Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 61 / No. 24
June 22, 2012

National HIV Testing Day — June 27, 2012

June 27 is National HIV Testing Day, which promotes testing as an important strategy to detect, treat, and prevent human immunodeficiency virus (HIV) infection. HIV testing is the essential entry point to health care and social services that improve the quality of life and survival for persons who learn that they have HIV (*1*). Persons who receive appropriate treatment, monitoring, and health care also reduce their chances of transmitting the virus to others. In 2006, CDC recommended that all persons aged 13–64 years be screened for HIV in health-care settings in which the prevalence of undiagnosed HIV infection is >0.1%, and that persons with increased risk for HIV be retested at least annually (*2*).

In March 2012, the Panel on Antiretroviral Guidelines for Adults and Adolescents updated its guidelines on the initiation of antiretroviral therapy (ART) for persons with HIV and no history of HIV treatment (*3*). ART is now recommended for all persons with HIV; the strength of this recommendation varies according to a person's pretreatment CD4 cell count. These updated recommendations are based on the increasing evidence of the harmful effects of unsuppressed HIV replication and the emerging evidence of the effectiveness of ART in preventing HIV transmission. The recommendations emphasize the importance of learning one's HIV status by getting tested, and for persons at increased risk for HIV, getting retested at least annually (*1*). HIV testing information is available at http://www.cdc.gov/features/hivtesting and at http://www.hivtest.org.

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Previous HIV Testing Among Adults and Adolescents Newly Diagnosed with HIV Infection — National HIV Surveillance System, 18 Jurisdictions, United States, 2006–2009

In 2006, CDC recommended human immunodeficiency virus (HIV) testing for adults, adolescents, and pregnant women in health-care settings and HIV testing at least annually for persons at high risk for HIV infection* to foster early detection, facilitate linkage to care, and improve health outcomes (*1*). Understanding previous HIV testing patterns among persons recently diagnosed with HIV infection can help in the design of HIV testing strategies that reduce the time between onset of HIV infection and its diagnosis. To assess previous HIV testing patterns among adults and adolescents newly diagnosed with HIV infection, CDC analyzed data for the period 2006–2009 from 18 jurisdictions participating in

* Persons likely to be at high risk include injection-drug users and their sex partners, persons who exchange sex for money or drugs, sex partners of HIV-infected persons, men who have sex with men, and heterosexual persons who themselves or whose sex partners have had more than one sex partner since their most recent HIV test.

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Centers for Disease Control and Prevention

HIV incidence surveillance through CDC's National HIV Surveillance System (NHSS) (*2*).[†] This report describes the results of that analysis, which indicated that among adults and adolescents for whom testing history information (THI) was available, 41% were diagnosed with HIV infection at their first HIV test, and 59% had a negative test at some point before HIV diagnosis. Groups with the highest percentage of persons testing HIV-negative ≤12 months before HIV diagnosis included those aged 13–29 years (33%), males with HIV transmission attributed to male-to-male sexual contact (29%), and whites (28%). These results demonstrate that many persons diagnosed with HIV infection have never been tested previously. Persons who are unaware of their HIV infection might not change their behavior to reduce the risk for transmission and will not be linked to care, resulting in worse health outcomes. Enhanced efforts are needed to increase annual HIV testing for populations at high risk for HIV infection to increase early detection.

The analysis included persons aged ≥13 years with a new diagnosis of HIV infection during the period 2006–2009 (reported to CDC through June 2010) from 18 jurisdictions participating in HIV incidence surveillance through NHSS (*2*). THI[§] collected for the purposes of HIV incidence surveillance and reported to CDC through January 2011 was used to determine whether persons diagnosed with HIV infection ever had a previous negative HIV test and to calculate the time from their most recent negative HIV test to HIV diagnosis (*2*). The number of diagnoses was adjusted for reporting delay but not for incomplete reporting. Multiple imputation was used to assign a transmission category to those cases for which risk information was not reported (*3,4*).

An estimated total of 125,104 persons aged ≥13 years were newly diagnosed with HIV infection during 2006–2009; THI was available for 57,476 (46%). Compared with persons for whom THI was unavailable, a higher percentage of those with THI were persons aged 13–29 years (37.8% versus 24.8%) or males with HIV transmission attributed to male-to-male sexual contact (men who have sex with men [MSM]) (73.9% versus 68.5%), and a lower percentage were persons aged 40–49 years (23.0% versus 29.5%) or aged ≥50 years (13.4% versus 19.8%). Among persons for whom THI was available, 59% (34,049) were reported as ever having a negative HIV test before HIV diagnosis, and of these, 32,752 (96%) had data available to calculate the time from their most recent negative HIV test

[†] The 18 jurisdictions contributing data for the 2006–2009 national HIV incidence estimate were the states of Alabama, Arizona, Colorado, Connecticut, Florida, Indiana, Louisiana, Michigan, Mississippi, New Jersey, New York, North Carolina, South Carolina, Texas, Virginia, and Washington, and the cities of Chicago, Illinois, and Philadelphia, Pennsylvania.

[§] As an integral component of NHSS, areas funded for HIV incidence surveillance collect THI, including self-reported date of first positive HIV antibody test, self-reported or documented evidence of negative HIV antibody test, date of most recent negative HIV antibody test, and number of negative HIV tests in the 2 years before testing HIV positive.

The *MMWR* series of publications is published by the Office of Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30333.

Suggested citation: Centers for Disease Control and Prevention. [Article title]. MMWR 2012;61:[inclusive page numbers].

to HIV diagnosis. The highest percentages of persons with a previous negative HIV test were observed among whites (9,846 [67%]), persons aged 13–29 years (14,220 [65%]), and males whose HIV transmission category was MSM (20,317 [65%]) or MSM/injection drug use (IDU) (1,151 [65%]) (Table 1).

