

Interim Guidance: Preexposure Prophylaxis for the Prevention of HIV Infection in Men Who Have Sex with Men

An estimated 56,000 human immunodeficiency virus (HIV) infections occur each year in the United States (1). Men who have sex with men (MSM) account for 53% of the estimated incident infections, and surveillance data suggest that the annual number of new HIV infections among MSM has been rising since the mid-1990s (1). Strategies for reducing acquisition of HIV infection by MSM have included 1) expanded HIV testing so that infected persons can be treated and their risk for transmitting infection minimized; 2) individual, small-group, and community-level behavioral interventions to reduce risk behaviors (2); 3) promotion of condom use; 4) detection and treatment of sexually transmitted infections (3); and 5) mental health and substance abuse counseling when needed. On November 23, 2010, investigators for the Pre-Exposure Prophylaxis Initiative (iPrEX) study announced results from a multinational, randomized, double-blind, placebo-controlled, phase III clinical trial of daily oral antiretrovirals (tenofovir disoproxil fumarate [TDF] and emtricitabine [FTC]) to prevent acquisition of HIV infection among uninfected but exposed MSM (4). This report provides interim guidance to health-care providers based on the reported results of that trial, which indicated that TDF plus FTC taken orally once a day as preexposure prophylaxis (PrEP) is safe and partially effective in reducing HIV acquisition among MSM when provided with regular monitoring of HIV status and ongoing risk-reduction and PrEP medication adherence counseling.

The iPrEX study was conducted in Peru, Ecuador, Brazil, Thailand, South Africa, and the United States. Eligible participants were consenting HIV-uninfected men and male-to-female transgender adults (aged ≥ 18 years) who reported sex with a man and reported engaging in high-risk sexual behaviors during the preceding 6 months, and had no clinical contraindication to taking a combined formulation of 300 mg TDF and 200 mg FTC (TDF/FTC).*

* Marketed under the brand name Truvada (Gilead Sciences, Inc., Foster City, California).

Enrolled participants were randomized to receive either daily doses of TDF/FTC or a placebo pill. Participants were seen every 4 weeks for an interview, HIV testing, risk-reduction and PrEP medication adherence counseling, pill count, and dispensing of pills and condoms. Every 3 months, participants received physical examinations with collection of blood and urine samples for evaluation of renal and liver function, and were tested for sexually transmitted infections and treated as needed. Positive HIV rapid tests were confirmed by Western blot. The cohort was followed for an average 1.2 years with a maximum of 2.8 years. Participants were tested for hepatitis B infection at enrollment, and those found to be susceptible to hepatitis B infection were offered vaccination; 94% accepted.

Based on analysis of data from visits through May 1, 2010, for 2,499 enrolled participants (including 29 male-to-female transgender persons) in the modified “intent to treat” analysis (excluding 10 participants found to be HIV-infected at enrollment and 48 who did not have an HIV test after enrollment), 36 of 1,224 participants in the PrEP arm and 64 of 1,217 participants in the placebo arm who were followed for acquisition of HIV infection. Enrollment in the PrEP arm was associated with a 44% reduction in HIV acquisition (95% confidence interval [CI] = 15%–63%). The reduction was greater in the “as treated” analysis; participants at visits with $\geq 50\%$ adherence by

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self-report and pill count/dispensing had a 50% reduction in HIV acquisition (CI = 18%–70%). Reduction in risk for HIV acquisition was 21% among participants at visits with <90% adherence (CI = -31%–52%) and 73% at visits with ≥90% adherence (CI = 41%–88%). Among those randomly assigned to the TDF/FTC arm, drug level testing was performed for all HIV seroconverters and a matched subset of participants who remained uninfected; a 92% reduction in risk for HIV acquisition (CI = 40%–99%) was found in participants with detectable levels of TDF/FTC versus those with no drug detected. TDF/FTC generally was well tolerated, although nausea in the first month was more common among those taking medication than among those on placebo (9% versus 5%). No differences in severe (grade 3) or life-threatening (grade 4) laboratory abnormalities were observed between the active and placebo arms, and no drug-resistant virus was found in the 100 participants infected after enrollment. Among 10 participants who were seronegative at enrollment but later found to have been infected before enrollment, two cases of FTC resistance occurred in the active arm, and one occurred in the placebo arm. Participants in both arms reported lower total numbers of sex partners with whom the participants had receptive anal intercourse and higher percentages of partners who used condoms than reported at baseline.

What is already known on this topic?

HIV infections are increasing among men who have sex with men (MSM) in the United States despite awareness of HIV/AIDS and the protective effect of consistent condom use. A recent international study indicated that HIV infection among MSM can be reduced by daily preexposure prophylaxis (PrEP) with a well-tolerated combination of specific antiviral medications.

What is added by this report?

This report provides interim guidance for health-care providers in the United States based on results of the only large clinical trial testing the efficacy and safety of PrEP for reducing HIV acquisition by MSM.

What are the implications for public health practice?

For MSM whose behaviors place them at high risk for HIV infection and who do not use other effective prevention methods consistently, PrEP might reduce their risk for HIV infection. Until comprehensive U.S. Public Health Service guidelines are available, CDC is providing interim guidance to help guide clinical practice.

Reported by

DK Smith, MD, RM Grant, MD, PJ Weidle, PharmD, A Lansky, PhD, J Mermin, MD, KA Fenton, MD, PhD, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, CDC.

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Editorial Note

This clinical trial demonstrated the safety and efficacy of daily TDF/FTC, in conjunction with behavioral interventions, in reducing sexual HIV acquisition in a multinational population of MSM exposed to HIV through high-risk sex (4). A recent safety study of PrEP with TDF among 400 MSM in the United States also revealed few safety concerns (5). As a component of a comprehensive HIV prevention intervention, PrEP showed a significant added benefit, although effectiveness was highly dependent on medication adherence.

The findings in this report are subject to at least five limitations. First, the trial was not large enough to evaluate efficacy in each of the sites, and the majority of the participants were in South America; only 10% were in the United States, making it impossible to determine effects on incidence in the United States trial sites specifically. Second, the assessment of adherence by drug-level testing was not performed for all trial participants and was performed for seroconverters at the first clinical visit in which infection was diagnosed; therefore, the findings might not reflect drug levels at the time of infection. Third, the study does not provide information about long-term health effects of TDF/FTC in HIV-uninfected men or men who became HIV-infected while on PrEP medications. Fourth, results of drug-level testing showed that adherence measures in the trial might overstate levels of actual adherence; many of those with high levels of adherence to the daily regimen by self-report, pill count, and bottles dispensed had low levels or no drug measured in their blood (4). Finally, sexual risk behavior and adherence to PrEP medications among MSM taking TDF/FTC for PrEP outside of a trial setting, and with awareness of trial results, might be different from what was observed for men in the iPrEx trial.

Based on the results of this study, CDC and other U.S. Public Health Service (PHS) agencies have begun to develop PHS guidelines on the use of PrEP for MSM at high risk for HIV acquisition in the United States as part of a comprehensive set of HIV prevention services. Completing the guidelines and obtaining expert input and public comment will take several months before they can be published. Concerns exist that without early guidance, various unsafe and potentially less effective PrEP-related practices could develop among health-care providers and MSM beginning to use PrEP in the coming weeks and months. These concerns include 1) use of other antiretrovirals than those so far proven safe for uninfected persons (e.g., more than two drugs or protease inhibitors); 2) use of dosing schedules of unproven efficacy (e.g., “intermittent” dosing just before and/or after sex); 3) not screening for acute infection before beginning PrEP or long intervals without retesting for HIV infection; and 4) providing prescriptions

without other HIV prevention support (e.g., condom access and risk-reduction counseling). Until the more detailed PHS guidelines are available, CDC is providing interim recommendations to help guide clinical practice (3,6–9) (Box).

Until the safety and efficacy of PrEP is determined in trials now under way with populations at high risk for HIV acquisition by other routes of transmission (10), PrEP should be considered only for MSM. The iPrEX trial results provide strong evidence that support for adherence to the prescribed medication regimen must be a routine component of any PrEP program. To minimize the risk for drug resistance, PrEP should not be started in persons with signs or symptoms of acute viral infection unless HIV-uninfected status is confirmed by HIV RNA testing or a repeat antibody test performed after the viral syndrome resolves (6). When evaluating MSM for the prescription of PrEP medications, it is important to establish whether other effective risk-reduction measures (e.g., condom use) are not being used consistently and to ascertain that the risk for HIV acquisition is high (e.g., frequent partner change or concurrent partners in a geographic setting with high HIV prevalence) because these patients might benefit most from the addition of PrEP to their HIV prevention regimen. Health-care providers and patients should be aware that HIV prevention is not a labeled indication for the use of Truvada[†] and that its long-term safety in HIV-uninfected persons is not yet known. Health-care providers should report any serious adverse events resulting from prescribed TDF/FTC for PrEP to the Food and Drug Administration’s MedWatch.[§] In addition, because the medication is costly, ensuring that patients understand the financial implications of starting PrEP is critical.

PrEP has the potential to contribute to effective and safe HIV prevention for MSM if 1) it is targeted to MSM at high risk for HIV acquisition; 2) it is delivered as part of a comprehensive set of prevention services, including risk-reduction and PrEP medication adherence counseling, ready access to condoms, and diagnosis and treatment of sexually transmitted infections; and 3) it is accompanied by monitoring of HIV status, side effects, adherence, and risk behaviors at regular intervals.

[†] These recommendations do not reflect current Food and Drug Administration–approved labeling for TDF/FTC.

[§] Available at <http://www.fda.gov/safety/medwatch>.

References

1. Hall HI, Song RG, Rhodes P, et al. Estimation of HIV incidence in the United States. *JAMA* 2008;300:520–9.
2. CDC. Diffusion of Effective Behavioral Interventions. Atlanta, GA: US Department of Health and Human Services, CDC; 2010. Available at <http://www.effectiveinterventions.org/en/home.aspx>. Accessed January 20, 2011.

BOX. CDC interim guidance for health-care providers electing to provide preexposure prophylaxis (PrEP) for the prevention of HIV infection in adult men who have sex with men and who are at high risk for sexual acquisition of HIV**Before initiating PrEP***Determine eligibility*

- Document negative HIV antibody test(s) immediately before starting PrEP medication.
- Test for acute HIV infection if patient has symptoms consistent with acute HIV infection.
- Confirm that patient is at substantial, ongoing, high risk for acquiring HIV infection.
- Confirm that calculated creatinine clearance is ≥ 60 mL per minute (via Cockcroft-Gault formula).

Other recommended actions

- Screen for hepatitis B infection; vaccinate against hepatitis B if susceptible, or treat if active infection exists, regardless of decision about prescribing PrEP.
- Screen and treat as needed for STIs.

