Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 64 / No. 41
October 23, 2015

Progress Toward Global Eradication of Dracunculiasis, January 2014–June 2015

Donald R. Hopkins, MD[1]; Ernesto Ruiz-Tiben, PhD[1]; Mark L. Eberhard, PhD[2]; Sharon L. Roy, MD[3]

Dracunculiasis (Guinea worm disease) is caused by *Dracunculus medinensis*, a parasitic worm. Approximately 1 year after a person acquires infection from contaminated drinking water, the worm emerges through the skin, usually on the lower limb. Pain and secondary bacterial infection can cause temporary or permanent disability that disrupts work and schooling. The campaign to eradicate dracunculiasis worldwide began in 1980 at CDC. In 1986, the World Health Assembly called for dracunculiasis elimination (*1*), and the global Guinea Worm Eradication Program, led by the Carter Center and supported by the World Health Organization (WHO), United Nations Children's Fund (UNICEF), CDC, and other partners, began assisting ministries of health in countries where dracunculiasis was endemic. In 1986, an estimated 3.5 million cases occurred each year in 20 countries in Africa and Asia (*1*,*2*). Since then, although the goal of eradicating dracunculiasis has not been achieved, considerable progress has been made. Compared with the 1986 estimate, the annual number of reported cases in 2015 has been reduced by 99% and cases are confined to four endemic countries. This report updates published (*3*–*5*) and unpublished surveillance data reported by ministries of health and describes progress toward dracunculiasis eradication from January 2014 through June 2015. During 2014, a total of 126 cases were reported from four countries (Chad [13 cases], Ethiopia [three], Mali [40], and South Sudan [70]), compared with 148 cases reported in 2013, from the same four countries. The overall 15% reduction in cases during 2013–2014 was less than that experienced in recent years, but the rate of decline increased again to 70% in the first 6 months of 2015 compared with the same period during 2014. Continued active surveillance with aggressive detection and appropriate management of cases are essential program components; however, epidemiologic challenges and civil unrest and insecurity pose potential barriers to eradication.

Because the life cycle of *D. medinensis* is complex, its transmission can be interrupted using several strategies (*4*). Dracunculiasis can be prevented with four main interventions: 1) educating residents in communities where the disease is endemic, particularly persons from whom worms are emerging, to avoid immersing affected body parts in sources of drinking water; 2) filtering potentially contaminated drinking water through a cloth filter or pipe filter; 3) treating potentially contaminated surface water with the insecticide temephos (Abate) to kill the copepods (small crustaceans that host *D. medinensis* larvae); and 4) providing safe drinking water from bore-hole or protected hand-dug wells (*6*). Containment of transmission* is

* Transmission from a patient with dracunculiasis is contained if all of the following conditions are met: 1) the infected patient is identified before or within 24 hours after worm emergence; 2) the patient has not entered any water source since the worm emerged; 3) a village volunteer or other health care provider has managed the patient properly, by cleaning and bandaging the lesion until the worm has been fully removed manually and by providing health education to discourage the patient from contaminating any water source (if two or more emerging worms are present, transmission is not contained until the last worm is removed); 4) the containment process, including verification of dracunculiasis, is validated by a Guinea Worm Eradication Program supervisor within 7 days of emergence of the worm; and 5) temephos is used if any uncertainty about contamination of sources of drinking water exists, or if a source of drinking water is known to have been contaminated. All of these criteria must be achieved for each emerged worm for the case to be considered contained.

INSIDE

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

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

achieved through four complementary measures: 1) voluntary isolation of each patient to prevent contamination of drinking water sources, 2) provision of first aid to prevent secondary infections, 3) manual extraction of the worm, and 4) application of occlusive bandages. No vaccine or medicine to prevent or treat Guinea worm disease currently exists.

D. medinensis has approximately a 1-year incubation period (range = 10–14 months) following infection (*6*). A case of dracunculiasis is defined as an infection occurring in a person exhibiting a skin lesion or lesions with emergence of one or more Guinea worms. Each infected person is counted as a case only once during a calendar year. Countries enter the WHO precertification stage of eradication after 1 full year with no reported indigenous[†] cases. An imported case is an infection resulting from ingestion of contaminated water from a source identified through patient interviews and epidemiologic investigation in a place other than in the community where the patient is detected and reported (i.e., another country or village within the same country). Since 2012, no known cases imported from one country to another have been reported.

In each affected country, a national dracunculiasis eradication program receives monthly reports regarding cases from each village under active surveillance. Reporting rates are calculated as the proportion of all villages under active surveillance reporting monthly. Active surveillance is conducted in all villages with endemic dracunculiasis or at high risk for importation, with daily searches of households for persons with signs or symptoms of dracunculiasis, to ensure case detection within 24 hours of worm emergence and prompt patient management to prevent contamination of water sources. Villages where endemic transmission of dracunculiasis is interrupted (i.e., zero cases reported for ≥12 consecutive months) are kept under active surveillance for 3 consecutive years. WHO certifies a country free from dracunculiasis after that country maintains adequate nationwide surveillance for ≥3 consecutive years and demonstrates that no cases of indigenous dracunculiasis occurred during that period. As of January 2015, WHO had certified 198 countries, areas, and territories as free from dracunculiasis (*3*). Eight countries remain to be certified: four where dracunculiasis is currently endemic (Chad, Ethiopia, Mali, and South Sudan), two in the precertification stage (Kenya and Sudan), and two never known to have had endemic dracunculiasis since the global eradication program began in 1980 (Angola and the Democratic Republic of the Congo).

During January 2014–June 2015, CDC evaluated 385 specimens that emerged from humans. Among these, six were collected in four formerly endemic countries (Ghana, Kenya, Niger, and Sudan) and the remaining 379 were collected in the four countries where dracunculiasis remains endemic. In total, 164 specimens (43%) were determined to be *D. medinensis*, all of which came from the four endemic countries. Because some

[†] An indigenous case of dracunculiasis is defined as an infection occurring in a person exhibiting a skin lesion or lesions with emergence of one or more Guinea worms in a person who had no history of travel outside his or her residential locality during the preceding year.

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].

patients have multiple Guinea worms emerge, more laboratory-confirmed specimens than cases might be reported.

Country Reports

Chad. Following a decade with no reported cases, Chad reported 10 cases in 2010, and after indigenous cases were confirmed over 3 consecutive years, dracunculiasis was declared to be endemic in 2012 (*7*,*8*). In 2014, Chad reported 13 cases (eight contained) in 11 villages, compared with 14 cases in 2013. During the first half of 2015, six cases (zero contained) were reported in six villages, the same as the number of cases reported in the same period of 2014, four of which were contained. Only one of the 11 villages that reported a case in 2014 and none of the six villages that reported a case during January–June 2015 had previously reported a case.

Guinea worm infections in dogs in Chad were first detected in 2012 and since then, more dogs than humans have been identified with emerging Guinea worms in this country. This has not occurred in any other country during the eradication campaign. Worm specimens obtained from dogs were determined to be genetically indistinguishable from *D. medinensis* worms removed from humans in Chad (*7*). Most infections during the current outbreak have occurred in communities along the Chari River. The Carter Center has assisted the Ministry of Health in implementing active village-based surveillance for the disease in more than 700 villages in the at-risk zone. The working hypothesis, based on biologic, environmental, and epidemiologic investigations by CDC and the Carter Center, is that the cases in humans and infected dogs are associated with the domestic and commercial fishing industry along the Chari River and involve fish or other aquatic hosts that serve as paratenic hosts (intermediate hosts in which no development of the parasite occurs). New human cases are thought to occur when inadequately cooked paratenic hosts are consumed by humans and when such hosts, including fish and fish entrails, are consumed raw by dogs (*7*). Overall, 113 infected dogs were reported in 2014; during January–June 2015, 302 infected dogs were reported, a 325% increase over the 71 reported during the same period in 2014.

Beginning in October 2013, Chad's Guinea Worm Eradication Program urged villagers to cook their fish well, bury fish entrails, and prevent dogs from eating fish entrails. By May 2015, according to monthly sample surveys, this intervention was being implemented in more than half of the at-risk population in surveyed communities. In February 2014, efforts began to persuade villagers to tether infected dogs until the worms emerged to prevent contamination of water and infection of copepods.

Chad has offered a cash reward equivalent to about US$100 for reporting a case of dracunculiasis in humans since before 2010. Since February 2015, a cash reward equivalent to about US$20 for reporting and tethering infected dogs has been offered. The Minister of Health visited seven endemic villages in March 2015 to help mobilize local authorities and villagers and publicize the cash rewards. Whereas 40% of infected dogs were tethered in 2014, 70% were tethered during January–June 2015. As of April 2015, among 127 villages that had an infected human or dog during 2014–2015, 81 (64%) had at least one source of safe drinking water. Temephos usage is limited by the extremely large lagoons used for fishing and as sources of drinking water; however, starting in August 2014, an innovative technique of applying temephos to smaller cordoned sections of the lagoons at entry points used by infected humans or dogs was introduced and used to protect 19 villages in 2014 and 30 villages during January 2015–June 2015. The Carter Center and the WHO Collaborating Center for Dracunculiasis Eradication, Training, and Research at CDC are supporting research to better understand the unusual epidemiology of the current outbreak of dracunculiasis in Chad and assess antihelminthic treatment of dogs to prevent maturation of worms.

Ethiopia. In 2014, Ethiopia reported three cases of dracunculiasis (two contained) in three neighboring villages within Gog district in Gambella region, a reduction of 73% from the 11 cases reported in 2013. Three infected dogs and one infected baboon were also reported in the same area in 2014. During January–June 2015, one case (contained) and one infected dog were reported in the same area, compared with two cases and no infected dogs during the same period of 2014. Temephos was applied in all implicated villages within 7 days of identification of the case and infected animal. A total of 173 villages are under active surveillance in three districts of Gambella region with endemic disease. In October 2014, Ethiopia increased the amount of its cash reward for reporting a case to the equivalent of US$100.

Mali. Although no cases were reported during the first 6 months of 2014, in the remainder of 2014, Mali's Guinea Worm Eradication Program reported 40 cases (88% contained) in three villages in nomadic localities: Tanzikratene (29 cases) in Gao region, Nanguaye (10) in Timbuktu region, and Fion (one) in Segou region. These 40 cases represent a nearly four-fold increase over the 11 cases (64% contained) reported from eight villages in 2013. The first two villages have no source of safe drinking water; Fion has one safe source. Temephos was applied to surface water sources in all three localities soon after cases began to appear. More than 570 villages are under active surveillance, including the three villages that had cases in 2014, although the northern regions of Kidal, Gao, and Timbuktu are currently experiencing civil unrest and insecurity. In October 2014, Mali doubled its cash reward to the equivalent of US$100 for reporting a case. As in 2014, no cases were reported during the first 6 months of 2015.