Among the 57,476 persons newly diagnosed with HIV infection for whom THI was available, 13,900 (24%) had a negative HIV test ≤12 months before HIV diagnosis, 6,758 (12%) had a negative HIV test 13–24 months before HIV diagnosis, 12,094 (21%) had a negative HIV test >24 months before HIV diagnosis, 1,297 (2%) were missing data to calculate the time since their last negative HIV test to HIV diagnosis, and 23,427 (41%) had HIV diagnosed on their first test. The groups with the highest percentage of persons testing HIV-negative ≤12 months before HIV diagnosis were persons aged 13–29 years (7,122 [33%]), whites (4,112 [28%]), and males in the MSM transmission category (9,620 [29%]). The groups with the highest percentage of persons with no previous negative HIV test included those aged ≥50 years (4,492 [59%]), males in the heterosexual contact[¶] (3,476 [56%]) or IDU (1,674 [54%]) transmission categories, blacks/African Americans (13,188 [44%]), and females in the heterosexual contact transmission category (5,451 [44%]) (Table 2).

A higher percentage of persons diagnosed with HIV on their first test had acquired immunodeficiency syndrome (AIDS) within 6 months of HIV diagnosis compared with those who had

[¶] Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

TABLE 1. Estimated number* and percentage of adults and adolescents diagnosed with HIV infection, with HIV testing history information,[†] having a negative HIV test before HIV diagnosis,[§] by selected characteristics — National HIV Surveillance System, 18 jurisdictions,[¶] 2006–2009

	Diagnosis of HIV infection						
		HIV diagnoses with testing history information					
				Previous negative HIV test		No previous test	
Characteristic	No.	No.	(%)	No.	(%)**	No.	(%)**
Total††	**125,104**	**57,476**	**(45.9)**	**34,049**	**(59.2)**	**23,427**	**(40.8)**
Age group at diagnosis (yrs)							
13–29	38,521	21,734	(56.4)	14,220	(65.4)	7,513	(34.6)
30–39	32,339	14,816	(45.8)	9,386	(63.4)	5,430	(36.7)
40–49	33,179	13,244	(39.9)	7,252	(54.8)	5,992	(45.2)
≥50	21,065	7,683	(36.5)	3,191	(41.5)	4,492	(58.5)
Race/Ethnicity							
Black/African American	62,824	29,945	(47.7)	16,756	(56.0)	13,188	(44.0)
Hispanic/Latino§§	25,234	11,135	(44.1)	6,490	(58.3)	4,644	(41.7)
White	33,377	14,781	(44.3)	9,846	(66.6)	4,935	(33.4)
Other	3,669	1,616	(44.0)	957	(59.2)	659	(40.8)
Transmission category (males)							
Male-to-male sexual contact	65,908	31,493	(47.8)	20,317	(64.5)	11,176	(35.5)
Injection drug use	8,889	3,104	(34.9)	1,431	(46.1)	1,674	(53.9)
Male-to-male sexual contact and injection drug use	3,696	1,781	(48.2)	1,151	(64.6)	630	(35.4)
Heterosexual contact¶¶	14,167	6,186	(43.7)	2,710	(43.8)	3,476	(56.2)
Other***	188	48	(25.7)	17	(35.8)	31	(64.2)
Subtotal	92,849	42,613	(45.9)	25,627	(60.1)	16,986	(39.9)
Transmission category (females)							
Injection drug use	5,330	2,306	(43.3)	1,356	(58.8)	950	(41.2)
Heterosexual contact¶¶	26,776	12,499	(46.7)	7,048	(56.4)	5,451	(43.6)
Other***	149	58	(39.1)	18	(31.2)	40	(68.9)
Subtotal	32,255	14,863	(46.1)	8,422	(56.7)	6,441	(43.3)

Abbreviation: HIV = human immunodeficiency virus.

* Estimated numbers resulted from statistical adjustment that accounted for reporting delays and missing risk factor information, but not for incomplete reporting.

† Data used to determine whether a person had a negative HIV test result before HIV diagnosis.

§ Those with a negative HIV test at any point before the first positive HIV test.

¶ The 18 jurisdictions contributing data for the 2006–2009 national HIV incidence estimate were the states of Alabama, Arizona, Colorado, Connecticut, Florida, Indiana, Louisiana, Michigan, Mississippi, New Jersey, New York, North Carolina, South Carolina, Texas, Virginia, and Washington, and the cities of Chicago, Illinois, and Philadelphia, Pennsylvania.

** Percentage among those for whom testing history information was available.

†† Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column might not sum to the column total.

§§ Hispanics/Latinos might be of any race.

¶¶ Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

*** Includes hemophilia, blood transfusion, perinatal exposure, and any risk factor not reported or not identified.

TABLE 2. Time from last negative HIV test to HIV diagnosis among adults and adolescents diagnosed with HIV infection* who have HIV testing history information,† by selected characteristics — National HIV Surveillance System, 18 jurisdictions,§ 2006–2009