Beginning PrEP medication regimen

- Prescribe 1 tablet of Truvada* (TDF [300 mg] plus FTC [200 mg]) daily.
- In general, prescribe no more than a 90-day supply, renewable only after HIV testing confirms that patient remains HIV-uninfected.
- If active hepatitis B infection is diagnosed, consider using TDF/FTC for both treatment of active hepatitis B infection and HIV prevention.
- Provide risk-reduction and PrEP medication adherence counseling and condoms.

Follow-up while PrEP medication is being taken

- Every 2–3 months, perform an HIV antibody test; document negative result.
- Evaluate and support PrEP medication adherence at each follow-up visit, more often if inconsistent adherence is identified.
- Every 2–3 months, assess risk behaviors and provide risk-reduction counseling and condoms. Assess STI symptoms and, if present, test and treat for STI as needed.
- Every 6 months, test for STI even if patient is asymptomatic, and treat as needed.
- 3 months after initiation, then yearly while on PrEP medication, check blood urea nitrogen and serum creatinine.

On discontinuing PrEP (at patient request, for safety concerns, or if HIV infection is acquired)

- Perform HIV test(s) to confirm whether HIV infection has occurred.
- If HIV positive, order and document results of resistance testing and establish linkage to HIV care.
- If HIV negative, establish linkage to risk-reduction support services as indicated.
- If active hepatitis B is diagnosed at initiation of PrEP, consider appropriate medication for continued treatment of hepatitis B.

Abbreviations: HIV = human immunodeficiency virus; STI = sexually transmitted infection; TDF = tenofovir disoproxil fumarate; FTC = emtricitabine.

Sources: CDC. Sexually transmitted diseases treatment guidelines, 2010. MMWR 2010;59(No. RR-12).

Schacker T, Collier AC, Hughes J, Shea T, Corey L. Clinical and epidemiologic features of primary HIV infection. *Ann Intern Med* 1996;125:257–64.

CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP) part II: immunization of adults. MMWR 2006;55(No. RR-16).

Food and Drug Administration. Truvada: highlights of prescribing information (package insert). Available at http://www.accessdata.fda.gov/drugsatfda_docs/label/2008/021752s0171bl.pdf. Accessed January 20, 2011.

Liaw YF, Chu CM. Hepatitis B virus infection. *Lancet* 2009;373:582–92.

*These recommendations do not reflect current Food and Drug Administration–approved labeling for TDF/FTC.

3. CDC. Sexually transmitted diseases treatment guidelines, 2010. MMWR 2010;59(No. RR-12).

4. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med* 2010;363:2587–99.

5. Grohskopf L, Gvetadze R, Pathak S, et al. Preliminary analysis of biomedical data from the phase II clinical safety trial of tenofovir disoproxil fumarate (TDF) for HIV-1 pre-exposure prophylaxis (PrEP) among U.S. men who have sex with men (MSM). Presented at the 18th International AIDS Conference, Vienna, Austria, July 2010.

6. Schacker T, Collier AC, Hughes J, Shea T, Corey L. Clinical and epidemiologic features of primary HIV infection. *Ann Intern Med* 1996;125:257–64.

7. CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP) part II: immunization of adults. MMWR 2006;55(No. RR-16).

8. Food and Drug Administration. Truvada: highlights of prescribing information (package insert). Available at http://www.accessdata.fda.gov/drugsatfda_docs/label/2008/021752s0171bl.pdf. Accessed January 20, 2011.

9. Liaw YF, Chu CM. Hepatitis B virus infection. *Lancet* 2009;373:582–92.

10. AIDS Vaccine Advocacy Coalition. Global advocacy for HIV prevention. Ongoing PrEP trials. Available at <http://www.avac.org/ht/d/sp/i/3507/pid/3507>. Accessed January 20, 2011.

Lead Poisoning of a Child Associated with Use of a Cambodian Amulet — New York City, 2009

Lead poisoning in children is a preventable public health problem that can adversely affect the developing nervous system and result in learning and behavior problems. The most common source of exposure for lead-poisoned children aged <6 years in the United States is lead-based paint. However, nonpaint sources have been identified increasingly as the cause of lead poisoning, particularly in immigrant communities. This report describes a case of lead poisoning in a child aged 1 year that was investigated by the New York City Department of Health and Mental Hygiene's (NYC DOHMH) Lead Poisoning Prevention Program in 2009. The likely source of exposure was an amulet made in Cambodia with leaded beads that was worn by the child. Health-care providers and public health workers should consider traditional customs when seeking sources of lead exposure in Southeast Asian populations. Health-care providers should ask parents about their use of amulets, especially those in Southeast Asian families and those with children found to have elevated blood lead levels (BLLs). Educational efforts are needed to inform Southeast Asian immigrants that amulets can be a source of lead poisoning.

Restrictions in the use of lead in paint and gasoline have reduced the amount of environmental lead, resulting in a 98% decline in the number of children with BLLs ≥ 10 $\mu\text{g}/\text{dL}$ from 1976 to 2004. The geometric mean BLL of children aged 1–5 years declined from 14.9 $\mu\text{g}/\text{dL}$ in the late 1970s to 1.9 $\mu\text{g}/\text{dL}$ in 2004 (1,2). Despite this improvement, some children remain at greater risk for lead poisoning: black children, children aged 1–5 years (especially children aged 1–2 years because of hand-to-mouth activity typical for this age group), children living in older deteriorated housing, and children living in poverty (2). In New York City, Asian children also have been noted to be at risk for lead poisoning (3).

The most common source of lead poisoning for young children is lead-based paint; however, nonpaint sources of lead are being identified increasingly in lead poisoning cases (4). Children with immigrant backgrounds might be at increased risk through exposure to lead-containing products from their family's country of origin. In New York City in 2007, among children with BLLs ≥ 15 $\mu\text{g}/\text{dL}$, 38% of foreign-born children did not have a lead paint hazard in the home compared with 21% of U.S.-born children ($p < 0.05$) (3). Nonpaint lead risk factors include recent travel to a foreign country and use of imported products such as spices, food, candy, cosmetics, health remedies, ceramics or pottery, and jewelry.

Case Report

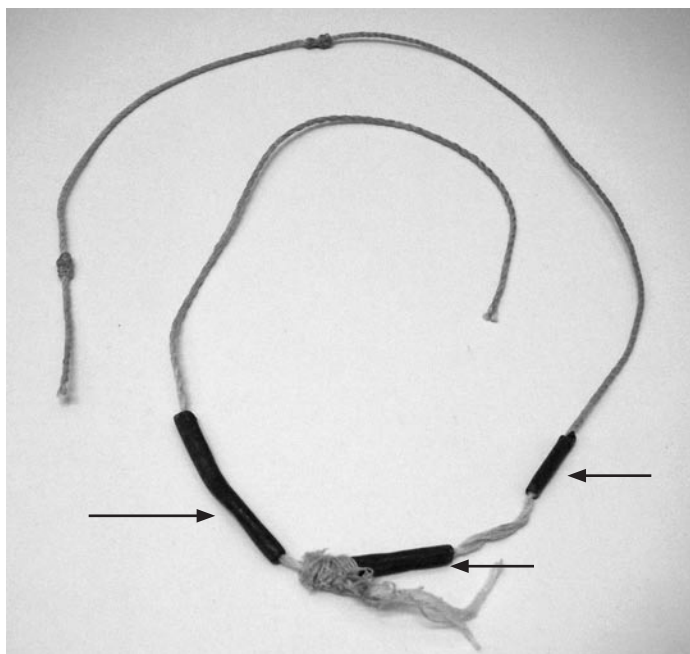
In March 2009, routine lead testing of a healthy, nonanemic boy aged 1 year who was born in the United States to Cambodian-born parents showed an elevated BLL of 10 $\mu\text{g}/\text{dL}$. Because the toddler shared a household with a cousin who had lead poisoning, he also had been tested at age 6 months, and was found to have a BLL of 1 $\mu\text{g}/\text{dL}$ at that time. During the first home interview and inspection after the elevated BLL, the child's home and routine activities were evaluated by a risk assessor certified by the Environmental Protection Agency. The boy's father denied use of imported products, and no paint or nonpaint lead sources were identified. Out of 29 X-ray fluorescence (XRF) readings of painted areas obtained during the inspection, none were above U.S. Housing and Urban Development guidelines of 1 mg/cm^2 of lead (5).

Three months later, the child's BLL increased to 20 $\mu\text{g}/\text{dL}$. In a telephone interview before a second home inspection, the boy's father again denied that the child wore jewelry or charms, but when questioned more closely, he said that the toddler wore an amulet or "something to protect him." The amulet, acquired by the boy's mother in a rural Cambodian market, was a knotted string onto which gray metallic beads had been molded (Figure). The father reported that the boy had worn the amulet around his neck since age 3 months and had been observed mouthing it.

The second home inspection revealed one positive XRF reading of 2.2 mg/cm^2 on an interior window sill and several potential nonpaint lead sources: two imported spices, imported rice, and the amulet. All four nonpaint samples were sent to a laboratory for acid-digestion testing. The lead contents of the food items were below the limits of detection used, which were 0.94 mg/kg and 0.95 mg/kg for the spices and 0.49 mg/kg for the rice. The amulet's metal beads had a total lead content of 450,000 mg/kg (45%).

Within 8 days of the amulet being removed from the home, the child's BLL had decreased from 20 $\mu\text{g}/\text{dL}$ to 14 $\mu\text{g}/\text{dL}$. Six weeks after the amulet was removed, and 2 days after the lead paint violation was reported as abated, the child's BLL was 10 $\mu\text{g}/\text{dL}$. Five months after the amulet was removed, the boy's BLL was down to 5 $\mu\text{g}/\text{dL}$. Although other factors might have contributed to the child's overall lead burden, the most likely source identified was the amulet, based on its high lead content, statements that the child had been observed mouthing it, and the rapid decrease in the child's BLL after its removal.

FIGURE. Amulet with leaded beads (indicated by arrows) made in Cambodia similar to the one worn by a lead-poisoned child — New York City, 2009.



Photo/New York City Department of Health and Mental Hygiene

The toddler's cousin, aged 6 years, who was living in the same home, had lead poisoning diagnosed in September 2008. His BLL had been 17 $\mu\text{g}/\text{dL}$. Fifty-eight violations for lead had been repaired in the home, and during the next 8 months the boy had BLLs of 11–15 $\mu\text{g}/\text{dL}$. He also had worn a Cambodian amulet, and 3 months after he stopped wearing his amulet, his BLL was 7 $\mu\text{g}/\text{dL}$. The toddler's sister, aged 10 years, was tested and had a BLL of 4 $\mu\text{g}/\text{dL}$. Although she also wore an amulet, she presumably was old enough not to mouth it.