South Sudan. The South Sudan Guinea Worm Eradication Program reported 70 cases of dracunculiasis in 2014, of which 47 (67%) were contained (Table 1), representing a 38% reduction from the 113 cases reported in 2013. During January–June 2015, only one case (contained) was provisionally reported, compared with 19 cases (79% contained) reported from 13 villages during January–June 2014, a 95% reduction in cases and a 92% decrease in villages reporting cases (Table 2). During November 2014–May 2015, South Sudan reported zero cases. As previously described (*4*), movements of persons along multiple routes for seasonal activities such as livestock grazing and farming, sporadic insecurity created during interethnic cattle raiding, and other factors have presented unusually complex challenges to this program. In addition, civil unrest and insecurity that began in December 2013 continued into 2015, although the area in Eastern Equatoria state with the highest endemicity was less affected by the insecurity, and coverage with interventions against transmission of dracunculiasis remains high (Table 1). In April 2014, South Sudan introduced a cash reward equivalent to about US$125 for reporting a case of dracunculiasis and achieved 82% awareness of the reward by the end of that year (*9*).

TABLE 1. Reported dracunculiasis cases, surveillance, and status of local interventions in villages with endemic disease, by country — worldwide, 2014

	Country				
	Chad*	Ethiopia	Mali†	South Sudan	Total
Reported cases					
Number indigenous, 2014	13	3	40	70	**126**
Number imported,§ 2014	0	0	0	0	**0**
Contained in 2014 (%)	(62)	(67)	(88)	(67)	**(73)**
Change in indigenous cases in villages/localities under surveillance, same period 2013 and 2014 (%)	(-7)	(-57)	(+264)	(-38)	**(-15)**
Villages under active surveillance, 2014					
Number of villages	756	168	574	4,700	**6,198**
Reporting monthly (%)	(100)	(100)	(100)	(100)	**(100)**
Number reporting ≥1 case	11	3	3	37	**54**
Number reporting only imported¶ cases	0	2	0	24	**26**
Number reporting indigenous cases	11	1	3	13	**28**
Status of interventions in villages with endemic dracunculiasis, 2014					
Number of villages with endemic dracunculiasis, 2013–2014	93	3	3	48	**147**
Reporting monthly** (%)	(98)	(100)	(75)	(100)	**(99)**
Filters in all households** (%)	(98)	(100)	(100)	(96)	**(97)**
Using temephos** (%)	(69)	(100)	(100)	(100)	**(80)**
≥1 source of safe water** (%)	(73)	(100)	(33)	(35)	**(60)**
Provided health education** (%)	(99)	(100)	(100)	(100)	**(99)**

* Participants at the annual Chad Guinea Worm Eradication Program review meeting in November 2014 adopted "1+ case village" as a new description for villages in Chad affected by human cases of Guinea worm disease and/or dogs infected with Guinea worms and defined it as "a village with one or more indigenous and/or imported cases of Guinea worm infections in humans, dogs, and/or cats in the current calendar year and/or previous year."
† Civil unrest and insecurity since a coup in 2012 continued to constrain Guinea Worm Eradication Program operations (supervision, surveillance, and interventions in Gao, Kidal, and Timbuktu regions).
§ Imported from another country.
¶ Imported from another country or from another in-country disease-endemic village.
** The denominator is the number of villages/localities where the program applied interventions during 2013–2014.

TABLE 2. Number of reported indigenous dracunculiasis* cases, by country — worldwide, January 2013–June 2015

	Cases by year				Cases by period			
		2014				January–June 2015		
Country	2013 No.	No.	Contained (%)	1-yr change (%)	January–June 2014* No.	No.	Contained (%)	6-mo change (%)
Chad	14	13	(62)	(-7)	6	6	(0)	(0)
Ethiopia	7	3	(67)	(-57)	2	1	(100)	(-50)
Mali†	11	40	(88)	(264)	0	0	(0)	(0)
South Sudan	113	70	(67)	(-38)	19	1	(100)	(-95)
Sudan	3	0	(0)	(-100)	0	0	(0)	(0)
Total	**148**	**126**	**(73)**	**(-15)**	**27**	**8**	**(25)**	**(-70)**

* No reports of cases imported from one country to another were reported during January 2014–June 2015.
† Civil unrest and insecurity since a coup in April 2012 continued to constrain program operations in regions with endemic dracunculiasis (Gao, Kidal, Mopti, and Timbuktu) during 2014–2015.

Summary

What is already known on this topic?

The number of new cases of dracunculiasis (Guinea worm disease) occurring worldwide has decreased each year since 1986, when the World Health Assembly declared global elimination as a goal, from an estimated 3.5 million in 1986 to 126 in 2014.

What is added by this report?

The number of dracunculiasis cases reported worldwide during 2014 declined by 15% compared with 2013, and by 70% in January–June 2015 compared with January–June 2014. Although earlier target dates for global dracunculiasis eradication were missed, progress in eradicating human disease has accelerated, with only eight human cases reported globally during January–June 2015. Transmission is ongoing in four countries: Chad, Ethiopia, Mali, and South Sudan. The emergence of dracunculiasis in domesticated dogs in Chad and program disruptions caused by civil unrest and insecurity in Mali and South Sudan are now the greatest challenges to interrupting transmission.

What are the implications for public health practice?

The Guinea Worm Eradication Program surveillance system and intervention platform, although challenged by issues related to civil unrest and insecurity, remains adaptable to local conditions with a cadre of village volunteers and local supervisors, supported by regional and national supervisors, National Guinea Worm Eradication Programs, The Carter Center, the World Health Organization, and partners. The surveillance structure in place for dracunculiasis eradication is a potential model for other community-based surveillance activities and for control and elimination of other neglected tropical diseases in sub-Saharan Africa.

Discussion

In 2014, the 126 dracunculiasis cases reported through the global Guinea Worm Eradication Program were the lowest number ever reported, and reports from the first half of 2015 suggest that the total cases in 2015 might be even lower. Ghana, which once reported the second highest number of cases among all affected countries, was certified free of dracunculiasis transmission in January 2015. Despite facing major challenges, South Sudan has reported only one case in July 2015, compared with 22 in July 2014 and, as a result of the strong political support and technical leadership of the South Sudanese program, is on track to become the first among the last four endemic countries to interrupt transmission.

However, considerable challenges remain. The civil unrest and insecurity in Mali and South Sudan and the unusual epidemiology occurring in Chad represent the greatest challenges facing the global campaign. The sporadic infections in dogs and baboons in Ethiopia are not unprecedented; both these infections and those in humans seem to be declining.

Although the goals from the 1991 and 2004 World Health Assemblies to eradicate dracunculiasis globally in 1995 and 2009, respectively, were not achieved (*6*,*10*), considerable progress toward eradication has been made since 1986. This progress continued with a modest decrease in cases from 2013 to 2014, and was followed by a 70% decrease in cases during the first 6 months of 2015 compared with the same period in 2014. In 2014, 79% of cases occurred during the second half of the year, largely because of the outbreaks in South Sudan during July–August and in Mali during September–November. From 2013 to 2014, and during January–June 2014 and the same period during 2015, the number of villages reporting endemic cases in these four countries decreased by >50%.

Surveillance is a challenge everywhere dracunculiasis exists, and since March 2012, has been especially weak in dracunculiasis-affected areas of Mali because of civil unrest and insecurity. With sufficient attention to nationwide surveillance, including use of cash rewards for reports of rumors of possible cases, prompt containment of any infections, appropriate interventions, strong political support, and adequate security in the four remaining endemic countries (Chad, Ethiopia, Mali, and South Sudan), dracunculiasis will likely become the first parasitic disease to be eradicated.

[1]The Carter Center, Atlanta, Georgia; [2]Division of Parasitic Diseases and Malaria, Center for Global Health, CDC; [3]Division of Foodborne, Waterborne, and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases and World Health Organization Collaborating Center for Research, Training, and Eradication of Dracunculiasis, CDC.

Corresponding author: Sharon L. Roy, slroy@cdc.gov, 404-718-4698.

References

1. World Health Assembly. Elimination of dracunculiasis: resolution of the 39th World Health Assembly. Geneva, Switzerland: World Health Organization; 1986. Resolution WHA 39.21. Available at http://www.who.int/neglected_diseases/mediacentre/WHA_39.21_Eng.pdf.
2. Watts SJ. Dracunculiasis in Africa in 1986: its geographic extent, incidence, and at-risk population. Am J Trop Med Hyg 1987;37:119–25.
3. World Health Organization. Dracunculiasis eradication: global surveillance summary, 2014. Wkly Epidemiol Rec 2015;90:201–15.
4. Hopkins DR, Ruiz-Tiben E, Eberhard ML, Roy SL. Progress toward global eradication of dracunculiasis—January 2013–June 2014. MMWR Morb Mortal Wkly Rep 2014;63:1050–4.
5. Hopkins DR, Ruiz-Tiben E, Weiss A, Withers PC Jr, Eberhard ML, Roy SL. Dracunculiasis eradication: and now, South Sudan. Am J Trop Med Hyg 2013;89:5–10.
6. Ruiz-Tiben E, Hopkins DR. Dracunculiasis (Guinea worm disease) eradication. Adv Parasitol 2006;61:275–309.
7. Eberhard ML, Ruiz-Tiben E, Hopkins DR, et al. The peculiar epidemiology of dracunculiasis in Chad. Am J Trop Med Hyg 2014;90:61–70.
8. CDC. Renewed transmission of dracunculiasis—Chad, 2010. MMWR Morb Mortal Wkly Rep 2011;60:744–8.
9. World Health Organization. Meeting of the International Task Force for Disease Eradication, April 2015. Wkly Epidemiol Rec 2015;90:384–92.
10. World Health Assembly. Elimination of dracunculiasis: resolution of the 57th World Health Assembly. Geneva, Switzerland: World Health Organization; 2004. Resolution WHA 57.9. Available at http://www.who.int/gb/ebwha/pdf_files/wha57/a57_r9-en.pdf.

Progress Toward Poliomyelitis Eradication — Afghanistan, January 2014–August 2015

Chukwuma Mbaeyi, DDS[1]; Akif Saatcioglu, MD[2]; Rudolf H. Tangermann, MD[2]; Stephen Hadler, MD[3]; Derek Ehrhardt, MPH, MSN[1]

Despite recent progress toward global polio eradication, endemic transmission of wild poliovirus (WPV) continues to be reported in Afghanistan and Pakistan (*1*,*2*). The Afghanistan program must overcome many challenges to remain on track toward achieving the objectives set in the 2013–2018 strategic plan of the Global Polio Eradication Initiative (GPEI) (*3*). Cross-border transmission of WPV type 1 (WPV1) continues to occur among children traveling to and from Pakistan (*4*). The country's routine immunization system remains weak and unable to reach recommended benchmarks in most regions; hence, the national Polio Eradication Initiative (PEI) relies mainly on providing children aged <5 years with oral poliovirus vaccine (OPV), administered during supplementary immunization activities (SIAs).* Because of ongoing conflict and insecurity, some children continue to be missed during SIAs in areas not under government control; however, the majority of missed children live in accessible areas and are often unreached because of a failure to plan, implement, and supervise SIAs efficiently. This report describes polio eradication activities and progress in Afghanistan during January 2014–August 2015 and updates previous reports (*5*,*6*). During 2014, a total of 28 WPV1 cases were reported in Afghanistan, compared with 14 cases in 2013; nine cases were reported during January–August 2015, the same number as during the same period in 2014. To eliminate poliovirus transmission in Afghanistan, emergency operations centers (EOCs) need to be established at the national level and in critical regions without delay to improve overall coordination and oversight of polio eradication activities. The recently revised National Emergency Action Plan for polio eradication needs to be fully implemented, including detailed microplanning and enhanced monitoring and supervision of SIAs, as well as improved cross-border coordination with Pakistan.