	Persons diagnosed with HIV infection with testing history information								
		With previous negative HIV test							
		≤12 mos before		13–24 mos before		>24 mos before		No previous test	
Characteristic	No.	No.	(%)¶	No.	(%)¶	No.	(%)¶	No.	(%)
Total**	**57,476**	**13,900**	**24.2**	**6,758**	**11.8**	**12,094**	**21.0**	**23,427**	**40.8**
Age group at diagnosis (yrs)									
13–29	21,734	7,122	32.8	3,025	13.9	3,556	16.4	7,513	34.6
30–39	14,816	3,502	23.6	1,838	12.4	3,699	25.0	5,430	36.7
40–49	13,244	2,324	17.5	1,359	10.3	3,292	24.9	5,992	45.2
≥50	7,683	952	12.4	537	7.0	1,546	20.1	4,492	58.5
Race/Ethnicity									
Black/African American	29,945	6,649	22.2	3,355	11.2	6,091	20.3	13,188	44.0
Hispanic/Latino††	11,135	2,729	24.5	1,229	11.0	2,295	20.6	4,644	41.7
White	14,781	4,112	27.8	1,969	13.3	3,400	23.0	4,935	33.4
Other	1,616	410	25.4	205	12.7	308	19.1	659	40.8
Transmission category (males)									
Male-to-male sexual contact	31,493	9,260	29.4	4,147	13.2	6,224	19.8	11,176	35.5
Injection drug use	3,104	442	14.2	274	8.8	650	20.9	1,674	53.9
Male-to-male sexual contact and injection drug use	1,781	453	25.4	246	13.8	402	22.6	630	35.4
Heterosexual contact§§	6,186	852	13.8	462	7.5	1,273	20.6	3,476	56.2
Other¶¶	48	5	10.3	3	6.2	8	16.5	31	64.0
Subtotal	42,613	11,013	25.8	5,131	12.0	8,557	20.1	16,986	39.9
Transmission category (females)									
Injection drug use	2,306	484	21.0	262	11.4	549	23.8	950	41.2
Heterosexual contact§§	12,499	2,399	19.2	1,361	10.9	2,978	23.8	5,451	43.6
Other¶¶	58	5	8.6	3	5.2	9	15.5	40	68.7
Subtotal	14,863	2,887	19.4	1,627	10.9	3,537	23.8	6,441	43.3

Abbreviation: HIV = human immunodeficiency virus.

* Estimated numbers resulted from statistical adjustment that accounted for reporting delays and missing risk factor information, but not for incomplete reporting.

† Data used to determine whether a person had a negative HIV test result before HIV diagnosis and to calculate the time from the last negative HIV antibody test to HIV diagnosis.

§ The 18 jurisdictions contributing data for the 2006–2009 national HIV incidence estimate were the states of Alabama, Arizona, Colorado, Connecticut, Florida, Indiana, Louisiana, Michigan, Mississippi, New Jersey, New York, North Carolina, South Carolina, Texas, Virginia, and Washington, and the cities of Chicago, Illinois, and Philadelphia, Pennsylvania.

¶ Percentage among those for whom testing history information was available to calculate the time since their last negative HIV test to HIV diagnosis.

** Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column might not sum to the column total.

†† Hispanics/Latinos might be of any race.

§§ Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

¶¶ Includes hemophilia, blood transfusion, perinatal exposure, and any risk factor not reported or not identified.

a previous negative HIV test (37% versus 20%). No significant changes from 2006 to 2009 were observed in any stratum in the percentages of persons with a previous negative HIV test.

Reported by

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Editorial Note

The findings in this report show that the majority (59%) of the adults and adolescents diagnosed with HIV infection during 2006–2009 in the 18 jurisdictions included in the analysis had a negative HIV test before diagnosis; only 24% had a negative test ≤12 months before HIV diagnosis, with higher percentages observed among young persons and MSM. Previous reports have shown increasing numbers of new HIV infections among young persons and MSM; the findings in this report might reflect enhanced testing efforts directed toward these groups (*2,5*).

The findings also show a high percentage of persons diagnosed with HIV infection with no previous HIV test, particularly those aged ≥50 years, blacks/African Americans, and persons whose HIV transmission is attributed to heterosexual contact or IDU. HIV surveillance data show a higher prevalence of AIDS diagnosed within 12 months after HIV diagnosis among injection drug users and persons aged ≥50 years (*6*),

What is already known on this topic?

Individual awareness of human immunodeficiency virus (HIV) infection might reduce behaviors that lead to transmission of HIV, facilitate linkage to care, and improve health outcomes. In 2006, CDC recommended increasing HIV screening in health-care settings and annual HIV testing for persons at high risk for HIV infection.

What is added by this report?

The majority (59%) of the adults and adolescents diagnosed with HIV infection in this analysis had a negative HIV test at some point before HIV diagnosis; only 24% had a negative test within 12 months before HIV diagnosis.

What are the implications for public health practice?

The findings in this report underscore the need to enhance efforts to increase annual HIV testing for populations at high risk for HIV infection to increase early detection, reduce the percentage of persons being diagnosed with HIV on their first test, and reduce the time between onset of HIV infection and its diagnosis. The use of an effective combination of HIV prevention efforts will ensure the greatest impact among persons at high risk for HIV infection.

indicating that these groups tend to be diagnosed later in the course of HIV disease than other groups. Additionally, persons diagnosed with HIV infection on their first test are more likely to be diagnosed later in the course of HIV infection. Emphasis on HIV screening in health-care settings and annual testing for persons at high risk would help increase the proportion of HIV-infected persons who benefit from early diagnosis.

The findings in this report are subject to at least three limitations. First, results are based on data from 18 jurisdictions, which accounted for approximately 60% of reported AIDS cases in the United States during 2006–2009, and therefore are not generalizable to the entire U.S. population. Second, less than half of the estimated number of persons diagnosed with HIV infection had THI available. Although younger persons and MSM were more likely to have THI available, the extent to which this difference might have affected the findings is unknown. Finally, adjustment for reporting delays and missing risk factor information might have introduced uncertainties into estimates of HIV diagnoses.