Reported by

M Mann, MD, MN Rublowska, JE Ehrlich, MD, Lead Poisoning Prevention Program, New York City Dept of Health and Mental Hygiene, New York. MS Sucusky, MPH, CM Kennedy, DrPH, Healthy Homes and Lead Poisoning Prevention Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC.

Editorial Note

Wearing amulets is common among Cambodians and other ethnic groups in Southeast Asia, including Vietnamese, Hmong, and Lao populations. Typically, infants and toddlers wear these “protection strings” around their necks, wrists, or waists (6). The amulets usually are made of black or white string with several knots, metal beads, or both. The knots and beads

What is already known on this topic?

Although the most common source of lead poisoning for young children is lead-based paint, nonpaint sources of lead are being identified increasingly in lead poisoning cases, particularly in immigrant communities.

What is added by this report?

This report describes a case of pediatric lead poisoning that likely resulted from wearing an amulet made in Cambodia with leaded beads, a newly identified lead risk factor for the Southeast Asian community.

What are the implications for public health practice?

Educational efforts are needed to inform Southeast Asian immigrants that amulets can be a potential source of lead poisoning. Health-care providers should ask parents about use of amulets, especially Southeast Asian families and those with children found to have elevated blood lead levels.

are believed by some to be infused with protective powers. In this case, the mother of the toddler reported that on her most recent trip to Cambodia, she had three amulets custom-made (“cooked in a pot”) for the children in her family. Anecdotal information suggests that lead bullets sometimes are melted to make the beads for such amulets.

This case identified a lead risk factor not previously recognized for the Southeast Asian community. In addition, this case highlights the importance of blood lead testing in children of immigrants because of the increased risk for exposure to lead-containing foreign products. CDC recommends blood lead testing for internationally adopted and refugee children.* NYC DOHMH recommends testing all children with recent travel to foreign countries.

This case also adds to the medical literature of nonpaint lead sources as causes of lead poisoning. Some incidents of lead poisoning in children from atypical sources have been documented previously (4,7), and two cases of jewelry-associated lead poisonings in children have been reported recently. In 2004, a boy aged 4 years from Oregon had a BLL of 123 $\mu\text{g}/\text{dL}$ after ingesting a necklace with a 38.8% lead content that had come from a vending machine (8). In 2006, another boy aged 4 years from Minnesota died from acute lead poisoning after ingesting a heart-shaped metallic charm containing 99.1% lead (9). These two cases led to the recall of 150 million pieces of imported metallic toy jewelry sold in vending machines and a voluntary recall of 300,000 heart-shaped charm bracelets, respectively. These cases also call attention to ingestion of jewelry as a mechanism for lead poisoning.

Educational efforts are needed to inform Southeast Asian immigrants that amulets can be sources of lead poisoning for

* Guidelines available at <http://www.cdc.gov/nceh/lead/tips/populations.htm>.

children. Health-care providers and public health workers should ask about this custom when seeking a source of exposure in Southeast Asians with elevated BLLs. Targeted educational efforts in Southeast Asian communities also should be considered. This case also underscores the importance of being aware of different cultural practices, such as wearing amulets, and highlights the need to assess and reassess the same risk factors and rephrasing questions using different words when communicating with immigrant families.

References

1. CDC. Children's blood lead levels in the United States. Atlanta, GA: US Department of Health and Human Services, CDC; 2007. Available at <http://web.archive.org/web/20080526204553/http://www.cdc.gov/nceh/lead/research/kidsBLL.htm>. Accessed January 14, 2010.
2. Jones RL, Homa DM, Meyer PA, et al. Trends in blood lead levels and blood lead testing among US children aged 1 to 5 years, 1988–2004. *Pediatrics* 2009;123:e376–85.
3. New York City Department of Health and Mental Hygiene. Preventing lead poisoning in New York City annual report 2007. New York, NY: New York City Department of Health and Mental Hygiene; 2009. Available at <http://www.nyc.gov/html/doh/downloads/pdf/lead/lead-2007report.pdf>. Accessed January 25, 2011.
4. Gorospe EC, Gerstenberger SL. Atypical sources of childhood lead poisoning in the United States: a systematic review from 1966–2006. *Clin Toxicol (Phila)* 2008;46:728–37.
5. US Department of Housing and Urban Development. Lead-based paint inspections [Chapter 7]. In: HUD guidelines for the evaluation and control of lead-based paint hazards in housing. Washington, DC: US Department of Housing and Urban Development; 1995.
6. Kemp C. Cambodian refugee health care beliefs and practices. *J Community Health Nurs* 1985;2:41–52.
7. CDC. Childhood lead poisoning associated with tamarind candy and folk remedies—California, 1999–2000. *MMWR* 2002;51:684–6.
8. CDC. Lead poisoning from ingestion of a toy necklace—Oregon, 2003. *MMWR* 2004;53:509–11.
9. CDC. Death of a child after ingestion of a metallic charm—Minnesota, 2006. *MMWR* 2006;55:340–1.

Updated Recommendations for Use of Meningococcal Conjugate Vaccines — Advisory Committee on Immunization Practices (ACIP), 2010

On October 27, 2010, the Advisory Committee on Immunization Practices (ACIP) approved updated recommendations for the use of quadrivalent (serogroups A, C, Y, and W-135) meningococcal conjugate vaccines (Menveo, Novartis; and Menactra, Sanofi Pasteur) in adolescents and persons at high risk for meningococcal disease. These recommendations supplement the previous ACIP recommendations for meningococcal vaccination (1,2). The Meningococcal Vaccines Work Group of ACIP reviewed available data on immunogenicity in high-risk groups, bactericidal antibody persistence after immunization, current epidemiology, vaccine effectiveness (VE), and cost-effectiveness of different strategies for vaccination of adolescents. The Work Group then presented policy options for consideration by the full ACIP. This report summarizes two new recommendations approved by ACIP: 1) routine vaccination of adolescents, preferably at age 11 or 12 years, with a booster dose at age 16 years and 2) a 2-dose primary series administered 2 months apart for persons aged 2 through 54 years with persistent complement component deficiency (e.g., C5–C9, properidin, factor H, or factor D) and functional or anatomic asplenia, and for adolescents with human immunodeficiency virus (HIV) infection. CDC guidance for vaccine providers regarding these updated recommendations also is included.

Rationale for Adding a Booster Dose to the Adolescent Schedule

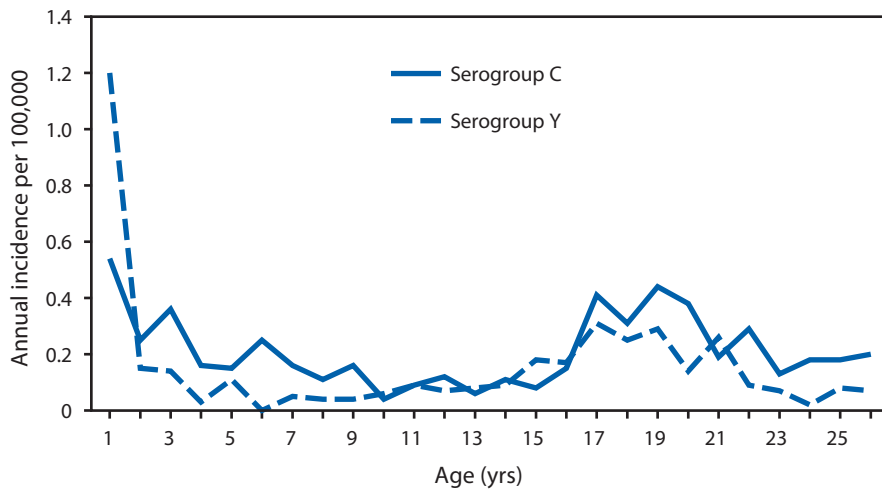
The goal of the 2005 ACIP meningococcal immunization recommendations was to protect persons aged 16 through 21 years, when meningococcal disease rates peak. At that time, vaccination was recommended at age 11 or 12 years rather than at age 14 or 15 years because 1) more persons have preventive-care visits at age 11 or 12 years, 2) adding this vaccine at the 11 or 12 year-old visit would strengthen the pre-adolescent vaccination platform, and 3) the vaccine was expected to protect adolescents through the entire period of increased risk. Meningococcal conjugate vaccines were licensed in 2005 based on immunogenicity (because a surrogate of protection had been defined) and safety data. After licensure, additional data on bactericidal antibody persistence, trends in meningococcal disease epidemiology in the United States, and VE have indicated many adolescents might not be protected for more than 5 years. Therefore, persons immunized at age 11 or 12 years might have decreased protective immunity by ages 16 through 21 years, when their risk for disease is greatest.

Meningococcal disease incidence has decreased since 2000, and incidence for serogroups C and Y, which represent the majority of cases of vaccine-preventable meningococcal disease, are at historic lows. However, the peak in disease among persons aged 18 years (Figure) has persisted, even after routine vaccination was recommended in 2005. In the 2009 National Immunization Survey-Teen, 53.6% of adolescents aged 13 through 17 years had received a dose of meningococcal vaccine (3). From 2000–2004 to 2005–2009, the estimated annual number of cases of serogroups C and Y meningococcal disease decreased 74% among persons aged 11 through 14 years but only 27% among persons aged 15 through 18 years. Cases of meningococcal disease caused by serogroups C and Y among persons who were vaccinated with meningococcal conjugate vaccine have been reported. An early VE analysis that modeled expected cases of disease in vaccinated persons estimated a VE of 80%–85% up to 3 years after vaccination (4). In 2010, CDC received 12 reports of serogroup C or Y meningococcal disease among persons who had received a meningococcal conjugate vaccine. The mean age of these persons was 18.2 years (range: 16 through 22 years). The mean time since vaccination was 3.25 years (range: 1.5–4.6 years). Five of these 12 persons had an underlying condition that might have increased their risk for meningococcal disease (CDC, unpublished data, 2010).

A case-control study evaluating the VE of meningococcal conjugate vaccine was begun in January 2006 (ACIP meeting, October 2010). Because Menactra was the only licensed vaccine until February 2010, the preliminary results are estimates for Menactra only; no data are available regarding the effectiveness of Menveo. As of October 1, 2010, 108 case-patients and 158 controls were enrolled in the effectiveness study. The overall VE estimate in persons vaccinated 0–5 years earlier was 78.0% (95% confidence interval [CI] = 29%–93%). VE for persons vaccinated less than 1 year earlier was 95% (CI = 10%–100%), VE for persons vaccinated 1 year earlier was 91% (CI = 10%–101%), and VE for persons vaccinated 2 through 5 years earlier was 58% (CI = -72%–89%). Although the CIs around the point estimates are wide, the ACIP Work Group concluded that VE wanes.