Immunization Activities

Estimated national routine vaccination coverage of infants with 3 doses of oral poliovirus vaccine (OPV3) was 75% in Afghanistan in 2014, compared with 70% in 2013 (*7*). The proportion of nonpolio acute flaccid paralysis (NPAFP)† cases in children aged 6–23 months who were reported to have received ≥3 doses of OPV, which is a proxy indicator for routine OPV3 coverage, was 64% nationally in 2014, with wide regional variation: 24% in the conflict-affected Southern Region, 50% in the Southeastern Region, 63% in the Western Region, and >70% in the other five regions. The proportion of children aged 6–23 months with NPAFP who never received OPV either through routine immunization services or SIAs (i.e., "zero-dose" children) was <1% nationally during 2014.

During January 2014–August 2015, house-to-house SIAs in Afghanistan targeted children aged <5 years, using different OPV formulations, including trivalent (types 1, 2, and 3), bivalent (types 1 and 3), and monovalent (type 1) OPV. During this period, 41 SIAs were conducted using OPV, including seven national immunization days (NIDs), six subnational immunization days (SNIDs), and 28 short-interval, additional dose, case-response campaigns.§ Additionally, vaccination campaigns were conducted using injectable inactivated poliovirus vaccine (IPV) in selected parts of districts at high risk for polio transmission in the Southern and Eastern regions after having gained access during November 2014 and February and August 2015. Vaccination campaigns were also implemented at transit points and border crossings with Pakistan as well as in camps for displaced persons.

Ongoing conflict and insecurity continue to limit access to children during SIAs, especially in parts of the Southern and Eastern regions, as well as in Farah Province of the Western Region. During NIDs conducted in 2015, estimates of children living in temporarily inaccessible areas¶ ranged from 1% to 3% of approximately 9 million children aged <5 years. SIAs in the Southern Region were further hampered by temporary bans imposed by local antigovernment groups in the provinces of Helmand (March–July 2014 and December 2014–January 2015) and Kandahar (June–early August 2015). However, administrative coverage and postcampaign monitoring data of NIDs and SNIDs conducted in 2015 show that a majority of children not reached during SIAs live in accessible areas. Data from

* 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 subnationally (i.e., in portions of the country).

† 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.

§ Short-interval, additional dose campaigns are used for case-response vaccination after detection of a WPV case, or during negotiated periods of nonviolence in otherwise inaccessible areas, to vaccinate children with a monovalent or bivalent OPV dose, which is administered within 1–2 weeks of the previous dose.

¶ Areas where vaccination teams are temporarily unable to operate because of security concerns or bans on vaccination.

NIDs conducted in March 2015 suggest that 538,412 (7%) of 7,607,067 children targeted during the SIA were unvaccinated, among whom only 109,017 (20%) were living in inaccessible areas. During NIDs conducted in May and August 2015, the proportion of children missed because of inaccessibility were 32% and 14%, respectively. During these campaigns, approximately 400,000–500,000 missed children lived in accessible areas.

Lot quality assurance sampling (LQAS),** which is used to assess the quality of SIAs (*8*), indicates that improvements noted in 2014 appear to have eroded slightly in 2015. SIAs in approximately one third of districts assessed were deemed unsatisfactory, with only 66%–68% of districts achieving the desired pass threshold of ≥80% to date in 2015, compared with 70%–77% of districts during the same period in 2014.

Poliovirus Surveillance

Acute Flaccid Paralysis (AFP) Surveillance. In 2014, the annual national NPAFP rate was 12.6 per 100,000 population aged <15 years (regional range = 9.1–15.5) (Table). The percentage of AFP cases for which adequate stool specimens were collected was 92% (regional range = 82%–98%). Six AFP cases reported from five provinces were classified as polio-compatible, including one case each reported from Farah, Helmand, Kandahar, and Kunar, and two cases reported from Uruzgan. These compatible cases indicate that gaps in surveillance quality remain, despite strong overall AFP surveillance performance indicators.††

Environmental Surveillance. Supplemental surveillance for polioviruses through sewage sampling began in Afghanistan in September 2013. Environmental surveillance is currently taking place at 13 sites in five provinces (Kandahar and Helmand in the Southern Region, Nangarhar and Kunar in the Eastern Region, and Kabul City in the Central Region). WPV1 was first isolated from sewage samples in July 2014. Since then, a total of 25 specimens from seven sites were positive for WPV1. In 2014, a total of 18 (19%) of 97 sewage specimens tested positive for WPV1. To date, only seven (8%) of 93 specimens have tested positive in 2015. WPV1 was most recently detected in sewage samples taken from Helmand Province in April 2015. WPV3 has not been detected in sewage samples since environmental surveillance began in Afghanistan.

Epidemiology of WPV and Vaccine-Derived Poliovirus (VDPV)

A total of 28 WPV1 cases were reported in 2014, compared with 14 cases in 2013; nine cases were reported during January–August 2015, the same number reported during the same period in 2014 (Figure 1, Figure 2, Table). During this period, WPV1 cases were reported from 19 (5%)

** A rapid survey method used to assess the quality of vaccination activities after SIAs in predefined areas, such as health districts (known as "lots"), using a small sample size. LQAS involves dividing the population into lots and randomly selecting persons in each lot. If the number of unvaccinated persons in the sample exceeds a preset decision value, then the lot is classified as having an unsatisfactory level of vaccination coverage, and mop-up activities are recommended. If the threshold of ≥80% is met, the area/district is classified as having "passed," although mop-up activities might still be indicated in certain areas.

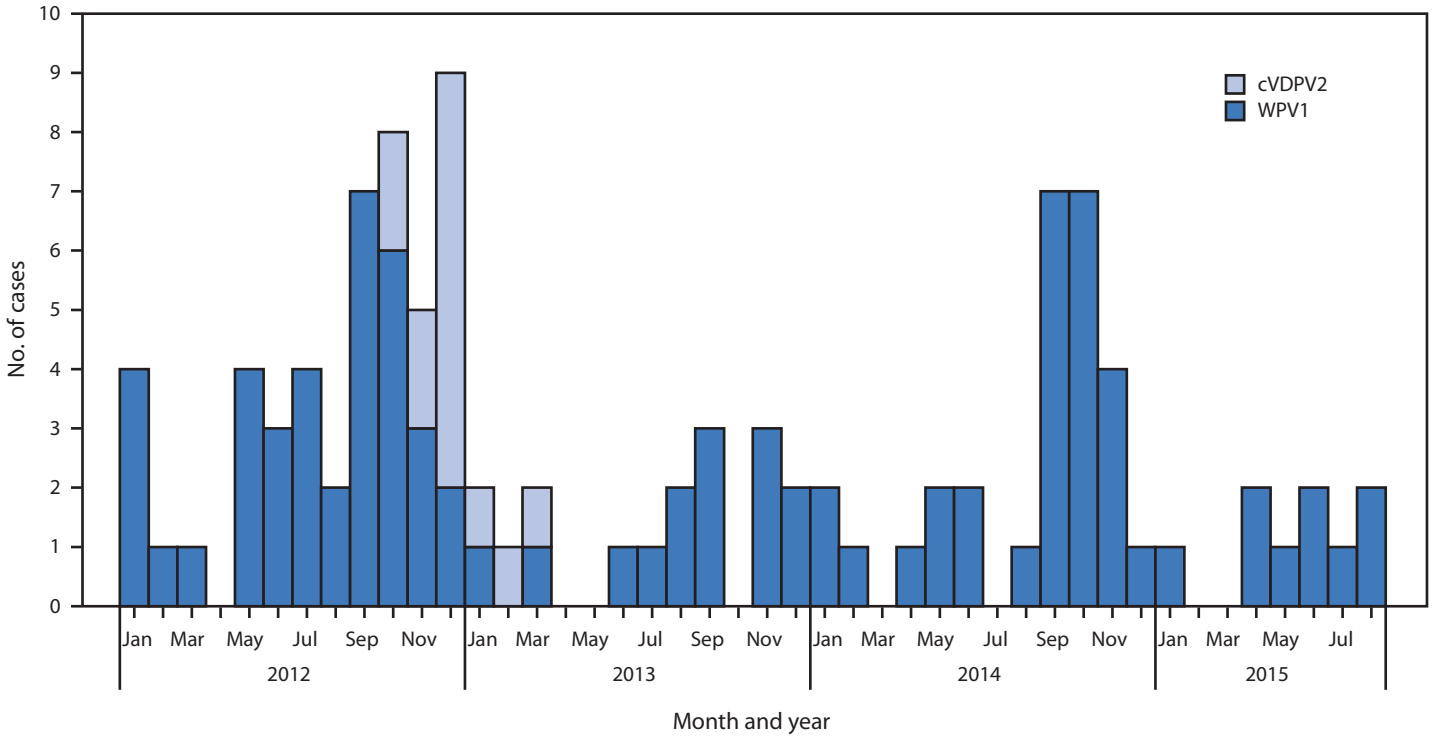
†† The quality of AFP surveillance is monitored by performance indicators that include 1) the detection rate of NPAFP cases and 2) the proportion of AFP cases with adequate stool specimens. World Health Organization (WHO) operational targets for countries with endemic poliovirus transmission are an NPAFP detection rate of ≥2 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 (without leakage or desiccation).

TABLE. Acute flaccid paralysis (AFP) surveillance indicators and reported cases of wild poliovirus (WPV) and type 2 circulating vaccine-derived poliovirus (cVDPV2), by region, period, and poliovirus type — Afghanistan, January 2014–August 2015*

Region	AFP surveillance indicators (2014)			No. of WPV cases reported					No. of cVDPV2 cases reported	
				Period			Type		Period	
	No. of AFP cases	Rate of nonpolio AFP†	% of AFP cases with adequate specimens§	Jan–Jun 2014	Jul–Dec 2014	Jan–Aug 2015	WPV1	WPV3	Jul–Dec 2014	Jan–Aug 2015
Overall	**2,392**	**12.6**	**92**	**8**	**20**	**9**	**37**	**0**	**0**	**0**
Badakhshan	52	9.5	98	0	0	0	0	0	0	0
Northeastern	301	14.0	94	0	0	0	0	0	0	0
Northern	331	14.1	92	0	0	0	0	0	0	0
Central	397	9.1	97	0	0	0	0	0	0	0
Eastern	294	15.5	91	5	1	2	8	0	0	0
Southeastern	201	9.8	98	1	3	0	4	0	0	0
Southern	426	12.9	82	1	16	2	19	0	0	0
Western	390	15.3	97	1	0	5	6	0	0	0

* Data as of August 31, 2015.
† Per 100,000 children aged <15 years.
§ Two specimens collected ≥24 hours apart, both within 14 days of paralysis onset, and shipped on dry ice or frozen packs to a World Health Organization–accredited laboratory, arriving in good condition (without leakage or desiccation).