The National HIV/AIDS Strategy calls for expanded efforts to prevent HIV infection using a combination of effective, evidence-based approaches (*7*) and for intensified HIV prevention efforts in the communities where HIV is most heavily concentrated (e.g., among blacks/African Americans, Hispanics/Latinos, gay and bisexual men, and substance abusers). Accordingly, the strategic plan of CDC's Division of HIV/AIDS Prevention aims to increase the percentage of persons living with HIV who know their serostatus and who are diagnosed with HIV infection at earlier stages of disease by supporting and strengthening HIV testing in these communities (*8*). As part of CDC's continued support for HIV testing, CDC has launched a new 5-year funding opportunity for health departments in states, territories, and selected cities to reduce HIV transmission by better targeting resources and supporting the highest-impact prevention strategies to increase HIV testing and access to care, improve health outcomes, and increase awareness by educating communities about the threat of HIV infection. Other strategies include the Act Against AIDS campaign, which is a 5-year national campaign launched in 2009 by CDC and the White House that focuses on raising HIV/AIDS awareness among all persons in the United States and reducing the risk for infection among the hardest-hit populations, including gay and bisexual men, blacks/African Americans, Hispanics/Latinos, and other communities at increased risk. The findings in this report provide insight into HIV testing patterns among persons diagnosed with HIV infection in the United States and underscore the need to enhance efforts to increase annual HIV testing for populations at high risk for HIV infection and to reduce the percentage of persons being diagnosed with HIV on their first test, particularly blacks/African Americans and injection drug users.

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Carbapenem-Resistant *Enterobacteriaceae* Containing New Delhi Metallo-Beta-Lactamase in Two Patients — Rhode Island, March 2012

U.S. and international efforts to control carabapenem-resistant *Enterobacteriaceae* (CRE) are critical to protect public health. Clinicians caring for patients infected with such organisms have few, if any, therapeutic options available. CRE containing New Delhi metallo-beta-lactamase (NDM), first reported in a patient who had been hospitalized in New Delhi, India, in 2007 (*1*), are of particular concern because these enzymes usually are encoded on plasmids that harbor multiple resistance determinants and are transmitted easily to other *Enterobacteriaceae* and other genera of bacteria (*2*). A urine specimen collected on March 4, 2012, from a patient who recently had been hospitalized in Viet Nam, but who was receiving care at a hospital in Rhode Island, was found to have a *Klebsiella pneumoniae* isolate containing NDM. The isolate was susceptible only to tigecycline, colistin, and polymyxin B. Point-prevalence surveys of epidemiologically linked patients revealed transmission to a second patient on the hematology/oncology unit. These two cases bring to 13 the number of cases of NDM reported in the United States. After contact precautions were reinforced and environmental cleaning was implemented, no further cases were identified. Similarly aggressive infection control efforts can limit the spread of NDM in acute-care medical facilities (*3,4*).

A Rhode Island resident returned to her native Cambodia in May 2011. While there, she was diagnosed with spinal cord compression and was hospitalized December 20–30 in Ho Chi Minh City, Vietnam, where an indwelling catheter was placed in her atonic bladder. She received ceftazidime and metronidazole during that hospitalization. On January 6, 2012, she returned to Rhode Island and was hospitalized the same day. Lymphoma was diagnosed; she underwent chemotherapy and required prolonged bladder catheterization. On January 13, a urine culture grew an extended spectrum, beta-lactamase–producing *Escherichia coli*. She was placed on contact precautions requiring visitors to her room to don gowns and gloves. She was allowed to walk in the hallway if she was continent, performed hand hygiene before leaving the room, and wore a clean garment, but was incontinent at least once while outside her room. On February 15, a urine culture grew two strains of carbapenemase-producing *K. pneumoniae*. From hospital admission through March 3, the patient was administered a range of antibiotics, including ceftriaxone, cefazolin, ciprofloxacin, metronidazole, piperacillin/tazobactam, meropenem, colistin, fluconazole, and oral and intravenous vancomycin. On March 4, a second urine culture grew carbapenemase-producing *K. pneumoniae*. The modified Hodge test, a laboratory test for the presence of carbapenemase, was weakly positive. The patient was asymptomatic; her catheter was replaced and a repeat urine culture was negative, without antibiotic therapy.

In light of the patient's unusual travel history and the weakly positive modified Hodge test, the isolate was sent to CDC and was confirmed as CRE containing NDM. It was susceptible to tigecycline (minimum inhibitory concentration [MIC] = 2 μg/mL), colistin, and polymyxin B (MIC = 1 μg/mL), but resistant to 24 antimicrobials, including aztreonam and several antimicrobial combinations, by cation-adjusted Mueller-Hinton broth dilution. After receiving this information, isolation precautions were changed for this patient, prohibiting her from walking outside her room and limiting diagnostic tests or procedures requiring her to leave her room. The medical director and staff members of the hospital infection control department educated medical and nursing staff members about NDM and needed precautions. Topics reviewed included the epidemiology of CRE, specifically NDM, and modes of transmission, gastrointestinal carriage, and limited treatment options for infected patients. The patient was discharged March 26. A stool specimen collected April 3 was negative for carbapenemase-producing *K. pneumoniae* using phenotypic methods (*5*). *K. pneumoniae* isolates from the urine specimen collected February 15 also were sent to CDC; one was found to be indistinguishable from the isolate from March 4, the other was an epidemiologically related subtype. Surveillance cultures were tested using CDC-recommended methods for control of infections with carbapenem-resistant or carbapenemase-producing *Enterobacteriaceae* in acute-care facilities (*5,6*).