The ACIP Work Group also concluded that serologic data are consistent with waning immunity. Three characteristics of conjugate vaccines are believed to be important for establishing long-term protection against a bacterial pathogen: memory response, herd immunity, and circulating antibody (5). Recent data from the United Kingdom indicate that

FIGURE. Annual incidence of meningococcal disease (serogroup C and serogroup Y), by age — Active Bacterial Core surveillance (ABCs), United States, 1999–2008



although vaccination primes the immune system, the memory response after exposure might not be rapid enough to protect against meningococcal disease. After initial priming with a serogroup C meningococcal conjugate vaccine (MenC), a memory response after a booster dose was not measurable until 5–7 days later (6). The incubation period for meningococcal disease usually is less than 3 days. Although herd immunity has been an important component associated with long-term protection with MenC vaccine in the United Kingdom and other countries, immunization coverage has increased slowly in the United States, and to date no evidence of herd immunity has been observed (ACIP meeting, October 2010). Therefore, the Work Group concluded that circulating bactericidal antibody is critical for protection against meningococcal disease. The Work Group took into consideration the proportion of subjects with bactericidal antibody levels above thresholds considered protective, depending on the assay used, evaluating antibody persistence in five studies (Table 1). Although each study tested a small number of vaccine recipients, the Work Group concluded that the studies found sufficient evidence to indicate that approximately 50% of persons vaccinated 5 years earlier had bactericidal antibody levels protective against meningococcal disease. Therefore, more than 50% of persons immunized at age 11 or 12 years might not be protected when they are at higher risk at ages 16 through 21 years.

Two studies evaluated the response after a booster dose of Menactra at 3 and 5 years after the primary vaccination (7; ACIP meeting, June 2009). At both 3 and 5 years after the first dose, the booster dose elicited substantially higher geometric mean antibody titers (GMT), compared with the titers elicited by a primary dose. Using a complement serum bactericidal activity (SBA) assay and baby rabbit complement (brSBA) as

a measure of immune response, a booster dose administered 5 years after the first dose elicited a GMT for serogroup C of 23,613, compared with 9,045 among subjects administered a primary dose (ACIP meeting, October 2010). As expected with conjugate vaccines, the first dose primes the immune system to have a strong response to the booster dose. Local and systemic reactions to the booster were comparable to those in persons receiving a first dose. The duration of protective antibody after the booster dose is not known but is expected to last through age 21 years for booster doses administered at ages 16 through 18 years.

Optimizing meningococcal vaccination.

Despite the current low burden of meningococcal disease, the ACIP Work Group agreed that because of mounting evidence of waning immunity by 5 years postvaccination, vaccinating adolescents with a single dose at age 11 or 12 years is not the best strategy for protection through age 21 years. The Work Group considered two other options for optimizing protection: moving the dose from age 11 or 12 years to age 14 or 15 years or vaccinating at age 11 or 12 years and providing a booster dose at age 16 years. Although a single dose at age 14 or 15 years likely would protect most adolescents through the higher risk period at ages 16 through 21 years, the opportunities to administer vaccine at age 14 or 15 years might be more limited. Data indicate that as adolescents grow older, they are less likely to visit a health-care provider for preventive care (8). Adding a booster dose to the recommended schedule would provide more opportunities to increase vaccination coverage, while persons aged 11 through 13 years would continue to be protected. An economic analysis comparing the three adolescent vaccination strategies concluded that administering a booster dose has a cost per quality-adjusted life year similar to that of a single dose at age 11 years or age 15 years but is estimated to prevent twice the number of cases and deaths (CDC, unpublished data, 2010).

Rationale for 2-Dose Primary Series for Persons with a Reduced Response to a Single Dose

Evidence supporting the need for a 2-dose primary meningococcal vaccine series for the small number of persons at increased risk for meningococcal disease was reviewed. Data indicated that SBA could be increased with 2 doses, 2 months apart. For persons who are asplenic or have HIV infection, a 2-dose primary series improves the initial immune response to vaccination. A 2-dose primary series in patients with persistent complement component deficiency will help achieve the high

TABLE 1. Summary of serogroup C bactericidal antibody persistence as determined by serum bactericidal activity (SBA) 2–5 years after vaccination with Menveo and/or Menactra

Age group (yrs) at vaccination	Years postvaccination	Serogroup C SBA	Vaccine	No. of vaccine recipients in study	% of recipients with protective antibody levels
11 through 18*	2	% hSBA \geq 1:8	Menveo	273	62
			Menactra	185	58
11 through 18 [†]	3	% hSBA \geq 1:4	Menactra	52	35
			MPSV4	48	35
11 through 18 [§]	3	% brSBA \geq 1:128	Menactra	71	75
			MPSV4	72	60
2 through 10 [§]	5	% brSBA \geq 1:128	Menactra	108	55
			MPSV4	207	42
11 through 18 [§]	5	% brSBA \geq 1:128	Menactra	16	56
			MPSV4	10	60

Abbreviations: hSBA = SBA using human complement; brSBA = SBA using baby rabbit complement; MPSV4 = quadrivalent meningococcal polysaccharide vaccine.

* **Source:** Gill C, Baxter R, Anemona A, Ciavarrò G, Dull P. Persistence of immune responses after a single dose of Novartis meningococcal serogroup A, C, W-135 and Y CRM-197 conjugate vaccine (Menveo) or Menactra among healthy adolescents. *Human Vaccines* 2010;6:881–7.

[†] **Source:** Vu DM, Welsch JA, Zuno-Mitchell P, Dela Cruz JV, Granoff DM. Antibody persistence 3 years after immunization of adolescents with quadrivalent meningococcal conjugate vaccine. *J Infect Dis* 2006;193:821–8.

[§] **Source:** Proceedings of the Advisory Committee on Immunization Practices (ACIP) meeting, June 2009.

levels of SBA activity needed to confer protection in the absence of effective opsonization.

The complement pathway is important to preventing meningococcal disease, and *Neisseria meningitidis* is the primary bacterial pathogen affecting persons with late component complement (LCCD) or properdin deficiency. Although persons with LCCD are able to mount an overall antibody response equal to or greater than complement-sufficient persons after vaccination with quadrivalent meningococcal polysaccharide vaccine (MPSV4), antibody titers wane more rapidly in persons with complement component deficiency, and higher antibody levels are needed for other clearance mechanisms such as opsonophagocytosis to function (9,10). Asplenic persons are at increased risk for invasive infection caused by many encapsulated bacteria, including *N. meningitidis*. Moreover, the mortality rate is 40%–70% among these persons when they become infected with *N. meningitidis*. Asplenic persons achieve significantly lower geometric mean SBA titers than healthy persons after vaccination with meningococcal C conjugate vaccine, with 20% not achieving brSBA titers \geq 1:8. This proportion was reduced to 7% when a second dose of vaccine was administered to nonresponders 2 months later, suggesting a booster might be effective in achieving higher circulating antibody levels and improving immunologic memory (11).

Patients with HIV infection likely are at increased risk for meningococcal disease, although not to the extent that they are at risk for invasive *Streptococcus pneumoniae* infection. The

risk to persons with HIV infection also is not as great as to persons with complement component deficiency or asplenia. One study has investigated the response rates to a single dose of meningococcal conjugate vaccine among HIV-infected adolescents. Response to vaccination measured by brSBA titers \geq 1:128 was 86%, 55%, 73%, and 72% for serogroups A, C, Y, and W-135, respectively. Response rates were significantly lower among patients with a CD4+ T-lymphocyte percentage of <15% or viral loads >10,000 copies/mL (12).

The immunogenicity and safety of a 2-dose primary series has not been studied in older children and adults. However, Menactra and Menveo have been studied following administration as a 2-dose primary series in infants and young children. Infants vaccinated with a 2-dose primary series of Menactra at ages 9 months and 12 through 15 months achieved high antibody titers after the second dose. Administration of 2 doses of Menveo 2 months apart to children aged 2 through 5 years was associated with a similar rate of adverse events as a single dose (13).

Recommendation for Routine Vaccination of Persons Aged 11 Through 18 Years

ACIP recommends routine vaccination of persons with quadrivalent meningococcal conjugate vaccine at age 11 or 12 years, with a booster dose at age 16 years. After a booster dose of meningococcal conjugate vaccine, antibody titers are higher than after the first dose and are expected to protect adolescents through the period of increased risk through age 21 years. For adolescents who receive the first dose at age 13 through 15 years, a one-time booster dose should be administered, preferably at age 16 through 18 years, before the peak in increased risk. Persons who receive their first dose of meningococcal conjugate vaccine at or after age 16 years do not need a booster dose. Routine vaccination of healthy persons who are not at increased risk for exposure to *N. meningitidis* is not recommended after age 21 years.

Recommendation for Persons Aged 2 Through 54 Years with Reduced Immune Response

Data indicate that the immune response to a single dose of meningococcal conjugate vaccine is not sufficient in persons with certain medical conditions. Persons with persistent

complement component deficiencies (e.g., C5–C9, properdin, factor H, or factor D) or asplenia should receive a 2-dose primary series administered 2 months apart and then receive a booster dose every 5 years. Adolescents aged 11 through 18 years with HIV infection should be routinely vaccinated with a 2-dose primary series. Other persons with HIV who are vaccinated should receive a 2-dose primary series administered 2 months apart. All other persons at increased risk for meningococcal disease (e.g., microbiologists or travelers to an epidemic or highly endemic country) should receive a single dose.

CDC Guidance for Transition to an Adolescent Booster Dose

Some schools, colleges, and universities have policies requiring vaccination against meningococcal disease as a condition of enrollment. For ease of program implementation, persons aged 21 years or younger should have documentation of receipt of a dose of meningococcal conjugate vaccine not more than 5 years before enrollment. If the primary dose was administered before the 16th birthday, a booster dose should be administered before enrollment in college. The booster dose can be administered anytime after the 16th birthday to ensure that the booster is provided. The minimum interval between doses of meningococcal conjugate vaccine is 8 weeks.

No data are available on the interchangeability of vaccine products. Whenever feasible, the same brand of vaccine should be used for all doses of the vaccination series. If vaccination providers do not know or have available the type of vaccine product previously administered, any product should be used

to continue or complete the series. Persons with complement component deficiency, asplenia, or HIV infection who have previously received a single dose of meningococcal conjugate vaccine should receive their booster dose at the earliest opportunity.

These updated meningococcal conjugate vaccine recommendations from ACIP have been summarized (Table 2). Additionally, a meningococcal conjugate vaccine information statement is available at <http://www.cdc.gov/vaccines/pubs/vis/default.htm>, and details regarding the routine meningococcal conjugate vaccination schedule are available at <http://www.cdc.gov/vaccines/recs/schedules/default.htm#child>. Adverse events after receipt of any vaccine should be reported to the Vaccine Adverse Event Reporting System at <http://vaers.hhs.gov>.