FIGURE 1. Number of cases of wild poliovirus type 1 (WPV1) and circulating vaccine-derived poliovirus type 2 (cVDPV2), by month and year — Afghanistan, 2012–2015



of 399 districts in Afghanistan. Among the WPV1 cases reported in 2014, three cases occurred in children who were displaced from North Waziristan in neighboring Pakistan, whereas nearly half (13 of 28) were reported from Kandahar Province in the Southern Region as part of an outbreak that began in September 2014. Of the nine WPV1 cases reported so far in 2015, four occurred in the security-compromised Farah Province of the Western Region, two were reported from Nangarhar Province (Eastern Region), whereas Hirat Province (Western Region), Helmand Province and Nimroz Province (Southern Region) each reported one case. Of the 37 WPV1 cases reported during January 2014–August 2015, 26 (70%) were reported among children aged <36 months. Among these 26 children, eight (31%) had never received OPV, one (4%) had received a single dose, and 12 (46%) had received >4 doses. Eight of the nine WPV1 cases thus far reported during 2015 were in children who never received OPV through routine immunization services regardless of age.

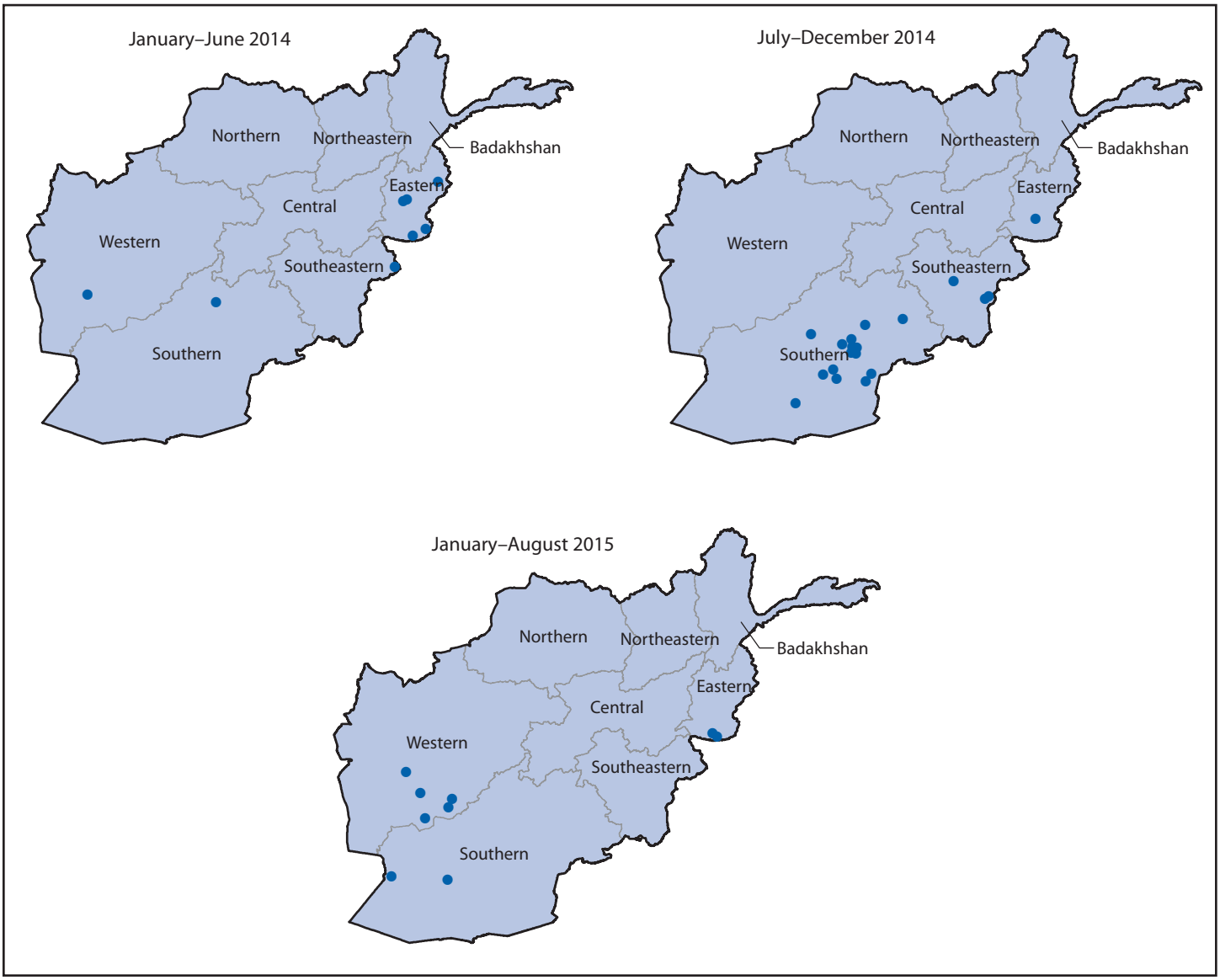
Based on genomic sequencing, 26 of 28 WPV1 cases detected in 2014 belong to the R4B cluster known to be also circulating in neighboring areas of Pakistan; of the two remaining cases, one (Laghman Province, Eastern Region) belonged to the R4A cluster, believed to have originated in Pakistan, and the other (Kandahar Province, Southern Region) belonged to the R2A cluster, considered indigenous to Afghanistan (*9*). The seven cases reported from the Western and Southern regions in 2015 belong to the R4B cluster that spread from Kandahar in late 2014; the two cases from Nangarhar are closely matched and likely linked to cross-border importation from Pakistan. No polio cases attributable to WPV3 or circulating VDPV[§§] have been detected in Afghanistan since April 2010 and March 2013, respectively.

Discussion

Afghanistan experienced a major setback in its progress towards the eradication of polio during the period under review. After having come close to interrupting indigenous transmission of WPV during 2013 (*5*), Afghanistan saw a resurgence in poliovirus transmission in 2014, as the number of cases doubled from levels reported in the previous year. Thus far in 2015, few cases have been reported, similar to the pattern observed during the comparable low transmission season of 2014. However, as the high transmission season approaches, there is cause for concern regarding the feasibility of interrupting transmission within a year, given ongoing WPV circulation in areas with known immunity gaps (i.e., areas with suboptimal

[§§] VDPVs can cause paralytic polio in humans and have the potential for sustained circulation. 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.

FIGURE 2. Cases of wild poliovirus type 1, by region — Afghanistan, January 2014–August 2015*



* Each dot represents one case. Dots are randomly placed within second administrative units.

routine or SIA OPV coverage) in the Southern, Eastern, and Western regions.

Although there are encouraging signs in the endemic transmission areas of the Southern Region, with no cases reported from Kandahar, and only a single case reported from each of Helmand and Nimroz provinces in 2015, vulnerabilities remain. The neighboring Farah Province in the Western Region has accounted for nearly half of the cases reported in 2015, frequently involving unvaccinated children. High levels of population movement between the Western and Southern regions provide ample opportunities for transmission between districts in the two regions. Data from short-interval, additional dose, case-response campaigns and routine immunization activities indicate the persistence of immunity gaps in both regions. Despite a small improvement in estimated OPV3 coverage nationally in 2014, routine immunization remained low in both the Southern and Western regions. Obstacles to achieving optimal routine immunization coverage in these regions are largely related to insecurity, poor infrastructure, and limited access to health services.

LQAS results indicate that the overall quality of vaccination campaigns in 2015 has declined slightly compared with 2014, with considerable numbers of children who live in accessible areas being missed during campaigns. Improving the quality of

Summary

What is already known on this topic?

Afghanistan is one of the two remaining countries (the other being Pakistan) 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?

The number of WPV type 1 cases reported in Afghanistan in 2014 doubled compared with 2013, representing a major setback in the country's efforts to eradicate polio. Continued WPV circulation in the polio-endemic transmission zones of the Southern Region, persistent immunity gaps in the adjoining provinces of the Western Region, and cross-border transmission in districts bordering Pakistan in the Eastern Region pose the greatest challenges to the goal of polio eradication in Afghanistan.

What are the implications for public health practice?

To achieve the goal of polio eradication, urgent action is required to improve the quality of vaccination activities in Afghanistan. Accordingly, the government of Afghanistan and Global Polio Eradication Initiative partners should establish national and regional emergency operations centers without delay to manage the coordination and oversight of polio vaccination and surveillance activities.

SIAs will require better preparation through proper staff training and detailed microplanning, and then ensuring adequate monitoring and supervision during the course of campaigns. Additionally, innovative approaches adopted in the National Emergency Action Plan to reach and vaccinate more children should be consistently implemented and regularly evaluated for effectiveness. These approaches include assignment of permanent polio teams that conduct regular house-to-house visits for polio vaccination to low-performing districts,[¶¶] use of permanent transit teams to vaccinate children at busy transit points close to inaccessible areas, and more recently, implementation of a strategy to record, revisit, and vaccinate children not at home during the initial house visit. Negotiations with local authorities and persons of influence in insecure and conflict-affected areas with limited or no access during SIAs should continue while ensuring that the polio program maintains its neutrality. Cross-border coordination with neighboring Pakistan must remain a top priority, including the continued use of permanent transit teams to vaccinate children moving across the border in both directions.

[¶¶] Defined in November 2012, districts with 1) confirmed polio cases in the previous 2 years, or 2) confirmed polio cases in 1 of the previous 2 years, plus reported "zero-dose" NPAFP cases in the previous 2 years; <90% estimated OPV coverage in the previous two SIAs; rejected LQAS in more than one round of vaccination campaigns; average level of community awareness of SIAs <50% in previous two SIAs; and inaccessibility.

The establishment of a national polio EOC in Nigeria played a crucial role in the country's successful elimination of indigenous poliovirus transmission (*10*). Hence, the national PEI in Afghanistan will stand to benefit from establishing polio EOCs nationally and in critical regions to improve overall coordination of polio eradication activities. In addition, with the updated and strengthened National Emergency Action Plan having been finalized to address key vulnerabilities, the government of Afghanistan must demonstrate the high levels of commitment needed to interrupt indigenous poliovirus transmission. This commitment must translate into urgent action that will make the goal of global polio eradication a reality.

Acknowledgments

Becky Maholland, Office of Public Health Preparedness and Response, CDC; World Health Organization Global Polio Laboratory Network.

[1]Global Immunization Division, Center for Global Health, CDC;[2] Polio Eradication Department, World Health Organization; [3]Division of Bacterial Diseases, National Center for Immunization and Respiratory Diseases, CDC.

Corresponding author: Chukwuma Mbaeyi, cmbaeyi@cdc.gov, 404-823-7764.