Results were negative for a rectal swab obtained March 30 from the next patient who occupied the same hospital room on March 28. However, one of seven patients on the same hematology/oncology unit at the time of the index patient's stay grew a carbapenemase-producing *K. pneumoniae* from a rectal swab specimen collected March 30. The specimen was confirmed as containing NDM at CDC. Molecular fingerprinting using pulsed-field gel electrophoresis revealed that it was indistinguishable from the *K. pneumoniae* isolates collected February 15 and March 4 from the index patient. Point-prevalence surveys of rectal swabs or stool specimens from the five additional patients from the hematology/oncology unit collected April 5 and 6 and from 14 patients on April 23 did not detect carbapenemase-producing *K. pneumoniae*. All

patients housed on the hematology/oncology unit as the two patients harboring CRE were identified and their charts were flagged so that they will have rectal swab screening cultures the first time they are readmitted. Environmental services staff members conducted additional cleaning of patient rooms and hallway high-touch surfaces (e.g., door knobs and hand rails) on the hematology/oncology unit on April 13. The index patient and second patient each were cared for by separate medical teams, of which no physicians or nurse practitioners had provided care to both patients. Nursing records identified 23 nursing staff members of the hematology/oncology unit who had cared for both patients between March 12 and 26; one agreed to be screened by rectal culture and was found to be negative.

Reported by

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Editorial Note

Since the first report in 2009, cases involving NDM-producing *Enterobacteriaceae* have been reported in every continent except South America and Antarctica (*7*). Among 29 cases in the United Kingdom, at least 17 involved patients who had traveled to India or Pakistan, among whom 14 had been hospitalized in one of those countries (*8*). Although medical care in the Indian subcontinent was associated with many early reports, recent cases have been described involving persons who traveled to endemic regions* but were not hospitalized (*7*). The plasmid-carrying NDM is highly transmissible to other bacteria, and bacteria carrying NDM can colonize the gastrointestinal systems of humans for prolonged periods and can spread through contamination of water sources and environmental surfaces (*7*). Not surprisingly, nosocomial spread also has been documented outside of the Indian subcontinent. Of 77 cases of infection or colonization with CRE containing NDM in Europe, 13 might have been hospital-acquired in Europe (*9*). Spread of NDM in other parts of Asia also has been reported, including four patients in South Korea without travel history (*10*), similar to recent reports elsewhere (*7*).

Based on currently available information, a robust infection control effort is needed to limit or slow the spread of all CRE, including NDM, at the local, national, and international levels. High rates of hand hygiene compliance and adherence to contact precautions, including the use of dedicated devices for monitoring vital signs, are essential, along with minimizing the use of invasive devices and antibiotics. A robust antimicrobial stewardship program can assist in limiting unnecessary antibiotic exposure among hospitalized patients. If NDM is identified, point-prevalence surveys of patients on the affected hospital or skilled nursing facility unit are important to identify patients carrying CRE containing NDM (*7*). A recent preliminary report from a U.S. hospital documented that an intensive-care unit–based, active surveillance program using nucleic acid amplification for detecting CRE colonization, coupled with contact precautions for all colonized patients, was able to achieve a sustained 53% reduction in the prevalence of CRE colonization across 100 beds in the unit (BP Currie, MD, Montefiore Medical Center, personal communication, May 14, 2012). Because patients frequently are transferred to and from acute- and chronic-care facilities, successful prevention and control of NDM most likely will be achieved by using a regional approach (*7*), as has been done in Israel (*3,4*). Because colistin often is the only available antibiotic to treat CRE containing NDM, robust infection control efforts are needed to slow the spread of NDM in the United States.

Acute- and chronic-care facilities should have a written plan that clearly describes how they will detect CRE and limit transmission before it becomes endemic. Clinical specimens will

What is already known on this topic?

New Delhi metallo-beta-lactamase (NDM)–producing *Klebsiella pneumoniae* are resistant to extended-spectrum antimicrobials, including carbapenems. The resistance mechanism is highly transmissible and its presence substantially limits treatment options. NDM-producing *Enterobacteriaceae* have been identified in the United States, primarily among patients with exposure to health care in endemic countries.

What is added by this report?

An NDM-producing organism was isolated from a patient being treated in the United States after having been hospitalized in Vietnam. Implementation of CDC-recommended carbapenem-resistant *Enterobacteriaceae* (CRE) control practices, including surveillance cultures of epidemiologically linked contacts, identified likely transmission to one other patient on the same ward of the U.S. hospital. Additional control measures were applied and additional surveillance and clinical cultures have not identified further transmission.

What are the implications for public health practice?

An aggressive approach to control of CRE, including highly transmissible carbapenemase-producing organisms, is essential to slow the spread of these organisms in the United States. In an outbreak, use of surveillance cultures to identify asymptomatic transmission potentially is an important part of these efforts.

* Point prevalence studies have found high levels of colonization of CRE containing NDM in the Indian subcontinent.

identify only a fraction of cases. Screening cultures of contacts are important during an outbreak. Surveillance cultures might be used in acute-care or long-term–care facilities that admit few patients colonized or infected with such microbes to alert infection control staff members to implement aggressive containment strategies, as noted in the updated CDC guidance.† As described in this report, point-prevalence surveys can identify patients colonized with CRE. Identifying CRE at the facility level and reporting to state departments of health should trigger regional efforts to enhance detection and control of such multiresistant microbes. The continued global emergence of NDM and the manner in which it has become endemic in some regions highlights the importance of preventing the spread of NDM (*2–4,6,7*). Robust local, regional, and national detection and control efforts will be required to do so.

† Available at http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html.