References

1. CDC. Prevention and control of meningococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2005;54(No. RR-7).
2. CDC. Updated recommendation from the Advisory Committee on Immunization Practices (ACIP) for revaccination of persons at prolonged increased risk for meningococcal disease. *MMWR* 2009;58:1042–3.
3. CDC. National, state, and local area vaccination coverage among adolescents aged 13–17 years—United States, 2009. *MMWR* 2010; 59:1018–23.
4. MacNeil JR, Cohn AC, Zell ER, et al. Early estimate of the effectiveness of quadrivalent meningococcal conjugate vaccine. *Pediatr Infect Dis J* 2011. Epub January 4, 2011.
5. Pollard A, Perrett K, Beverley P. Maintaining protection against invasive bacteria with protein–polysaccharide conjugate vaccines. *Nat Rev Immunol* 2009;9:213–20.

TABLE 2. Summary of meningococcal conjugate vaccine recommendations, by risk group — Advisory Committee on Immunization Practices (ACIP), 2010

Risk group	Primary series	Booster dose
Persons aged 11 through 18 years	1 dose, preferably at age 11 or 12 years	At age 16 years if primary dose at age 11 or 12 years At age 16 through 18 years if primary dose at age 13 through 15 years No booster needed if primary dose on or after age 16 years
HIV-infected persons in this age group	2 doses, 2 months apart	At age 16 years if primary dose at age 11 or 12 years At age 16 through 18 years if primary dose at age 13 through 15 years No booster needed if primary dose on or after age 16 years
Persons aged 2 through 55 years with persistent complement component deficiency* or functional or anatomical asplenia	2 doses, 2 months apart	Every 5 years At the earliest opportunity if a 1-dose primary series administered, then every 5 years
Persons aged 2 through 55 years with prolonged increased risk for exposure†	1 dose	Persons aged 2 through 6 years: after 3 years Persons aged 7 years or older: after 5 years‡

Abbreviation: HIV = human immunodeficiency virus.

* Such as C5–C9, properdin, or factor D.

† Microbiologists routinely working with *Neisseria meningitidis* and travelers to or residents of countries where meningococcal disease is hyperendemic or epidemic.

‡ If the person remains at increased risk.

6. Snape M, Kelly D, Salt P, et al. Serogroup C meningococcal glycoconjugate vaccine in adolescents: persistence of bactericidal antibodies and kinetics of the immune response to a booster vaccine more than 3 years after immunization. *Clin Infect Dis* 2006;43:1387–94.
7. Vu DM, Welsch JA, Zuno-Mitchell P, Dela Cruz JV, Granoff DM. Antibody persistence 3 years after immunization of adolescents with quadrivalent meningococcal conjugate vaccine. *J Infect Dis* 2006;193:821–8.
8. Rand CM, Schaffer SJ, Humiston SG, et al. Patient-provider communication and human papillomavirus vaccine acceptance. *Clin Pediatr* 2011;50:106–13.
9. Platonov AE, Vershinina IV, Kuijper EJ, Borrow R, Käyhty H. Long term effects of vaccination of patients deficient in a late complement component with a tetravalent meningococcal polysaccharide vaccine. *Vaccine* 2003;21:4437–47.
10. Fijen CA, Kuijper EJ, Drogari-Apiranthitou M, Van Leeuwen Y, Daha MR, Dankert J. Protection against meningococcal serogroup ACYW disease in complement-deficient individuals vaccinated with the tetravalent meningococcal capsular polysaccharide vaccine. *Clin Exp Immunol* 1998;114:362–9.
11. Balmer P, Falconer M, McDonald P, et al. Immune response to meningococcal serogroup C conjugate vaccine in asplenic individuals. *Infect Immun* 2004;72:332–7.
12. Siberry GK, Williams PL, Lujan-Zilbermann J, et al. Phase I/II, open-label trial of safety and immunogenicity of meningococcal (groups A, C, Y, and W-135) polysaccharide diphtheria toxoid conjugate vaccine in human immunodeficiency virus-infected adolescents. *Pediatr Infect Dis J* 2010;29:391–6.
13. Halperin, S, Gupta, A, Jeanfreau R, et al. Comparison of the safety and immunogenicity of an investigational and a licensed quadrivalent meningococcal conjugate vaccine in children 2–10 years of age. *Vaccine* 2010;28:7865–72.

Notes from the Field

Respiratory Diphtheria-Like Illness Caused by Toxigenic *Corynebacterium ulcerans* — Idaho, 2010

On September 12, 2010, the Idaho Department of Health and Welfare was notified of a case of respiratory diphtheria-like illness in an Idaho man aged 80 years whose pharyngeal specimens yielded *Corynebacterium ulcerans*. Although *C. ulcerans* is zoonotic, the patient reported no animal contact or consumption of an unpasteurized dairy product. His vaccination history was unknown. Respiratory diphtheria-like illness from *C. ulcerans* is uncommon but has been reported in industrialized countries where respiratory diphtheria is rare. The last case of diphtheria-like illness caused by *C. ulcerans* in the United States was reported in 2005 (1).

On September 5, the patient had sought medical attention for nasal congestion and voice changes; treatment for allergic rhinitis did not improve his condition. On September 9, the patient was hospitalized for a surgical procedure to alleviate bilateral obstruction of the nasal passages, during which a pseudomembrane was observed. On September 11, he experienced stridor, required intubation, and became febrile with signs of sepsis. Throughout the next day, severe neck swelling developed, and a computed tomography scan revealed pronounced hypopharyngeal mucosal thickening. On suspicion of respiratory diphtheria, the patient was treated with azithromycin. On September 12, *C. ulcerans* was isolated from pharyngeal tissue surgically removed on September 9, and a 100,000 international-unit dose of diphtheria antitoxin (DAT) was requested and received from CDC. After DAT administration on September 12, the patient had a complicated recovery and was discharged on October 6. On September 20, CDC reported that the *C. ulcerans* isolates were toxigenic by the Elek agar virulence test.

Respiratory diphtheria-like illness caused by toxigenic *C. ulcerans* infections can be clinically indistinguishable from toxigenic *Corynebacterium diphtheriae* infections. Both organisms can produce diphtheria toxin and lead to life-threatening disease that requires urgent treatment with DAT and antibiotics. Although the hallmark of respiratory diphtheria is the presence of a pseudomembrane in the pharynx (1), the pseudomembrane in this patient was only visible during a

surgical procedure. Clinicians should consider respiratory diphtheria among patients who have low-grade fever and pseudomembranous pharyngitis. If diphtheria is suspected, patients should receive urgent treatment with DAT without waiting for laboratory confirmation. Health-care providers can obtain DAT by contacting CDC's Emergency Operations Center at 770-488-7100.

Antibiotic treatment of diphtheria-like illness caused by *C. ulcerans* should follow clinical guidelines for patients infected with *C. diphtheriae* (2). Unlike *C. diphtheriae* infections, human-to-human transmission of *C. ulcerans* infections has not been documented (3); therefore, postexposure antibiotic prophylaxis was not administered to close contacts of the Idaho patient. However, because studies on the transmission of *C. ulcerans* are limited, vaccination status of contacts should be assessed and brought up-to-date, if necessary, with an age-appropriate diphtheria-toxoid-containing vaccine, which prevents disease from toxigenic strains of *C. diphtheriae* and *C. ulcerans*. CDC recommends that adults receive a diphtheria-toxoid-containing vaccine every 10 years after completing a primary childhood vaccination series (4).

Reported by

SR Blue, MD, Sawtooth Epidemiology and Infectious Diseases, Boise; C Hahn, MD, Idaho Dept of Health and Welfare. P Cassidy, MS, T Tiwari, MD, Div of Bacterial Diseases, National Center for Immunization and Respiratory Diseases; K Carter, DVM, Office of Public Health Preparedness and Response; JM Colborn, PhD, EIS Officer, CDC.

References

1. Tiwari TS, Golaz A, Yu DT, et al. Investigations of 2 cases of diphtheria-like illness due to toxigenic *Corynebacterium ulcerans*. Clin Infect Dis 2008;46:395–401.
2. American Academy of Pediatrics. Diphtheria. In: Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. Red book: 2009 report of the Committee on Infectious Diseases. 28th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2009:280–3.
3. Lartigue ME, Monnet X, Le Flèche A, et al. *Corynebacterium ulcerans* in an immunocompromised patient with diphtheria and her dog. J Clin Microbiol 2005;43:999–1001.
4. CDC. Recommended adult immunization schedule—United States, 2010. MMWR 2010;59(1).

Notifiable Diseases and Mortality Tables

TABLE I. Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending January 22, 2011 (3rd week)*

