.4% 10 mL and 58.1% 1 mL) and 28,446 (20.3%) vials of intranasal naloxone were provided to laypersons."

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Currently Employed Adults Who Had Paid Sick Leave,* by Industry† — National Health Interview Survey, United States, 2009–2013§



* Based on responses to a question that asked, "Do you have paid sick leave on this MAIN job or business?"
† Respondents were asked to identify the business or industry of their main job, and these industries/businesses were then categorized by the North American Industry Classification System (http://www.census.gov/eos/www/naics/).
§ Estimates were based on a sample of the U.S. civilian, noninstitutionalized population aged ≥18 years. Adults not currently employed at the time of interview were not included in the denominators when calculating percentages.
¶ The percentage difference between women and men within this category was statistically significant at $p<0.01$.

During 2009–2013, approximately 60% of employed men and women had paid sick leave at their main job. For both men (90%) and women (88%), paid sick leave was most common in the public administration sector and least common in the agriculture, forestry, and fishing sector (24% for men and 22% for women). Women were more likely than men to have paid sick leave in the following industries: construction; finance, insurance, and real estate; mining; services; and transportation, communications, electric, gas, and sanitary services. Men employed in the manufacturing and wholesale and retail trade industries were more likely to have paid sick leave than women in those industries.

Source: National Health Interview Survey, 2009–2013. Available at http://www.cdc.gov/nchs/nhis.htm.

Reported by: Roger R. Rosa, PhD, RRosa@cdc.gov, 202-245-0655; Abay Asfaw, PhD, Rene Pana-Cryan, PhD.

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ISSN: 0149-2195