Acknowledgments

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Update to CDC's *U.S. Medical Eligibility Criteria for Contraceptive Use, 2010*: Revised Recommendations for the Use of Hormonal Contraception Among Women at High Risk for HIV Infection or Infected with HIV

Prevention of unintended pregnancy among women at risk for human immunodeficiency virus (HIV) infection or infected with HIV is critically important. One strategy for preventing unintended pregnancies in this population is improving access to a broad range of effective contraceptive methods. In 2010, CDC published *U.S. Medical Eligibility Criteria for Contraceptive Use, 2010* (US MEC), providing evidence-based guidance for the safe use of contraceptive methods among women with certain characteristics or medical conditions, including women who are at high risk for HIV infection or are HIV infected (*1*). Recently, CDC assessed the evidence regarding hormonal contraceptive use and the risk for HIV acquisition, transmission, and disease progression. This report summarizes that assessment and the resulting updated guidance. These updated recommendations affirm the previous guidance, which stated that 1) the use of hormonal contraceptives, including combined hormonal contraceptives, progestin-only pills, depot medroxyprogesterone acetate (DMPA), and implants, is safe for women at high risk for HIV infection or infected with HIV (US MEC category 1), and 2) all women who use contraceptive methods other than condoms should be counseled regarding the use of condoms and the risk for sexually transmitted infections (*1*). However, a clarification is added to the recommendation for women at high risk for HIV infection who use progestin-only injectables to acknowledge the inconclusive nature of the body of evidence regarding the association between progestin-only injectable use and HIV acquisition. The clarification also notes the importance of condom use and other HIV preventive measures, expansion of the variety of contraceptive methods available (i.e., contraceptive method mix), and the need for further research on these issues.

Background

Half of all pregnancies in the United States are unintended, and those pregnancies are at increased risk for adverse maternal and infant outcomes (*2,3*). Approximately 4 million women at risk for unintended pregnancy in the United States are not using contraception (*4*), demonstrating the need for increased contraceptive access and use. HIV infection also is a critical public health issue in the United States. In 2010, an estimated 10,000 new HIV infections occurred among U.S. women.* One in 139 women will be diagnosed with HIV during her lifetime.† Pregnancy itself carries risks, including morbidity, mortality, and a possible increased risk for HIV infection (*5–7*). Pregnancies among HIV-infected women confer additional risks including the risk for mother-to-child transmission of HIV; therefore, the need for contraceptive use to avoid unintended pregnancy in sexually active HIV-infected women is important.

Some recent studies have suggested that women using progestin-only injectables (primarily DMPA) or combined oral contraceptives might have an increased risk for HIV acquisition and transmission to noninfected partners, whereas others studies have not found these associations (*8*). Animal and laboratory studies have assessed potential mechanisms by which hormonal contraception might influence risk for HIV acquisition, transmission, and disease progression, including effects on the vaginal epithelium and other changes in the genital tract, as well as alteration of local and systemic immune responses (*8*). However, the clinical relevance of these mechanisms in humans remains unclear (*8*). Therefore, evaluation was needed of the published studies on hormonal contraception and HIV acquisition among women at high risk for HIV infection, as well as HIV disease progression and HIV transmission to noninfected male partners among women living with HIV.

Rationale and Methods

Published by CDC in 2010, US MEC was adapted from *Medical Eligibility Criteria for Contraceptive Use,*§ published by the World Health Organization (WHO), which has been publishing global evidence-based contraceptive guidance since 1996. Recommendations are provided using categories 1 to 4; 1 represents a method that is safe to use without restriction and 4 represents an unacceptable health risk (Table). CDC is committed to ensuring that these recommendations remain up-to-date and based on the best available scientific evidence. An update can be triggered either by identification of new evidence or by any evidence-based updates made to the WHO global guidance. In February 2012, based on new evidence, WHO affirmed its previous guidance on the safety of hormonal contraceptives among women at high risk for HIV infection and those living with HIV infection and clarified

* Additional information available at http://www.cdc.gov/hiv/topics/surveillance/resources/reports.

† Additional information available at http://www.cdc.gov/hiv/topics/women/index.htm.

§ Available at http://www.who.int/reproductivehealth/publications/family_planning/9789241563888/en.

TABLE. Recommendations for contraceptive use by women who are at high risk for human immunodeficiency virus (HIV) infection, or who have HIV infection, or who have acquired immunodeficiency syndrome (AIDS) — United States, 2012