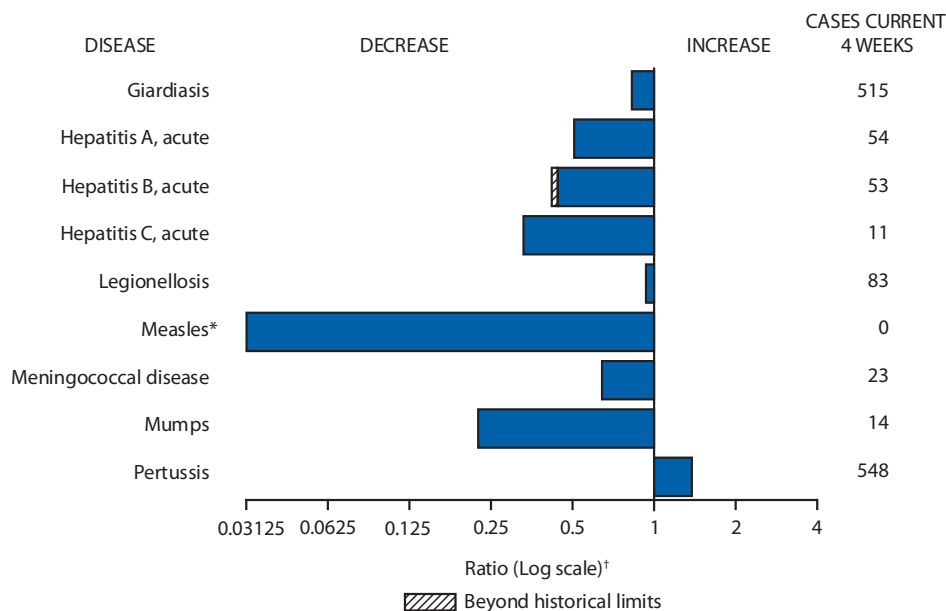
Disease	Current week	Cum 2011	5-year weekly average [†]	Total cases reported for previous years					States reporting cases during current week (No.)
				2010	2009	2008	2007	2006	
Anthrax	—	—	—	—	1	—	1	1	
Arboviral diseases ^{§,¶} :									
California serogroup virus disease	—	—	—	72	55	62	55	67	
Eastern equine encephalitis virus disease	—	—	—	10	4	4	4	8	
Powassan virus disease	—	—	0	5	6	2	7	1	
St. Louis encephalitis virus disease	—	—	0	8	12	13	9	10	
Western equine encephalitis virus disease	—	—	—	—	—	—	—	—	
Babesiosis	—	—	—	NN	NN	NN	NN	NN	
Botulism, total	—	1	1	108	118	145	144	165	
foodborne	—	—	0	7	10	17	32	20	
infant	—	1	1	76	83	109	85	97	
other (wound and unspecified)	—	—	0	25	25	19	27	48	
Brucellosis	—	3	1	125	115	80	131	121	
Chancroid	—	2	1	37	28	25	23	33	
Cholera	—	1	0	11	10	5	7	9	
Cyclosporiasis [§]	1	2	4	171	141	139	93	137	FL (1)
Diphtheria	—	—	—	—	—	—	—	—	
<i>Haemophilus influenzae</i> ,** invasive disease (age <5 yrs):									
serotype b	—	—	1	17	35	30	22	29	
nonserotype b	—	—	5	153	236	244	199	175	
unknown serotype	4	15	4	264	178	163	180	179	PA (1), FL (1), OK (1), CA (1)
Hansen disease [§]	1	2	2	58	103	80	101	66	CA (1)
Hantavirus pulmonary syndrome [§]	—	1	0	17	20	18	32	40	
Hemolytic uremic syndrome, postdiarrheal [§]	—	3	1	219	242	330	292	288	
Influenza-associated pediatric mortality ^{§,††}	3	9	2	61	358	90	77	43	WV (1), CO (1), UT (1)
Listeriosis	6	14	13	764	851	759	808	884	NY (2), FL (2), CO (1), OR (1)
Measles ^{§§}	—	—	0	57	71	140	43	55	
Meningococcal disease, invasive ^{¶¶} :									
A, C, Y, and W-135	—	4	5	243	301	330	325	318	
serogroup B	—	—	3	109	174	188	167	193	
other serogroup	—	—	1	9	23	38	35	32	
unknown serogroup	6	20	11	414	482	616	550	651	MO (1), NE (1), KS (1), CA (3)
Novel influenza A virus infections ^{***}	—	—	—	4	43,774	2	4	NN	
Plague	—	—	0	2	8	3	7	17	
Poliomyelitis, paralytic	—	—	—	—	1	—	—	—	
Polio virus Infection, nonparalytic [§]	—	—	—	—	—	—	—	NN	
Psittacosis [§]	—	—	0	4	9	8	12	21	
Q fever, total [§]	1	3	1	120	113	120	171	169	
acute	1	3	1	91	93	106	—	—	CA (1)
chronic	—	—	0	29	20	14	—	—	
Rabies, human	—	—	—	1	4	2	1	3	
Rubella ^{†††}	—	—	0	6	3	16	12	11	
Rubella, congenital syndrome	—	—	0	—	2	—	—	1	
SARS-CoV [§]	—	—	—	—	—	—	—	—	
Smallpox [§]	—	—	—	—	—	—	—	—	
Streptococcal toxic-shock syndrome [§]	2	7	2	159	161	157	132	125	VT (1), PA (1)
Syphilis, congenital (age <1 yr) ^{§§§}	—	—	8	233	423	431	430	349	
Tetanus	—	—	0	8	18	19	28	41	
Toxic-shock syndrome (staphylococcal) [§]	—	2	1	75	74	71	92	101	
Trichinellosis	—	2	0	4	13	39	5	15	
Tularemia	—	—	0	110	93	123	137	95	
Typhoid fever	—	2	8	415	397	449	434	353	
Vancomycin-intermediate <i>Staphylococcus aureus</i> [§]	—	2	1	90	78	63	37	6	
Vancomycin-resistant <i>Staphylococcus aureus</i> [§]	—	—	—	1	1	—	2	1	
Vibriosis (noncholera <i>Vibrio</i> species infections) [§]	1	4	5	767	789	588	549	NN	FL (1)
Viral hemorrhagic fever ^{¶¶¶}	—	—	0	1	NN	NN	NN	NN	
Yellow fever	—	—	—	—	—	—	—	—	

See Table 1 footnotes on next page.

TABLE I. (Continued) Provisional cases of infrequently reported notifiable diseases (<1,000 cases reported during the preceding year) — United States, week ending January 22, 2011 (3rd week)*

—: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts.
 * Case counts for reporting years 2010 and 2011 are provisional and subject to change. For further information on interpretation of these data, see <http://www.cdc.gov/ncphi/diss/nndss/phs/files/ProvisionalNationa%20NotifiableDiseasesSurveillanceData20100927.pdf>.
 † Calculated by summing the incidence counts for the current week, the 2 weeks preceding the current week, and the 2 weeks following the current week, for a total of 5 preceding years. Additional information is available at <http://www.cdc.gov/ncphi/diss/nndss/phs/files/5yearweeklyaverage.pdf>.
 ‡ Not reportable in all states. Data from states where the condition is not reportable are excluded from this table except starting in 2007 for the arboviral diseases, STD data, TB data, and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at <http://www.cdc.gov/ncphi/diss/nndss/phs/infdis.htm>.
 § Includes both neuroinvasive and nonneuroinvasive. Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for West Nile virus are available in Table II.
 ** Data for H. influenzae (all ages, all serotypes) are available in Table II.
 †† Updated weekly from reports to the Influenza Division, National Center for Immunization and Respiratory Diseases. Since October 3, 2010, 13 influenza-associated pediatric deaths occurred during the 2010-11 influenza season. Since August 30, 2009, a total of 282 influenza-associated pediatric deaths occurring during the 2009-10 influenza season have been reported.
 ‡‡ No measles cases were reported for the current week.
 ¶¶ Data for meningococcal disease (all serogroups) are available in Table II.
 *** CDC discontinued reporting of individual confirmed and probable cases of 2009 pandemic influenza A (H1N1) virus infections on July 24, 2009. During 2009, four cases of human infection with novel influenza A viruses, different from the 2009 pandemic influenza A (H1N1) strain, were reported to CDC. The four cases of novel influenza A virus infection reported to CDC during 2010 were identified as swine influenza A (H3N2) virus and are unrelated to the 2009 pandemic influenza A (H1N1) virus. Total case counts for 2009 were provided by the Influenza Division, National Center for Immunization and Respiratory Diseases (NCIRD).
 ††† No rubella cases were reported for the current week.
 §§§ Updated weekly from reports to the Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention.
 ¶¶¶ There was one case of viral hemorrhagic fever reported during week 12 of 2010. The one case report was confirmed as lassa fever. See Table II for dengue hemorrhagic fever.

FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals January 22, 2011, with historical data



* No measles cases were reported for the current 4-week period yielding a ratio for week three of zero (0).
 † Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

Notifiable Disease Data Team and 122 Cities Mortality Data Team
 Patsy A. Hall-Baker
 Deborah A. Adams Rosaline Dhara
 Willie J. Anderson Pearl C. Sharp
 Michael S. Wodajo Lenee Blanton

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 22, 2011, and January 23, 2010 (3rd week)*

Reporting area	Dengue Virus Infection									
	Dengue Fever [†]				Dengue Hemorrhagic Fever [§]					
	Current week	Previous 52 weeks		Cum 2011	Cum 2010	Current week	Previous 52 weeks		Cum 2011	Cum 2010
	Med	Max				Med	Max			
United States	—	6	37	—	23	—	0	2	—	—
New England	—	0	3	—	1	—	0	0	—	—
Connecticut	—	0	0	—	—	—	0	0	—	—
Maine [¶]	—	0	2	—	1	—	0	0	—	—
Massachusetts	—	0	0	—	—	—	0	0	—	—
New Hampshire	—	0	0	—	—	—	0	0	—	—
Rhode Island [¶]	—	0	0	—	—	—	0	0	—	—
Vermont [¶]	—	0	1	—	—	—	0	0	—	—
Mid. Atlantic	—	1	12	—	11	—	0	1	—	—
New Jersey	—	0	0	—	—	—	0	0	—	—
New York (Upstate)	—	0	0	—	—	—	0	0	—	—
New York City	—	1	12	—	8	—	0	1	—	—
Pennsylvania	—	0	3	—	3	—	0	0	—	—
E.N. Central	—	1	7	—	3	—	0	1	—	—
Illinois	—	0	2	—	1	—	0	0	—	—
Indiana	—	0	2	—	—	—	0	0	—	—
Michigan	—	0	2	—	—	—	0	0	—	—
Ohio	—	0	2	—	2	—	0	0	—	—
Wisconsin	—	0	2	—	—	—	0	1	—	—
W.N. Central	—	0	6	—	—	—	0	1	—	—
Iowa	—	0	1	—	—	—	0	0	—	—
Kansas	—	0	1	—	—	—	0	0	—	—
Minnesota	—	0	2	—	—	—	0	0	—	—
Missouri	—	0	0	—	—	—	0	0	—	—
Nebraska [¶]	—	0	6	—	—	—	0	0	—	—
North Dakota	—	0	1	—	—	—	0	0	—	—
South Dakota	—	0	0	—	—	—	0	1	—	—
S. Atlantic	—	2	17	—	4	—	0	1	—	—
Delaware	—	0	0	—	—	—	0	0	—	—
District of Columbia	—	0	0	—	—	—	0	0	—	—
Florida	—	2	14	—	3	—	0	1	—	—
Georgia	—	0	2	—	1	—	0	0	—	—
Maryland [¶]	—	0	0	—	—	—	0	0	—	—
North Carolina	—	0	1	—	—	—	0	0	—	—
South Carolina [¶]	—	0	3	—	—	—	0	0	—	—
Virginia [¶]	—	0	3	—	—	—	0	0	—	—
West Virginia	—	0	1	—	—	—	0	0	—	—
E.S. Central	—	0	2	—	—	—	0	0	—	—
Alabama [¶]	—	0	2	—	—	—	0	0	—	—
Kentucky	—	0	1	—	—	—	0	0	—	—
Mississippi	—	0	0	—	—	—	0	0	—	—
Tennessee [¶]	—	0	1	—	—	—	0	0	—	—
W.S. Central	—	0	1	—	—	—	0	1	—	—
Arkansas [¶]	—	0	0	—	—	—	0	1	—	—
Louisiana	—	0	0	—	—	—	0	0	—	—
Oklahoma	—	0	1	—	—	—	0	0	—	—
Texas [¶]	—	0	0	—	—	—	0	0	—	—
Mountain	—	0	2	—	1	—	0	0	—	—
Arizona	—	0	1	—	—	—	0	0	—	—
Colorado	—	0	0	—	—	—	0	0	—	—
Idaho [¶]	—	0	1	—	—	—	0	0	—	—
Montana [¶]	—	0	1	—	—	—	0	0	—	—
Nevada [¶]	—	0	1	—	1	—	0	0	—	—
New Mexico [¶]	—	0	1	—	—	—	0	0	—	—
Utah	—	0	0	—	—	—	0	0	—	—
Wyoming [¶]	—	0	0	—	—	—	0	0	—	—
Pacific	—	0	5	—	3	—	0	0	—	—
Alaska	—	0	1	—	—	—	0	0	—	—
California	—	0	5	—	1	—	0	0	—	—
Hawaii	—	0	0	—	—	—	0	0	—	—
Oregon	—	0	0	—	—	—	0	0	—	—
Washington	—	0	2	—	2	—	0	0	—	—
Territories										
American Samoa	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	109	525	—	239	—	1	14	—	6
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Case counts for reporting year 2010 and 2011 are provisional and subject to change. For further information on interpretation of these data, see <http://www.cdc.gov/ncphi/diss/ndss/pdfs/files/ProvisionalNationalNotifiableDiseasesSurveillanceData20100927.pdf>. Data for TB are displayed in Table IV, which appears quarterly.[†] Dengue Fever includes cases that meet criteria for Dengue Fever with hemorrhage, other clinical and unknown case classifications.[§] DHF includes cases that meet criteria for dengue shock syndrome (DSS), a more severe form of DHF.[¶] Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