References

1. Moturi EK, Porter KA, Wassilak SG, et al. Progress toward polio eradication—worldwide, 2013–2014. MMWR Morb Mortal Wkly Rep 2014;63:468–72.
2. Hagan JE, Wassilak SG, Craig AS, et al. Progress toward polio eradication—worldwide, 2014–2015. MMWR Morb Mortal Wkly Rep 2015;64:527–31.
3. Global Polio Eradication Initiative. Polio eradication and endgame strategic plan 2013–2018. Geneva, Switzerland: World Health Organization; 2014. Available at http://www.polioeradication.org/resourcelibrary/strategyandwork.aspx.
4. Porter KA, Diop OM, Burns CC, Tangermann RH, Wassilak SG. Tracking progress toward polio eradication—worldwide, 2013–2014. MMWR Morb Mortal Wkly Rep 2015;64:415–20.
5. CDC. Progress toward poliomyelitis eradication—Afghanistan, January 2012–September 2013. MMWR Morb Mortal Wkly Rep 2013;62:928–33.
6. Farag NH, Alexander J, Hadler S, et al. Progress toward poliomyelitis eradication—Afghanistan and Pakistan, January 2013–August 2014. MMWR Morb Mortal Wkly Rep 2014;63:973–7.
7. World Health Organization. WHO vaccine-preventable diseases monitoring system: 2015 global summary. Geneva, Switzerland: World Health Organization; 2014. Available at http://apps.who.int/immunization_monitoring/globalsummary.
8. Global Polio Eradication Initiative. Assessing vaccination coverage levels using clustered lot quality assurance sampling. Geneva, Switzerland: World Health Organization; 2012. Available at http://www.polioeradication.org/portals/0/document/research/opvdelivery/lqas.pdf.
9. Simpson DM, Sadr-Azodi N, Mashal T, et al. Polio eradication initiative in Afghanistan, 1997–2013. J Infect Dis 2014;210(Suppl 1):S162–72.
10. Etsano A, Gunnala R, Shuaib F, et al. Progress toward poliomyelitis eradication—Nigeria, January 2014–July 2015. MMWR Morb Mortal Wkly Rep 2015;64:878–82.

Use of Serogroup B Meningococcal Vaccines in Adolescents and Young Adults: Recommendations of the Advisory Committee on Immunization Practices, 2015

Jessica R. MacNeil, MPH[1]; Lorry Rubin, MD[2]; Temitope Folaranmi, MBChB[1,3]; Ismael R. Ortega-Sanchez[4]; PhD; Manisha Patel, MD[1]; Stacey W. Martin, MS[1]

At its June 2015 meeting, the Advisory Committee on Immunization Practices (ACIP) recommended that adolescents and young adults aged 16–23 years may be vaccinated with a serogroup B meningococcal (MenB) vaccine to provide short-term protection against most strains of serogroup B meningococcal disease. This report summarizes the deliberations of ACIP, the rationale for its decision, and recommendations for use of MenB vaccines in adolescents and young adults. Two MenB vaccines have recently been licensed by the Food and Drug Administration (FDA) for use in the United States and approved for use in persons aged 10–25 years: MenB-FHbp (Trumenba, Wyeth Pharmaceuticals, Inc.) and MenB-4C (Bexsero, Novartis Vaccines). Both MenB vaccines were licensed based on statutory regulations for accelerated approval (*1*), which enabled FDA to approve the MenB vaccines for serious or life-threatening diseases based on safety and demonstration that vaccine effectiveness, as measured by bactericidal antibody responses with assays using several MenB test strains that were representative of prevalent strains in the United States, is reasonably likely to predict clinical benefit. As a requirement for accelerated approval, confirmatory studies in the postmarketing period will be conducted to verify and further describe the effectiveness of the vaccines against an extended number of MenB strains that represent a broader diversity of endemic disease. Additional postlicensure safety data are also needed and will be reviewed by ACIP as they become available.

Recommendations for routine use of vaccines in children, adolescents, and adults are developed by the Advisory Committee on Immunization Practices (ACIP). ACIP is chartered as a federal advisory committee to provide expert external advice and guidance to the Director of the Centers for Disease Control and Prevention (CDC) on use of vaccines and related agents for the control of vaccine-preventable diseases in the civilian population of the United States. Recommendations for routine use of vaccines in children and adolescents are harmonized to the greatest extent possible with recommendations made by the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists (ACOG). Recommendations for routine use of vaccines in adults are harmonized with recommendations of AAFP, ACOG, and the American College of Physicians (ACP). ACIP recommendations approved by the CDC Director become agency guidelines on the date published in the Morbidity and Mortality Weekly Report (MMWR). *Additional information is available at http://www.cdc.gov/vaccines/acip.*

Methods

The ACIP Meningococcal Vaccines Work Group reviewed the immunogenicity and safety data from seven clinical trials of MenB-FHbp (*2*–*5*) (Pfizer, unpublished data) and five clinical trials of MenB-4C (*6*–*10*) during monthly teleconferences. The work group evaluated the available published and unpublished data and evidence regarding meningococcal disease epidemiology in the United States, carriage, cost-effectiveness, immunogenicity, and safety. Based on a literature search and consultation with the manufacturers, these studies represent all known clinical trials and evidence for these two vaccines. A summary of the data reviewed and Work Group discussions was presented to ACIP, and recommendations for use of MenB vaccines in adolescents and young adults were approved by ACIP at its June 24, 2015, meeting (meeting minutes are available at http://www.cdc.gov/vaccines/acip/meetings/meetings-info.html).

The type and quality of evidence supporting the use of MenB vaccines in adolescents and young adults, including college students, was evaluated using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework (*11*,*12*) (Table 1).

Epidemiology of Serogroup B Meningococcal Disease Among Adolescents and Young Adults, Including College Students

ACIP reviewed the burden of serogroup B meningococcal disease among adolescents, young adults, and college students. Meningococcal disease is a rare but serious illness and each case is life-threatening. The United States is currently experiencing a historic low in meningococcal disease incidence (0.18 per 100,000 among persons of all ages) (CDC, unpublished data, 2013), and the incidence of disease has declined for all meningococcal serogroups, including serogroup B, a serogroup not included in the quadrivalent (serogroups A, C, W, Y) meningococcal conjugate vaccines. The incidence of serogroup B meningococcal disease is stable and low in

adolescents and young adults aged 11-23 years, with approximately 50 to 60 cases and five to 10 deaths reported annually; the majority (>80%) of these cases occur in older adolescents and young adults aged 16–23 years (CDC, unpublished data). Seven outbreaks of serogroup B meningococcal disease have occurred on college campuses since 2009 (range = 2–13 cases), resulting in 41 cases and three deaths. Whereas several outbreaks of serogroup B meningococcal disease have occurred in recent years on college campuses, during 2009–2013, the estimated incidence of serogroup B meningococcal disease in college students aged 18–23 years (0.09 per 100,000) was similar to, or lower than, the incidence in all persons aged 18–23 years (0.14 per 100,000), and non-college students aged 18–23 years (0.21 per 100,000) (CDC, unpublished data).

It is estimated that approximately 15 to 29 cases and two to five deaths could be prevented annually with a routine adolescent MenB vaccination program administered at age 11, 16, or 18 years (Table 2). A recommendation for college students only is estimated to prevent approximately nine cases and one death annually (Table 2).

MenB Vaccine Immunogenicity and Safety

Evaluation of vaccine effectiveness against all serogroup B meningococcal strains is difficult because the strains are antigenically and genetically diverse. Efficacy studies designed to assess clinical disease outcomes would be the clearest demonstration of the benefit of MenB vaccines to prevent meningococcal B disease; however, such studies would be difficult to conduct because of the low prevalence and sporadic occurrence of disease in the United States. Vaccine effectiveness of MenB-FHbp and MenB-4C, for purposes of U.S. licensure, was inferred based on an immunologic marker of protection, serum bactericidal activity with human complement (hSBA) as measured by assays using selected meningococcal serogroup B strains. Immunogenicity was assessed as the proportion of subjects who achieved a fourfold or greater increase in hSBA titer for each of the serogroup B strains tested, and the proportion of subjects who achieved a titer greater than or equal to the lower limit of quantification of the assay for all strains (composite response) (*13*). The lower limit of quantification was defined as the lowest amount of the antibody in a sample that can be reliably quantified.

TABLE 1. Summary of evidence for MenB-FHbp and MenB-4C vaccination of healthy adolescents and young adults, including college students — United States

Outcome	Evidence type*	
	MenB-FHbp	MenB-4C
Benefits		
Short-term immunogenicity	2	2
Persistence in immunogenicity	4	3
MenB immunogenicity with concomitant vaccination	2	†
Harms		
Serious adverse events	2	2
Serious adverse events following concomitant vaccination	2	†

* Evidence type: 2 = moderate level of evidence; 3 = low level of evidence; 4 = lowest level of evidence.
† Not assessed because of lack of available data.

Both MenB-FHbp and MenB-4C vaccines contain components that include factor H binding protein. In two animal models, antibodies measured after MenB-4C vaccination have been noted to be cross-reactive with human factor H (*14,15*). However, it is not known if auto-antibodies to factor H develop in humans after vaccination with MenB-FHbp or MenB-4C and, if auto-antibodies are generated postvaccination, whether they are of clinical significance. FDA reviewed safety data from six MenB-4C clinical trials and seven MenB-FHbp clinical trials, which included approximate totals of 3,100 and 4,500 vaccine recipients, respectively. For most participants who reported an autoimmune condition, the onset of symptoms consistent with the diagnosis existed before the first vaccination (*16,17*). Theoretically, onset of autoimmune-disease-related symptoms could be delayed well beyond vaccination and postlicensure safety surveillance will be important to detect any potential safety signals.

MenB-FHbp

MenB-FHbp consists of two purified recombinant lipidated factor H binding protein (FHbp) antigens. One antigen from

TABLE 2. Potential cases and deaths prevented and cost-effectiveness of different strategies for MenB vaccination of adolescents and young adults, including college students, by age — United States

Age at MenB series	Cases prevented	Deaths prevented	NNV* to prevent case	NNV to prevent death	Cost per QALY (million $)
11 yrs	15	2	203,000	1,512,000	8.7
16 yrs	28	5	107,000	788,000	4.1
18 yrs	29	5	102,000	638,000	3.7
College student	9	1	368,000	2,297,000	9.4

Abbreviations: MenB = meningococcal B vaccine; NNV = number needed to vaccinate; QALY = quality-adjusted life years.
Sources: Unpublished data, ACIP meeting June 2015. Key model assumptions were presented at the June 2015 ACIP meeting. Methods described in Shepard CW, Ortega-Sanchez IR, Scott RD 2nd, Rosenstein NE. Cost-effectiveness of conjugate meningococcal vaccination strategies in the United States. Pediatrics 2005;115:1220–32.

each FHbp subfamily (A and B) is included in the vaccine. MenB-FHbp is licensed as a 3-dose series, with the second and third doses administered 2 and 6 months, respectively, after the first dose.

The immunogenicity and safety of MenB-FHbp in adolescents and young adults were evaluated in seven clinical trials: five randomized controlled trials and two open-label studies (*2–5*,*16*,*18*) (Pfizer, unpublished data). In a multicenter trial conducted in the United States, persons aged 11–17 years were randomly assigned to one of three groups: group 1 received MenB-FHbp and quadrivalent human papillomavirus vaccine (4vHPV [Gardasil, Merck and Co.]); group 2 received MenB-FHbp and saline; and group 3 received 4vHPV and saline.