Condition	Category*				Clarifications/Evidence
	COC/P/R	POP	DMPA	Implants	
High risk for HIV	1	1	1†	1	**Clarification:** Some studies suggest that women using progestin-only injectable contraception might be at increased risk for HIV acquisition; other studies do not show this association. CDC reviewed all available evidence and agreed that the data were not sufficiently conclusive to change current guidance. However, because of the inconclusive nature of the body of evidence on possible increased risk for HIV acquisition, women using progestin-only injectable contraception should be strongly advised to also always use condoms (male or female) and take other HIV preventive measures. Expansion of contraceptive method mix and further research on the relationship between hormonal contraception and HIV infection are essential. These recommendations will be continually reviewed in light of new evidence. **Evidence:** Prospective studies have assessed the risk for HIV acquisition among HIV-negative women using different hormonal contraceptives. Most found no statistically significant association between use of oral contraceptive pills and HIV acquisition, except one study among sex workers in Kenya, which just reached statistical significance. Studies evaluating an association between use of DMPA or nonspecified injectables and HIV acquisition showed inconsistent results and are limited by methodological problems. Because of the inconsistency of the body of evidence, available data do not establish a clear causal association with HIV acquisition, nor is the possibility of an association definitively ruled out.§
HIV infection¶	1†	1†	1†	1†	**Clarification:** Drug interactions might exist between hormonal contraceptives and antiretroviral drugs; refer to the section on drug interactions. **Evidence:** Most studies suggest no association between use of hormonal contraception and progression of HIV, as measured by CD4+ count <200 cells/mm^3, initiation of antiretroviral therapy, or mortality. One randomized controlled trial found an increased risk for a composite outcome of declining CD4+ count or death among hormonal contraceptive users when compared with copper intrauterine device users; however, this study had significant loss to follow-up and method switching among groups, limiting its interpretation. One prospective observational study directly assessed the effect of hormonal contraception on female-to-male HIV transmission by measuring seroconversions in male partners of women with known hormonal contraceptive use status. This study reported a statistically significant association between injectable contraception and female-to-male transmission of HIV. This study had several strengths, including statistical adjustment for multiple potential confounders, low loss to follow-up and frequent follow-up visits, large size of the population studied, genetic linkage of HIV transmissions, and measurement of genital viral shedding. However, the limitations included the potential for residual confounding in observational data, uncertainty regarding whether the genital shedding data bolster the main findings, and the limited statistical power given small numbers of new HIV infections in men. Studies assessing the effect of hormonal contraception on genital viral shedding have been mixed, and studies overall found no association between hormonal contraceptive use and plasma HIV viral load. Thus, direct evidence is extremely limited. Indirect evidence on genital shedding is inconsistent, and indirect evidence on plasma viral load is largely reassuring. Available data do not establish a clear causal association with female-to-male HIV transmission, nor is the possibility of an association definitively ruled out.§
AIDS¶	1†	1†	1†	1†	**Clarification**: Drug interactions might exist between hormonal contraceptives and antiretroviral drugs; refer to the section on drug interactions.

Abbreviations: COC = combined oral contraceptives; P = combined hormonal patch; R = combined vaginal ring; POP = progestin-only pills; DMPA = depot medroxyprogesterone acetate.

* Categories: 1 = A condition for which there is no restriction for the use of the contraceptive method; 2 = A condition where the advantages of using the method generally outweigh the theoretical or proven risks; 3 = A condition where the theoretical or proven risks usually outweigh the advantages of using the method; 4 = A condition that poses an unacceptable health risk if the contraceptive method is used.

† Please consult the clarification to this classification.

§ Source: World Health Organization. Hormonal contraception and HIV. Geneva, Switzerland: World Health Organization; 2012. Available at http://www.who.int/reproductivehealth/topics/family_planning/hc_hiv/en/index.html.

¶ Condition that exposes a woman to increased risk as a result of unintended pregnancy.

its recommendation on the use of progestin-only injectables by women at high risk for HIV infection (*8*). Because of this update, CDC initiated a process to assess whether its guidance should be updated similarly.

Three systematic reviews conducted for WHO have summarized published evidence regarding the use of hormonal contraception and the risk for HIV acquisition, transmission, and disease progression and were considered during CDC's review of the evidence and the WHO recommendations (*8*).¶ With regard to the question about hormonal contraceptive use

¶ The full list of references included in the systematic reviews is available at http://www.cdc.gov/reproductivehealth/unintendedpregnancy/usmec.htm.

and risk for HIV acquisition among HIV-negative women, 20 observational studies were identified (*8*). Among these studies, as well as a subset of higher-quality studies, most found no significant association between oral contraceptive use and HIV acquisition. Among studies that assessed use of injectables, including DMPA and norethisterone enanthate (NET-EN), evidence was equivocal, with some studies finding a statistically significant increase in risk for HIV acquisition, whereas others did not. All of the studies had limitations that affect the interpretation of these data, and concerns remain regarding the potential for residual confounding, especially around differential condom use, even in the subset of higher quality studies. Overall, the evidence does not suggest an association between oral contraceptive use and risk for HIV acquisition. Evidence on injectable use does not establish a causal association with HIV acquisition, nor does it definitively rule out the possibility of an effect (*8*).

With regard to hormonal contraceptive use among HIV-positive women and risk for female-to-male HIV transmission, one observational study provided direct evidence (*8*). The study showed a significant increased risk for transmission with use of injectables, but not oral contraceptives, as compared with no hormonal contraceptive use. This study also observed increased genital HIV-1 RNA among injectable users, but not oral contraceptive users. The systematic review noted several strengths of this study, including statistical adjustment for confounders, high retention rate and frequent follow-up visits, large study population, genetic linkage of HIV transmissions, and measurement of genital viral shedding. The study also discussed several limitations, such as the potential for residual confounding particularly with regard to condom use, uncertainty about whether the amount of genital shedding detected among the injectable users was consistent with the observed increase in transmission risk, and limited statistical power because of the small number of new HIV infections among men (*8*). Several studies that provided indirect evidence assessed outcomes among users of hormonal contraceptives such as changes in genital viral shedding or plasma viral load (*8*). The studies of genital viral shedding had mixed results, whereas studies assessing plasma viral load generally showed no adverse effects. Many of the studies had methodological weaknesses, and the implications for HIV infectivity are unclear. Given the limited direct data on this question, more evidence is needed (*8*).

None of the 10 observational studies that examined hormonal contraceptive use and risk for HIV disease progression (as measured by mortality, progression to acquired immunodeficiency syndrome [AIDS], increased viral load, or decreased CD4 count) observed statistically significant associations (*8*). One randomized controlled trial showed an increased risk for disease progression among women using hormonal contraceptives as compared with women using copper intrauterine devices; however, the study was subject to high rates of method switching and loss to follow-up (*8*). Overall, this evidence is reassuring and does not suggest an increased risk for HIV disease progression with hormonal contraceptive use (*8*).