Morbidity and Mortality Weekly Report

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 22, 2011, and January 23, 2010 (3rd week)*

Reporting area	Hepatitis (viral, acute), by type														
	A					B					C				
	Current week	Previous 52 weeks		Cum 2011	Cum 2010	Current week	Previous 52 weeks		Cum 2011	Cum 2010	Current week	Previous 52 weeks		Cum 2011	Cum 2010
		Med	Max				Med	Max				Med	Max		
United States	13	30	44	46	76	7	61	91	39	138	3	13	25	10	35
New England	—	2	5	1	7	—	1	5	1	4	—	1	4	—	5
Connecticut	—	0	3	—	2	—	0	2	—	2	—	0	4	—	1
Maine†	—	0	1	—	—	—	0	2	—	—	—	0	0	—	—
Massachusetts	—	1	5	—	5	—	0	2	—	2	—	0	1	—	4
New Hampshire	—	0	1	—	—	—	0	2	1	—	N	0	0	N	N
Rhode Island†	—	0	4	—	—	U	0	0	U	U	U	0	0	U	U
Vermont†	—	0	1	1	—	—	0	1	—	—	—	0	1	—	—
Mid. Atlantic	2	4	10	5	13	2	5	10	4	9	2	2	6	2	3
New Jersey	—	0	2	—	2	—	1	5	—	1	—	0	2	—	—
New York (Upstate)	1	1	4	1	—	2	1	6	2	1	2	1	4	2	3
New York City	1	1	7	2	5	—	1	4	—	3	—	0	1	—	—
Pennsylvania	—	1	4	2	6	—	1	5	2	4	—	0	3	—	—
E.N. Central	1	4	9	4	16	—	9	17	1	27	—	2	7	1	4
Illinois	—	1	3	—	2	—	2	5	—	5	—	0	1	—	—
Indiana	—	0	2	—	—	—	1	5	—	4	—	0	2	1	—
Michigan	—	1	5	1	5	—	2	6	—	8	—	1	6	—	4
Ohio	1	1	5	3	2	—	2	6	1	6	—	0	1	—	—
Wisconsin	—	0	3	—	7	—	2	8	—	4	—	0	2	—	—
W.N. Central	—	1	13	1	5	2	2	7	4	7	—	0	8	—	—
Iowa	—	0	3	1	3	—	0	2	—	2	—	0	0	—	—
Kansas	—	0	2	—	—	—	0	2	—	—	—	0	1	—	—
Minnesota	—	0	12	—	—	—	0	4	—	—	—	0	6	—	—
Missouri	—	0	2	—	1	2	1	3	2	4	—	0	2	—	—
Nebraska†	—	0	4	—	1	—	0	2	2	1	—	0	1	—	—
North Dakota	—	0	3	—	—	—	0	0	—	—	—	0	0	—	—
South Dakota	—	0	1	—	—	—	0	1	—	—	—	0	0	—	—
S. Atlantic	3	6	14	10	13	2	16	32	17	43	—	2	6	2	5
Delaware	—	0	1	1	—	—	0	2	—	1	U	0	0	U	U
District of Columbia	—	0	1	—	—	—	0	1	—	—	—	0	1	—	1
Florida	1	3	7	3	3	2	5	11	12	20	—	0	0	—	—
Georgia	—	1	3	2	3	—	3	7	—	16	—	0	2	—	—
Maryland†	—	0	3	2	1	—	1	6	2	—	—	0	3	2	2
North Carolina	—	0	5	—	—	—	1	16	—	3	—	1	3	—	2
South Carolina†	—	0	3	—	5	—	1	4	—	—	—	0	1	—	—
Virginia†	2	1	6	2	1	—	1	6	3	3	—	0	2	—	—
West Virginia	—	0	5	—	—	—	0	12	—	—	—	0	5	—	—
E.S. Central	—	1	5	1	2	—	7	13	9	28	—	3	8	2	7
Alabama†	—	0	2	—	1	—	1	4	—	7	—	0	1	—	—
Kentucky	—	0	5	1	—	—	2	8	5	11	—	2	6	1	7
Mississippi	—	0	1	—	—	—	0	3	—	—	U	0	0	U	U
Tennessee†	—	0	2	—	1	—	3	8	4	10	—	1	4	1	—
W.S. Central	—	2	7	1	1	—	9	29	1	8	1	1	5	1	2
Arkansas†	—	0	1	—	—	—	0	4	—	—	—	0	0	—	—
Louisiana	—	0	2	—	—	—	1	3	—	3	—	0	1	—	—
Oklahoma	—	0	1	—	—	—	2	6	—	1	1	0	3	1	—
Texas†	—	2	7	1	1	—	5	25	1	4	—	0	3	—	2
Mountain	1	3	8	4	11	—	2	8	—	8	—	1	5	1	1
Arizona	—	1	4	2	5	—	0	2	—	2	U	0	0	U	U
Colorado	1	1	3	2	4	—	0	5	—	1	—	0	2	1	1
Idaho†	—	0	2	—	—	—	0	1	—	—	—	0	2	—	—
Montana†	—	0	1	—	1	—	0	0	—	—	—	0	1	—	—
Nevada†	—	0	2	—	—	—	0	3	—	4	—	0	1	—	—
New Mexico†	—	0	1	—	—	—	0	1	—	—	—	0	2	—	—
Utah	—	0	1	—	1	—	0	1	—	1	—	0	2	—	—
Wyoming†	—	0	3	—	—	—	0	1	—	—	—	0	0	—	—
Pacific	6	5	17	19	8	1	6	17	2	4	—	1	3	1	8
Alaska	—	0	1	—	—	—	0	1	—	1	U	0	0	U	U
California	5	4	16	18	7	—	4	16	—	2	—	0	2	—	5
Hawaii	—	0	1	—	—	—	0	1	—	—	U	0	0	U	U
Oregon	1	0	2	1	1	1	1	3	2	1	—	0	3	—	3
Washington	—	0	2	—	—	—	1	3	—	—	—	0	3	1	—
Territories															
American Samoa	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	6	—	—	—	1	6	—	—	—	0	7	—	—
Puerto Rico	—	0	2	—	—	—	0	2	—	1	—	0	0	—	—
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

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U: Unavailable. —: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

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Morbidity and Mortality Weekly Report

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 22, 2011, and January 23, 2010 (3rd week)*

Reporting area	<i>Streptococcus pneumoniae</i> , [†] invasive disease										Syphilis, primary and secondary				
	All ages					Age <5									
	Current week	Previous 52 weeks		Cum 2011	Cum 2010	Current week	Previous 52 weeks		Cum 2011	Cum 2010	Current week	Previous 52 weeks		Cum 2011	Cum 2010
		Med	Max				Med	Max				Med	Max		
United States	176	270	535	867	1,034	15	39	84	55	142	53	244	319	266	631
New England	1	9	99	5	29	—	1	14	—	4	1	9	20	11	19
Connecticut	—	0	91	—	—	—	0	12	—	—	—	1	8	—	—
Maine [§]	—	2	6	3	5	—	0	1	—	1	—	0	3	—	1
Massachusetts	—	1	5	—	3	—	1	4	—	1	—	5	15	6	15
New Hampshire	—	0	7	—	12	—	0	1	—	2	1	0	2	1	1
Rhode Island [§]	—	0	36	—	9	—	0	3	—	—	—	1	4	4	2
Vermont [§]	1	1	6	2	9	—	0	1	—	—	—	0	2	—	—
Mid. Atlantic	18	29	56	116	83	2	7	19	5	23	6	32	45	25	85
New Jersey	—	1	8	2	10	—	1	5	2	6	3	4	12	8	12
New York (Upstate)	4	3	9	5	12	2	2	8	2	6	—	2	10	5	1
New York City	6	12	32	63	25	—	2	14	—	3	—	18	31	—	52
Pennsylvania	8	10	22	46	36	—	1	5	1	8	3	7	16	12	20
E.N. Central	29	59	99	167	242	2	6	18	8	30	—	27	48	6	94
Illinois	—	2	7	—	5	—	2	5	—	5	—	7	26	—	51
Indiana	—	10	24	7	40	—	1	6	—	7	—	3	14	1	—
Michigan	1	12	27	26	51	—	1	6	—	7	—	4	12	3	20
Ohio	25	25	45	111	115	2	2	6	5	5	—	9	19	1	20
Wisconsin	3	7	22	23	31	—	0	4	3	6	—	1	3	1	3
W.N. Central	6	10	61	22	29	3	1	12	4	5	—	6	18	8	12
Iowa	—	0	0	—	—	—	0	0	—	—	—	0	3	—	1
Kansas	1	2	7	5	3	—	0	2	—	—	—	0	3	—	—
Minnesota	—	0	46	—	—	—	0	8	—	—	—	2	9	5	1
Missouri	4	2	10	8	11	3	0	4	3	2	—	3	9	3	10
Nebraska [§]	1	2	9	9	12	—	0	2	1	2	—	0	2	—	—
North Dakota	—	0	11	—	—	—	0	1	—	—	—	0	0	—	—
South Dakota	—	0	3	—	3	—	0	2	—	1	—	0	1	—	—
S. Atlantic	59	62	144	294	281	2	9	27	23	37	12	56	103	75	117
Delaware	1	1	4	7	2	—	0	1	—	—	1	0	4	2	—
District of Columbia	—	0	3	—	2	—	0	2	—	2	—	2	20	2	7
Florida	52	25	89	170	99	2	3	18	10	6	1	21	44	26	42
Georgia	5	10	26	34	60	—	2	9	5	12	—	9	29	—	6
Maryland [§]	—	9	31	49	49	—	1	6	4	3	—	6	15	11	4
North Carolina	—	0	0	—	—	—	0	0	—	—	1	6	22	16	36
South Carolina [§]	1	8	23	30	58	—	1	4	—	8	2	3	7	7	10
Virginia [§]	—	1	4	4	5	—	1	4	4	5	7	5	22	11	11
West Virginia	—	2	9	—	6	—	0	4	—	1	—	0	2	—	1
E.S. Central	11	24	48	64	115	2	2	7	7	10	8	16	39	15	30
Alabama [§]	—	0	0	—	—	—	0	0	—	—	3	5	11	7	14
Kentucky	2	3	16	15	8	—	0	2	2	2	4	2	12	4	3
Mississippi	—	1	8	1	7	—	0	2	—	1	1	4	16	1	1
Tennessee [§]	9	20	43	48	100	2	2	6	5	7	—	5	17	3	12
W.S. Central	28	35	192	77	64	3	5	21	4	9	18	37	64	68	103
Arkansas [§]	3	3	19	12	6	—	0	3	1	1	4	3	10	8	17
Louisiana	—	2	6	8	14	—	0	3	—	4	1	7	29	1	26
Oklahoma	3	1	5	3	2	3	1	5	3	2	1	2	7	1	3
Texas [§]	22	27	171	54	42	—	3	17	—	2	12	24	33	58	57
Mountain	19	34	69	104	170	—	4	12	3	19	—	10	25	7	25
Arizona	7	13	38	53	98	—	2	7	2	12	—	3	8	2	6
Colorado	12	11	22	38	38	—	1	4	1	2	—	2	8	—	10
Idaho [§]	—	0	2	1	—	—	0	2	—	—	—	0	2	—	1
Montana [§]	—	0	2	—	1	—	0	1	—	—	—	0	2	—	—
Nevada [§]	—	1	4	1	8	—	0	1	—	2	—	2	9	4	3
New Mexico [§]	—	3	10	9	10	—	0	4	—	—	—	1	4	1	3
Utah	—	3	9	—	15	—	0	3	—	3	—	1	4	—	2
Wyoming [§]	—	0	15	2	—	—	0	1	—	—	—	0	0	—	—
Pacific	5	5	18	18	21	1	0	7	1	5	8	44	63	51	146
Alaska	—	2	9	5	12	—	0	5	—	3	—	0	1	—	—
California	5	3	17	13	9	1	0	5	1	2	5	38	52	43	123
Hawaii	—	0	2	—	—	—	0	0	—	—	—	0	5	—	2
Oregon	—	0	0	—	—	—	0	0	—	—	1	1	7	1	4
Washington	—	0	0	—	—	—	0	0	—	—	2	4	11	7	17
Territories															
American Samoa	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—
Puerto Rico	—	0	0	—	—	—	0	0	—	—	—	3	15	2	8
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Case counts for reporting year 2010 and 2011 are provisional and subject to change. For further information on interpretation of these data, see <http://www.cdc.gov/ncphi/diss/nndss/pdfs/files/ProvisionalNationalNotifiableDiseasesSurveillanceData20100927.pdf>. Data for TB are displayed in Table IV, which appears quarterly.