One month following the third dose, 81.0% (95% confidence interval [CI] = 78.0%–83.7%) of subjects in group 1 and 83.9% (CI = 81.1%–86.4%) of subjects in group 2 had a composite response to all four strains tested (*2*,*18*). One month following the second of 3 doses, approximately 50% of the subjects in each study group had a composite response to all four strains. In studies conducted in Europe among persons aged 11–18 years, the hSBA responses in subjects who received MenB-FHbp according to the same schedule were similar to hSBA antibody responses in subjects in the U.S. study (*3*,*18*).

Evaluation of concomitant administration of MenB-FHbp with vaccines routinely administered to adolescents in the United States or Europe occurred in three trials. Subjects received MenB-FHbp coadministered with 4vHPV, quadrivalent meningococcal conjugate vaccine (MenACWY [Menactra, Sanofi Pasteur]), tetanus-diphtheria-acellular pertussis vaccine (Tdap, [Adacel, Sanofi Pasteur]), or tetanus-diphtheria-acellular pertussis-inactivated polio (Tdap/IPV [Repevax, Sanofi Pasteur]) vaccines, depending on the study population in the trial. Except for the antibody response to HPV type 18, no immunogenic interference was observed for serogroup B or concomitant vaccine antigens (HPV types 6, 11, 16, MenACWY, tetanus, diphtheria, pertussis, and IPV antigens) when MenB-FHbp was administered concomitantly (*4*,*5*). For HPV type 18, noninferiority criteria (lower bound of the CI of the geometric mean titer ratio >0.67) were not met for the geometric mean titer ratio at 1 month after the third 4vHPV dose (lower bound of the CI for the geometric mean titer ratio was 0.62); however, for each HPV vaccine type, ≥99% of subjects achieved seroconversion.

Antibody persistence through 48 months after dose 3 for MenB-FHbp was evaluated in a clinical trial (Pfizer, unpublished data). The data demonstrate an initial rapid decline in antibodies after vaccination followed by a flattening out of the antibody curve at approximately 6 months after the third dose. At 48 months, >50% of vaccinated subjects continued to demonstrate hSBA titers greater than or equal to the lower limit of quantification against three of the four strains tested (Pfizer, unpublished data).

In seven clinical trials (*2–5*) (Pfizer, unpublished data), a total of 9,808 subjects received at least 1 dose of MenB-FHbp; four subjects reported seven serious adverse events that were considered by the study investigator to be related (or possibly related) to the vaccine.* All vaccine-related serious adverse events resolved without sequelae. No increased risk for any specific serious adverse event considered to be clinically significant was identified in any of the studies. No deaths were considered to be related to MenB-FHbp. The most common solicited adverse reactions observed in the 7 days after receipt of MenB-FHbp in the clinical trials were pain at the injection site (≥85%), fatigue (≥40%), headache (≥35%), myalgia (≥30%), and chills (≥15%) (*18*).

MenB-4C

MenB-4C consists of three recombinant proteins (neisserial adhesion A [NadA], factor H binding protein [FHbp] fusion protein, and neisserial heparin binding antigen [NHBA] fusion protein) and outer membrane vesicles (OMVs) containing outer membrane protein PorA serosubtype P1.4. MenB-4C is licensed as a 2-dose series, with doses administered at least 1 month apart, although in some studies, MenB-4C doses were administered up to 6 months apart. No data are available following 3 doses of MenB-4C in a North American population.

The immunogenicity and safety of MenB-4C in adolescents and young adults were evaluated in five clinical trials; three randomized controlled trials, one randomized uncontrolled trial, and one immunogenicity extension study (*6–10*,*17*,*19*). In a randomized controlled trial conducted in Chile, persons aged 11–17 years received 2 doses of MenB-4C 1, 2, or 6 months apart. One month following the second dose, 90%–94% of subjects had a composite response to all three strains tested, depending on the vaccination schedule administered; 77%–94% of subjects had an hSBA titer of ≥1:4 against all three strains tested at 18–24 months after the second dose, depending on the vaccination schedule administered (*9*).

In a randomized controlled trial conducted in the United Kingdom, a subset of enrolled subjects (university students aged 18–24 years) received 2 doses of MenB-4C vaccine 1 month apart. One month following the second dose, 88% (CI = 82%–93%) of subjects had a composite response to all three strains tested; 66% (CI = 58%–72%) of the subjects had a composite response to all three strains tested at 11 months

* The administration of the investigational vaccine and a serious adverse event were considered reasonably related in time and the serious adverse event could not be explained by causes other than exposure to the investigational vaccine. The reported serious adverse events included pyrexia (1), vomiting (1), vertigo (1), chills (1), headache (1), anaphylaxis (1), and neutropenia (1).

after the second dose (*8*). In a randomized uncontrolled trial conducted in Australia and Canada, persons aged 11–17 years received 2 doses of MenB-4C 1 month apart. One month following the second dose, 63% (CI = 57%–68%) of subjects had a composite response to all three strains tested (*7*,*19*).

In three clinical trials for which a control group was available, serious adverse events were assessed in 2,716 subjects who received at least 1 dose of MenB-4C and for whom safety data were collected through 6 months postvaccination (*6*,*8*,*10*). Five serious adverse events were considered by the study investigator to be related (or possibly related) to the vaccine.[†] Rates of serious adverse events were similar in the vaccine and the control groups. In addition, information about serious adverse events was collected during three vaccination campaigns in response to three outbreaks of serogroup B meningococcal disease (at two U.S. universities and in one region of Canada). A total of 59,091 participants in the vaccination campaigns received at least 1 dose of MenB-4C. Three serious adverse events were considered to be related (or possibly related) to the vaccine[§]; all resolved with no sequelae (CDC and Novartis, unpublished data). No deaths were considered to be related to MenB-4C in the clinical trials or campaigns. The most common solicited adverse reactions observed in the 7 days after receipt of MenB-4C in the clinical trials were pain at the injection site (≥83%), myalgia (≥48%), erythema (≥45%), fatigue (≥35%), headache (≥33%), induration (≥28%), nausea (≥18%), and arthralgia (≥13%) (*19*). Immunogenicity and safety data regarding MenB-4C when coadministered with vaccines routinely administered to U.S. adolescents are not available.

Summary of ACIP Deliberations and Rationale

The available data suggest that MenB vaccines might be an important step for controlling serogroup B meningococcal disease. Although current data suggest they will protect against the majority of currently circulating strains, these vaccines are not expected to provide protection against disease caused by all serogroup B strains circulating in the United States. Additional studies assessing breadth of strain coverage are ongoing, and ACIP will review results as they become available. Immune responses following MenB vaccination in the studies described were evaluated after completion of the primary immunization series, but no data are available on vaccine effectiveness against clinical disease endpoints or duration of protection against clinical disease. On the basis of the limited available data, no concerning patterns of serious adverse events have been reported for MenB vaccines; additional safety data and postlicensure safety surveillance data are needed and will be reviewed by ACIP as they become available. In addition, the potential impact of MenB vaccines on nasopharyngeal carriage and herd protection is inconclusive, as is the potential impact vaccine introduction might have on the population of *Neisseria meningitidis*.

After reviewing the available data, ACIP supported consideration of vaccination of all adolescents rather than college students only, primarily because an important number of serogroup B meningococcal disease cases occurs in persons aged 18–23 years who are not attending college, and vaccinating college students only is estimated to prevent the fewest cases and deaths among all the options considered (Table 2). However, ACIP also acknowledges the impact that cases and outbreaks have on college campuses, both in terms of the cost for vaccination campaigns in response to these outbreaks as well as public concern. On the basis of the available antibody persistence data, ACIP concluded that a preference to administer the MenB series in later adolescence exists, preferably at

Summary

What is currently recommended?

The Advisory Committee on Immunization Practices recommends routine vaccination of all adolescents aged 11–18 years with a quadrivalent meningococcal conjugate vaccine (MenACWY). A single dose should be administered at age 11 or 12 years with a booster dose at age 16 years for persons who receive the first dose before age 16 years. Routine vaccination of certain persons at increased risk for meningococcal disease with MenACWY and serogroup B meningococcal (MenB) vaccine is also recommended.

Why are the recommendations being modified now?

Two serogroup B meningococcal vaccines were recently licensed by the Food and Drug Administration and approved for use in persons aged 10–25 years. The evidence supporting the use of MenB vaccines in adolescents and young adults was evaluated using the Grading of Recommendations, Assessment, Development, and Evaluation framework. The recommendation was designated as Category B (recommended for individual clinical decision making).

What are the new recommendations?

A MenB vaccine series may be administered to adolescents and young adults aged 16–23 years to provide short-term protection against most strains of serogroup B meningococcal disease. The preferred age for MenB vaccination is 16–18 years.

[†] The administration of the investigational vaccine and a serious adverse event were considered reasonably related in time and the serious adverse event could not be explained by causes other than exposure to the investigational vaccine. The reported serious adverse events included tremor (1), dyspnea (1), acute thyroiditis (1), and juvenile arthritis (2).

[§] The administration of the investigational vaccine and a serious adverse event were considered reasonably related in time and the serious adverse event could not be explained by causes other than exposure to the investigational vaccine. The reported serious adverse events included rhabdomyolysis (1), anaphylaxis (1), and fever (1).

age 16–18 years, to maximize the likelihood that protection would last into the highest age-related risk period.

The current low prevalence of disease, coupled with the fact that important data for making policy recommendations for MenB vaccines are not yet available, resulted in ACIP determining that insufficient evidence exists to make a routine public health recommendation that all adolescents be vaccinated with MenB vaccine. Given the seriousness of meningococcal disease and the availability of licensed vaccines, ACIP agreed that sufficient evidence exists to encourage individual clinical decision making.

Recommendations

A MenB vaccine series may be administered to adolescents and young adults aged 16–23 years to provide short-term protection against most strains of serogroup B meningococcal disease. The preferred age for MenB vaccination is 16–18 years (recommendation Category B).¶

MenB vaccine should either be administered as a 3-dose series of MenB-FHbp or a 2-dose series of MenB-4C. The two MenB vaccines are not interchangeable; the same vaccine product must be used for all doses. On the basis of available data and expert opinion, MenB-FHbp or MenB-4C may be administered concomitantly with other vaccines indicated for this age, but at a different anatomic site, if feasible.

No randomized controlled clinical trials have been conducted to evaluate use of MenB vaccines in pregnant or lactating women. Vaccination should be deferred in pregnant and lactating women unless the woman is at increased risk (*20*), and, after consultation with her health care provider, the benefits of vaccination are considered to outweigh the potential risks.

Additional information for health care providers and parents can be found on the CDC website at http://www.cdc.gov/meningococcal.

In February 2015, ACIP recommended routine use (recommendation Category A)** of MenB vaccines in certain groups of persons at increased risk for serogroup B meningococcal disease, including during outbreaks of serogroup B meningococcal disease (*20*). College campuses that have recently experienced an outbreak of serogroup B meningococcal disease should continue to follow the recommendations for use of MenB vaccines in outbreak settings that recommend vaccination for persons aged ≥10 years.