CDC invited seven participants from outside the agency and two participants from inside the agency to serve as ad hoc reviewers of the evidence and the WHO revised recommendations. The reviewers were selected based on their expertise in HIV infection or family planning. The reviewers participated in a March 2012 teleconference with CDC during which they reviewed and discussed the scientific evidence base, as well as information on unintended pregnancy, contraceptive use, HIV infection, and maternal risk in the United States. Finally, the reviewers provided their individual perspectives regarding whether WHO's revised recommendations were suitable for use in the United States. The reviewers considered the evidence, the conclusions from the WHO consultation, and how the WHO recommendations might apply to the United States. Although acknowledging that the United States context differs from the global context in a number of ways (e.g., lower HIV incidence and prevalence; greater access to health-care services, including contraceptive methods, antiretroviral therapy, and HIV testing and counseling; and lower pregnancy-related risks), the individual reviewers strongly and consistently favored adopting the WHO revised recommendations.

Recommendations for the Use of Hormonal Contraceptives in Women at High Risk for HIV Infection or Infected with HIV

CDC affirmed the previous recommendations, which stated that 1) the use of hormonal contraceptives, including combined hormonal contraceptives, progestin-only pills, DMPA, and implants, is safe for women at high risk for HIV infection or infected with HIV (US MEC category 1) and 2) all women who use contraceptive methods other than condoms should be counseled about the use of condoms and the risk for sexually transmitted infections (*1*). However, consistent with WHO, CDC added a clarification for women at high risk for HIV infection using progestin-only injectables, which highlights the inconclusive nature of the evidence around hormonal contraceptive use and risk for HIV acquisition among women, and strongly encourages condom use and other measures to prevent HIV (Table).

In addition, the previous US MEC guidance included a clarification for the recommendations on hormonal contraceptive methods for women with AIDS regarding the potential for drug interactions between hormonal contraceptives and antiretroviral (ARV) drugs. However, current guidance from

the U.S. Department of Health and Human Services recommends that many patients with HIV infection should also take ARV drugs, including any patient with a CD4 count ≤500 cells/mm^3.** Therefore, CDC has added this clarification regarding potential drug interactions between hormonal contraception and ARV drugs to the recommendations for women with HIV (Table).

Contraception is critically important to prevent unintended pregnancy among women at risk for HIV infection or infected with HIV and such women can continue to use all hormonal contraceptive methods without restriction. However, HIV infection preventive measures, such as voluntary testing and counseling, access and adherence to ARV drugs, and correct and consistent use of condoms, should be strongly encouraged among all women at risk for HIV acquisition and women living with HIV infection. Additional information is available at http://www.cdc.gov/reproductivehealth/unintendedpregnancy/usmec.htm.

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** Additional information available at http://www.aidsinfo.nih.gov/contentfiles/adultandadolescentgl.pdf.

Acknowledgments

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Erratum

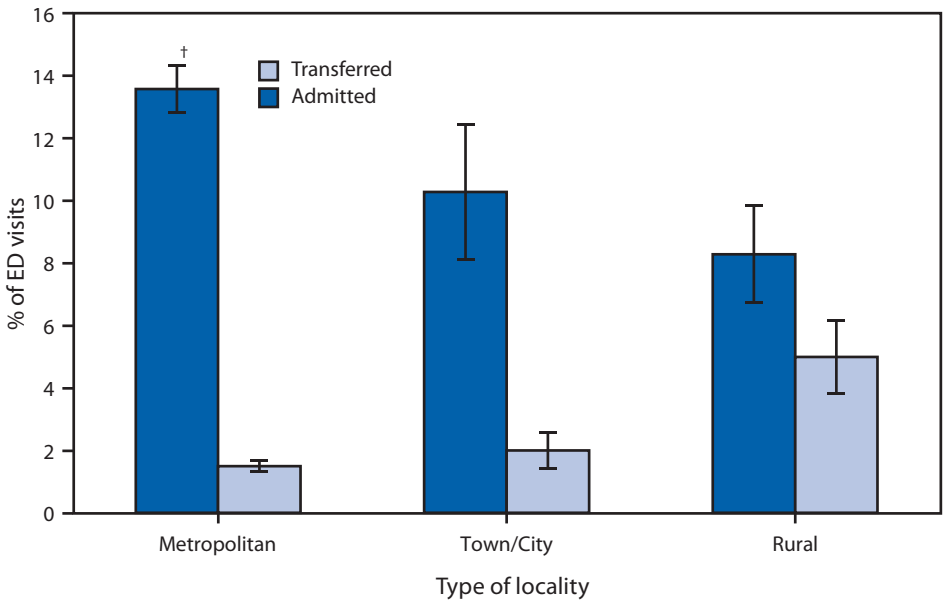
Vol. 61, No. 20

In the cover box, "World No Tobacco Day — May 31, 2012," on page 365, in the third paragraph, the last sentence should read as follows: **By achieving a modest decline in smoking prevalence worldwide (from 25% to 20%) through further use of tobacco control measures, 100 million deaths can be prevented by 2020 (*4*).**

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Hospital Admission after Emergency Department (ED) Visits, by Type of Locality — United States, 2007–2009*



* Percentages are based on 3-year annual averages.
† 95% confidence interval.

During 2007–2009, ED visits in rural areas were least likely (8.3%) and visits in metropolitan areas were most likely (13.6%) to result in admission to the hospital associated with the ED. The percentage of ED visits that resulted in transferring the patient to another hospital was highest among rural hospitals (5.0%) compared with hospitals in metropolitan areas (1.5%) and in towns (2.0%).

Source: National Hospital Ambulatory Medical Care Survey. Emergency department visit files. Available at http://www.cdc.gov/nchs/ahcd/ahcd_questionnaires.htm.

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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.

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U.S. Government Printing Office: 2012-523-043/02017 Region IV ISSN: 0149-2195