[†] Includes drug resistant and susceptible cases of invasive *Streptococcus pneumoniae* disease among children <5 years and among all ages. Case definition: Isolation of *S. pneumoniae* from a normally sterile body site (e.g., blood or cerebrospinal fluid).

[§] Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

TABLE II. (Continued) Provisional cases of selected notifiable diseases, United States, weeks ending January 22, 2011, and January 23, 2010 (3rd week)*

Reporting area	Varicella (chickenpox)					West Nile virus disease [†]									
	Current week	Previous 52 weeks		Cum 2011	Cum 2010	Neuroinvasive					Nonneuroinvasive [§]				
		Med	Max			Current week	Previous 52 weeks	Cum 2011	Cum 2010	Current week	Previous 52 weeks	Cum 2011	Cum 2010		
United States	101	281	562	430	767	—	0	71	—	1	—	1	53	—	—
New England	—	18	43	15	63	—	0	3	—	—	—	0	2	—	—
Connecticut	—	6	20	—	10	—	0	2	—	—	—	0	2	—	—
Maine [¶]	—	4	15	—	22	—	0	0	—	—	—	0	0	—	—
Massachusetts	—	5	12	—	15	—	0	2	—	—	—	0	1	—	—
New Hampshire	—	2	8	—	9	—	0	1	—	—	—	0	0	—	—
Rhode Island [¶]	—	0	3	1	1	—	0	0	—	—	—	0	0	—	—
Vermont [¶]	—	1	10	14	6	—	0	0	—	—	—	0	0	—	—
Mid. Atlantic	6	32	62	36	97	—	0	19	—	—	—	0	13	—	—
New Jersey	—	8	30	2	34	—	0	3	—	—	—	0	6	—	—
New York (Upstate)	N	0	0	N	N	—	0	9	—	—	—	0	7	—	—
New York City	—	0	1	—	—	—	0	7	—	—	—	0	4	—	—
Pennsylvania	6	22	40	34	63	—	0	3	—	—	—	0	3	—	—
E.N. Central	42	95	176	196	292	—	0	15	—	—	—	0	8	—	—
Illinois	6	21	45	21	78	—	0	10	—	—	—	0	5	—	—
Indiana [¶]	5	5	35	11	10	—	0	2	—	—	—	0	2	—	—
Michigan	6	30	62	55	104	—	0	6	—	—	—	0	1	—	—
Ohio	25	28	58	109	89	—	0	1	—	—	—	0	1	—	—
Wisconsin	—	7	22	—	11	—	0	0	—	—	—	0	1	—	—
W.N. Central	—	15	32	18	47	—	0	7	—	—	—	0	11	—	—
Iowa	N	0	0	N	N	—	0	1	—	—	—	0	2	—	—
Kansas [¶]	—	4	22	7	24	—	0	1	—	—	—	0	3	—	—
Minnesota	—	0	0	—	—	—	0	1	—	—	—	0	3	—	—
Missouri	—	8	23	10	21	—	0	1	—	—	—	0	0	—	—
Nebraska [¶]	N	0	0	N	N	—	0	3	—	—	—	0	7	—	—
North Dakota	—	0	10	—	1	—	0	2	—	—	—	0	2	—	—
South Dakota	—	1	7	1	1	—	0	2	—	—	—	0	3	—	—
S. Atlantic	24	35	100	53	80	—	0	4	—	—	—	0	4	—	—
Delaware [¶]	—	0	3	—	—	—	0	0	—	—	—	0	0	—	—
District of Columbia	—	0	4	1	—	—	0	1	—	—	—	0	1	—	—
Florida [¶]	21	16	57	42	42	—	0	3	—	—	—	0	1	—	—
Georgia	N	0	0	N	N	—	0	1	—	—	—	0	3	—	—
Maryland [¶]	N	0	0	N	N	—	0	3	—	—	—	0	2	—	—
North Carolina	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
South Carolina [¶]	—	0	35	—	2	—	0	1	—	—	—	0	0	—	—
Virginia [¶]	3	10	29	10	12	—	0	1	—	—	—	0	1	—	—
West Virginia	—	7	26	—	24	—	0	0	—	—	—	0	0	—	—
E.S. Central	1	5	22	13	15	—	0	1	—	1	—	0	3	—	—
Alabama [¶]	1	5	22	13	15	—	0	1	—	—	—	0	1	—	—
Kentucky	N	0	0	N	N	—	0	1	—	—	—	0	1	—	—
Mississippi	—	0	2	—	—	—	0	1	—	1	—	0	2	—	—
Tennessee [¶]	N	0	0	N	N	—	0	1	—	—	—	0	2	—	—
W.S. Central	27	42	177	61	81	—	0	15	—	—	—	0	3	—	—
Arkansas [¶]	—	1	32	—	8	—	0	3	—	—	—	0	1	—	—
Louisiana	—	2	4	2	7	—	0	3	—	—	—	0	1	—	—
Oklahoma	N	0	0	N	N	—	0	1	—	—	—	0	0	—	—
Texas [¶]	27	39	171	59	66	—	0	15	—	—	—	0	2	—	—
Mountain	1	20	37	34	89	—	0	18	—	—	—	0	15	—	—
Arizona	—	0	0	—	—	—	0	13	—	—	—	0	9	—	—
Colorado [¶]	—	8	17	—	40	—	0	5	—	—	—	0	11	—	—
Idaho [¶]	N	0	0	N	N	—	0	0	—	—	—	0	1	—	—
Montana [¶]	—	3	28	30	14	—	0	0	—	—	—	0	0	—	—
Nevada [¶]	N	0	0	N	N	—	0	0	—	—	—	0	1	—	—
New Mexico [¶]	1	1	8	4	8	—	0	5	—	—	—	0	2	—	—
Utah	—	4	17	—	27	—	0	1	—	—	—	0	1	—	—
Wyoming [¶]	—	0	3	—	—	—	0	1	—	—	—	0	1	—	—
Pacific	—	1	6	4	3	—	0	7	—	—	—	0	6	—	—
Alaska	—	1	5	4	3	—	0	0	—	—	—	0	0	—	—
California	—	0	0	—	—	—	0	7	—	—	—	0	6	—	—
Hawaii	—	0	6	—	—	—	0	0	—	—	—	0	0	—	—
Oregon	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
Washington	N	0	0	N	N	—	0	1	—	—	—	0	1	—	—
Territories															
American Samoa	N	0	0	N	N	—	0	0	—	—	—	0	0	—	—
C.N.M.I.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Guam	—	0	2	—	—	—	0	0	—	—	—	0	0	—	—
Puerto Rico	2	9	30	10	10	—	0	0	—	—	—	0	0	—	—
U.S. Virgin Islands	—	0	0	—	—	—	0	0	—	—	—	0	0	—	—

C.N.M.I.: Commonwealth of Northern Mariana Islands.

U: Unavailable. —: No reported cases. N: Not reportable. NN: Not Nationally Notifiable. Cum: Cumulative year-to-date counts. Med: Median. Max: Maximum.

* Case counts for reporting year 2010 and 2011 are provisional and subject to change. For further information on interpretation of these data, see <http://www.cdc.gov/ncphi/diss/nndss/phs/files/ProvisionalNationalNotifiableDiseasesSurveillanceData20100927.pdf>. Data for TB are displayed in Table IV, which appears quarterly.

† Updated weekly from reports to the Division of Vector-Borne Infectious Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ArboNET Surveillance). Data for California serogroup, eastern equine, Powassan, St. Louis, and western equine diseases are available in Table I.

§ Not reportable in all states. Data from states where the condition is not reportable are excluded from this table, except starting in 2007 for the domestic arboviral diseases and influenza-associated pediatric mortality, and in 2003 for SARS-CoV. Reporting exceptions are available at <http://www.cdc.gov/ncphi/diss/nndss/phs/infdis.htm>.

¶ Contains data reported through the National Electronic Disease Surveillance System (NEDSS).

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