Precautions and Contraindications

Before administering MenB vaccines, health care providers should consult the package insert for precautions, warnings, and contraindications (*18*,*19*). Adverse events occurring after administration of any vaccine should be reported to the Vaccine Adverse Event Reporting System (VAERS). Reports can be submitted to VAERS online, by fax, or by mail. Additional information about VAERS is available by telephone (1-800-822-7967) or online (https://vaers.hhs.gov).

¶ Category B recommendations are made for individual clinical decision making.

** Category A recommendations are made for all persons in an age- or risk-factor-based group.

Acknowledgments

ACIP members (membership roster for July 2014–June 2015 available at http://www.cdc.gov/vaccines/acip); ACIP Meningococcal Vaccines Work Group.

[1]Meningitis and Vaccine Preventable Diseases Branch, Division of Bacterial Diseases, National Center for Immunization and Respiratory Diseases, CDC; [2]Advisory Committee on Immunization Practices Meningococcal Vaccines Work Group, Steven and Alexandra Cohen Children's Medical Center of New York, New Hyde Park, New York and Hofstra North Shore-LIJ School of Medicine, Hempstead, New York; [3]Epidemic Intelligence Service, CDC; [4]Division of Viral Diseases, National Center for Immunization and Respiratory Diseases, CDC.

Corresponding author: Jessica R. MacNeil, jmacneil@cdc.gov.

References

1. Accelerated approval of new drugs for serious or life-threatening illnesses, 21 C.F.R. Sect. 314.500 (2015). Available at http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=314&showFR=1&subpartNode=21:5.0.1.1.4.8.
2. Bhuyan P, Eiden J, Jones TR, et al. Immunogenicity of human papilloma vaccine coadministered with an investigational bivalent rLP2086 vaccine against meningococcal serogroup B in healthy adolescents. Philadelphia, PA: IDWeek; 2014. Available at http://ofid.oxfordjournals.org/content/1/suppl_1/S317.2.full?sid=25a2b12f-c211-4ecc-bb47-e6ceba7bb4a2.
3. Richmond PC, Marshall HS, Nissen MD, et al. Safety, immunogenicity, and tolerability of meningococcal serogroup B bivalent recombinant lipoprotein 2086 vaccine in healthy adolescents: a randomised, single-blind, placebo-controlled, phase 2 trial. Lancet Infect Dis 2012;12:597–607.
4. Vesikari T, Ostergaard L, Diez-Domingo J, et al. Meningococcal serogroup B bivalent rLP2086 vaccine elicits broad and robust serum bactericidal responses in healthy adolescents. J Pediatric Infect Dis Soc; 2015. Available at http://jpids.oxfordjournals.org/content/early/2015/08/03/jpids.piv039.full.
5. Vesikari T, Wysocki J, Kieninger D, et al. Immunogenicity, safety, and tolerability of bivalent rLP2086 meningococcal group B vaccine administered concomitantly with diphtheria, tetanus, acellular pertussis and inactivated poliomyelitis vaccine to healthy adolescents. In: Proceedings of the 32nd Annual Meeting of the European Society for Paediatric Infectious Diseases; May 6–16, 2014, Dublin, Ireland.
6. Block SL, Szenborn L, Daly W, et al. A comparative evaluation of two investigational meningococcal ABCWY vaccine formulations: Results of a phase 2 randomized, controlled trial. Vaccine 2015;33:2500–10.
7. Perrett KP, McVernon J, Richmond PC, et al. Immune responses to a recombinant, four-component, meningococcal serogroup B vaccine (4CMenB) in adolescents: a phase III, randomized, multicentre, lot-to-lot consistency study. Vaccine 2015;33:5217–24.
8. Read RC, Baxter D, Chadwick DR, et al. Effect of a quadrivalent meningococcal ACWY glycoconjugate or a serogroup B meningococcal vaccine on meningococcal carriage: an observer-blind, phase 3 randomised clinical trial. Lancet 2014;384:2123–31.
9. Santolaya ME, O'Ryan M, Valenzuela MT, et al. Persistence of antibodies in adolescents 18–24 months after immunization with one, two, or three doses of 4CMenB meningococcal serogroup B vaccine. Hum Vaccin Immunother 2013;9:2304–10.

10. Santolaya ME, O'Ryan ML, Valenzuela MT, et al. Immunogenicity and tolerability of a multicomponent meningococcal serogroup B (4CMenB) vaccine in healthy adolescents in Chile: a phase 2b/3 randomised, observer-blind, placebo-controlled study. Lancet 2012;379:617–24.
11. Advisory Committee on Immunization Practices (ACIP). Evidence-based recommendations—GRADE. Atlanta, GA: US Department of Health and Human Services, CDC; 2015. Available at http://www.cdc.gov/vaccines/acip/recs/GRADE/about-grade.html.
12. Advisory Committee on Immunization Practices (ACIP). GRADE evidence tables—recommendations in MMWR. Atlanta, GA: US Department of Health and Human Services, CDC; 2015. Available at http://www.cdc.gov/vaccines/acip/recs/GRADE/table-refs.html.
13. Food and Drug Administration. Approaches to licensure of meningococcal vaccines for prevention of serogroup B invasive meningococcal disease. Washington, DC: Food and Drug Administration; 2011. Available at http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/BloodVaccinesandOtherBiologics/VaccinesandRelatedBiologicalProductsAdvisoryCommittee/UCM248586.pdf.
14. Costa I, Pajon R, Granoff DM. Human factor H (FH) impairs protective meningococcal anti-FHbp antibody responses and the antibodies enhance FH binding. MBio 2014;5:e01625–14.
15. Granoff DM, Costa I, Konar M, Giuntini S, Van Rompay KK, Beernink PT. Binding of complement factor H (FH) decreases protective anti-FH binding protein antibody responses of infant rhesus macaques immunized with a meningococcal serogroup B vaccine. J Infect Dis 2015;212:784–92.
16. Food and Drug Administration. Trumenba Biologics license application. Washington, DC: Food and Drug Administration; 2014. Available at http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM424626.pdf.
17. Food and Drug Administration. Bexsero Biologics license application. Washington, DC: Food and Drug Administration; 2014. Available at http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM434714.pdf.
18. Food and Drug Administration. Trumenba US package insert. Washington, DC: Food and Drug Administration; 2014. Available at http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM421139.pdf.
19. Food and Drug Administration. Bexsero US package insert. Washington, DC: Food and Drug Administration; 2015. Available at http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM431447.pdf.
20. Folaranmi T, Rubin L, Martin SW, Patel M, MacNeil JR. Use of serogroup B meningococcal vaccines in persons aged ≥10 years at increased risk for serogroup B meningococcal disease: recommendations of the Advisory Committee on Immunization Practices, 2015. MMWR Morb Mortal Wkly Rep 2015;64:608–12.

Notes from the Field

Mycobacterium chelonae Eye Infections Associated with Humidifier Use in an Outpatient LASIK Clinic — Ohio, 2015

Chris Edens, PhD[1,2]; Lauren Liebich, MPH[3]; Alison Laufer Halpin, PhD[1]; Heather Moulton-Meissner, PhD[1]; Samantha Eitniear, MPH-VPH[3]; Eric Zgodzinski, MPH[3]; Larry Vasko, MPH[3]; David Grossman, MD[3]; Joseph F. Perz, DrPH[1]; Marika C. Mohr, MS[4]

Laser-assisted in situ keratomileusis (LASIK) eye surgery is increasingly common, with approximately 600,000 procedures performed each year in the United States (*1*). LASIK eye surgery is typically performed in an outpatient setting and involves the use of a machine-guided laser to reshape the lens of the eye to correct vision irregularities (*2*). Clinic A is an ambulatory surgery center that performs this procedure on 1 day each month. On February 5, 2015, the Toledo-Lucas County Health Department (TLCHD) in Ohio was notified of eye infections in two of the six patients who had undergone LASIK procedures at clinic A on January 9, 2015. The two patients experienced eye pain after the procedures and received diagnoses of infection with *Mycobacterium chelonae*, an environmental organism found in soil and water.

TLCHD staff visited clinic A on February 12, 2015, to review procedures associated with LASIK surgery and identify possible routes of transmission. None were immediately identified. Clinic A subsequently performed 18 LASIK procedures on February 13, 2015. Two of these 18 patients experienced eye pain in early March 2015 and were determined to have laboratory-confirmed *M. chelonae*. These infections were reported to TLCHD, which prompted clinic A to suspend all further LASIK procedures.

Discussions between CDC, TLCHD, and the Ohio Department of Public Health focused on opportunities for water contamination during the procedures. Although TLCHD staff reported that they did not observe obvious lapses in medication preparation or hand hygiene, they did note that clinic A used two humidifiers to maintain the 40%–50% relative humidity recommended by the manufacturer of the laser device used in the LASIK procedures (*3*). These cold air, reservoir style, retail humidifiers were filled with tap water and located in the operating room close to where patients were situated during the procedures. Both humidifiers contained an internal reservoir that held water during use. One of these devices used an ultrasonic nebulizer to produce a mist, whereas the other passed dry inlet air over a saturated wick. The misting humidifier had been purchased in December 2014, and the evaporative device had been in use for multiple years. CDC recommended collecting environmental samples throughout the operating room, including from the water reservoir and air output vents on each of the humidifiers.

Laboratory testing performed by CDC isolated *M. chelonae* from the water reservoir of the misting humidifier. Pulsed-field gel electrophoresis results indicated that three of the four patient isolates and the humidifier isolate were indistinguishable; the isolate from the fourth patient was closely related (>95% similarity). After this investigation, clinic A disposed of both humidifiers and upgraded its centralized air handling system to control both temperature and humidity in the operating room environment. No further cases have been reported after the resumption of LASIK procedures in June 2015.

This outbreak was likely caused by the use of a consumer-grade misting humidifier that had been contaminated with *M. chelonae*. Because of the high level of humidity recommended by the manufacturers of the lasers used in LASIK procedures, it is possible that additional LASIK clinics employ similar humidifier systems. Current American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers/American Society for Healthcare Engineering (ANSI/ASHRAE/ASHE) ventilation guidelines state that humidifiers should be located within air handling units or ductwork, and that steam humidification should be used (*4*). Additionally, current CDC environmental infection control guidance states that use of reservoir style humidifiers is not permitted in health care facilities (*5*,*6*). This outbreak highlights the potential risk associated with the use of misting humidifiers in health care settings, and the need for diligent adherence to published recommendations for patient care during all procedures performed in outpatient settings.

[1]Division of Healthcare Quality Promotion, National Center for Emerging and Zoonotic Infectious Diseases, CDC; [2]Epidemic Intelligence Service, CDC; [3]Toledo-Lucas County Department of Public Health, Ohio; [4]Ohio Department of Public Health.

Corresponding author: Chris Edens, wedens@cdc.gov, 404-639-0079.

References

1. Wang J, Chung JL, Schuele G, et al. Safety of cornea and iris in ocular surgery with 355-nm lasers. J Biomed Opt 2015;20:95005.
2. Maldonado MJ, Nieto JC, Piñero DP. Advances in technologies for laser-assisted in situ keratomileusis (LASIK) surgery. Expert Rev Med Devices 2008;5:209–29.
3. VISX I. VISX STAR S4 IR Excimer laser system directions for use. Santa Clara, CA: VISX, Incorporated; 2006.
4. American National Standards Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers/American Society for Healthcare Engineering (ANSI/ASHRAE/ASHE). ASHRAE Standard 170–2013, Ventilation of health care facilities. Atlanta, GA: ASHRAE; 2013.
5. Sehulster L, Chinn RY. Guidelines for environmental infection control in health-care facilities: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep 2003;52(No. RR-10).
6. American Institute of Architects Academy of Architecture for Health. Guidelines for design and construction of hospital and health care facilities, 2001. Washington, DC: American Institute of Architects Academy of Architecture for Health; 2001.

Announcements

World Stroke Day — October 29, 2015

On October 29, 2015, for World Stroke Day, the World Stroke Organization will continue its global campaign around women and stroke. More women than men die from stroke each year (*1*). Stroke is the second leading cause of death in persons aged greater than 60 years and the third leading cause of disability-adjusted life years (years of life lost because of disability or early death) worldwide (*2*,*3*). In the United States, more than 795,000 persons have a stroke each year and approximately 75,000 women die from stroke annually (*4*). Stroke is a primary cause of serious long-term disability (*1*). High blood pressure is the leading risk factor for stroke (*1*).

CDC is working to promote stroke awareness and prevention through efforts that include the Paul Coverdell National Acute Stroke Program (PCNASP), WISEWOMAN, and the Million Hearts initiative. The PCNASP funds nine states to measure, track, and improve the quality of stroke care.* The WISEWOMAN program provides screening for heart disease and stroke risk factors and lifestyle programs for low-income, uninsured, or underinsured women in 21 states and tribal organizations.† Million Hearts, which is co-led by CDC and the Centers for Medicare and Medicaid Services, aims to prevent 1 million heart attacks and strokes by 2017.§

CDC recommends that everyone know the signs and symptoms of stroke and call 9-1-1 immediately if they or someone else might be having a stroke. Access to fast treatment is vital. Engaging in healthy lifestyle behaviors such as exercising, consuming more fruits and vegetables and less sodium, and avoiding smoking might reduce the risk for experiencing a stroke. Also, regularly checking and controlling blood pressure can reduce the risk for stroke.

Additional information on World Stroke Day is available at http://www.worldstrokecampaign.org/get-involved/world-stroke-day-2015.html. Additional information regarding CDC's efforts to address stroke is available at http://www.cdc.gov/stroke/cdc_addresses.htm.

References

1. Go AS, Mozaffarian D, Roger VL, et al. Executive summary: heart disease and stroke statistics—2014 update: a report from the American Heart Association. Circulation 2014;129:399–410.
2. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012;380:2095–128.
3. Murray CJ, Vos T, Lozano R, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012;380:2197–223.
4. CDC. Prevalence of stroke—United States, 2006–2010. MMWR Morb Mortal Wkly Rep 2012;61:379–82.

* Additional information available at http://www.cdc.gov/dhdsp/programs/stroke_registry.htm.
† Additional information available at http://www.cdc.gov/wisewoman.
§ Additional information available at http://millionhearts.hhs.gov.

Announcements

World Polio Day — October 24, 2015

October 24 is World Polio Day, which recognizes the global progress made against a disease that at its height crippled over 100 children per week and now has been reduced to fewer than 100 cases per year. World Polio Day serves as a reaffirmation of the global commitment to eradicate this childhood disease.

The concerted effort of the Global Polio Eradication Initiative partners, including Rotary International, the World Health Organization, the United Nations Children's Fund, CDC, and the Bill and Melinda Gates Foundation, as well as polio vaccinators and public health workers in the field, has resulted in the World Health Organization announcing the removal of Nigeria from the list of polio-endemic countries in 2015, after a year without a reported wild poliovirus case in that country. Pakistan and Afghanistan are the only remaining polio-endemic countries, with a total of 51 cases reported between them this year as of October 14.

Recommendation Regarding Cardiovascular Disease Prevention and Control from the Community Preventive Services Task Force

The Community Preventive Services Task Force recently posted new information about two recommendations: 1) "Self-Measured Blood Pressure Monitoring Interventions for Improved Blood Pressure Control — When Used Alone," available at http://www.thecommunityguide.org/cvd/SMBP-alone.html, and 2) "Self-Measured Blood Pressure Monitoring Interventions for Improved Blood Pressure Control — When Combined with Additional Support," available at http://www.thecommunityguide.org/cvd/SMBP-additional.html.

Established in 1996 by the U.S. Department of Health and Human Services, the task force is an independent, nonfederal, uncompensated panel of public health and prevention experts whose members are appointed by the Director of CDC. The task force provides information for a wide range of decision makers on programs, services, and policies aimed at improving population health. Although CDC provides administrative, research, and technical support for the task force, the recommendations developed are those of the task force and do not undergo review or approval by CDC.

Errata

Vol. 64, No. 17

In the report, "Possible Sexual Transmission of Ebola Virus — Liberia, 2015," an author's name was misspelled. The author names should have read as follows: "Athalia Christie, MIA[1], Gloria J. Davies-Wayne, MPH[2], **Thierry Cordier-Lassalle, DESS[2]**, David J. Blackley, DrPH[1], A. Scott Laney, PhD[1], Desmond E. Williams, MD, PhD[1], Shivam A. Shinde, MBBS[2], Moses Badio, MSc[3], Terrence Lo, DrPH[1], Suzanne E. Mate, PhD[4], Jason T. Ladner, PhD[4], Michael R. Wiley, PhD[4], Jeffrey R. Kugelman, PhD[4], Gustavo Palacios, PhD[4], Michael R. Holbrook, PhD[5], Krisztina B. Janosko, MS[5], Emmie de Wit, PhD[5], Neeltje van Doremalen, PhD[5], Vincent J. Munster, PhD[5], James Pettitt, MS[5], Randal J. Schoepp, PhD[4], Leen Verhenne, MD[6], Iro Evlampidou, MD[6], Karsor K Kollie, MPH[3], Sonpon B. Sieh[3], Alex Gasasira, MBChB[2], Fatorma Bolay, PhD[7], Francis N. Kateh, MD[3], Tolbert G. Nyenswah, MPH[3], Kevin M. De Cock, MD[1]"

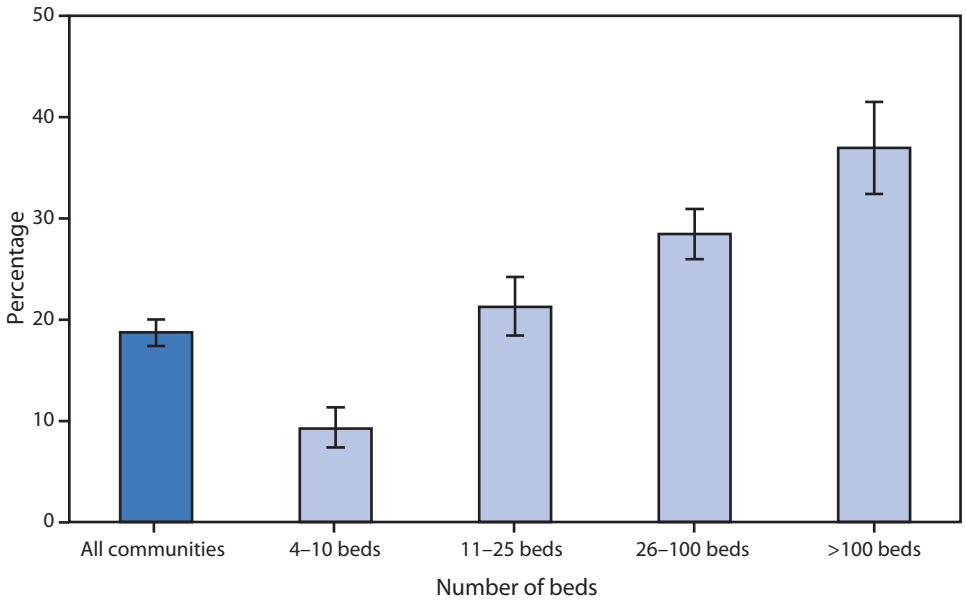
Vol. 64, No. 18

In the report, "Controlling the Last Known Cluster of Ebola Virus Disease — Liberia, January–February 2015," an author's name was misspelled. The author names should have read as follows: "Tolbert Nyenswah[1], Mosoka Fallah[1], Sonpon Sieh[1], Karsor Kollie[1], Moses Badio[1], Alvin Gray[1], Priscilla Dilah[1], Marnijina Shannon[1], Stanley Duwor[1], Chikwe Ihekweazu[2], **Thierry Cordier-Lassalle**[2], Shivam A. Shinde[2], Esther Hamblion[2], Gloria Davies-Wayne[2], Murugan Ratnesh[2], Christopher Dye[2], Jonathan S. Yoder[3], Peter McElroy[3], Brooke Hoots[3], Athalia Christie[3], John Vertefeuille[3], Sonja J. Olsen[3], A. Scott Laney[3], Joyce J. Neal[3], Thomas R. Navin[3], Stewart Coulter[3], Paran Pordell[3], Terrence Lo[3], Carl Kinkade[3], Frank Mahoney[3] (Author affiliations at end of text)"

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage of Residential Care Communities* Using Electronic Health Records,†§ by Number of Beds — National Study of Long-Term Care Providers, United States, 2014



* Residential care communities refer to assisted living and similar residential places (e.g., personal care homes, board and care homes, homes for the aged, and housing with service establishments). Nursing homes and those with missing data were excluded.
† Respondents were asked, "An electronic health record is a computerized version of the resident's health and personal information used in the management of the resident's health care. Other than for accounting or billing purposes, does this residential care community use electronic health records?"
§ With 95% confidence intervals.

In 2014, 19% of residential care communities used electronic health records (EHRs). The larger communities were more likely to use EHRs. The percentage of communities with >100 beds using EHRs (37%) was four times the percentage of communities with four to 10 beds (9%).

Source: National Study of Long-Term Care Providers, 2014. Available at http://www.cdc.gov/nchs/nsltcp.htm.

Reported by: Eunice Park-Lee, PhD, hta8@cdc.gov, 301-458-4506; Vincent Rome, MPH; Christine Caffrey, PhD; Lauren Harris-Kojetin, PhD.

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format. To receive an electronic copy each week, visit *MMWR*'s free subscription page at *http://www.cdc.gov/mmwr/mmwrsubscribe.html*. Paper copy subscriptions are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone 202-512-1800.

Readers who have difficulty accessing this PDF file may access the HTML file at *http://www.cdc.gov/mmwr/index2015.html*. Address all inquiries about the *MMWR* Series, including material to be considered for publication, to Executive Editor, *MMWR* Series, Mailstop E-90, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30329-4027 or to mmwrq@cdc.gov.

ISSN: 0149-2195 (Print)